



**UPGRIS**

Universitas Persatuan Guru Republik Indonesia Semarang

# MODULE HANDBOOK

Faculty of Mathematics, Natural  
Sciences, and Information  
Technology Education

Bachelor of Biology Education



2025



**MODULE HANDBOOK**  
**BACHELOR OF BIOLOGY EDUCATION STUDY PROGRAM (S1)**  
**FACULTY OF MATHEMATICS, SCIENCE AND TECHNOLOGY INFORMATION**  
**EDUCATION**

**UNIVERSITAS PERSATUAN GURU REPUBLIK INDONESIA SEMARANG**  
**Jl. Sidodadi Timur No. 24, Dr. Cipto, Semarang,**  
**Central Java 50125**  
**2025**



## **MODULE HANDBOOK**

### **Biology Education Study Programme (Bachelor's Degree)**

**Semarang, December 2025**

Name of Team Leader : Praptining Rahayu, S.Si., M.Pd.  
NPP/ NIDN : 078302172/0607098303  
Programme : Biology Education Study Program (Bachelor's Degree)  
Faculty : Mathematics, Science and Technology Information  
Education

Universitas Persatuan Guru Republik Indonesia Semarang, 2025

|                                                                                   |                                                                                                                                                      |                      |                                            |                                                                                       |                                |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------|
|  | <b>UNIVERSITAS PERSATUAN GURU<br/>REPUBLIK INDONESIA<br/>SEMARANG</b><br>Sidodadi Timur Street No. 24, Dr.<br>Cipto, Semarang,<br>Central Java 50125 |                      | <b>Number:<br/>001.A/PB/FMIPA/XII/2025</b> |                                                                                       |                                |
|                                                                                   | <b>Module Handbook</b>                                                                                                                               |                      | <b>Revision : 00</b>                       |                                                                                       |                                |
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| <b>Process</b>                                                                    | <b>Responsible</b>                                                                                                                                   |                      |                                            |                                                                                       |                                |
|                                                                                   | <b>Name</b>                                                                                                                                          | <b>NPP/NIDN</b>      | <b>Position</b>                            | <b>Signature</b>                                                                      | <b>Date</b>                    |
| Drafting                                                                          | Dr. Azizul Ghofar Candra W.,M.Pd.                                                                                                                    | 158901481/0616108901 | Team Leader Module Handboo k               |    | Decemb er 8 <sup>th</sup> 2025 |
|                                                                                   | Dr. Prasetyo, M.Pd.                                                                                                                                  | 098401250/0602038401 | Team Member Module Handboo k               |    | Decemb er 8 <sup>th</sup> 2025 |
|                                                                                   | Ipah Budi Minarti, S.Pd.,M.Pd .                                                                                                                      | 138801413/0620058801 | Team Member Module Handboo k               |  | Decemb er 8 <sup>th</sup> 2025 |
| Examinati on                                                                      | Rivanna Citraning Rachmawa ti, S.Si.,M.Pd.                                                                                                           | 098101248/0621118101 | Secretary of the Program me                |  | Decemb er 8 <sup>th</sup> 2025 |
| Approval                                                                          | Praptining Rahayu, S.Si.,M.Pd.                                                                                                                       | 078302172/0607098303 | Program me Coordinat or                    |  | Decemb er 8 <sup>th</sup> 2025 |
| Enactme nt                                                                        | Dr. Supandi, M.Si.                                                                                                                                   | 097401245/0621067401 | Dean of the Faculty                        |  | Decemb er 8 <sup>th</sup> 2025 |



# Approval of the Module Handbook

## for the Biology Education Study Programme (Bachelor's Degree)

- |                          |                                                             |
|--------------------------|-------------------------------------------------------------|
| 1. Higher Education      | : Universitas Persatuan Guru Republik Indonesia Semarang    |
| 2. Faculty               | : Mathematics, Science and Technology Information Education |
| 3. Programme             | : Biology Education                                         |
| 4. Address               | : Jl. Sidodadi Timur, No.24, Dr. Cipto, Semarang            |
| 5. Programme Coordinator |                                                             |
| a. Name                  | : Praptining Rahayu, S.Si.,M.Pd.                            |
| b. NPP/ NIDN             | : 078302172/0607098303                                      |
| c. Office Address        | : Jl. Sidodadi Timur, No.24, Dr. Cipto, Semarang            |
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Dean,



Dr. Supandi, M.Si.  
NPP. 097401245

Programme Coordinator,

Praptining Rahayu, Si.,M.Pd.  
NPP. 078302172

## Programme Identity

| No | Name of Higher Education Institution (HEI) | Universitas Persatuan Guru Republik Indonesia Semarang                                        |
|----|--------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1  | Faculty                                    | Mathematics, Science and Technology Information Education                                     |
| 2  | Study Programme                            | Biology Education (Bachelor's Degree)                                                         |
| 3  | Accreditation Rating/ Predicate            | Excellent                                                                                     |
| 4  | Number of Students                         | 129                                                                                           |
| 5  | Number of Lectures                         | 20                                                                                            |
| 6  | Programme Address                          | Jl. Sidodadi Timur No. 24, Dr. Cipto, Semarang                                                |
| 7  | Telephone                                  | (024) 8316377                                                                                 |
| 8  | Programme Website                          | <a href="https://pendidikanbiologi.upgris.ac.id/">https://pendidikanbiologi.upgris.ac.id/</a> |

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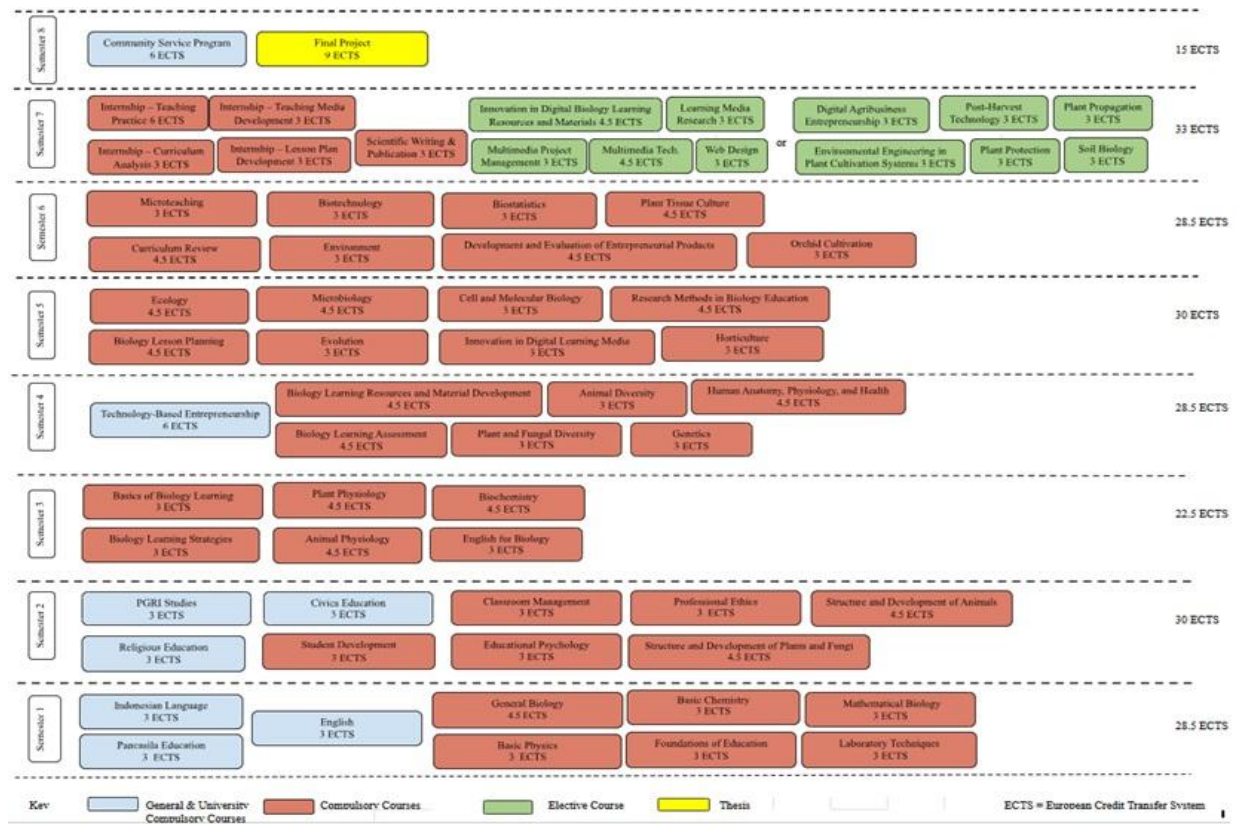
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## Overview

| No |                           | Credit point  | Semester     |              |              |              |              |              |              |              |
|----|---------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|    |                           |               | 1            | 2            | 3            | 4            | 5            | 6            | 7            | 8            |
| 1  | University course         | 30.00         | 9            | 9            | 0            | 6            | 0            | 0            | 0            | 6            |
| 2  | Compulsory course         | 162.00        | 19.5         | 21           | 22.5         | 22.5         | 30           | 28.5         | 18           | 0            |
| 3  | Elective course           | 15.00         | 0            | 0            | 0            | 0            | 0            | 0            | 15           | 0            |
| 4  | Final Project             | 9.00          | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 9            |
|    | <b>Total per Semester</b> | <b>216.00</b> | <b>28.50</b> | <b>30.00</b> | <b>22.50</b> | <b>28.50</b> | <b>30.00</b> | <b>28.50</b> | <b>33.00</b> | <b>15.00</b> |



**1st Semester**  
**Odd 2025/2026**

### Pancasila Education

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           |                                          |                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121607                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Pancasila Education |                                          |                                                                                                                                                                                                                                                                                                                                |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           | <b>Semester / Rotation</b><br>1 / Odd    | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                 |
| <b>Teaching Methods</b><br>Lectures, Discussions,<br>Cased-Based Learning,<br>Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                             |
| <b>Type of examination (Final Grade Composition)</b><br>1. Mid-term Exam (20%) 100 Minutes<br>2. Final Exam (20%) 100 Minutes<br>3. Case Report (35%).<br>4. Discussion (10%)<br>5. Presentation (15%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Rahmat Sudrajat, S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |                                          | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                         |
| <b>Additional teacher involved:</b><br>1. Dr. Agus Sutono, S.Fil., M.Phil.<br>2. Fuad Noorzeha, S.Fil.I., M.Phil.<br>3. Andhika Nanda P., S.Pd., M.Pd.<br>4. Drs. Kiswoyo, M.M.<br>5. Dr. Rosalina Br. Ginting, M.Si.<br>6. Dr. Sri Suneki, M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                                          |                                                                                                                                                                                                                                                                                                                                |
| <b>Syllabus</b><br><b>The Objective</b> of this course is to provide students with an understanding and appreciation of Pancasila as the ideology and foundation of the Republic of Indonesia. It also guides students to examine, analyse, and solve national and state development issues based on Pancasila values. <b>The Competencies</b> expected from this course include students' ability to understand the historical foundation of Pancasila Education, explain Pancasila as a worldview and ethical system, actualise its values in social, national, and state life, correlate religion, state, and Pancasila, compare religious law and state law, explain Pancasila as the value foundation for the development of knowledge, analyse its role in |                                           |                                          |                                                                                                                                                                                                                                                                                                                                |

strengthening the unity of the Republic of Indonesia, and compose a scientific article based on case studies in the 4A context: anti-bullying, anti-sexual violence, anti-corruption, and anti-intolerance. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The Materials** covered in this course include the history and urgency of Pancasila Education, Pancasila as a worldview and ethical system, Pancasila values in civic life, religion-state-Pancasila relations, Pancasila as the foundation for scientific development and national unity, 4A-based case studies, and scientific article writing.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an ethical attitude as the implementation of Pancasila values in determining the foundation of state policies. (A4)
2. CLO 2: Demonstrate the conceptual foundation of Pancasila as a philosophical system and national ideology within the context of the 1945 Constitution and the foundation of the state. (C3)
3. CLO 3: Actualize the values of Pancasila by correlating them with the 5A values (anti-corruption, anti-intolerance, anti-bullying, anti-sexual violence, and anti-drugs) within Indonesia's legal foundation. (C4, A5)
4. CLO 4: Be responsible for developing Pancasila as a field of knowledge. (A5, C6)

### **Core readings:**

1. Dewantara, J. A., Hermawan, Y., Yunus, D., Prasetyo, W. H., Efriani, E., Arifiyanti, F., & Nurgiansah, T. H. (2024). Anti-corruption education as an effort to form students with character humanist and lawcompliant. *Jurnal Civics: Media Kajian Kewarganegaraan*, 18(1), 70-81.
2. Sutono, A., Noorzeha, F., & Purwosaputro, S. (2025). Konsep Negara Integral Soepomo dan Relevansinya pada Penerapan Konstitusi di Indonesia Tahun 2024. *PACIVIC: Jurnal Pendidikan Pancasila dan Kewarganegaraan*, 5(1), 30-46.
3. Noorzeha, F., & Maharani, S. D. (2024). Aktualisasi Pancasila sebagai Upaya Penghayatan Humanis: Relevansinya pada Reklamasi dan Relokasi Berdasarkan UU Pembangunan Nasional. *Jurnal Hukum Agama Hindu Widya Kerta*, 7(1), 33-46.
4. Arifin, S., Kusumah, M. A., Melati, H., Yusrifal, S. A., & Faradisha, R. Z. (2023). The importance of pancasila education as learning material in higher education. *NURTURE: Indonesian Journal of Educational Science and Technology*, 2(2), 207-214.
5. Rosyad, A. M., & Mahamood, S. F. (2025). A Systematic Literature Review of Pancasila Education in Higher Education: Trends, Pedagogical Innovations, and Learner Competencies. *International Journal of Science Education and Cultural Studies*, 4(2), 28-46.
6. Sudrajat, T. (2021). The role of higher education in implementing pancasila

education MKWU policy for national character development. In Social, Humanities, and Educational Studies (SHES): Conference Series (Vol. 4, No. 4, pp. 53-62).

7. Zulhilmi, F., & Sudrajat, R. (2023). Aktualisasi nilai-nilai Pancasila melalui kesenian Jaran Kepang di Desa Gilingsari Temanggung. *Spirit Edukasia: Journal of Social Science Education and Sports*, 3(1).

## English

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225221610                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Module name</b><br>English            |                                                                                                                                                                                                                                                                                                                                |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Semester / Rotation</b><br>1/ Odd     | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                 |
| <b>Teaching methods</b><br>Lectures, discussions, presentations, case-based learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (20%)</li> <li>2. Assignment (5%)</li> <li>3. Quiz (5%)</li> <li>4. Case report (25%)</li> <li>5. Presentation (20%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (15%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. AB Prabowo K.A., S.Pd., M.Hum.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                         |
| <b>Additional teacher involved</b> <ol style="list-style-type: none"> <li>1. Ajeng Setyorini, S.S., M.Pd.</li> <li>2. Dr. Dias Andris Susanto, S.Pd., M.Pd.</li> <li>3. Dr. Dyah Nugrahani, S.Pd., M.Hum.</li> <li>4. Entika Fani Prastikawati, S.Pd., M.Pd.</li> <li>5. Faiza Hawa, S.Pd., M.Hum.</li> <li>6. Fitri Yulianti, S.Pd., M.Pd.</li> <li>7. Indri Kustantinah, S.S., M.Hum.</li> <li>8. Dr. Jafar Sodik, S.Pd., M.Pd.</li> <li>9. Dra. Maria Yosephin W.L., M.Pd.</li> <li>10. Ririn Ambarini, S.Pd., M.Hum.</li> <li>11. R.R. Festi Himatu Karima, S.S., M.Hum.</li> <li>12. Siti Musarokah, S.Pd., M.Hum.</li> <li>13. Siti Nur'Aini, S.Pd., M.Hum., Ph.D.</li> <li>14. Sri Wahyuni, S.Pd., M.Pd.</li> <li>15. Dr. Sukma Nur Ardini, S.S., M.Pd.</li> <li>16. Theresia Cicik Sophia B., S.S., M.Pd.</li> </ol> |                                          |                                                                                                                                                                                                                                                                                                                                |
| <b>Syllabus/ Description of what will be done</b><br><b>The objective</b> of this module is to introduce undergraduate students to General Academic English and strengthen their basic grammatical competence and written communication skills for academic contexts. <b>The competencies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                                                                                                                                                                                                                                                                                                                |

achieved by students include the ability to understand and apply essential English tenses, analyse simple academic texts, and write simple academic texts accurately and coherently through guided practice, text analysis, and project-based tasks. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this module include the Simple Present, Continuous, Simple Past, Simple Future, and Simple Present Perfect tenses, as well as descriptive, procedure, and recount texts.

### **Learning goals and qualifications**

Upon completing this module, students are able to:

1. CLO 1: Demonstrate enthusiasm and adaptability in communicating in English. (A4)
2. CLO 2: Analyse the theoretical concepts of tenses and specific text types used in academic writing in English based on the 5A values. (C4)
3. CLO 3: Apply the theoretical concepts of various tenses and specific text types and use them correctly in academic writing in English based on the 5A values. (C3)

### **Core readings:**

1. Sudiran, S. & Prabowo, A. B. K. A., (2023). An analysis of students' competence in writing abstracts. *ETERNAL: English Teaching Journal*, 14(2), 177–186.
2. Wulandari, W., Susanto, D. A., & Hawa, F. (2024). Exploring Bamboozle as games-based learning media to support students' vocabulary: Its application in the classroom. *Innovative: Journal of Social Science Research*, 4(2), 6542–6551.
3. Takrim, M., & Mikkael, R. H. (2020). Pengaruh kompetensi dosen, motivasi, dan lingkungan belajar terhadap prestasi belajar mahasiswa pada mata kuliah Bahasa Inggris. *Economics and Digital Business Review*, 1(2), 90–101.
4. Susanto, D. A., Setyorini, A., & Priyolistiyanto, A. (2026). Cross-Cultural Classroom Discourse in English Language Education: A Comparative Exploration of Pedagogical Practices at (UPGRIS) Indonesia and (NRRU) Thailand. In 8th International Conference on Education and Social Science Research (ICESRE 2025) (pp. 297-313). Atlantis Press.
5. Palupi, R. E. A., Purwanto, B., & Sutriyono, S. (2022). Analisis kecemasan pada proses keterampilan berbicara peserta didik tingkat I pada mata kuliah Bahasa Inggris. *Jurnal Dimensi Pendidikan dan Pembelajaran*, 10(2), 138-145.
6. Aldizeeri, M., Nur'Aini, S., & Susanto, D. A. (2023). Investigating communicative language teaching barriers for English students in higher education. *VELES: Voices of English Language Education Society*, 7(2), 348–360.

## Indonesian language

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                                          |                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121609                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Module name</b><br>Indonesian language |                                          |                                                                                                                                                                                                                                                                                                                             |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           | <b>Semester / Rotation</b><br>1 / Odd    | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                              |
| <b>Teaching Methods</b><br>Lectures, Discussions,<br>Case-Based Learning,<br>Presentations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                          |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignment (10%)<br>2. Case report (30%)<br>3. Discussion (10%)<br>4. Presentation (15%)<br>5. Quiz (5%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (20%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                   |                                           |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Icuk Prayogi, S.S., MA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |                                          | <b>Semester week hours:</b> 90                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b><br>1. Hadi Riwayati Utami, M.Hum.<br>2. Azzah Nayla, S.Pd., M.Pd.<br>3. Muhajir, S.Pd., M.Hum.<br>4. Mukhlis, S.Pd., M.Pd.<br>5. Murywantobroto, Drs., M.Hum.<br>6. Nanik Setyawati, S.S., M.Hum.<br>7. Rawinda Fitrotul Mualafina, S.S., M.A.<br>8. Siti Fatimah, Dr., S.S., M.Pd.<br>9. Siti Ulfiyani, S.Pd., M.Pd.<br>10. Suyoto, Drs., M.Pd.<br>11. Zainal Arifin, S.Pd., M.Hum.                                                                                                                                                                       |                                           |                                          |                                                                                                                                                                                                                                                                                                                             |
| <b>Syllabus</b><br><b>The objective</b> of this course is to enhance students' academic literacy and professional communication skills in Indonesian within higher education and professional contexts while fostering integrity and ethical language use. <b>The competencies</b> achieved by students include the ability to apply knowledge of the history, grammar, writing standards, and ethics of the Indonesian language in solving academic and professional communication problems; develop critical reading, academic writing, and scholarly communication skills; explore academic |                                           |                                          |                                                                                                                                                                                                                                                                                                                             |

texts and scholarly resources to strengthen literacy and critical thinking; produce various forms of academic texts and presentations relevant to their discipline; apply clarity, coherence, referencing practices, and academic integrity; and improve communication skills through writing workshops, peer review activities, and reflective discussions. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the nature of Indonesian as the national and state language, its role as a vehicle for knowledge development and academic discourse, academic library research, proposal design for research and community projects, scientific reporting, and academic article writing.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate high integrity in studying the principles of the Indonesian language (A5)
2. CLO 2: Implement knowledge of the history of the Indonesian language, its grammar, writing standards, and writing ethics in solving problems (C3)
3. CLO 3: Analyze the concepts and intricacies related to the knowledge of the history of the Indonesian language, grammar, writing standards, and writing ethics to solve problems in the context of proper and correct language use aligned with the 5A values (C4)

### **Core readings:**

1. Badan Pengembangan dan Pembinaan Bahasa. (2022). Pedoman umum ejaan bahasa Indonesia (PUEBI) edisi terbaru. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.
2. Prayogi, I., & Oktavianti, I. N. (2025). Kesalahan Penulisan Kata-Kata Momentum dalam Bahasa Indonesia: Studi Berbasis Korpus. *ESTETIK: Jurnal Bahasa Indonesia*, 8(1), 86-113. <https://doi.org/10.29240/estetik.v8i1.11613>.
3. Putro, R. W. S., & Supriyono, A. Y. (2025). Bahasa Indonesia sebagai instrumen integrasi sosial dan budaya: Perspektif sejarah dan pendidikan. *Innovative: Journal Of Social Science Research*, 5(3), 2437-2453.
4. Rawinda, R. (2024). A Phenomenological Analysis of Indonesian Primary School Teachers' Experiences with Post-Classroom Observation Feedback.
5. Utami, H. R., Sumardiyani, L., Zahraini, D. A., & Ambarini, R. (2025). Addressing the gap between language literacy and physical education: A bilingual Socratic play-based inquiry model for vocabulary and grammar development. *Jurnal Penelitian Multidisiplin Bangsa*, 2(7), 1199–1210. <https://doi.org/10.59837/jpnmb.v2i7.656>
6. Williams, J., & Cui, G. (2005). Teaching writing in second and foreign language classrooms. New York: McGraw-Hill.

## Mathematical Biology

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225321645                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Module name</b><br>Mathematical Biology  |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Semester / Rotation</b><br>1 / Odd       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods :</b><br>Lectures, Discussions,<br>Presentations, Case-based<br>Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Prerequisites for attendance</b><br>None | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignment (10%)</li> <li>2. Quiz (5%)</li> <li>3. Mid-term exam (10%) 100 Minutes</li> <li>4. Final exam (20%) 100 Minutes</li> <li>5. Discussion (15%)</li> <li>6. Case report (20%)</li> <li>7. Presentation (20%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Prayito, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Farida Nursyahida, M.Pd.</li> <li>2. Sugiyanti, M.Pd.</li> <li>3. Rizky Esti Utami, M.Pd.</li> <li>4. Aurora Nur Aini, M.Sc.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                             |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>This course introduces</b> undergraduate students in the Biology Education programme to the fundamental concepts of Basic Mathematics, with <b>the objective</b> of equipping them with essential mathematical knowledge and skills required to understand biological phenomena and to support data analysis in biology learning contexts. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in performing algebraic operations, understanding equations and inequalities, examining functions and their graphs, applying exponents and logarithms, and using basic statistical concepts to interpret data related to biology and biology education. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online |                                             |                                                                                                                                                                                                                                                                                                                                    |

learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include algebraic operations, equations and inequalities, functions and graphs, exponents and logarithms, and basic statistics contextualised within biological and biology education applications.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate enthusiasm in examining the application of mathematics to understand aspects of life (A2)
2. CLO 2: Examine mathematical concepts to explain biological phenomena (C4)
3. CLO 3: Apply mathematical concepts to solve biological problems (C3)
4. CLO 4: Take responsibility for solving biological problems through the application of mathematical concepts (A3, P3)

**Core readings:**

1. Lorenzi, T., Painter, K. J., & Villa, C. (2025). Phenotype structuring in collective cell migration: a tutorial of mathematical models and methods. *Journal of Mathematical Biology*, 90(6), 61.
2. Narushin, V. G., Volkova, N. A., Dzhagaev, A. Y., Griffin, D. K., Romanov, M. N., & Zinovieva, N. A. (2025). Coupling artificial intelligence with proper mathematical algorithms to gain deeper insights into the biology of birds' eggs. *Animals*, 15(3), 292.
3. Anton, H., Bivens, I. C., & Davis, S. (2021). *Calculus: early transcendentals single variable*. John Wiley & Sons.
4. Diethelm, K., Kiryakova, V., Luchko, Y. *et al.* Trends, directions for further research, and some open problems of fractional calculus. *Nonlinear Dyn* 107, 3245–3270 (2022). <https://doi.org/10.1007/s11071-021-07158-9>.
5. Wulandari, D., Sutrisno, S., & Nirwana, M. B. (2021). Mardia's skewness and kurtosis for assessing normality assumption in multivariate regression. *Enthusiastic: International Journal of Applied Statistics and Data Science*, 1-6. <https://doi.org/10.20885/enthusiastic.vol1.iss1.art1>
6. Salah, J., Al Hashmi, M., Rehman, H. U., & Al Mashrafi, K. (2022). Modified mathematical models in biology by the means of Caputo derivative of a function with respect to another exponential function. *Mathem Statist*, 10(6), 1194-1205.
7. Buchori, A., Nursyahidah, F., Prasetyowati, D., & Osman, S. (2026). Developing a Trigonometry AR Book Using an Ethnomathematics Approach to Improve International Collage Students' Motivation and Learning Outcomes. *Advance Sustainable Science Engineering and Technology*, 8(1), 02601014-02601014.

## General Biology

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225331641                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Module name</b><br>General Biology    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Semester / Rotation</b><br>1 / Odd    | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Teaching Methods</b><br>Lectures, Discussions, Case-Based Learning, Guided Practicum, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Case report (15%)</li> <li>2. Practicum report (15%)</li> <li>3. Presentation (15%)</li> <li>4. Discussion (15%)</li> <li>5. Assignment (5%)</li> <li>6. Quiz (15%)</li> <li>7. Mid exam (10%) 150 Minutes</li> <li>8. Final exam (10%) 150 Minutes</li> </ol>                                                                                                                                                                                             |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Practice (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Practice (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Ipah Budi Minarti, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Fibria Kaswinarni, M.Si.</li> <li>2. Dr. Mei Sulistyoningsih, M.Si.</li> <li>3. Fibria Kaswinarni, S.Si., M.Si.</li> </ol>                                                                                                                                                                                                                                                                                                                                                  |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the fundamental concepts of Basic Biology, with <b>the objective</b> of providing a comprehensive understanding of biological principles that explain life processes from molecular to ecosystem levels. <b>Upon completion of the course, students are expected to demonstrate competencies</b> in explaining biological phenomena scientifically, explain relationships between structure and function in living organisms, interpret basic |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

biological data, and apply biological concepts to natural and environmental contexts. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials covered in this course** include the origin of life, physical and chemical phenomena underlying biological processes, cell structure and function, structure and function of plants and animals, metabolism, reproduction in plants and animals, biodiversity, genetics, and ecology. The course is delivered through a blended learning approach, combining face-to-face lectures and online learning activities facilitated via the institutional learning management system, enabling students to access learning resources, engage in discussions, complete assignments, and undertake formative assessments flexibly and independently. (Sistem Pembelajaran Daring) through SSO SIMEKAR [simekar.upgris.ac.id](https://simekar.upgris.ac.id).

### Learning goals and Qualifications

In this module students learn to:

1. CLO 1: demonstrate an enthusiastic character in applying the fundamental concepts of biology and their applications (A2)
2. CLO 2: explain the fundamental concepts of biology, the scientific method, the origin of life, physical and chemical phenomena, cells, plant structure and function, animal structure and function, metabolism, classification of living organisms, genetics, evolution, and ecology (C2)
3. CLO 3: apply logical, critical, and innovative thinking in learning the fundamental concepts of biology, the scientific method, the origin of life, physical and chemical phenomena, cells, plant structure and function, animal structure and function, metabolism, classification of living organisms, genetics, evolution, and ecology (C3, P3)
4. CLO 4: apply fundamental biological concepts and utilize science and technology in their field to solve problems, while demonstrating adaptability to diverse situations (C3, A3)
5. CLO 5: apply problem solving in biology and biology education, both independently and collaboratively, while internalizing entrepreneurial values (C3, A3)

### Core readings:

1. Momsen, J. L., Long, T. M., Wyse, S. A., & Ebert-May, D. (2021). Just the facts? Introductory undergraduate biology courses focus on low-level cognitive skills. *CBE Life Sciences Education*, 20(1), ar6.
2. Shen, Z., Tian, Y., Yao, Y., Jiang, W., Dong, J., Huang, X., Wu X., Farooq TH & Yan, W. (2023). Ecological restoration research progress and prospects: A bibliometric analysis. *Ecological Indicators*, 155, 110968. <https://doi.org/10.1016/j.ecolind.2023.110968>
3. Kaswinarni, F., & Nugraha, A. A. S. (2020). Kadar fosfor, kalium dan sifat fisik pupuk kompos sampah organik pasar dengan penambahan starter EM4, kotoran sapi dan kotoran ayam. *Titian Ilmu: Jurnal Ilmiah Multi Sciences*, 12(1), 1-6. <https://doi.org/10.30599/jti.v12i1.534>
4. Ao, C., Jiao, S., Wang, Y., Yu, L., & Zou, Q. (2022). Biological sequence classification: A review on data and general methods. *Research*, 2022, 0011.
5. Alhalili, Z. (2023). Metal oxides nanoparticles: general structural description,

- chemical, physical, and biological synthesis methods, role in pesticides and heavy metal removal through wastewater treatment. *Molecules*, 28(7), 3086.
6. Stevens, S., Wu, J., Thompson, M. J., Campolongo, E. G., Song, C. H., Carlyn, D. E., Dong, L., Dahdul W.M., Stewart, C., Worf, T.B., Chao, W.L & Su, Y. (2024). Bioclip: A vision foundation model for the tree of life. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition* (pp. 19412-19424).
  7. Burgess, J., Nirschl, J. J., Bravo-Sánchez, L., Lozano, A., Gupte, S. R., Galaz-Montoya, J. G., Zhang, Y., Su, Y., Bhowmik, D., Coman, Z., Hasan, S.M., Johannesson, A., Leinweber W.D., Nair, M.G., Yarlagadda, R., Zuraski, C., Chiu, W., Cohe, S., Hansen, N.J., Leonetti, M.D., Liu, C., Lundberg, E., & Yeung-Levy, S. (2025). Microvqa: A multimodal reasoning benchmark for microscopy-based scientific research. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 19552-19564).
  8. Lozano, A., Sun, M. W., Burgess, J., Chen, L., Nirschl, J. J., Gu, J., Lopez, I., Aklilu, J., Rau, A., Katzaer, W.A., Zhang, Y., Chiu, C., Wang, X., Song, A.S., Tibshirani, R & Yeung-Levy, S. (2025). Biomedica: An open biomedical image-caption archive, dataset, and vision-language models derived from scientific literature. In *Proceedings of the Computer Vision and Pattern Recognition Conference* (pp. 19724-19735).
  9. Fallahpour, A., Magnuson, A., Gupta, P., Ma, S., Naimier, J., Shah, A., Duan, H., Ibrahim, O., Goodarzi, H., Maddison, C.J & Wang, B. (2026). Bioreason: Incentivizing multimodal biological reasoning within a dna-llm model. *Advances in Neural Information Processing Systems*, 38, 111644-111671.

## Basic Physics

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| <b>Module number</b><br>3225321643                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Basic Physics             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Semester / Rotation</b><br>1 / Odd           | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, discussions,<br>guided practicum,<br>presentations, cased-based<br>learning                                                                                                                                                                                                                                                                                                                                             | <b>Prerequisites for<br/>attendance</b><br>None | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (20%)</li> <li>2. Case report (10%)</li> <li>3. Practicum report (20%)</li> <li>4. Presentation (10%)</li> <li>5. Assignment (15%)</li> <li>6. Quiz (5%)</li> <li>7. Mid-tem exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol>                                                                                             |                                                 | <b>CREDIT HOURS<br/>(+Workload in hours)</b><br>2 Credit Hours<br>Theory (14 hours of<br>Lecture + 15.5 hours of<br>structured assignment<br>+ 15.5 hours of self-<br>study)<br><br>Laboratory activity (1<br>Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in<br/>hrs)</b><br>3 ECTS Theory<br>(14 hours of Lecture +<br>15.5 hours of<br>structured assignment<br>+ 15.5 hours of self-<br>study)<br><br>Laboratory activity (1.5<br>ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Dr. Affandi Faisal Kurniawan, M.Sc.                                                                                                                                                                                                                                                                                                                                                                                              |                                                 | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b><br>Dr. Sigit Ristanto, S.Si., M.Sc.                                                                                                                                                                                                                                                                                                                                                                                       |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the fundamental concepts of Basic Physics, with <b>the objective</b> of equipping them with a solid understanding of physical principles governing motion, electricity, magnetism, and wave phenomena. <b>Upon completion of the course, students are expected to demonstrate competencies</b> in analysing physical systems, applying basic laws |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

and formulas in physics, interpreting physical phenomena quantitatively and qualitatively, and developing logical and analytical reasoning skills. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials covered in this course** include kinematics of motion, dynamics of motion, electricity, magnetism, and wave phenomena.

### Learning goals and Qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in carrying out basic physics learning (A2)
2. CLO 2: Explain fundamental physics concepts in depth in order to formulate solutions to procedural problems (C2)
3. CLO 3: Apply fundamental physics concepts, utilizing science and technology and local wisdom, and demonstrates the ability to develop oneself and adapt to the situations encountered (C3, P3)
4. CLO 4: Take responsibility for one's own work and be entrusted with responsibility for achieving work outcomes in the field of basic physics related to biological sciences (A3)

### Core readings:

1. Kurniawan, A. F., Anwar, M. S., Nadiyyah, K., & Nitya, I. G. N. (2025). Thickness optimization of a triple-layered microwave absorber combining magnetic and dielectric particles. *Asia-Pacific Journal of Science and Technology*, 30(2), APST-30. <https://doi.org/10.14456/apst.2025.30>
2. Gjerde, V., Havre Paulsen, V., Holst, B., & Kolstø, S. D. (2022). Problem solving in basic physics: Effective self-explanations based on four elements with support from retrieval practice. *Physical Review Physics Education Research*, 18(1), 010136.
3. Skalyga, V. A., Izotov, I. V., Golubev, S. V., Razin, S. V., Sidorov, A. V., & Viktorov, M. E. (2022). Gasdynamic electron cyclotron ion sources: Basic physics, applications, and diagnostic techniques. *Review of Scientific Instruments*, 93(3).
4. Zhang, X., Dong, Y., Wu, Y., Huang, J., Jia, C., Fernando, B., Shou M.Z., Zhang, L & Liu, J. (2025, July). Physreason: A comprehensive benchmark towards physics-based reasoning. In *Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)* (pp. 16593-16615).
5. Adam, M. I., Adha, A. R., Alfina, N. L., & Taqwa, M. R. A. (2025, April). Analysis of Dynamic Fluid Problem-Solving Ability in Prospective Physics Teacher. In *Proceeding International Conference on Religion, Science and Education* (Vol. 4, pp. 1327-1334).
6. Gunturu, A., Wen, Y., Zhang, N., Thundathil, J., Kazi, R. H., & Suzuki, R. (2024, October). Augmented Physics: Creating interactive and embedded physics simulations from static textbook diagrams. In *Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology* (pp. 1-12).

## Basic Chemistry

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| <b>Module number</b><br>3225321644                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Module name</b><br>Basic Chemistry       |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Semester / Rotation</b><br>1 / Odd       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Prerequisites for attendance</b><br>None | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignment (15%)</li> <li>2. Quiz (5%)</li> <li>3. Mid-term exam (20%) 100 Minutes</li> <li>4. Final exam (15%) 100 Minutes</li> <li>5. Discussion (30%)</li> <li>6. Case report (15%)</li> <li>7. Presentation (15%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Ling. Maria Ulfah, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Ipah Budi Minarti, M.Pd.</li> <li>2. Dr. Mei Sulistyoningih, M.Si.</li> <li>3. Fibria Kaswinarni, S.Si., M.Si.</li> <li>4. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the fundamental concepts of Basic Chemistry, with <b>the objective</b> of developing a sound understanding of chemical principles and their application to quantitative problem solving and everyday phenomena. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining chemical concepts systematically, applying basic chemical calculations accurately, identifying simple chemical processes, and relating chemical phenomena to scientific and real-life contexts. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is |                                             |                                                                                                                                                                                                                                                                                                                                    |

fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include atomic structure, the periodic system of elements, molecular structure, stoichiometry, solution chemistry, chemical energetics, chemical kinetics, chemical equilibrium, nuclear chemistry, and carbon chemistry.

**Learning goals and Qualifications in this module students learn to:**

1. CLO 1: Demonstrate an enthusiastic attitude during the teaching and learning process on the chemistry of life and its interactions (A2)
2. CLO 2: Explain hydrocarbons and functional groups, carbohydrates, proteins, lipids, nucleic acids, solution chemistry, and their interactions in depth in order to formulate solutions to procedural problems (C2)
3. CLO 3: Apply fundamental principles of redox reactions, organic chemistry, electrolysis, colloids, polymer chemistry, and environmental chemistry, utilizing science and technology and local wisdom. (C3, P3)
4. CLO 4: Takes responsibility for one's own work and can be entrusted with responsibility for achieving work outcomes related to simple chemical products (A3, P3)

**Core readings:**

1. Dewi, E. R. S., Ulfah, M., & Nugroho, A. S. (2025). Optimization of *Saccharomyces cerevisiae* Dose in Eco-Enzyme Fermentation: Effects on pH, BOD, DO, Nitrite, and Nitrate. *Advance Sustainable Science Engineering and Technology*, 7(4), 02504028-02504028. <https://doi.org/10.26877/asset.v7i4.2626>
2. Mawarnis, E. R., Maiyena, S., Roza, L., & Rahman, M. Y. A. (2023). Development of Basic Chemistry II Textbook Based on Research. *Jurnal Penelitian Pendidikan IPA*, 9(3), 1402-1411.
3. Rahayu, A., & Sari, R. S. (2023). Guided Inquiry-Based Basic Chemistry Practicum Guidelines and Its Impact on Students' Science Process Skills and Critical Thinking Skills. *Jurnal Pendidikan Kimia Indonesia*, 7(1), 1-9.
4. Azizah, U., & Yonata, B. (2023). The Integration of Green Chemistry Principles in Basic Chemistry Learning to Support Achievement of Sustainable Development Goals (SDGs) through Education. *Journal of technology and science education*, 13(1), 233-254.
5. Lindhorst, T. K. (2026). *Essentials of carbohydrate chemistry and biochemistry*. John Wiley & Sons.
6. Monclús, L., Arp, H. P. H., Groh, K. J., Faltynkova, A., Løseth, M. E., Muncke, J., Wang, Z., Wolf, L., Zimmermann, L. & Wagner, M. (2025). Mapping the chemical complexity of plastics. *Nature*, 643(8071), 349-355.

## Foundations of Education

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225321616                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Module name</b><br>Foundations of Education |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Semester / Rotation</b><br>1 / Odd          | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching Methods</b><br>Lectures, Discussions, Case-based learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Prerequisites for attendance</b><br>-       | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Case report (20%)</li> <li>2. Presentation (20%)</li> <li>3. Discussion (15%)</li> <li>4. Assignment (15%)</li> <li>5. Quiz (10 %)</li> <li>6. mid exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Prasetyo, M. Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Eko Retno Mulyaningrum, M. Pd.</li> <li>2. Atip Nurwahyunani, S.Si, S.Pd. M.Pd.</li> <li>3. Dr. Fenny Roshayanti, M.Pd</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>The course provide</b> foundational insight and professional grounding for prospective teachers, this course develops students' understanding of the nature and purposes of education, including its philosophical, juridical, historical, psychological, socio-cultural, moral, and religious foundations, education as a system, as well as educational standards, quality, policies, organisations, and contemporary educational issues and solutions; In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>the materials</b> cover educational aims, philosophical, |                                                |                                                                                                                                                                                                                                                                                                                                    |

legal, historical, psychological, social and cultural foundations, moral and religious education, education as a system, standards and quality assurance, educational policy, school organisation, character education, 21st-century science education, 21st-century life skills, and comparative studies of education in various countries; upon completion, students are expected to demonstrate **competencies** in critical and reflective thinking, pedagogical insight, ethical and professional responsibility, and the ability to apply solutions to educational problems.

### **Learning goals and Qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude during the teaching and learning process (A2)
2. CLO 2: Examine the philosophical, juridical, historical, sociological, psychological, and empirical foundations of education based on a review of references, and reformulates solutions to procedural problems in schools (C4)
3. CLO 3: Apply problems in schools and wisely based on philosophical, juridical, historical, sociological, psychological, and empirical foundations through a review of references by utilizing science and technology (C3)
4. CLO 4: Explain alternative solutions to school problems based on philosophical, juridical, historical, sociological, psychological, and empirical foundations through group-based reference review (C2)

### **Core readings:**

1. Fauzi, A. A., Purnomo, D., Nur Azizah, H., et al. (2023). Foundations of education. Sada Kurnia Pustaka.
2. Simonson, M., & Zvacek, S. (2024). *Teaching and learning at a distance: Foundations of distance education*. Emerald Publishing Limited.
3. Taylor, E. (2023). The foundations of critical race theory in education an introduction. In *Foundations of critical race theory in education* (pp. 1-10). Routledge.
4. Junaharesdi, A. (2025). Systematic Literature Review Filsafat Pendidikan Dalam Pembentukan Karakter Siswa. *Journal Of Innovation In Teaching And Instructional Media Учёбному: Yayasan Karinosseff Muda Indonesia*, 5(2), 462-478.
5. Marhamah, F., Shofwah, A. N., Ramadhani, C. S., Zahra, K. L., Lutfiah, Z. M., & Khairunnisa, K. (2025). Bold Basics of Social Studies in Elementary School. *International Journal Of Education, Social Studies, And Management (IJESSM)*, 5(3), 1464-1473.
6. Karim, A., Aunurrahman, A., Halida, H., & Ratnawati, R. E. (2023). Implementasi landasan pendidikan dalam mengoptimalkan peran guru dan manajemen sekolah dalam mencegah perilaku bullying. *Academy of Education Journal*, 14(2), 1515-1534.
7. Mubarak, F. (2024, March). Study of Tafsir Tarbawi as an Effort for the Relevance of Al-Qur'an Teachings in Educational Development in Indonesia. In *Proceeding International Conference on Religion, Science and Education* (Vol. 3, pp. 795-804).
8. Kusmaryono, I., & Kusumaningsih, W. (2023). Evaluating the Results of PISA Assessment: Are There Gaps Between the Teaching of Mathematical Literacy at Schools and in PISA Assessment?. *European Journal of Educational Research*, 12(3), 1479-1493.
9. Iskandar, R. A., & Sunarya, Y. (2024). Foundations of Educational

Management in a Pedagogical Perspective. *al-Afkar, Journal For Islamic Studies*, 7(2), 1267-1284.

## Laboratory Techniques

|                                                                                                                                                                                                                                                                                                                                                                      |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225322651                                                                                                                                                                                                                                                                                                                                   | <b>Module name</b><br>Laboratory Techniques |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                  | <b>Semester / Rotation</b><br>1 / Odd       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Teaching methods</b><br>Lectures, Discussions,<br>Guided Practicum,<br>Presentations, Case-Based<br>Learning                                                                                                                                                                                                                                                      | <b>Prerequisites for attendance</b><br>None | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (15%)</li> <li>2. Presentation (15%)</li> <li>3. Case report (15%)</li> <li>4. Practicum report (15%)</li> <li>5. Assignment (10%)</li> <li>6. Quiz (10%)</li> <li>7. mid-term exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                             | <b>ECTS (+Workload in hrs)</b><br>2 Credit Hours<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice) |
| <b>Module coordinator</b><br>M. Anas Dzakiy, S.Si., M.Sc.                                                                                                                                                                                                                                                                                                            |                                             | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Ipah Budi Minarti, S.Pd.,M.Pd.</li> <li>2. Eko Retno Mulyaningrum, M. Pd.</li> <li>3. Lussana Rossita Dewi, S.Si.,M.Pd.</li> </ol>                                                                                                                                                     |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syllabus</b><br><b>This course introduces</b> undergraduate students to the fundamental principles and practices of laboratory management, with the objective of providing essential knowledge and skills for conducting safe, effective, and well-organised laboratory activities in environmental science research and practice. <b>Upon completion of the</b>  |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**course, students are expected to demonstrate competencies** in managing laboratory facilities, applying standard laboratory procedures and work techniques, identifying the types and functions of laboratory equipment, and handling laboratory chemicals appropriately based on their characteristics. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials covered in this course** include laboratory management and organisation, laboratory procedures and techniques, laboratory equipment and their functions, characteristics and handling of chemical substances, preparation of solutions and proper arrangement of laboratory chemicals, occupational health and safety, accident prevention procedures, and first aid response to laboratory accidents.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in applying the basic principles of Occupational Safety and Health (OSH) in laboratories, laboratory work procedures, laboratory administration, and the management of hazardous and toxic waste (B3). (A2)
2. CLO 2: Explain the basic principles of Occupational Safety and Health (OSH) in laboratories, laboratory work procedures, laboratory administration, and hazardous and toxic waste (B3) management in order to formulate solutions to procedural problems. (C2)
3. CLO 3: Apply field-specific expertise and utilizes science and technology in problem solving, and demonstrates adaptability to the situations encountered. (C3, P3)

### **Core readings:**

1. Lee, J. Y., Oh, K. H., Shin, J., & Son, T. J. (2025). Laboratory Biosafety Guideline (2025) Revision. *Public Health Weekly Report*, 18(21), 784.
2. Kumar, V., Kumar, V., & Das, B. K. (2025). Biosafety, Sterilization, and Disinfection Protocols. In *Laboratory Techniques for Fish Disease Diagnosis* (pp. 17-36). Singapore: Springer Nature Singapore.
3. Carson, S., Miller, H. B., Witherow, D. S., & Srougi, M. C. (2025). *Molecular biology techniques: A classroom laboratory manual*. Academic Press.
4. Maima, A. O., & Otieno, S. A. Comprehensive Laboratory Safety Guides. In *Handbook for Vigilance in the Chemical and Biohazard Environments* (pp. 51-70). CRC Press.
5. Permana, I., Agharid, A. P., & Wang, F. (2025). Performance evaluation of contamination control and pressurization in a biosafety laboratory. *Energy and Buildings*, 335, 115545.
6. Graf, E. (2025). Laboratory Design for Molecular Technologies. *Manual of Molecular Microbiology: Fundamentals and Applications*, 145-152.
7. Yadav, U., & Bhardwaj, S. (2026). Laboratory Maintenance and Safety. In *Essential Laboratory Techniques and Biochemical Analysis* (pp. 1-28). CRC Press.
8. Forster, A. C., Bao, L., & Liljeruhm, J. (2025). *Synthetic biology: A lab manual*. World scientific.
9. Melnyk, V. G., & Grinzovsky, A. M. (2025). Biosafety of laboratory personnel:

risks and readiness for emergency response. *Medical Science of Ukraine (MSU)*, 21(1), 45-54.

**2nd Semester**  
**Even 2025/2026**

## Islamic Religious Education

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121601                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Module name</b><br>Islamic Religious Education |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Semester / Rotation</b><br>2 / Even            | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Prerequisites for attendance</b><br>-          | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                  |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignment (10%)</li> <li>2. Quiz (5%)</li> <li>3. Presentation (10%)</li> <li>4. Discussion (10%)</li> <li>5. Case report (35%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (20%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                   | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Sunan Baedowi, S.Pd.I., M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                   | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                             |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Drs. Abidin, M.S.I.</li> <li>2. Afiq Fikri Almas, M.Pd.</li> <li>3. Nur Aksin, S.Ag., MSi.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>This course aims</b> to nurture students' spiritual development, ethical awareness, and religious literacy as an integral dimension of holistic higher education. Students are expected to demonstrate <b>competencies</b> in reflecting on faith-based values, practising ethical behaviour, engaging in respectful dialogue in multicultural contexts, and analysing contemporary social issues from Islamic perspectives. The course encourages the development of integrity, responsibility, empathy, and social awareness in both personal and professional life. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which |                                                   |                                                                                                                                                                                                                                                                                                                                    |

is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The scope of study encompasses** the relationship between human beings and religion; the concepts of iman, Islam, and ihsan; Islamic ethics and morality with emphasis on anti-corruption, anti-bullying, anti-intolerance, anti-sexual violence, and anti-drug values; Islam in Indonesia; unity in diversity; Islam's historical and contemporary contributions to civilisation; and critical discussions on democracy, human rights, politics, law, and social transformation from Islamic viewpoints. Students also engage in reflective discussions and contextual case studies that connect religious values with real-life challenges.

### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrate faith and devotion to Allah SWT through habitual practices of worship such as prayer, fasting, and performing amar ma'ruf nahi mungkar (A5)
2. CLO 2: Demonstrate ethics, morals, and character (including anti-corruption, anti-bullying, anti-intolerance, sexual violence, and anti-drugs) (A5)
3. CLO 3: Understand and implement the concepts of Islam in Indonesia, Islam and religiosity, Islam and modernization, and Islam in the development of world civilization to achieve balance between worldly and spiritual needs in personal and social life (C3, A5)
4. CLO 4: Understand and implement the concepts of democracy, human rights, politics, and law from an Islamic perspective on contemporary issues (C3, A5)

### **Core readings:**

1. Umar, M., & Ismail, F. (2020). *Buku Ajar Pendidikan Agama Islam (Konsep Dasar bagi Mahasiswa Perguruan Tinggi Umum)*. Banyumas, Jawa Tengah: CV Pena Persada.
2. Susanti, S. S., Nursafitri, L., Hamzah, I., Zunarti, R., Darmanto., Fitriyah., Asy'arie, B. F., Sa'ad, M S., (2024). Innovative digital media in Islamic religious education learning. *Jurnal Pendidikan Agama Islam*, 21(1), 40-59
3. Lidyaningsih, W., & Hanif, M. (2023). Nurcholish Madjid's ideas on the renewal of Islamic education in Indonesia. *Indonesian Journal of Interdisciplinary Islamic Studies*, 6(2), 223–241.
4. Masturin. (2024). The Power of Two Learning Strategy in Islamic Religious Education Material Shaping Character Students. *Nazhruna: Jurnal Pendidikan Islam*, 7(2), 250-269.
5. Sapiudin. S & Ika, I (2025). The strategic role of Islamic religious education in the era of digital disruption. *Edukasi Islami: Jurnal Pendidikan Islam*, 14(3), 641-648.
6. Rahmawati, R., Rosita, R., & Asbari, M. (2022). The role and challenges of Islamic religious education in the age of globalization. *Journal of Information Systems and Management (JISMA)*, 1(1), 6-11.
7. Rohmah, S., Baedowi, S., & Rahmawati, I. (2025). Strategi penanaman karakter religius siswa melalui pembiasaan shalat dhuha dan membaca Al-Qur'an di SDN Sendanggayam. *Al Qodiri: Jurnal Pendidikan, Sosial dan Keagamaan*, 23(1), 98–111.
8. Aksin, N., Nurjanah, E., & Kurniawan, M. R. (2025). The principles of democracy from an Islamic perspective and its review in the Qur'an. *Jurnal Indonesia Sosial Teknologi*, 6(2).

## Catholic Religious Education

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121602                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Catholic Religious Education |                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Semester / Rotation</b><br>2 / Even             | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Prerequisites for attendance</b><br>-           | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                               |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Assignments (10%)</li> <li>3. Quiz (5%)</li> <li>4. Case report (20%)</li> <li>5. Presentation (20%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (20%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Chr. Argo Widiarto, M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                    | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                          |
| <b>Additional teacher involved:</b><br>Dr. FX. Didik Purwosetiyono, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                    |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus</b><br><p><b>This course aims</b> to provide a comprehensive understanding of Catholic teachings and their role in shaping ethical behaviour, social responsibility, and professional integrity in contemporary society. Students are expected to demonstrate <b>competencies</b> in practising empathy, respect for diversity, and analysing the role of the Church and faith in social life while integrating Catholic perspectives on humanity, God, and salvation. The course encourages students to evaluate and integrate Catholic teachings into academic, professional, and community contexts, promoting reflective thinking, moral reasoning, and social awareness. <b>The scope of study includes</b> theological perspectives on humanity as created in the image of God, the human vocation and mission, and the relationship between human beings, themselves, others, the environment, and God. Students explore religion as a means of understanding the macrocosm and microcosm and examine the lived experience of faith within the Catholic Church. <b>Additional topics include</b> religious pluralism, interreligious cooperation for human development, and the manifestation of faith in multicultural societies. The</p> |                                                    |                                                                                                                                                                                                                                                                                                                                 |

course further examines the life of Jesus Christ, including His suffering, death, and resurrection, the doctrine of the Trinity, and the mission of the Catholic Church in sustaining life and promoting social wellbeing. Emphasis is placed on the integration of faith with civic responsibility and national development grounded in Pancasila values. Students engage in discussions, case studies, and reflective learning activities to connect theological understanding with contemporary societal challenges. Learning activities are conducted through a hybrid mode combining face-to-face interaction and structured online learning facilitated by the university Learning Management System SPADA (Sistem Pembelajaran Daring), which is fully integrated within the SSO SIMEKAR (Single Sign On Sistem Informasi Merdeka Belajar).

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate empathy and respect in living together, and analyse the role of the Church and faith in society. (A4, C4)
2. CLO 2: Evaluate and integrate the concept of humanity from a Catholic perspective. (C5, A4)
3. CLO 3: Evaluate and integrate the concept of God in Catholicism. (C5, A4)
4. CLO 4: Evaluate and integrate the teachings of Jesus Christ and His Work of Salvation. (C5, A4)

### **Core readings:**

1. Hahn, S., & Mitch, C. (Eds.). (2024). *Ignatius Catholic study Bible: Old and New Testaments*. Ignatius Press.
2. Barron, R. (2025). *Catholicism: A journey to the heart of the faith* (2nd ed.). Word on Fire.
3. Meehan, A., & O'Connell, D. (2021). Religious education in Irish Catholic primary schools: Recent developments, challenges and opportunities. In S. Whittle (Ed.), *Irish and British reflections on Catholic education: Foundations, identity, leadership issues and religious education in Catholic schools* (pp. 199–210). Springer.
4. Buchanan, M. T., & Gellel, A.-M. (Eds.). (2019). *Global perspectives on Catholic religious education in schools: Volume II: Learning and leading in a pluralist world*. Springer.
5. Kristianus, K. (2022). The effect of Catholic religion on Dayak identity in West Kalimantan. *International Journal of Multi Discipline Science*, 5(1).
6. Hoon, C.Y. (2017). Putting religion into multiculturalism: Conceptualising religious multiculturalism in Indonesia. *Asian Studies Review*, 41(3), 476–493.
7. Robin, M. A. J. (2024). The spirituality of the catechists in Indonesia. *Proceedings International Conference on Catholic Religious Education and Philosophy*, 1(2).

## Christian Religious Education

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121603                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Module name</b><br>Christian Religious Education |                                                                                                                                                                                                                                                                                                                                |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Semester / Rotation</b><br>2 / Even              | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                 |
| <b>Teaching methods</b><br>Lectures, Discussions, Cased-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Prerequisites for attendance</b><br>-            | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignments (10%)<br>2. Quiz (5%)<br>3. Presentation (10%)<br>4. Discussion (10%)<br>5. Case report (35%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (20%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                     | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Bambang Irianto, M.Th.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b><br>Drs. Sudjono Stefanus, M.M.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                     |                                                                                                                                                                                                                                                                                                                                |
| <b>Syllabus</b><br><b>This course aims</b> to strengthen students' understanding of Christian teachings and their relevance to ethical living, social harmony, and civic engagement within pluralistic societies. Students are expected to demonstrate competencies in accepting differences, showing respect in dialogue, and applying Christian values in social and academic contexts while cultivating responsibility in community life. The course fosters the ability to understand, evaluate, and integrate the basic concepts of Christianity and Christian teachings on humanity and ethics into personal and professional practice. <b>The scope of study includes</b> theological reflections on God's work in creation, salvation, and guidance; humanity as created in the image of God; and the relationship between faith, knowledge, and service. Students examine Christian ethics, moral character, and the principle of love as the foundation of Christian life, including anti-sexual harassment, anti-bullying, and anti-corruption values. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem</i> |                                                     |                                                                                                                                                                                                                                                                                                                                |

*Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>.

**Additional topics include** human rights and responsibilities, Christianity and culture, interreligious harmony and tolerance, diversity as a social reality, democratic values, work as a divine calling, and the relationship between religion and the state from Christian perspectives. Students engage in discussions, case studies, and reflective activities to analyse contemporary social issues through Christian viewpoints and demonstrate responsible citizenship. Emphasis is placed on developing moral reasoning, social sensitivity, and inclusive attitudes in multicultural contexts.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an attitude of accepting differences in interactions with others, respecting during discussions, and applying Christian values in the context of social life (A3)
2. CLO 2: Demonstrate Christian responsibility in community life (A4)

### **Core readings:**

1. Collet, B. A. (2022). Challenges and Opportunities for Conducting Comparative Research on Religious Education in the Global South. *The Bloomsbury Handbook of Religious Education in the Global South*, 457.
2. Francis, L. J. (2020). Psychological Perspectives on Religious Education: An Individual Differences Approach. *Brill Research Perspectives in Religion and Education*, 1(2), 1-89.
3. Horowski, J. (2020). Christian religious education and the development of moral virtues: a neo-Thomistic approach. *British Journal of Religious Education*, 42(4), 447-458.
4. Tambunan, D. M., & Iskandar, F. (2024). The impact of technology-based learning media on students' interests in Christian religious education. *Journal of Educational Management and Instruction (JEMIN)*, 4(1), 185-195.
5. Tandana, E. A., Yowa, E. K., & Manik, N. D. Y. (2022). Character education in forming student behavior: A viewpoint of christian religious education learning. *Didache: Jurnal Teologi dan Pendidikan Kristen*, 3(2), 161-176.
6. Wolterstorff, N. (2011). *Justice in love*. Eerdmans.

## Hindu Religious Education

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121604                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Module name</b><br>Hindu Religious Education |                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Semester / Rotation</b><br>2 / Even          | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Prerequisites for attendance</b><br>-        | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignment (10%)</li> <li>2. Quiz (5%)</li> <li>3. Presentation (10%)</li> <li>4. Discussion (10%)</li> <li>5. Case report (35%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (20%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Venty, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                 | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                            |
| <b>Additional teacher involved:</b><br>-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                 |                                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus</b><br><b>This course aims</b> to strengthen students' understanding of Hindu teachings and their role in shaping ethical behaviour, spiritual awareness, and social harmony in contemporary society. Students are expected to demonstrate <b>competencies</b> in practising devotion to Sang Hyang Widhi Wasa through yajña, meditation, discipline, and the consistent application of dharma. The course emphasises the interpretation of Hindu philosophical concepts and their relevance to modern spiritual and social challenges. The scope of study includes the concept of śraddhā in the Vedas, Upaniṣads, and the Bhagavad Gītā, including the typology of faith and its role in spiritual development. Students explore contemporary issues such as materialism, secularism, and popular spirituality from Hindu perspectives on divinity, mokṣa, ātman, and bhakti yoga. The course examines teachings on karma, saṃsāra, and human dignity within the framework of puruṣārtha. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning |                                                 |                                                                                                                                                                                                                                                                                                                                   |

activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **Additional topics include** dāna, seva, ahimsā, and social responsibility in education and national development. Students analyse historical contributions of Hindu traditions to governance, law, and culture in Indonesia. The course also explores gender equality, democratic values, and interfaith dialogue based on Hindu teachings. Emphasis is placed on religious moderation, pluralism, inclusivism, and the legal foundations of religious freedom.

#### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrate faith and devotion to Sang Hyang Widhi Wasa through the habitual practice of yadnya, dhyana, brata, and dharma consistently (A5, P3).
2. CLO 2: Abstract the concept of śraddhā in the Vedas and other sacred texts, the meaning of Divinity from a Hindu perspective, as well as spirituality and contemporary religious issues in daily life (C4, A4).
3. CLO 3: Summarize the conception of humanity in Hindu teachings, the purpose of life, and human dignity (puruṣārtha), as well as the role and social responsibility of Hindus in national development (C3, A4).
4. CLO 4: Evaluate the contributions of Hindu teachings to Indonesia's legal, social, political, and cultural systems, as well as the synergy between yajña, tax awareness, Hindu nationalism, gender equality, and democracy (C5, A4).
5. CLO 5: Analyze the values of moderation, pluralism, and inclusivism in Hindu teachings, as well as the legal basis for freedom of religion and tolerance practices in sacred texts and Hindu history (C4, A4).

#### **Core readings:**

1. Peterson K. Ozili. (2025). Financial inclusion, religiosity and economic welfare in majority Christian, Hindu and Muslim countries. *Foresight*, 27(4), 727–751.
2. Thamanam, N., Lehwaldt, D., Sweeney, M. R., & Corbally, M. (2025). Measuring undergraduate nursing students' knowledge of Christian, Islamic, and Hindu death rituals: A national study. *Nurse Education Today*, 151, 106691.
3. Peterson K. Ozili. (2025). Financial inclusion, religiosity and economic welfare in majority Christian, Hindu and Muslim countries. *Foresight*, 27(4), 727–751.
4. Tomalin, E., (2024). Religion, ecology and Hindu nationalism in India. *Religion and Development*, 2(3), 463–482.
5. Sulasmi, N. K. A. (2023). Kepemimpinan Dalam Perspektif Susastra Hindu. *ŚRUTI: Jurnal Agama Hindu*, 3(2), 221-230.

## Buddhist Religious Education

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| <b>Module number</b><br>3225121605                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Module name</b><br>Buddhist Religious Education |                                                                                                                                                                                                                                                                                                                          |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Semester / Rotation</b><br>2 / Even             | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                           |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Prerequisites for attendance</b><br>-           | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                        |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Assignments (10%)</li> <li>3. Quiz (5%)</li> <li>4. Case Report (20%)</li> <li>5. Presentation (20%)</li> <li>6. Mid-term Exam (10%) 100 Minutes</li> <li>7. Final Exam (20%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                    | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Venty, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                    | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b><br>-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                          |
| <b>Syllabus</b><br><b>This course introduces</b> undergraduate students to the fundamental concepts, philosophy, and teachings of Buddhism as a foundation for forming a complete, wise, and morally responsible personality. The module emphasises the integration of ethical conduct, mental development, and wisdom in fostering peaceful coexistence within a pluralistic and democratic society. <b>The scope of the course includes</b> Buddhist perspectives on humanity and the Divine (Godhead), moral discipline (Sīla), universal law, and mental cultivation. Students also examine the relationship between Buddhist teachings and contemporary issues such as science and technology, culture and modernisation, democracy, human rights, religious moderation, politics, and law. Through reflective and contextual learning, the course prepares students to apply Buddhist values of tolerance, compassion, and harmony in personal, social, and national life. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA |                                                    |                                                                                                                                                                                                                                                                                                                          |

(Sistem Pembelajaran Daring), which is fully integrated within the SSO SIMEKAR (Single Sign On Sistem Informasi Merdeka Belajar) platform at <https://simekar.upgris.ac.id>. **The material to be delivered** are Humanity and the Philosophy of the Divine (Godhead) in Buddhism, Ethics, Morality, Culture, and Buddhist Society, Universal Law (Four Noble Truths, Three Marks of Existence, Cause and Effect, Karma), Harmony of Science and Technology (IPTEK), Modernization, and Art in Buddhism, Democracy, Human Rights (HAM), Religious Moderation, Politics, and Law.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate faith and devotion to Sanghyang Adi Buddha through the habitual practice of worship, such as pujabakti, meditation, and practicing the precepts. (A5)
2. CLO 2: Abstract the concept of sādḍha in the suttas and other sources, the meaning of Divinity from a Buddhist perspective, as well as spirituality and contemporary religious issues in daily life. (C4, A4)
3. CLO 3: Summarize the conception of humanity in Buddhism, the purpose and dignity of humans, as well as the social roles and responsibilities of Buddhists, including their contributions to national development. (C2, A3)
4. CLO 4: Evaluate the contributions of Buddhism to Indonesia's legal, social, political, and cultural systems, as well as the synergy between dāna pāramī, taxes, Buddhist nationalism, violence against women, and democracy in national life. (C5, A4)
5. CLO 5: Analyze the values of religious moderation, pluralism, and inclusivism in Buddhism, as well as the legal basis for freedom of religion and tolerance practices in the suttas and Buddhist history. (C4, A4)

### **Core readings:**

1. Venty, V. (2021). Kalyana Mitta as the fundamental potential for happiness and suffering in Buddhist mindfulness counseling. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, 7(2), 125-135.
2. Lee, K. C. (George), & Oh, A. (2019). Introduction to compassionate view intervention: A Buddhist counseling technique based on Mahāyāna Buddhist teachings. *Journal of Spirituality in Mental Health*, 21(2), 132–151.
3. Theresia, S., & Tiatry, S. (2023). The effect of loving-kindness meditation intervention on self-compassion in teachers of children with intellectual disabilities. *International Journal of Application on Social Science and Humanities*, 1(2), 1396–1406.
4. Dounghummes, N., Bhibulbhanuvat, S., & Boonrugsa, T. (2024). Translating Buddhist mindfulness into action: Engaging older Thai adults in participatory action research. *Qualitative Research Journal*, 24(2), 183–193. <https://doi.org/10.1108/QRJ-11-2023-0178>
5. Keown, D. (2013). *Buddhism: A very short introduction* (2nd ed.). Oxford University Press.
6. Bodhi, B. (2016). *The Noble Eightfold Path: Way to the End of Suffering*. Buddhist Publication Society.

## Confucian Religious Education

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                     |                                                                                                                                                                                                                                                                                                                                   |
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| <b>Module number</b><br>3225121606                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>Module name</b><br>Confucian Religious Education |                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | <b>Semester / Rotation</b><br>2 / Even              | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | <b>Prerequisites for attendance</b><br>-            | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignments (10%)<br>2. Quiz (5%)<br>3. Presentation (10%)<br>4. Discussion (10%)<br>5. Case report (35%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (20%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                     | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Venty, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                     | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b><br>-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                     |                                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus</b><br><b>This course aims</b> to cultivate ethical awareness, moral character, and social responsibility based on Confucian teachings and their relevance in contemporary multicultural societies. Students are expected to demonstrate <b>competencies</b> in practising devotion to Tian (Heaven) through daily self-cultivation, reflection, and the practice of li and xiu shen as expressions of moral virtue. The course emphasises the development of moral leadership, harmony, and civic responsibility. The scope of study includes the concept of xin (faith) in the Lun Yu, Zhong Yong, and Mengzi, and its relationship with sincerity, loyalty, and moral cultivation. Students explore contemporary ethical challenges such as hedonism, secularism, and moral crisis through Confucian perspectives on Tian, dao, ren, and ming. The course examines the concept of junzi as the ideal moral person and the role of moral cultivation in social harmony. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic |  |                                                     |                                                                                                                                                                                                                                                                                                                                   |

schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **Additional topics include** Confucian virtues such as ren, yi, li, zhong, and shu, and their application in family, society, and national life. Students analyse the historical contributions of Confucian communities to education, governance, and social harmony. The course also explores values of tolerance, pluralism, democracy, gender justice, and interfaith dialogue. Emphasis is placed on moderation, inclusivism, and the legal foundations of religious freedom and social harmony.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate faith and devotion to Tian (Heaven) through habitual practice of li, xiu shen, and daily reflection as a manifestation of faith and moral virtue (C3, A5)
2. CLO 2: Abstract the concept of faith (xin) in Confucian teachings, understanding of Tian, and issues of spirituality and contemporary religion in modern life (C4)
3. CLO 3: Summarize the concept of the noble human (junzi), dignity, and its social role and contribution to national development (C2)
4. CLO 4: Evaluate the contribution of Confucian teachings to Indonesia's legal, social, and cultural systems and the synergy between Ren, tax contributions, nationalism, gender justice, and democracy (C5)
5. CLO 5: Analyze the values of moderation, pluralism, and inclusivism in Confucian teachings and the legal basis for freedom of religion and tolerance practices in Confucian history and doctrine (C4)

**Core readings:**

1. Ames, R. T., (2020). Confucian Role Ethics: A Vocabulary. State University of New York Press
2. Bell, D. A. (2020). Just Hierarchy: Why Social Hierarchies Matter in China and the Rest of the World. Princeton University Press.
3. Dan, Y.. (2021). Confucius from the Heart: Ancient Wisdom for Today's World (Updated ed.). Pan Macmillan.
4. Ivanhoe, P. J. (2000). Confucian Moral Self Cultivation (3rd ed.). Hackett Publishing Company, Incorporated.
5. Startup, R. (2022). The Confusion of the Symbol and That Which Is Symbolised: Religion, the Nation State, Politics and Society. Open Journal of Philosophy, 12, 54-68. <https://doi.org/10.4236/ojpp.2022.121004>

### Civics Education

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                          |                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225121608                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Module name</b><br>Civics Education |                                          |                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        | <b>Semester / Rotation</b><br>2 / Even   | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (15%)<br>2. Presentation (20%)<br>3. Case report (40%)<br>4. Mid-term exam (10%) 100 Minutes<br>5. Final exam (15%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS heory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Rosalina Br. Ginting, M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        |                                          | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                            |
| <b>Additional teacher involved</b><br>1. Dr. Agus Sutono, S.Fil., M.Phil.<br>2. Andhika Nanda P., M.Pd.<br>3. Fuad Noorzeha, M.Phil.<br>4. Drs. Kiswoyo, MM.<br>5. Rahmat Sudrajat, M.Pd.<br>6. Dr. Sri Suneki, M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |                                          |                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus</b><br><b>This course aims</b> to foster democratic citizenship, national resilience, and responsible participation in public life by strengthening students' understanding of constitutional values, national identity, and civic responsibility within the Indonesian context. <b>Students are expected to</b> develop competencies in demonstrating responsible, honest, and civilised attitudes grounded in the values of Pancasila and the 1945 Constitution, while cultivating tolerance, inclusivity, anti-corruption values, and social responsibility in academic and societal environments. The course encourages the development of collaborative skills, social sensitivity, and active engagement as agents of social change who uphold the rule of law and prioritise the interests of the nation and society. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic |                                        |                                          |                                                                                                                                                                                                                                                                                                                   |

schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The scope of study includes** the introduction to civic education, Indonesian national identity and anti-intolerance values, the concepts and challenges of national unity in diversity, the development of Indonesian constitutional governance, and Indonesian citizenship. Further topics cover Indonesian democracy, human rights including anti-bullying and anti-sexual violence, human rights violations and law enforcement, Wawasan Nusantara and its implementation in national life, national resilience, national political strategy, territorial and airspace sovereignty, regional autonomy, and anti-corruption and anti-drug education. Students engage in critical discussions, case studies, and reflective activities to connect theoretical understanding with real-life civic participation. Emphasis is placed on analysing contemporary civic issues and developing ethical and responsible citizenship behaviours.

### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrate a responsible, honest, and civilized attitude as an Indonesian citizen who upholds the values of Pancasila and the 1945 Constitution (A5)
2. CLO 2: Possess moral, ethical, and citizenship personality traits and character that are tolerant, anti-corruption, and inclusive in social and academic environments, and become an agent of social change in performing tasks (A5)
3. CLO 3: Work collaboratively and analyze the basic concepts of citizenship, democracy, constitution, human rights, and diversity in the context of national life (C4, A4)
4. CLO 4: Uphold and participate in the rule of law and prioritize the interests of the nation and society at large through active participation in academic and social activities as a form of responsibility as a citizen aware of law and constitutional rights (P3, A5)

### **Core readings:**

1. Kaelan. (2020). Pancasila dalam Konteks Filsafat Ilmu. Yogyakarta, Indonesia: Paradigma.
2. Suneki, S., & Alfiyah, S. N. (2025). Kebhinekaan Global: Implementasinya Dalam Pendidikan Pancasila. *Civis: Jurnal Ilmiah Ilmu Sosial dan Pendidikan*, 14(2), 502–509.
3. Arti, H., Sudrajat, R., & Sutono, A. (2024). Aplikasi Wordwall Dalam Meningkatkan Motivasi Belajar: Analisis Pembelajaran Pancasila Di Lab School Universitas PGRI Semarang. *Civis: Jurnal Ilmiah Ilmu Sosial dan Pendidikan*, 13(2), 277-292
4. Campbell, D. E. (2019). What social scientists have learned about civic education: A review of the literature. *Peabody Journal of Education*, 94(1), 32-47.
5. Lestari, D., Sutono, A., & Sudrajat, R. (2021). Upaya dosen mata kuliah umum Pendidikan Kewarganegaraan dalam mencegah paham radikalisme di perguruan tinggi. *Majalah Lontar*, 33(1), 1–14.
6. Sutono, A., Noorzeha, F., & Purwosaputro, S. (2025). Konsep negara integral Soepomo dan relevansinya pada penerapan konstitusi di Indonesia tahun 2024. *PACIVIC: Jurnal Pendidikan Pancasila dan Kewarganegaraan*, 5(1), 30–46.

## PGRI Studies

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225221611                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Module name</b><br>PGRI Studies       |                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Semester / Rotation</b><br>2 / Even   | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                               |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignments (10%)</li> <li>2. Quiz (2%)</li> <li>3. Discussion (10%)</li> <li>4. Presentation (10%)</li> <li>5. Case analysis report (36%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (22%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Sukaton Purtomo Priyatmo, MM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                                                                                          |
| <b>Additional teacher involved</b> <ol style="list-style-type: none"> <li>1. Agus Wismanto, M.Pd.</li> <li>2. Arisul Ulumuddin, M.Pd.</li> <li>3. Dr. Erwan Rachmat, M.Pd.</li> <li>4. Hari Waluyo, MM.</li> <li>5. Dr. Suyitno, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                          |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus</b><br><b>This course aims</b> to familiarise students with the history, philosophy, values, and professional identity of the Indonesian Teachers Association (PGRI) while strengthening their commitment to the teaching profession and national educational development. <b>Students are expected to demonstrate competencies</b> in developing character and adab that reflect adaptability, enthusiasm, integrity, and pride in the PGRI organisation as a manifestation of devotion to God Almighty and commitment to the nation. The course fosters the ability to evaluate the historical development, organisational identity, vision, and mission of PGRI and to understand its role in improving the quality of educators and human resources in Indonesia. Students develop competencies in analysing organisational ethics, decision-making based on data and information, and the |                                          |                                                                                                                                                                                                                                                                                                                                 |

integration of the Pancasila Student Profile in educational practice. **The scope of study includes** the history and dynamics of PGRI, its organisational characteristics and identity, organisational ethics, the role of PGRI in human resource development, and the importance of professional networks in education. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **Additional topics include** the use of science and technology in strengthening PGRI's contribution to education, as well as the challenges faced by educators in the era of disruption, the Fourth Industrial Revolution, and contemporary societal change. Students engage in discussions, case analyses, and collaborative projects to evaluate organisational strategies and propose solutions to real educational challenges. Emphasis is placed on developing professional responsibility, leadership, and lifelong learning attitudes. Students are encouraged to reflect on their future roles as educators who contribute to national development and social transformation.

#### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrate character and adab that reflect adaptability, enthusiasm, and integrity in accordance with the ethical values of the PGRI organization as an expression of devotion to Almighty God (A5).
2. CLO 2: Evaluate the history and dynamics, characteristics and identity, challenges in the era of disruption, roles in human resource development, the profile of Pancasila students, PGRI organizational ethics, and technology-based global networks and 5A values (anti-sexual violence, anti-drugs, anti-corruption, anti-intolerance, and anti-bullying) to support the development of knowledge and professional practice (A4).
3. CLO 3: Integrate the history and dynamics, characteristics and identity, challenges in the era of disruption, roles in human resource development, the profile of Pancasila students, PGRI organizational ethics, and technology-based global networks and 5A values (anti-sexual violence, anti-drugs, anti-corruption, anti-intolerance, and anti-bullying) to support the development of knowledge and professional practice (C5, A4).
4. CLO 4: Identify, evaluate, and integrate the history and dynamics, characteristics and identity, challenges in the era of disruption, roles in human resource development, the profile of Pancasila students, PGRI organizational ethics, and technology-based global networks and 5A values (anti-sexual violence, anti-drugs, anti-corruption, anti-intolerance, and anti-bullying) to support the development of knowledge and professional practice in addressing challenges in the era of disruption and the Industrial Revolution 4.0 through 5A projects by utilizing science and technology to adapt to existing situations (C5, P4, A4).

#### **Core readings:**

1. Henawanto, A. (2014). Persepsi Guru terhadap Persatuan Guru Republik Indonesia dalam Meningkatkan Profesionalisme Guru. *Jurnal Kebijakan dan Pengembangan Pendidikan*, 2(1).
2. Erpiyana, I., & Mahardika, M. S. (2022). Peran Organisasi PGRI dalam

- Upaya Meningkatkan Kualitas Pendidikan. In Prosiding SEMDIKJAR (Seminar Nasional Pendidikan dan Pembelajaran) (Vol. 5, pp. 1081-1087).
3. Feriyansyah, A., Wulandari, R. P., Sanda, F., & Said, M. (2023). Perencanaan Stratejik Persatuan Guru Republik Indonesia Cimaung Dalam Meningkatkan Profesionalitas Guru Sekolah Dasar. *al-Afkar, Journal For Islamic Studies*, 6(2), 206-218.
  4. Anjani, K. T., & Rahmadi, D. (2022). Perjuangan PGRI dalam Mensejahterakan Guru: Kontribusi PGRI Dalam Pembentukan Undang-Undang Guru dan Dosen Tahun 2005. *WIKSA: Prosiding Pendidikan Sejarah Universitas Indraprasta PGRI*, 1(1).
  5. Taufik, T., Muthalib, N., & Ayu, J. S. (2024). Tak Pantang Aral melintang: Perjuangan PGRI Dalam Perbaikan Nasib Guru di DKI Jakarta (1998—2005). *WIKSA: Prosiding Pendidikan Sejarah Universitas Indraprasta PGRI*, 1(2), 366-378.
  6. Ning, N. R. A. (2014). Perkumpulan Pembina Lembaga Pendidikan Dasar dan Menengah Persatuan Guru Republik Indonesia (PPLP DASMEN PGRI) Jawa Timur Tahun 2002-2005. *Avatara: Jurnal Pendidikan Sejarah*, 2(3).
  7. Suryadi, A. (2022). Menjadi guru profesional dan beretika. CV Jejak (Jejak Publisher).

## Professional Ethics

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| <b>Module number</b><br>3225321626                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>Module name</b><br>Professional Ethics                      |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>Semester / Rotation</b><br>2 / Even                         | <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | <b>Prerequisites for attendance</b><br>Foundation of education | <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignments (5%)<br>2. Quiz (5%)<br>3. Discussion (20%)<br>4. Presentation (20%)<br>5. Case report (20%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (20%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Atip Nurwahyunani, S.Si., S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                | <b>Semester week hours: 90</b>                                                                                                                                                                                                                                                                                                     |
| <b>Additional teacher involved:</b><br>1. Rivanna Citraning Rachmawati, M.Pd.<br>2. Eko Retno Mulyaningrum, M.Pd.<br>3. Dr. Azizul Ghofar Candra Wicaksono, M.Pd<br>4. Dr. Prasetiyo, M,Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the principles of ethics and professionalism in education, with <b>the objective</b> of developing moral awareness and professional responsibility in teaching and educational practice. The course examines moral principles and professional ethics in biology education, including codes of conduct, academic integrity, and scientific responsibility, with particular attention to the role of teachers as ethical and professional role models. <b>Upon completion of the course, students are expected to demonstrate competencies</b> in understanding and identifying ethical principles in teaching, maintaining academic honesty, upholding objectivity and critical thinking, and acting |  |                                                                |                                                                                                                                                                                                                                                                                                                                    |

responsibly in educational research and professional practice. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials covered in this course** include ethical theories in education, professional codes of conduct, academic integrity, teacher professionalism, scientific responsibility, and ethical issues in teaching and educational research, preparing students to become responsible and ethical educators in biology education contexts.

### **Learning goals and Qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in the teaching and learning process (A2)
2. CLO 2: Examine the principles of pedagogy, technology, and their development in order to formulate solutions to procedural problems related to professional ethics in education (C2)
3. CLO 3: Explain issues of professional ethics in education critically and wisely by applying pedagogical principles, technology and its development, utilizing science and technology (IPTEKS) and local wisdom, and demonstrating the ability to develop oneself and adapt to the situations encountered (C2)
1. CLO 4: Take responsibility for one's own work and can be entrusted with responsibility for achieving work outcomes in the field of biology education (A3, P3).

### **Core readings:**

1. Indonesia, K. R. (2003). Undang-undang Republik Indonesia nomor 20 tahun 2003 tentang sistem pendidikan nasional. Jakarta: Pemerintah Republik Indonesia.
2. INDONESIA, P. R. Undang-undang Republik Indonesia Nomor 14 Tahun 2005 tentang Guru dan Dosen.
3. Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 5 Tahun 2022 tentang Standar Kompetensi Lulusan Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah.
4. Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 7 Tahun 2022 tentang Standar Isi Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah.
5. Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 16 Tahun 2022 tentang Standar Proses Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah.
6. Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 21 Tahun 2022 tentang Standar Penilaian untuk Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah.
7. Doungphummes, N., Bhibulbhanuvat, S., & Boonrugsa, T. (2024). Translating Buddhist mindfulness into action: Engaging older Thai adults in participatory action research. *Qualitative Research Journal*, 24(2), 183–193. <https://doi.org/10.1108/QRJ-11-2023-0178>
8. Muzakki, M. S., Yuliawati, F., & Purwati, H. (2022). Peningkatan Kompetensi Guru KKG Sleman Kerjasama UIN Sunan Kalijaga Yogyakarta. *Pelita: Jurnal Pengabdian Kepada Masyarakat*, 2(3), 79–82.

9. Kartinah, Sugiyanti, S., Prasetyowati, D., Harun, L., & Hartati, H. (2022).Pengabdian Kepada Masyarakat Pendampingan Penulisan Karya Tulis Ilmiah Dan Publikasi Bagi Guru Sekolah Dasar Di Kota Semarang. *PATIKALA: Jurnal Pengabdian Kepada Masyarakat*, 1(4), 204–208.
10. Peraturan Pemerintah Nomor 4 Tahun 2022 tentang Perubahan atas Peraturan Pemerintah Nomor 57 Tahun 2021 mengenai Standar Pendidikan Nasional.
11. Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied developmental science*, 24(2), 97-140.
1. Minarti, I. B., Nurwahyunani, A., & Rachmawati, R. C. (2025). PROFIL LITERASI ARTIFICIAL INTELLIGENCE (AI) GURU SMAN 1 MRANGGEN KABUPATEN DEMAK. *Jurnal Biogenerasi*, 10(2), 1296-1303.

## Educational Psychology

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| <b>Module number</b><br>322532 1 617                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Module name</b><br>Educational Psychology                    |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <b>Semester / Rotation</b><br>2 / Even                          | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | <b>Prerequisites for attendance:</b><br>Foundation of education | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (15%)<br>2. Case report (20%)<br>3. Presentation 20%)<br>4. Quiz (5%)<br>5. Assignment (20%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Azizul Ghofar Candra Wicaksono, M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                 | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b><br>1. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.<br>2. Dr. Eny Hartadiyati W.H., M.Si.Med<br>3. Dr. Syaipul Hayat, M.Pd<br>4. Dr. Fenny Roshayanti, M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                 |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br><b>This course examines</b> psychological principles underlying learning and teaching processes, with a focus on learner development, learning theories, motivation, individual differences, classroom interaction, and assessment. Students analyze how cognitive, affective, social, and behavioral factors influence learning and apply psychological concepts to address educational issues. Through case studies and discussions activities, the course develops students' ability to understand the pedagogical principles of educational psychology and apply it to diverse issues in educational contexts. Emphasis is placed on reflective practice, professional responsibility, and the development of collaborative and entrepreneurial values in educational settings. In this course, <b>the learning process</b> is carried out using a |  |                                                                 |                                                                                                                                                                                                                                                                                                                                    |

hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in learning Educational Psychology. (A2)
2. CLO 2: Explain the pedagogical principles of Educational Psychology, including an in-depth study of climate change, in order to solve procedural problems. (C2)
3. CLO 3: Identify students' personalities by utilizing science and technology and local wisdom. (C2)
4. CLO 4: Apply various alternative solutions in solving Educational Psychology problems independently and collaboratively, while internalizing entrepreneurial values. (C3, P3)

### **Core readings:**

1. Nabila, N. A. (2025). Konsep Dasar Psikologi Pendidikan Dalam Proses Pembelajaran. *Jurnal Pelita Ilmu Pendidikan (JPIP)*, 3(2), 33-36.
2. Fong, C. J., Rozek, C. S., & Rutherford, T. (2025). Motivation and Learning. In *Handbook of Research on Learning and Instruction* (pp. 226-246). Routledge.
3. Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Educational Psychology Review*, 32(2), 409–435. <https://doi.org/10.1007/s10648-019-09502-4>
4. Wicaksono, A. G. C., & Korom, E. (2025). Mediation effect of scientific competency on relationship between inductive reasoning and domain-general and domain-specific problem solving. *Thinking Skills and Creativity*, 57, 101830.
5. O'Donnell, A. M., Dobozy, E., Nagel, M. C., Bartlett, B., Smala, S., Wormald, C., Yates, G., Reeve, J., & Smith, J. K. (2024). *Educational psychology*. John Wiley & Sons.
6. Daumiller, M., & Meyer, J. (2025). Advancing feedback research in educational psychology: Insights into feedback processes and determinants of effectiveness. *Contemporary Educational Psychology*, 102390.
7. Alam, A. (2023, May). Improving learning outcomes through predictive analytics: Enhancing teaching and learning with educational data mining. In *2023 7th International Conference on Intelligent Computing and Control Systems (ICICCS)* (pp. 249-257). IEEE.
8. Martin, A. J. (2023). Integrating motivation and instruction: Towards a unified approach in educational psychology. *Educational Psychology Review*, 35(2), 54.
9. Hayat, M. S., Dewi, S., & Rita, E. (2025). Effectiveness of Differentiated Science Learning Oriented to STEAM-SDGs: Improving Students' Creative Thinking Skills on Energy Concepts. *KnE Social Sciences*.

## Student Development

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                |                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225321614                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Student Development                      |                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Semester / Rotation</b><br>2 / Even                         | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                    |
| <b>Teaching Methods</b><br>Lectures, Discussions, Case-Based Learning, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Prerequisites for attendance</b><br>Foundation of education | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (5%)</li> <li>2. Case report (40%)</li> <li>3. Presentation (30%)</li> <li>4. Quiz (5%)</li> <li>5. Mid-Term Examination (10%) 100 Minutes</li> <li>6. Final Examination (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory 27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Rivanna Citraning Rachmawati, S.Si, M. Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Reni Rakhmawati, S.Pd.,M.Pd.</li> <li>2. Dr. Mei Sulistyoningsih, M.Si.</li> <li>3. Fibria Kaswinarni, S.Si.,M.Si.</li> <li>4. Ipah Budi Minarti, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                |                                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus</b><br><b>The Objective</b> of this course is to provide students with a structured understanding of theories of student development and their influence on learning processes. <b>The Competencies</b> achieved by students include the ability to understand and analyse physical, cognitive, language, social-emotional, spiritual, and psychological development of learners; explain student development based on Piaget's theory, Vygotsky's theory, meaningful learning theory, and multiple intelligence theory; interpret classroom and observational cases from developmental perspectives; identify learning styles and learning motivation; analyse the influence of genetic and environmental factors. In this course, <b>the learning process</b> is carried out using |                                                                |                                                                                                                                                                                                                                                                                                                                   |

a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The Materials** covered in this course include theories of student development; physical development; language and communicative development; cognitive and intellectual development; Piaget's theory; Vygotsky's theory; meaningful learning theory; multiple intelligence theory; social-emotional and spiritual development; genetic and environmental influences; learning styles; learning motivation; psychological problems in diverse cultural contexts; and project-based case studies presented through posters and presentations.

### **Learning goals and Qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in learning about learner development (A2).
2. CLO 2: Explain pedagogical principles in learner development in depth in order to resolve learner-related problems (C2)
3. CLO 3: Apply solution wisely in the study of climate change problems as it relates to learner development by utilizing science and technology (IPTEKS) and local wisdom (C3, P3)
4. CLO 4: Apply solutions to learner-related problems independently and collaboratively, guided by entrepreneurial values (C3, P3)

### **Core readings:**

1. Singh, J. (2025). *Foundations of Psychology in Education*. Chyren Publication.
2. O'Donnell, A. M., Dobozy, E., Nagel, M. C., Bartlett, B., Smala, S., Wormald, C., Yates, G., Reeve, J., & Smith, J. K. (2024). *Educational psychology*. John Wiley & Sons.
3. Woolfson, L. M. (2025). *Key topics in educational psychology*. Taylor & Francis.
4. Lestari, R. D., Setiawani, S., & Monalisa, L. A. (2022). Analysis of mathematical communication skills in problem solving linear programs on online learning reviewed from impulsive and reflective cognitive styles. *In AIP Conference Proceedings* (Vol. 2633, No. 1, p. 030037). AIP Publishing LLC.
5. Pongpalilu, F., Hamsiah, A., Raharjo, R., Sabur, F., Nurlela, L., Hakim, L., Waliulu, H., Hasanah, N., Maruddani, R., T., J., Suroso., Winata, E., Y., & Tresnawati, S. (2023). *Perkembangan Peserta Didik: Teori & Konsep Perkembangan Peserta Didik Era Society 5.0*. PT. Sonpedia Publishing Indonesia.
6. Addzaky, K. U. (2024). Perkembangan peserta didik SMA (Sekolah menengah atas). *Jurnal Ilmiah Nusantara*, 1(3), 75-85.
7. Rizani, D. A., Boleng, D. T., & Hapsari, T. R. (2022, December). Analisis karakteristik peserta didik ditinjau dari perkembangan motivasi belajar dan sosial emosional. *In Prosiding Seminar Nasional PPG Universitas Mulawarman* (Vol. 3, pp. 47-51).
8. Syahputri, K. R., Kholis, K., Puspitasari, N. A. A., Aisyah, S., & Setiyono, J. (2023). Peran Lingkungan dalam Perkembangan Peserta Didik: Studi Kasus pada Anak Usia Pra-Remaja. *In Seminar Nasional dan Gelar Karya*

*Produk Hasil Pembelajaran* (Vol. 1, No. 1, pp. 694-699).

9. Rahman, A. N., Nikmah, L., Astuti, P. W., Reni, T. D., & Setiyono, J. (2023, December). Aspek perkembangan peserta didik pada siswa sekolah menengah pertama (SMP). In *Seminar Nasional dan Gelar Karya Produk Hasil Pembelajaran* (Vol. 1, No. 1, pp. 683-686).

## Classroom Management

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| <b>Module number</b><br>322532 1 615                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Module name</b><br>Classroom Management |                                                              |                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                            | <b>Semester / Rotation</b><br>2 / Even                       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                            | <b>Prerequisites for attendance:</b><br>Students Development | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignment (10%)<br>2. Discussion (20%)<br>3. Quiz (5%)<br>4. Case report (20%)<br>5. Presentation (20%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (15%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                            |                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Eny Hartadiyati W.H., M.Si.Med                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                            |                                                              | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                               |
| <b>Additional teacher involved:</b><br>1. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.<br>2. Eko Retno Mulyaningrum, M.Pd.<br>3. Atip Nurwahyunani, S.SP., S.Si., M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                            |                                                              |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the fundamental concepts and practices of classroom management, with <b>the objective</b> of developing the knowledge and skills required to create effective, inclusive, and well-managed learning environments. The course examines the definitions, aims, principles, components, and approaches to classroom management, as well as the professional competencies teachers need to manage classrooms successfully. Students also explore learner characteristics and the development of student potential that must be considered in classroom management, current issues and |                                            |                                                              |                                                                                                                                                                                                                                                                                                                                 |

trends in classroom management, and the application of classroom management concepts as problem-solving strategies. Upon completion of the course, students are expected to demonstrate **competencies** in identifying classroom situations, effective classroom management plans, and classroom management practices based on real educational contexts. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered include foundational concepts of classroom management, teacher competencies, student characteristics and potential development, contemporary issues in classroom management, and the design and simulation of classroom management strategies.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in the learning process. (A2)
2. CLO 2: Identify instructional services provided to learners in accordance with their characteristics. (C2)
3. CLO 3: Apply problem-solving ideas by applying classroom management concepts to address issues in instructional services. (C3, P3)
4. CLO 4: Apply decisions collaboratively in solving problems related to instructional service issues. (C3, P3)

### Core Readings

1. Waluyo, H. J., Suwandi, S., & Kurniawan, H. (Eds.). (2022). *ICHSS 2021: Proceedings of the 1st International Conference of Humanities and Social Science, ICHSS 2021, 8 December 2021, Surakarta, Central Java, Indonesia*. European Alliance for Innovation.
2. Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2022). *Classroom management that works: Research-based strategies for every teacher*. Alexandria, VA: ASCD.
3. Nurcahya, A., Zohriah, A., & Firdaos, R. (2024). Basic concepts of educational management. *J-MIND (Jurnal Manajemen Indonesia)*, 9(1), 9-20.
4. Kementerian Pendidikan Dasar dan Menengah Republik Indonesia. (2025). *Regulation of the Minister of Primary and Secondary Education of the Republic of Indonesia Number 11 of 2025 concerning teachers and lecturers*. Jakarta, Indonesia: Kementerian Pendidikan Dasar dan Menengah.
5. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2025). *Decree of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 63 of 2025 concerning teachers and lecturers*. Jakarta, Indonesia: Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.
6. Alsya'bani, I. S., Safitri, D. N., & Purnomo, H. (2025). Innovative Strategies of Islamic Religious Education Teachers in Building a Creative and Characterized Generation. *Jurnal Studi Islam dan Kemuhammadiyah (JASIKA)*, 5(1), 1-12.
7. Korpershoek, H., de Boer, H., & Mouw, J. M. (2025). An Update of the Meta-Analysis of the Effects of Classroom Management Interventions on Students'

- Academic, Behavioral, Social-Emotional, and Motivational Outcomes. *Review of Educational Research*, 00346543251361903.
8. Azizah, M. A., Budiyono, A., Rozaq, A., & Hakim, A. R. (2025). Transforming classroom management as the key to increasing student learning interest. *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman*, 14(1), 102-117.
  9. Burden, P. R. (2025). *Classroom management: Creating a successful K-12 learning community*. John Wiley & Sons.
  10. Firodiya, S., Saikar, S., Dhuke, A., & Rupnawar, V. (2025, September). Smart Classroom Management Software for Enhanced Learning Environments. In *2025 2nd International Conference on Integration of Computational Intelligent System (ICICIS)* (pp. 1-6). IEEE.
  11. Zaini, M., & Khair, U. (2025, June). Operationalizing Gender-Based Classroom Management in a Pesantren-Affiliated Junior High School. In *ACIE 2024: Proceedings of the 3rd Annual Conference of Islamic Education, ACIE 2024, 14-15 October 2024, Jember, East Java, Indonesia* (p. 422). European Alliance for Innovation.
  12. Minarti, I. B., Nurwahyunani, A., & Rachmawati, R. C. (2025). PROFIL LITERASI ARTIFICIAL INTELLIGENCE (AI) GURU SMAN 1 MRANGGEN KABUPATEN DEMAK. *Jurnal Biogenerasi*, 10(2), 1296-1303.

## Structure and Development of Plants and Fungi

|                                                                                                                                                                                                                                                                                                                                                                     |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <b>Module number</b><br>3225332627                                                                                                                                                                                                                                                                                                                                  | <b>Module name</b><br>Structure and Development of Plants and Fungi           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                 | <b>Semester / Rotation</b><br>2 / Even                                        | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                             | <b>Prerequisites for attendance</b><br>General Biology, Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (5%)</li> <li>2. Assignments (25%)</li> <li>3. Practicum report (20%)</li> <li>4. Case report (10%)</li> <li>5. Presentation (10%)</li> <li>6. Quiz (10%)</li> <li>7. Mid-term exam (10%) 150 Minutes</li> <li>8. Final exam (10%) 150 Minutes</li> </ol> |                                                                               | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>1 Credit Hours<br>Laboratory Activity<br>(45 hours of Laboratory Activity)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity<br>(1.5 ECTS)<br>(45 hours of Laboratory Activity)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Rivanna Citraning Rachmawati, M.Pd.                                                                                                                                                                                                                                                                                                    |                                                                               | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Prasetyo, M.Pd.</li> <li>2. Dr. Mei Sulistyoningih, M.Si.</li> <li>3. Fibria Kaswinarni, S.Si., M.Si.</li> </ol>                                                                                                                                                                  |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Syllabus

This course introduces undergraduate students to the fundamental concepts of plant structure and development, with **the objective** of enabling them to understand plant anatomy and morphology within the context of horticultural plants, biotechnology, and classification. Upon completion of the course, students are expected to demonstrate **competencies** in explaining the structure and function of plant cells, tissues, and organs, identifying the morphology of roots, stems, leaves, flowers, fruits, and seeds, and relating plant structural characteristics to classification and biotechnological applications. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this **course** include plant anatomy, organ morphology, developmental aspects of plants, horticultural plant diversity, and basic concepts of plant biotechnology and classification. Learning activities are conducted through practical sessions, discussions, presentations, and mini-projects designed to foster logical, critical, systematic, innovative, and responsible thinking in plant biology and biology education contexts.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Show enthusiasm during learning of Plant and Fungi Structure Development with full integrity. (A2)
2. CLO 2: Understand the Plant and Fungi Structure Development, including an in-depth study of climate change, thereby capable of solving procedural problems. (C2)
3. CLO 3: Apply solution critically and wisely using concepts of plant and fungi structure development by utilizing science and technology and local wisdom and adapting to the situation faced (C3, P3)
4. CLO 4: Conduct practical activities on plant and fungi structure development in the laboratory and field while paying attention to bioethical principles and Occupational Health and Safety (P3, A3)

### Core readings:

1. Zagorskina, N. V., Zubova, M. Y., Nechaeva, T. L., Kazantseva, V. V., Goncharuk, E. A., Katanskaya, V. M., Baranova, E.N., & Aksenova, M. A. (2023). Polyphenols in plants: structure, biosynthesis, abiotic stress regulation, and practical applications. *International Journal of Molecular Sciences*, 24(18), 13874. <https://doi.org/10.3390/ijms241813874>.
2. Dewi, L. R., Satriani, S., Rahma, A., & Arimah, S. (2025). Inventarisasi Pteridophyta Epifit dan Asosiasi Pohon Inangnya di Hutan Desa Paninggaran, Pekalongan. *Jurnal Ilmiah Biologi UMA (JIBIOMA)*, 7(2), 134-146.
3. Arimah, S., Kaswinarni, F., & Rachmawati, R. C. (2025). Pengaruh Berbagai Media Tanam terhadap Pertumbuhan Microgreen Bunga Matahari (*Helianthus annuus*). *Biocaster: Jurnal Kajian Biologi*, 5(4), 865-878. <https://doi.org/10.36312/biocaster.v5i4.667>
4. Anderson, C. T., & Pelloux, J. (2025). The dynamics, degradation, and afterlives of pectins: influences on cell wall assembly and structure, plant

development and physiology, agronomy, and biotechnology. *Annual Review of Plant Biology*, 76(1), 85-113.

5. Le Naour--Vernet, M., Lahfa, M., Maidment, J. H., Padilla, A., Roumestand, C., de Guillen, K., Kroj. T & Césari, S. (2025). Structure-guided insights into the biology of fungal effectors. *New Phytologist*, 246(4), 1460-1477.
6. Cargill, R. I., Shimizu, T. S., Kiers, E. T., & Kokkoris, V. (2025). Cellular anatomy of arbuscular mycorrhizal fungi. *Current Biology*, 35(11), R545-R562.
7. Yao, J., Huang, S., He, L., Wei, S., Yang, W., Zhang, Q., Wang. W., Yang. X., Xie. S., Li. Y., Zhao.P., & Zhu, G. (2025). Antifungal Polyacetylenic Deoxyglycosides Isolated from Endophytic Fungus *Xylaria* sp. VDL4 Associated with *Vaccinium dunalianum*. *Journal of Fungi*, 11(3), 209.
8. Dwivedi, S. L., Vetukuri, R. R., Kelbessa, B. G., Gepts, P., Heslop-Harrison, P., Araujo, A. S., Sharma. S., & Ortiz, R. (2025). Exploitation of rhizosphere microbiome biodiversity in plant breeding. *Trends in Plant Science*.

## Structure and Development of Animals

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| <b>Module number</b><br>3225332630                                                                                                                                                                                                                                                                                                                                   | <b>Module name</b><br>Structure and Development of Animals                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                  | <b>Semester / Rotation</b><br>2 / Even                                        | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                              | <b>Prerequisites for attendance</b><br>General Biology, Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (17%)</li> <li>2. Practicum report (20%)</li> <li>3. Case report (10%)</li> <li>4. Presentation (10%)</li> <li>5. Assignment (13%)</li> <li>6. Quis (10%)</li> <li>7. Mid-term exam (10%) 150 Minutes</li> <li>8. Final exam (10%) 150 Minutes</li> </ol> |                                                                               | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity<br>(1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Reni Rakhmawati, S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                           |                                                                               | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Mei Sulistyoningih, M.Si.</li> <li>2. Fibria Kaswinarni, S.Si., M.Si.</li> <li>3. Eko Retno Mulyaningrum, M. Pd</li> </ol>                                                                                                                                                         |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syllabus</b><br>This course introduces undergraduate students to the fundamental principles of vertebrate structure, anatomy, and developmental biology, with <b>the objective</b> of                                                                                                                                                                             |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

providing a comprehensive understanding of embryological processes and comparative vertebrate anatomy. Upon completion of the course, students are expected to demonstrate **competencies** in explaining stages of vertebrate embryonic development, including fertilisation, cleavage, morula, blastula, gastrulation, neurulation, and organogenesis, as well as in identifying tissues and cells through microscopic observation. Students are also able to compare the anatomical structures of major vertebrate groups Pisces, Amphibia, Reptilia, Aves, and Mammalia and interpret the relationships between structure and function. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include vertebrate embryology, histological observation of tissues and cells, external morphology, internal organ systems, and comparative anatomy of vertebrates, with learning activities delivered through morphological observation, dissection (sectio), and microscopic tissue analysis using prepared slides to support practical understanding and pedagogical competence.

### **Learning goals and Qualifications**

In this module students learn to:

2. CLO 1: Demonstrate an enthusiastic attitude in the teaching and learning process related to the functions and processes occurring in animals, as well as plant environment interactions. (A2)
3. CLO 2: Explain the structure of animal organs; covering embryonic development in vertebrates, tissue structure in vertebrates, and vertebrate organ anatomy in depth in order to formulate solutions to procedural problems. (C2)
4. CLO 3: Explain principles of animal organ structure, including vertebrate embryonic development, tissue structure, and organ anatomy, while utilizing science and technology and local wisdom. (C2)
5. CLO 4: Explain concepts and principles of animal organ structure: vertebrate embryonic development, tissue structure, and organ anatomy into laboratory and field practical activities, with due consideration to bioethical principles and Occupational Health and Safety (K3). (C2)
6. CLO 5: Identify alternative solutions to problems related to animal organ structure vertebrate embryonic development, tissue structure, and organ anatomy independently and collaboratively, while internalizing entrepreneurial values. (C2, A3, P3)

### **Core readings:**

2. Burda, I., Martin, A. C., Roeder, A. H., & Collins, M. A. (2023). The dynamics and biophysics of shape formation: Common themes in plant and animal morphogenesis. *Developmental cell*, 58(24), 2850-2866.
3. Sulistiyoningsih, M., & Rakhmawati, R. (2021, August). Efektivitas Pemberian Silase Limbah Ikan Untuk Meningkatkan Panjang Tulang Femur, Tibia Dan Metatarsus, Pada Bebek Pedaging. In *Prosiding Seminar Nasional Dies Natalis UTP Surakarta* (Vol. 1, No. 01, pp. 53-59).
4. Owen, R. (2025). *Odontography or a Treatise on the Comparative Anatomy of the Teeth, Their Physiological Relations, Mode of Development, and Microscopic Structure in the Vertebrate Animals: Vol. 1*. BoD–Books on

Demand.

5. Gangwal, A., & Lavecchia, A. (2025). Artificial intelligence in preclinical research: enhancing digital twins and organ-on-chip to reduce animal testing. *Drug Discovery Today*, 30(5), 104360.
6. Mitra, M., Sajan, Paul, S., Huppert, A., & Jurkevitch, E. (2026). From Microbes to Animals: A Review on Prey Choice and Prey-Predator Dynamics Across Organismal Scales. *FEMS Microbiology Reviews*, fuag004.

**3rd Semester**  
**Odd 2025/2026**

## Biochemistry

|                                                                                                                                                                                                                                                                              |                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Module number</b><br>3225332635                                                                                                                                                                                                                                           | <b>Module name</b><br>Biochemistry                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                          | <b>Semester / Rotation</b><br>3/ Odd                                           | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                      | <b>Prerequisites for attendance:</b><br>Basic Chemistry, Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>Type of examination (Final Grade Composition)</b><br>1. Assignments (10%)<br>2. Discussions (10%)<br>3. Quiz (10%)<br>4. Case report (10%)<br>5. Practicum report (20%)<br>6. Presentation (20%)<br>7. Mid-term exam (10%) 150 Minutes<br>8. Final exam (10%) 150 Minutes |                                                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |  |
| <b>Module coordinator</b><br>Dr. Ling. Maria Ulfah, S.Si., M.Pd.                                                                                                                                                                                                             |                                                                                | <b>Semester week hours</b><br>135 Hours                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| <b>Additional teacher involved:</b><br>1. Dr. Enny Hartadiyati W.H.,M.Si.Med.<br>2. Dr. Mei Sulistyoningsih, M.Si.<br>3. Fibria Kaswinarni, S.Si., M.Si.                                                                                                                     |                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts of biochemistry, with <b>the objective</b> of developing a comprehensive understanding of                                                      |                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |

the chemical structures and properties of biologically important organic compounds involved in metabolism. Upon completion of the course, students are expected to demonstrate **competencies** in analysing structure–function relationships of biomolecules, explaining enzymatic catalysis and metabolic pathways, identifying common metabolic disorders found in the surrounding community, and communicating scientific findings effectively. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the chemical structure and properties of proteins, enzymes, vitamins, carbohydrates, lipids, and nucleic acids; digestion of organic compounds; metabolism of carbohydrates, proteins, lipids, vitamins, enzymes, and nucleic acids; and metabolic disorders related to these compounds. Students learn and work in groups to conduct laboratory experiments based on local potential, identify biochemical problems, apply solutions, and report their findings in the form of scientific articles accessible to both the academic community and the wider public.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process about metabolism in living cells. (A2)
2. CLO 2: Explain the concept of metabolism in living cells in order to formulate solutions to its procedural problems. (C2)
3. CLO 3: Apply the principles and concepts of metabolism in living cells while utilizing science and technology and local wisdom. (C3, P3)
4. CLO 4: Explain concepts of plant functions and processes, as well as plant–environment interactions and development, in laboratory and field practice activities while observing bioethical principles and Occupational Health and Safety (OHS/K3). (C2, P3)
5. CLO 5: Being responsible for one's own work and being entrusted with responsibility for achieving work outcomes related to metabolism in living cells. (A3)

### Core readings:

1. Ulfah, M., Faizsyahrani, L. P., Sumarno, S., & Wijaya, A. T. (2025). Ammonia and Total Nitrogen Removal Using Equisetum hymale Based Phytoremediation in Landfill Leachate. *Jurnal Penelitian Pendidikan IPA*, 11(5), 813-820. <https://doi.org/10.29303/jppipa.v11i5.11009>
2. Sheng, X., Lin, H., Cole, P. A., & Zhao, Y. (2026). Biochemistry and regulation of histone lysine L-lactylation. *Nature Reviews Molecular Cell Biology*, 27(2), 95-109.
3. Guerra, R. M., & Pagliarini, D. J. (2023). Coenzyme Q biochemistry and biosynthesis. *Trends in biochemical sciences*, 48(5), 463-476.
4. Sharma, A. K., Khandelwal, R., & Wolfrum, C. (2024). Futile lipid cycling: from biochemistry to physiology. *Nature Metabolism*, 6(5), 808-824.
5. Bao, H., Liu, Y., Li, H., Qi, W., & Sun, K. (2023). Luminescence of carbon quantum dots and their application in biochemistry. *Heliyon*, 9(10).

6. Wang, D., & Yu, L. (2024). Migrasome biogenesis: when biochemistry meets biophysics on membranes. *Trends in biochemical sciences*, 49(9), 829-840.
7. Bolgova, O., Shypilova, I., & Mavrych, V. (2025). Large language models in biochemistry education: comparative evaluation of performance. *JMIR medical education*, 11, e67244.
8. Wang, F., Ma, W., Fan, D., Hu, J., An, X., & Wang, Z. (2024). The biochemistry of melanogenesis: An insight into the function and mechanism of melanogenesis-related proteins. *Frontiers in Molecular Biosciences*, 11, 1440187.
9. Gless, B. H., Schmied, S. H., Beijder, B. S., & Olsen, C. A. (2023). Forster resonance energy transfer assay for investigating the reactivity of thioesters in biochemistry and native chemical ligation. *JACS Au*, 3(5), 1443-1451.

### Animal Physiology

| Module number<br>322533 2 632                                                                                                                                                                                                                                                                                                                                      |  | Module name<br>Animal Physiology                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                |  | <b>Semester / Rotation</b><br>3/ Odd                                                                                | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                            |  | <b>Prerequisites for attendance:</b><br>Basic Biology<br>Structure and development of animal, Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English<br>(international)                                                                                                                                                                                                                                                                                                                               |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignment (10%)</li> <li>2. Discussion (25%)</li> <li>3. Quiz (5%)</li> <li>4. Practicum report (20%)</li> <li>5. Case report (10%)</li> <li>6. Presentation (10%)</li> <li>7. Mid-term exam (10%) 150 Minutes</li> <li>8. Final exam (10%) 150 Minutes</li> </ol> |  |                                                                                                                     | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study) |

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| <b>Module coordinator</b><br>Reni Rakhmawati, S.Pd.,M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Semester week hours</b><br>135                                                |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Mei Sulistyoningasih, M.Si.</li> <li>2. Fibria Kaswinarni, S.Si.,M.Si.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                  |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the principles and mechanisms underlying animal physiology, with <b>the objective</b> of developing a comprehensive understanding of how physiological systems function at different levels of biological organisation and how animals maintain homeostasis and adapt to environmental changes. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining physiological processes related to water and ion balance, thermal regulation, cellular metabolism and energy production, nutrition, respiration, excretion, blood physiology, nervous and endocrine regulation, reproductive and developmental processes, and physiological adaptation. Students are also able to identify strategies of physiological regulation and apply physiological principles to optimise production through physiological engineering approaches. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The materials</b> covered in this course include homeostatic mechanisms, water and ion regulation, thermal physiology, cellular metabolism and energy production, nutrition, respiratory physiology, excretory systems, physiological adaptation, blood physiology, nervous and endocrine systems, reproductive and developmental physiology, and optimisation of biological production based on physiological principles. |                                                                                  |
| <b>Learning goals and qualifications</b><br>In this module students learn to: <ol style="list-style-type: none"> <li>1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process about the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata. (A3)</li> <li>2. CLO 2: Explain the mechanisms of internal regulation (homeostasis), cellular functional mechanisms (membrane transport, signal transduction, and cellular metabolism), and the physiological mechanisms of the nervous, hormonal, respiratory, digestive, reproductive, and excretory systems. (C2)</li> <li>3. CLO 3: Explain the mechanisms of physiological adaptation of the body to environmental changes such as thermoregulation, osmoregulation, high</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                  |

pressure in deep seas, or low oxygen levels. (C3)

4. CLO 4: Conduct laboratory practicum activities in animal physiology. (C3, P3)
5. CLO 5: Identify various alternative solutions in solving problems in the field of animal physiology in the laboratory. (C4)

**Core readings:**

1. Sulistyoningsih, M., Rakhmawati, R., & Wibowo, S. (2023). Pengaruh Teknik Pembesaran pada Kandang Close house Berbasis IoT Terhadap Bobot dan Karkas Ayam Broiler. *Jurnal Ilmiah Agrineca*, 23(1), 56-61.
2. Tudor, E. P., Lewandrowski, W., & Tomlinson, S. (2023). Integrating animal physiology into the adaptive management of restored landscapes. *Environmental Management*, 72(3), 519-528.
3. Debaere, S. F., Opinion, A. G. R., Allan, B. J., Rummer, J. L., & De Boeck, G. (2024). Bridging the divide in organismal physiology: a case for the integration of behaviour as a physiological process. *Journal of Experimental Biology*, 227(22), jeb247685.
4. Dallas, J. W., & Warne, R. W. (2023). Captivity and animal microbiomes: potential roles of microbiota for influencing animal conservation. *Microbial ecology*, 85(3), 820-838.
5. Deng, Q., Zhao, N., Zhu, C., & Zhang, B. (2022). Long non-coding RNAs in the physiology of aquaculture animals: a perspective update. *Reviews in Fish Biology and Fisheries*, 32(4), 1103-1122.
6. Hildebrandt, J. P. (2023). Ecology meets physiology: phenotypic plasticity and the ability of animals to adjust to changing environmental conditions. *Physiologia*, 3(2), 366-380.
7. von Liebig, J. (2023). Animal chemistry, or organic chemistry in its application to physiology and pathology. In *Scientific and Medical Knowledge Production, 1796-1918* (pp. 110-115). Routledge.
8. Biesiekierski, J. R., Yao, C. K., Tuck, C. J., & Snelson, M. (2025). Methodological advances in gastrointestinal tract physiology measurements: relevance to nutritional studies. *Proceedings of the Nutrition Society*, 84(2), 155-167.
9. Imani, N., & Vale, B. (2022). Developing a method to connect thermal physiology in animals and plants to the design of energy efficient buildings. *Biomimetics*, 7(2), 67.
10. Duncan, R. P., Moustafa, D. A., Lewin, G. R., Diggle, F. L., Bomberger, J. M., Whiteley, M., & Goldberg, J. B. (2024). Improvement of a mouse infection model to capture *Pseudomonas aeruginosa* chronic physiology in cystic fibrosis. *Proceedings of the National Academy of Sciences*, 121(33), e2406234121.

## Plant Physiology

|                                                                                                                                                                                                                                                                                                               |                                        |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225332629                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Plant Physiology |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                           |                                        | <b>Semester / Rotation</b><br>3 / Odd                                                                      | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                       |                                        | <b>Prerequisites for attendance</b><br>Structure and development of plant and fungi, Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (30%)<br>2. Practicum report (20%)<br>3. Case report (10%)<br>4. Presentation (10%)<br>5. Assignment (5%)<br>6. Quiz (5%)<br>7. Mid exam (10%) 150 Minutes<br>8. Final exam (10%) 150 Minutes                                           |                                        |                                                                                                            | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS) (45 hours of practice) (Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS) (45 hours of practice) (Total 135 hours) |
| <b>Module coordinator</b><br>Lussana Rossita Dewi, S.Si.,M.Pd.                                                                                                                                                                                                                                                |                                        |                                                                                                            | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Additional teacher involved:</b><br>1. Dr. Dra. Enny Hartadiyati W.H., M.Si.Med.<br>2. M. Anas Dzakiy, M.Sc.<br>3. Dyah Ayu W. S.Si., M.Biotech                                                                                                                                                            |                                        |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syllabus/Description of what will be done</b><br><b>This course introduces</b> undergraduate students to the fundamental principles of basic plant physiology, with <b>the objective</b> of developing an understanding of physiological processes that regulate plant functions, growth, and development. |                                        |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Upon completion of the course, students are expected to demonstrate **competencies** in explaining mechanisms of water absorption and loss, nutrient uptake, metabolic processes including photosynthesis, nitrogen, phosphorus and sulphur metabolism, respiration, and assimilate translocation. Students are also able to identify the roles of enzymes and plant hormones, as well as physiological processes related to plant growth, development, and seed physiology. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include absorption and water loss processes, plant nutrition, photosynthesis, nitrogen, phosphorus and sulphur metabolism and respiration, assimilate translocation, enzymes and hormones, plant growth and development, and seed physiology.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process about the functions and processes that occur in plants, as well as plant, environment interactions. (A3)
2. CLO 2: Explain the functions and processes that occur in plants, as well as plant–environment interactions, in order to formulate solutions to procedural problems. (C2)
3. CLO 3: Apply the principles and concepts of plant functions and processes, as well as plant environment interactions, by utilizing science and technology and local wisdom. (C3, A3)
4. CLO 4: Explain the concepts of plant functions and processes, as well as plant environment interactions and their development, in laboratory and field practice activities while observing bioethical principles and Occupational Health and Safety (OHS/K3). (C2, P1, A3)
5. CLO 5: Apply alternative solutions to problems related to plant functions and processes, as well as plant environment interactions, independently and collaboratively while internalizing entrepreneurial values. (C3, A3)

### **Core readings:**

1. Fazhilah, T., Nurwahyunani, A., Dewi, L. R., & Kaswinarni, F. (2023). PEMBERIAN LIMBAH DIAPERS DAN PUPUK KOTORAN KAMBING TERHADAP JUMLAH DANLEBAR DAUN KANGKUNG DARAT (*Ipomoea reptans* Poir). *Jurnal Salome: Multidisipliner Keilmuan*, 1(4), 264-276.
2. Mostofa, M. G., Rahman, M. M., Ghosh, T. K., Kabir, A. H., Abdelrahman, M., Khan, M. A. R., Mochida. K., & Tran, L. S. P. (2022). Potassium in plant physiological adaptation to abiotic stresses. *Plant Physiology and Biochemistry*, 186, 279-289.
3. Haghpanah, M., Hashemipetroudi, S., Arzani, A., & Araniti, F. (2024). Drought tolerance in plants: physiological and molecular responses. *Plants*, 13(21), 2962.
4. Bhatla, S. C., & Lal, M. A. (2023). *Plant physiology, development and metabolism*. Springer Nature.
5. Jing, T., Li, J., He, Y., Shankar, A., Saxena, A., Tiwari, A., ... & Awasthi, M.

- K. (2024). Role of calcium nutrition in plant Physiology: Advances in research and insights into acidic soil conditions-A comprehensive review. *Plant Physiology and Biochemistry*, 210, 108602.
6. Ahmad, A., Hashmi, S. S., Palma, J. M., & Corpas, F. J. (2022). Influence of metallic, metallic oxide, and organic nanoparticles on plant physiology. *Chemosphere*, 290, 133329.
  7. Noori, A., Hasanuzzaman, M., Roychowdhury, R., Sarraf, M., Afzal, S., Das, S., & Rastogi, A. (2024). Silver nanoparticles in plant health: Physiological response to phytotoxicity and oxidative stress. *Plant Physiology and Biochemistry*, 209, 108538.
  8. Celi, G. E. A., Grato, P. L., Lanza, M. G. D. B., & Dos Reis, A. R. (2023). Physiological and biochemical roles of ascorbic acid on mitigation of abiotic stresses in plants. *Plant Physiology and Biochemistry*, 202, 107970.
  9. Wang, X., Xie, H., Wang, P., & Yin, H. (2023). Nanoparticles in plants: uptake, transport and physiological activity in leaf and root. *Materials*, 16(8), 3097.
  10. Fillah, A. H. A., Rahayu, P., & Dewi, L. R. (2024). Studi Komparatif Antara Tutup Filter dan Tutup Rapat pada Pertumbuhan Vegetatif Fase Pertumbuhan Planlet pada Anggrek Dendrobium donny rizal. *Spizaetus: Jurnal Biologi dan Pendidikan Biologi*, 5(1), 38-46.
  11. Nugroho, A. S., & Dzakiy, M. A. (2023). KEANEKARAGAMAN JENIS TUMBUHAN PAKU DI HUTAN NGRESEPMBALONG SEMARANG. *BIOFAIR*, 488-497.

## Basic of Biology Learning

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                 |                                                                                           |                                                                                                                                                                                                                                                                                                                                    |
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| <b>Module number</b><br>322532 1 618                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Module name</b><br>Basic of Biology Learning |                                                                                           |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                 | <b>Semester / Rotation</b><br>3 / Odd                                                     | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                 | <b>Prerequisites for attendance:</b><br>Educational psychology<br>Foundation of education | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (10%)<br>2. Case report (30%)<br>3. Presentation (20%)<br>4. Assignment (10%)<br>5. Quiz (10%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                 |                                                                                           | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                 |                                                                                           | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b><br>1. Dr. Fenny Roshayanti, M.Pd.<br>2. Eko Retno Mulyaningrum, M.Pd<br>3. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |                                                                                           |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br>This course introduces undergraduate students in the Biology Education programme to the fundamental concepts and theoretical foundations of learning, with <b>the objective</b> of developing a comprehensive understanding of learning theories and their application in biology education. The course examines the definitions, aims, functions, principles, foundations, and motivational aspects of learning theories, including behaviourism, cognitivism, constructivism, and humanistic theory. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in analysing learning phenomena, selecting and applying appropriate learning theories based on learner characteristics, educational contexts, and contemporary issues in 21st-century biology education. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the |                                                 |                                                                                           |                                                                                                                                                                                                                                                                                                                                    |

academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the concepts and principles of learning theories, motivation in learning, and major theoretical perspectives on learning. Learning activities are delivered through direct instruction, independent assignments, group discussions, case-based presentations, and analysis of learning issues aligned with instructional principles, learner development, and current trends in biology education.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate integrity in studying the fundamentals of biology instruction. (A2)
2. CLO 2: Identify learning theories in biology instruction through literature review. (C2)
3. CLO 3: Identify solutions to biology learning problems based on learning theories in biology instruction through literature review. (C3)
4. CLO 4: Apply instructional problems in schools based on learning theories in biology instruction by utilizing science and technology (IPTEKS) and literature review. (C3, P3)
5. CLO 5: Identify solutions to biology learning problems in the classroom while internalizing entrepreneurial values through literature review. (C3, A4)

### **Core readings:**

1. Lagoudakis, N., Vlachos, F., Christidou, V., Vavougios, D., & Batsila, M. (2024). The Use of Brain Based Learning Elements in a Teaching Approach for Scientific Understanding of Biology Concepts. *American Journal of Educational Research*, 12(7), 247-253.
2. Shadmehr, R., & Mussa-Ivaldi, S. (2023). *Biological learning and control: how the brain builds representations, predicts events, and makes decisions*. Mit Press.
3. Hujjatusnaini, N., Corebima, A. D., Prawiro, S. R., & Gofur, A. (2022). The effect of blended project-based learning integrated with 21st-century skills on pre-service biology teachers' higher-order thinking skills. *Jurnal Pendidikan IPA Indonesia*, 11(1), 104-118.
4. Fowler, S., Roush, R., & Wise, J. (2024). *Concepts of biology*.
5. Kulkarni, A. (2022). Preparation and Testing of Food Freshness Indicators: an Application-Oriented Learning Module Integrating Basic Concepts of Microbiology and Chemistry Laboratory. *Journal of Microbiology & Biology Education*, 23(2), e00063-22.
6. Chen, Z., Hou, C., Wang, L., Yu, C., Chen, T., Shen, B., Hou, Y., Li, P., & Li, T. (2022). Screening membraneless organelle participants with machine-learning models that integrate multimodal features. *Proceedings of the National Academy of Sciences*, 119(24), e2115369119.
7. Jaume, G., Vaidya, A., Chen, R. J., Williamson, D. F., Liang, P. P., & Mahmood, F. (2024). Modeling dense multimodal interactions between biological pathways and histology for survival prediction. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 11579-11590).
8. Vanchurin, V., Wolf, Y. I., Katsnelson, M. I., & Koonin, E. V. (2022). Toward

a theory of evolution as multilevel learning. *Proceedings of the National Academy of Sciences*, 119(6), e2120037119.

9. Mapstone, C., & Plusa, B. (2025). Machine learning approaches for image classification in developmental biology and clinical embryology. *Development*, 152(4), DEV202066.
10. Prasetiyo, P. (2025, December). KEBERLANJUTAN EKOSISTEM DALAM MEWUJUDKAN KETAHANAN PANGAN BERBASIS DEEP LEARNING DI ERA TRANSFORMASI DIGITAL. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 13, No. 1, pp. Speaker-Speaker).

## Biology Learning Strategies

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |                                                                                                                                                                                                                                                                                                                                   |
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| <b>Module number</b><br>3225321619                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Module name</b><br>Biology Learning Strategies                                  |                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Semester / Rotation</b><br>3/ Odd                                               | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Prerequisites for attendance</b><br>Educational psychology, student development | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (10%)</li> <li>2. Case report (25%)</li> <li>3. Presentation (25%)</li> <li>4. Quiz (10%)</li> <li>5. Assignment (10%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                    |                                                                                    | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Fenny Roshayanti, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                    | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Atip Nurwahyunani, S.Si., S.Pd.,M.Pd.</li> <li>2. Dr. Prasetyo, M.Pd.</li> <li>3. Dr. Enny Hartadiyati W.H., <u>M.Si.</u>Med.</li> <li>4. Dr. Syaipul Hayat, <u>M.Pd</u></li> </ol>                                                                                                                                                                                                                                                                                                                                                                   |                                                                                    |                                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and practices of learning strategies, with <b>the objective</b> of developing their ability to design, implement, and evaluate effective learning processes across diverse educational contexts. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in understanding the nature of learning strategies, explaining human generational development, identifying appropriate learning approaches, models, and methods, and applying constructive and collaborative |                                                                                    |                                                                                                                                                                                                                                                                                                                                   |

learning models into instructional practice. Students are also able to apply key pedagogical frameworks such as basic teaching and learning and TPACK in e-learning-based instruction, and to design, implement, and simulate effective learning scenarios. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the essence of learning strategies, human generational development, learning approaches, constructive and collaborative learning models, learning methods, KDM, TPACK, e-learning-based instruction, and the implementation of learning designs through scenarios and simulations.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the learning process. (A2)
2. CLO 2: Explain approaches, strategies, and learning models, as well as the development of learning environments that are appropriate to students' characteristics. (C2)
3. CLO 3: Apply learning models by simulating instructional models according to students' characteristics. (C3, P3)
4. CLO 4: Apply solutions related to issues in the implementation of learning collaboratively. (C3, P3)

### Core readings:

1. Jayanti, U. N. A. D., Adlini, M. N., & Wiryawan, Y. N. M. R. (2024). Pre-service biology teachers' knowledge of the 21st-century skills and its associated instructional models: The Indonesian context. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 10(3), 819-829.
2. Majid, I., Aboe, R. M., & Sari, A. N. (2024). Effects of Biology Learning Models on Metacognitive Skills of Senior High School Students. *Jurnal Pendidikan IPA Indonesia*, 13(3).
3. Theodoris, C. V., Xiao, L., Chopra, A., Chaffin, M. D., Al Sayed, Z. R., Hill, M. C., Mantineo, H., Brydon, E. M., Zeng, Z., Liu, X. S., & Ellinor, P. T. (2023). Transfer learning enables predictions in network biology. *Nature*, 618(7965), 616-624.
4. Carpenter, S. K., Pan, S. C., & Butler, A. C. (2022). The science of effective learning with spacing and retrieval practice. *Nature Reviews Psychology*, 1(9), 496-511.
5. Zulyusri, Z., Elfira, I., Lufri, L., & Santosa, T. A. (2023). Literature study: Utilization of the PjBL model in science education to improve creativity and critical thinking skills. *Jurnal Penelitian Pendidikan IPA*, 9(1), 133-143.
6. Dou, B., Zhu, Z., Merkurjev, E., Ke, L., Chen, L., Jiang, J., Zhu, Y., Liu, J., Zhang, B., & Wei, G. W. (2023). Machine learning methods for small data challenges in molecular science. *Chemical Reviews*, 123(13), 8736-8780.
7. Guo, F., Guan, R., Li, Y., Liu, Q., Wang, X., Yang, C., & Wang, J. (2025). Foundation models in bioinformatics. *National science review*, 12(4), nwaf028.
8. Stevens, S., Wu, J., Thompson, M. J., Campolongo, E. G., Song, C. H.,

Carlyn, D. E., Dong. L., Dahdul. W.M., Stewart. C., Wolf-Berger. T., Chao. W-L., & Su, Y. (2024). Bioclip: A vision foundation model for the tree of life. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition* (pp. 19412-19424).

9. Roshayanti, F., Marfiana, T., & Indiati, I. (2026, February). Student Response to the Use of the "Make a Mangrove" Game in Learning the Ecosystem Concept. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 475-486). Atlantis Press.
10. Indiati, I., Marfiana, T., & Roshayanti, F. (2025). Mangrove Forests As A Learning Resource: Improving Students' Science Literacy In ESD-Oriented Science Learning. *Architecture Image Studies*, 6(3), 1433-1450.

## English for Biology

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| <b>Module number</b><br>322532 1 647                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <b>Module name</b><br>English for Biology      |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | <b>Semester / Rotation</b><br>3/ Odd           | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Prerequisites for attendance</b><br>English | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                  |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (20%)</li> <li>2. Presentation (20%)</li> <li>3. Assignment (10%)</li> <li>4. Quiz (10%)</li> <li>5. Case report (20%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Ling maria Ulfah, M.Si                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved</b> <ol style="list-style-type: none"> <li>1. Dr. Azizul Ghofar Candra W, <u>M.Pd</u></li> <li>2. Lussana Rossita Dewi, <u>S.Si.,M.Pd.</u></li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/ Description of what will be done</b><br>This module introduces undergraduate students to General Academic English, focusing on the development of basic grammatical competence and written communication skills for academic contexts. The course covers essential English tenses, including the Simple Present, Continuous, Simple Past, Simple Future, and Simple Present Perfect tenses, as well as common academic text types such as descriptive, procedure, and recount texts. Learning activities include lectures, guided practice, text comprehension, and collaborative tasks to support students in writing simple academic texts accurately and coherently. This module serves as a foundational course to strengthen students' academic writing and communication skills across disciplines. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and |  |                                                |                                                                                                                                                                                                                                                                                                                                    |

structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>.

**Learning goals and qualifications in this module students learn to:**

Upon completing this module, students are able to:

1. Demonstrate an enthusiastic character in the teaching and learning process regarding basic English skills in the context of biology and biology education studies. (A2)
2. Understand the process of in-depth text reading, text understanding, listening, writing, and speaking from scientific articles, biology textbooks, and popular biology books in order to formulate procedural problem-solving. (C2, P3)
3. Apply the principles of basic English skills in the context of biology and biology education studies by utilizing science and technology (IPTEKS) and local wisdom. (C3, P3)
4. Responsible for one's own work and being entrusted with responsibility for achieving work outcomes related to basic English skills in the context of biology and biology education studies. (A4, P4)

**Core readings:**

1. Wulandari, W., Susanto, D. A., & Hawa, F. (2024). Exploring Bamboozle as games-based learning media to support students' vocabulary: Its application in the classroom. *Innovative: Journal of Social Science Research*, 4(2), 6542–6551.
2. Swales, J. M., & Feak, C. B. (2021). *Academic writing for graduate students: Essential tasks and skills* (4th ed.). Ann Arbor, MI: University of Michigan Press.
3. Jufri, A. W., Imam, B., Wahab, A. D. A., & Riyanto, A. A. (2023). The Implementation of English for Biology Based on CLIL Student Handbook to Improve English Proficiency of Prospective Student Biology Teacher. *Jurnal Penelitian Pendidikan IPA*, 9(1), 346-349.
4. Kanamitie, J. N., Nketsiah, J., & Asenso, K. (2023). English language proficiency: A predictor of academic performance in biology. *International Journal of Research and Innovation in Social Science*, 7(3), 358-367.
5. Siregar, S., & Yuniasih, E. (2022). The Development of Scientific Literacy-Based English Teaching Materials For Biology Students. *Ethical Lingua: Journal of Language Teaching and Literature*, 9(1), 175-183.
6. Shah, R. K., Paneru, N. R., & Bohara, B. B. (2024). Essence from within: Unveiling the voices of Nepalese master's degree students in English and biology education on internal assessments within the semester system. *Edelweiss Applied Science and Technology*, 8(6), 8986-9005.
7. Toman, M., & Hubálovská, M. (2024, November). Review Study "Virtual Reality in Biology Education". In *International Conference on Technology in Education* (pp. 235-245). Singapore: Springer Nature Singapore.

**4th Semester**  
**Even 2025/2026**

## Biology Learning Assessment

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| <b>Module number</b><br>322533 1 621                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Module name</b><br>Biology Learning Assessment                                                                                                 |                                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Semester / Rotation</b><br>4 / Odd                                                                                                             | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Prerequisites for attendance:</b><br>Student Development, Educational psychology, Fundamental of Biology Learning, biology learning strategies | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Assignment (15%)</li> <li>3. Quiz (10%)</li> <li>4. Presentation (20%)</li> <li>5. Case report (20%)</li> <li>6. Mid-term exam (10%) 150 Minutes</li> <li>7. Final exam (10%) 150 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                   | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (4.5 ECTS)<br>(40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study<br><br>Total 135 hours |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                   | <b>Semester week hours</b><br>135                                                                                                                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.</li> <li>2. Dr. Fenny Roshayanti, M.Pd.</li> <li>3. Ipah Budi Kinarti, M.Pd</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syllabus</b><br>This course introduces undergraduate students in the Biology Education programme to the fundamental concepts and practices of learning assessment in biology education, with <b>the objective</b> of developing a comprehensive understanding of the role and position of educational evaluation within the curriculum and instructional processes. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining competency-based assessment principles, evaluating student learning achievement, designing and applying various forms of learning outcome tests, and implementing appropriate assessment procedures. Students are also able to develop valid and reliable |                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                   |

assessment instruments, apply scoring techniques, process the data, interpret test results, and report learning outcomes effectively. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the nature and role of educational evaluation, characteristics of competency-based assessment, evaluation of student learning achievement, types of learning outcome tests, principles and procedures of assessment, score processing techniques, instrument development and scoring methods, test analysis and interpretation, characteristics of good evaluation techniques, and reporting and utilisation of assessment results.

#### **Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate an enthusiastic character in developing learning assessments. (A2)
2. CLO 2: Identify the nature, principles, and position of educational evaluation within the curriculum and instruction, as well as the types and procedures for developing assessment instruments for learning outcomes and processes. (C2)
3. CLO 3: Implement assessment techniques and instruments along with their evaluation to solve didactical. (C3, P3)
4. CLO 4: Apply alternative decisions in determining assessment techniques and instruments according to the needs of the learning process and outcomes. (C3, P3)

#### **Core Reading**

1. Wicaksono, A. G. C., & Korom, E. (2023). Attitudes towards science in higher education: Validation of a questionnaire among science teacher candidates and engineering students in Indonesia. *Heliyon*, 9(9), 1–10.
2. Minarti, I. B., Nurwahyunani, A., & Purichasari, D. (2023). Assessment literacy profile of science teachers at SMAN 1 Gubug. *International Journal of Research in Education*, 3(1), 42–50.
3. Dewi, L. R., Gratiana, A., & Minarti, I. B. (2022). Efektivitas Asesmen Proyek Untuk Meningkatkan Hasil Belajar Siswa Pada Pembelajaran Biologi Di Sekolah Menengah Atas. *Jurnal Biogenerasi*, 7(2), 136-147.
4. AULIA, W. (2023). *ANALISIS KESIAPAN GURU DALAM IMPLEMENTASI ASESMEN AUTENTIK PEMBELAJARAN BIOLOGI PADA KURIKULUM MERDEKA DI SMA NEGERI SE-KABUPATEN KEBUMEN* (Doctoral dissertation, Universitas PGRI Semarang).
5. Stanja, J., Gritz, W., Krugel, J., Hoppe, A., & Dannemann, S. (2023). Formative assessment strategies for students' conceptions—The potential of learning analytics. *British Journal of Educational Technology*, 54(1), 58-75.
6. Piao, S., & Wang, X. (2023). Biological systems under climate change: What do we learn from the IPCC AR6. *Global Change Biology*, 29(18), 5120-5121.
7. Danaeifar, M., & Najafi, A. (2025). Artificial intelligence and computational biology in gene therapy: a review. *Biochemical Genetics*, 63(2), 960-983.
8. Kusumawati, V., Susilowati, S. M. E., & Isnaeni, W. (2021). Evaluation of

- Authentic Assessment Implementation on Biology Learning at Senior High Schools in Semarang. *Journal of Innovative Science Education*, 10(1), 8-16.
9. Melinda, N. E., & Tanjung, I. F. (2021). Analysis of Implementing Authentic Assessment of Curriculum 2013 By High School Biology Teachers. *Jurnal Pelita Pendidikan*, 10(2), 28-35.
  10. Lubis, M., Cholily, Y. M., Rahardjanto, A., Pantiwati, Y., & Wahyono, P. (2025). Authentic Assessment Research Trends in Biology Learning: A Bibliometric Analysis. *Al Jahiz: Journal of Biology Education Research*, 6(1), 53-74.
  11. Sari, M. S., Sunarmi, S., Prasetyo, T. I., Setiawan, D., & Widowati, K. A. A. (2021, March). Optimalization of authentic assessment instrument for biology professional teacher's competency development during Covid-19 pandemic era. In *AIP Conference Proceedings* (Vol. 2330, No. 1, p. 030014). AIP Publishing LLC.
  12. Muhaini, R. N. (2022, January). An Evaluation of the Implementation of Assessment in Biology Distant Learning Based on Curriculum 2013. In *5th International Conference on Current Issues in Education (ICCIE 2021)* (pp. 187-192). Atlantis Press.

## Genetics

|                                                                                                                                                                                                                                                                            |  |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225321638                                                                                                                                                                                                                                         |  | <b>Module name</b><br>Genetics                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                        |  | <b>Semester / Rotation</b><br>4 / Even                                                      | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                    |  | <b>Prerequisites for attendance</b><br>General Biology, Laboratory Techniques, biochemistry | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (25%)<br>2. Practicum report (20%)<br>3. Case report (15%)<br>4. Presentation (10%)<br>5. Assignments (5%)<br>6. Quiz (5%)<br>7. Mid-term exam (10%) 100 Minutes<br>8. Final exam (10%) 100 Minutes |  |                                                                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                               |  |                                                                                             | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Additional teacher involved:</b><br>1. Dyah Ayu Widyastuti, S.Si., M.Biotech.<br>2. Dr. Dra. Enny Hartadiyati W.H., M.Si., Med.<br>3. Dr. Mei Sulistyoningsih, M.Si.<br>4. Fibria Kaswinarni, S.Si., M.Si.                                                              |  |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and principles of genetics, with <b>the objective</b> of developing a comprehensive                                                          |  |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

understanding of inheritance patterns and molecular mechanisms underlying heredity in living organisms. The course begins with the historical foundations of genetics through Mendel's experiments and the formulation of Mendel's First and Second Laws, which form the basis of classical genetics. Upon completion of the course, students are expected to demonstrate **competencies** in explaining genetic terminology and symbols, analysing gene interactions and post-Mendelian inheritance patterns such as linkage, codominance, sex linkage, polygenic inheritance, and lethal genes, as well as understanding the nature of hereditary material including chromosomes, DNA, and RNA. Students are also able to explain protein synthesis mechanisms encompassing DNA replication, transcription, and translation, chromosomal aberrations and gene mutations, apply multiple allele concepts through case studies such as blood group inheritance, estimate genetic probabilities, construct and interpret chromosome maps using gene distance and three-point crosses, explain sex determination mechanisms, and identify population genetics using the Hardy Weinberg principle and concepts of speciation. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include classical and molecular genetics, genetic linkage and crossing over, chromosome mapping, sex determination, and population genetics.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in participating in genetics learning. (A2)
2. CLO 2: Explain genetics concepts in depth in order to formulate procedural problem-solving. (C2, P3)
3. CLO 3: Apply concept in the field of genetics by utilizing science and technology and local wisdom, as well as being able to develop oneself and adapt to the situations encountered. (C3, A4)
4. CLO 4: Apply genetics concepts into laboratory practice activities while observing bioethical principles and Occupational Health and Safety (OHS/K3). (C3, P3, A4)
5. CLO 5: Being responsible in carrying out genetics learning activities. (A3)

### Core readings:

1. Umamah, I., Dewi, E. R. S., & Rahayu, P. (2026). Optimization of Aloe vera as a Natural Plant Growth Regulator to Enhance the Growth of Dendrobium Orchid 'Arif'. *Bioscientist: Jurnal Ilmiah Biologi*, 14(1), 239-248.
2. Ye, X., Yuan, J., Bai, Y., Chen, Y., Jiang, H., Cao, Y., ... & Chen, Q. (2025). Appraising the life-course impact of Epstein-Barr virus exposure and its genetic signature on periodontitis. *Journal of Periodontology*, 96(7), 717-730.
3. Stewart Jr, C. N. (Ed.). (2025). *Plant biotechnology and genetics: principles, techniques, and applications*. John Wiley & Sons.
4. Li, S. (2025). Application of entertainment e-learning mode based on genetic algorithm and facial emotion recognition in environmental art and design courses. *Entertainment Computing*, 52, 100798.
5. Levin, M. (2025). Ingressing minds: Causal patterns beyond genetics and

environment in natural, synthetic, and hybrid embodiments. *Unpublished preprint*. Available from: [https://osf.io/5g2xj\\_v3](https://osf.io/5g2xj_v3) [Accessed 4 July 2025].

6. Hamed, B. A., Farghaly, H. M., Omar, A., & Abd El-Hafeez, T. (2025). Identifying key genetic variants in Alzheimer's disease progression using Graph Convolutional Networks (GCN) and biological impact analysis. *Journal of Big Data*, 12(1), 171.
7. Shang, L., Gad, K., & Lenhard, M. (2025). Converging on long and short: the genetics, molecular biology and evolution of heterostyly. *Current Opinion in Plant Biology*, 85, 102731.
8. Sharma, A., Prabhu, S., & Awasthi, S. (2026). Modern plant stress adaptation: integrating defense, nanotechnology and genetics. *3 Biotech*, 16(3), 105.

## Animal Diversity

|                                                                                                                                                                                                                                                                                                                                                               |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225332631                                                                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Animal Diversity                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                           | <b>Semester / Rotation</b><br>4 / Even                                                      | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum.                                                                                                                                                                                                                                                       | <b>Prerequisites for attendance</b><br>General Biology Structure and Development of Animals | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (21%)</li> <li>2. Case report (10%)</li> <li>3. Practicum report (10%)</li> <li>4. Presentation (10%)</li> <li>5. Assignment (12%)</li> <li>6. Quiz (7%)</li> <li>7. Mid exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                                                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory<br>(14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Reni Rakhmawati, S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                    |                                                                                             | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Fibria Kaswinarni, S.Si., M.Si.</li> <li>2. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> <li>3. M. Anas Dzakiy, S.Si., M.Sc.</li> </ol>                                                                                                                                            |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syllabus</b><br>This course introduces undergraduate students to the fundamental concepts and principles of animal diversity, with <b>the objective</b> of developing an understanding of biodiversity, classification systems, and the identification of animal groups from                                                                               |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

invertebrates to vertebrates. Upon completion of the course, students are expected to demonstrate **competencies** in explaining concepts of biodiversity, applying taxonomic principles, observing and classifying animals based on morphological and basic taxonomic characteristics, and analysing environmental biodiversity issues within biology education contexts. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the concept of biodiversity, principles of animal classification, characteristics of major invertebrate and vertebrate groups, and issues related to animal diversity and conservation. Learning activities are delivered through lectures, case-based discussions, presentations, literature exploration, and practical observations in laboratory and field settings.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process about the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata. (A3)
2. CLO 2: Explain the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata in order to formulate procedural problem-solving. (C2)
3. CLO 3: Apply the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata by utilizing science and technology (IPTEKS) and local wisdom to solve a problem. (C3, A4)
4. CLO 4: Apply the concepts and principles of the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata in laboratory and field practice activities while observing bioethical principles and Occupational Health and Safety (OHS/K3). (C3, P3, A4)
5. CLO 5: Analyze alternative solutions to problems related to the characteristics or structural features, classification, benefits, and applications of the phyla Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda, Echinodermata, Mollusca, Annelida, Arthropoda, and Chordata independently and collaboratively while internalizing entrepreneurial values. (C4, A4)

### **Core readings:**

1. Rachmawati, R. C., Filany, D. E., Yuliani, H. E., Pranama, H. F., & Kurniawati, S. (2022, December 27). *Identifikasi keanekaragaman invertebrata di kawasan Pantai Tirang, Kota Semarang, Jawa Tengah*. Seminar Nasional Sains & Entrepreneurship, 1(1).

2. Rachmawati, R. C., Putri, M. S., Miharjo, E. S. R., Ulfah, A. N., & Septiana, M. A. (2022, December 27). *Inventarisasi kelimpahan molusca di Pantai Teluk Awur Jepara*. Seminar Nasional Sains & Entrepreneurship, 1(1).
3. Gangwal, A., & Lavecchia, A. (2025). Artificial intelligence in preclinical research: enhancing digital twins and organ-on-chip to reduce animal testing. *Drug Discovery Today*, 30(5), 104360.
4. Mufidah, R., & Qomaria, N. (2025). Identifikasi potensi lokal madura pantai lon malang sebagai sumber belajar materi ekologi dan keanekaragaman hayati indonesia. *Jurnal Inovasi Pendidikan Sains (JIPS)*, 6(1), 1-11.
5. Rahmani, I. S., Prayogo, M. S., Sa'diyah, N. K., & Soleha, R. J. (2026). Keanekaragaman Hewan Invertebrata: Pendekatan Biologi dan Relevansinya dengan Al-Qur'an. *JIMU: Jurnal Ilmiah Multidisipliner*, 4(02).
6. Vitasari, N. (2026). *Keragaman Hayati Indonesia dan Sebarannya*. Meraki Pustaka.
7. Ramadhani, D. N., Haryani, D., Sektavia, E., Pratiwi, F. P., & Nursanti, F. E. KEANEKARAGAMAN HAYATI INDONESIA DALAM MENUNJANG KETAHANAN PANGAN.
8. Idaheryana, A., Sholihah, L. Z., & Irawanto, R. (2025, March). Literature Review: Keanekaragaman Serangga di Kebun Raya Purwodadi, Pasuruan. In *Prosiding Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat LPPM Universitas' Aisyiyah Yogyakarta* (Vol. 3, pp. 652-657).
9. Apriliani, A., Dewi, N. K., & Irawanto, R. (2025, March). Keanekaragaman Hayati Sebagai Edukasi Etnobotani di Madiun. In *Prosiding Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat LPPM Universitas' Aisyiyah Yogyakarta* (Vol. 3, pp. 658-666).
10. Sulistyoningsih, M., Reni Rakhmawati, & Wibowo, S. (2023). Pengaruh Teknik Pembesaran pada Kandang Close house Berbasis IoT Terhadap Bobot dan Karkas Ayam Broiler. *JURNAL ILMIAH AGRINECA*, 23(1), 56–61. <https://doi.org/10.36728/afp.v23i1.2284>

## Plant and Fungal Diversity

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| <b>Module number</b><br>3225332628                                                                                                                                                                                                                                                                                                                                | <b>Module name</b><br>Plant and Fungal Diversity                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                               | <b>Semester / Rotation</b><br>4 / Even                                                                                           | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                            | <b>Prerequisites for attendance</b><br>General Biology<br>Structure and development of plant and fungi,<br>Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Practicum report (20%)</li> <li>3. Case report (20%)</li> <li>4. Presentation (15%)</li> <li>5. Assignment (5%)</li> <li>6. Quiz (5%)</li> <li>7. Mid-term exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                                                                                                                  | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory<br>(14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Rivanna Citraning Rachmawati, S.Si, M. Pd                                                                                                                                                                                                                                                                                            |                                                                                                                                  | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Lussana Rosita Dewi, M.Pd.</li> <li>2. Dr. Eny Hartadiyati W.H., M.Si.Med.</li> <li>3. Ipah Budi Minarti, M.Pd.</li> <li>4. Fibria Kaswinarni, S.Si.,M.Si.</li> <li>5. M. Anas Dzakiy, M.Sc.</li> </ol>                                                                             |                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Syllabus

This course introduces undergraduate students to the fundamental concepts and practical aspects of plant diversity, with **the objective** of developing an understanding of the scope of plant diversity, classification principles, and the identification of major plant groups. Upon completion of the course, students are expected to demonstrate **competencies** in explaining plant diversity concepts, applying classification principles, identifying various plant groups including microscopic and macroscopic algae, bryophytes, pteridophytes, fungi, gymnosperms, and angiosperms and relating plant diversity to local environmental contexts. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include plant diversity concepts, plant classification systems, and the characteristics of major plant groups. Learning activities are conducted through online lectures and discussions, independent learning activity, collaborative discussions via the learning management system, case-based learning, and the preparation of scientific reports and articles based on student activities conducted in their local environment.

## Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude during learning activities on Plant and Fungal Diversity with full integrity. (A2)
2. CLO 2: Explain the concepts of plant and fungal diversity in depth in order to formulate solutions to procedural problems. (C2)
3. CLO 3: Apply the concepts of plant and fungal diversity through the utilization of science and technology as well as local wisdom, while demonstrating self-development and adaptability to encountered situations. (C3, A3)
4. CLO 4: Conduct practical activities related to plant and fungal diversity in the laboratory and in the field by observing bioethical principles and Occupational Health and Safety (OHS). (P4)
5. CLO 5: Apply problem-solving strategies related to conservation issues and the roles of plant and fungal diversity, both independently and collaboratively, by internalizing entrepreneurial values. (C3, A3)

## Core readings:

1. van Galen, L. G., Stewart, J. D., Qin, C., Corrales, A., Manley, B. F., Kiers, E. T., & Van Nuland, M. E. (2025). Global divergence in plant and mycorrhizal fungal diversity hotspots. *Nature Communications*, 16(1), 6702.
2. Gao, Y., Xu, Y., Dong, Z., Guo, Y., Luo, J., Wang, F & Zou, X. (2025). Endophytic fungal diversity and its interaction mechanism with medicinal plants. *Molecules*, 30(5), 1028.
3. Mondo, S. J., & Grigoriev, I. V. (2025). A genomic perspective on fungal diversity and evolution. *Nature Reviews Microbiology*, 23(11), 718-733.
4. Xu, Z., Guo, X., Allen, W. J., Hu, Y., Wang, J., Li, M., & Guo, W. (2025). Soil fungi influence the relationship between plant diversity and ecosystem multifunctionality. *Nature Communications*, 16(1), 5521.
5. Hibbett, D., Nagy, L. G., & Nilsson, R. H. (2025). Fungal diversity, evolution, and classification. *Current Biology*, 35(11), R463-R469.

6. Li, R., He, Z., He, P., Yang, R., Ma, D., Li, Y., & Zhang, Z. (2025). Crop diversification improves productivity and soil health by regulating fungal diversity. *Soil and Tillage Research*, 252, 106628.
7. Anwar, K. (2026). KEANEKARAGAMAN DAN KLASIFIKASI JAMUR. *DASAR-DASAR MIKOLOGI: STRUKTUR, FUNGSI DAN PERAN JAMUR*, 16.
8. Araruna, I. I., Latifah, S & Prasetyo, A. R. KEANEKARAGAMAN JENIS JAMUR MAKROSKOPIS PADA DESTINASI WISATA PENDAKIAN RESORT TETEBATU TAMAN NASIONAL GUNUNG RINJANI.
9. ASMAYANI, N. (2026). *Keanekaragaman dan Sebaran Jamur Makroskopis pada Hutan Karst di Taman Nasional Bantimurung Bulusaraung= Diversity and Distribution of Macrofungi in the Karst Forest of Bantimurung Bulusaraung National Park* (Doctoral dissertation, Universitas Hasanuddin).
10. Arimah, S., Kaswinarni, F., & Rachmawati, R. C. (2025). Pengaruh Berbagai Media Tanam terhadap Pertumbuhan Microgreen Bunga Matahari (*Helianthus annuus*). *Biocaster: Jurnal Kajian Biologi*, 5(4), 865-878.
11. Triska Ananda, T., Kaswinarni, F., Citraning Rachmawati, R., PGRI Semarang, U., Sidodadi Timur No, J., & Semarang, K. (2023). KEANEKARAGAMAN JENIS LICHENES SEBAGAI BIOINDIKATOR KUALITAS UDARA DI OBJEK WISATA WONO SRENI INDAH KOTA JEPARA. *Jurnal Ilmiah Teknosains*, 9(2). <https://lichenportal.org/cnalh/>.

## Human Anatomy, Physiology, and Health

|                                                                                                                                                                                                                                                                            |  |                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <b>Module number</b><br>3225332633                                                                                                                                                                                                                                         |  | <b>Module name</b><br>Human Anatomy, Physiology, and Health                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                        |  | <b>Semester / Rotation</b><br>4 / Even                                                                                                 | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum.                                                                                                                                                                   |  | <b>Prerequisites for attendance</b><br>General Biology, Laboratory Techniques, Structure and Development of Animals, Animal Physiology | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (25%)<br>2. Practicum report (20%)<br>3. Case report (10%)<br>4. Presentation (10%)<br>5. Assignment (10%)<br>6. Quiz (5%)<br>7. Mid-term exam (10%) 150 Minutes<br>8. Final exam (10%) 150 Minutes |  |                                                                                                                                        | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Dr. M.Syaipul Hayat, M.Pd.                                                                                                                                                                                                                    |  |                                                                                                                                        | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Additional teacher involved:</b><br>1. Ipah Budi Minarti, M.Pd.<br>2. Dr. Env Hartadivati W.H., M.Si.Med.                                                                                                                                                               |  |                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

3. Dr. M.Syaipul Hayat, M.Pd.
4. Fibria Kaswinarni, S.Si.,M.Si.

### **Syllabus/Description of what will be done**

This course introduces undergraduate students to the fundamental concepts of basic human anatomy and physiology, with **the objective** of developing an understanding of the structural organisation and functional mechanisms of the human body. Upon completion of the course, students are expected to demonstrate **competencies** in explaining the structure and function of major human body systems, including the integumentary, skeletal, muscular, endocrine, nervous, and circulatory systems, as well as analysing the relationships between anatomical structures and physiological processes. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>.

**The materials covered in this course** include the anatomical structure and physiological mechanisms of the integumentary system, skeletal system, muscular system, hormonal (endocrine) system, nervous system, and circulatory system. to learning resources, interactive engagement, and continuous assessment.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in learning Human Anatomy, Physiology, and Health. (A2)
2. CLO 2: Identify the anatomical structures and physiological functions of the integumentary, skeletal, muscular, nervous, endocrine, circulatory, respiratory, digestive, urinary, immune, reproductive, and sensory systems. (C2)
3. CLO 3: Analyze disorders related to human health affecting the integumentary, skeletal, muscular, nervous, endocrine, circulatory, respiratory, digestive, urinary, immune, reproductive, and sensory systems. (C4)
4. CLO 4: Analyze practical work activities on Basal Metabolic Rate (BMR), blood capillary observation, hemoglobin (Hb) testing, muscle contraction, patellar reflex, frog decapitation, and Galli Mainini test. (C4, P4)
5. CLO 5: Demonstrate responsibility in completing coursework and laboratory assignments in Human Anatomy, Physiology, and Health. (A3)

### **Core readings:**

1. Ahmad, H., Yadav, R., & Nisha, R. (2026). Overview of Human Anatomy and Physiology. In *Allied Healthcare in Practice* (pp. 69-92). Apple Academic Press.
2. Rivera García, G. E., Cervantes López, M. J., Ramírez Vázquez, J. C., Llanes Castillo, A., & Cruz Casados, J. (2025). Reviewing mobile apps for teaching human anatomy: Search and quality evaluation study. *JMIR Medical Education*, 11, e64550.
3. Galić, L., Lončarić, Z., & Lisjak, M. (2025). A review of phenolic compounds: From biosynthesis and ecological roles to human health and nutrition. *Phyton*, 94(11), 3297.

4. Nevoit, G., Landauskas, M., McCarty, R., Bumblyte, I. A., Potyazhenko, M., Taletaviciene, G., & Vainoras, A. (2025). Schumann resonances and the human body: questions about interactions, problems and prospects. *Applied Sciences*, 15(1), 449.
5. Adrianto, H., & Soekanto, A. (2025). *ANATOMI DAN FISILOGI MANUSIA*. Penerbit Andi.
6. Octaviani, Y. I., & Handayani, Y. (2026). *Anatomi Tubuh Manusia*.
7. DA Latifa, S. T., Murditya, M. B., Safitri, R. U. R., Gr, S. S., Mumtaza, M. F., & Gr, S. P. M. P. (2025). *101+ Bio Basic: Anfi Swan (Anatomi Fisiologi Hewan/Manusia)*. Amakom.
8. Sumadewi, K. T., Farah Diba, M. K. M., Bolly, H. M. B., BS, S., Wirata, G., Wiguna, N. I. P., ... & Ft, S. (2025). *Anatomi Dasar*. PT Bukuloka Literasi Bangsa.

## Biology Learning Resources and Material Development

|                                                                                                                                                                                                                                                 |  |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225332620                                                                                                                                                                                                              |  | <b>Module name</b><br>Biology Learning Resources and Material Development                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                             |  | <b>Semester / Rotation</b><br>4 / Even                                                                          | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Teaching methods:</b><br>Lectures, Project-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                      |  | <b>Prerequisites for attendance</b><br>Educational psychology, student development, biology learning strategies | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (15%)<br>2. Presentation (15%)<br>3. Project report (25%)<br>4. Assignment (10%)<br>5. Quiz (5%)<br>6. Mid-term exam (10%) 150 Minutes<br>7. Final exam (20%) 150 Minutes |  |                                                                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Dr. Muhammad Syaipul Hayat S.Pd, M.Pd.                                                                                                                                                                             |  |                                                                                                                 | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Additional teacher involved:</b><br>1. Ipah Budi Minarti, S.Pd., M.Pd.<br>2. Dr. Enny Hartadiyati W.H., M.Si.Med.<br>3. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.                                                                               |  |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syllabus/Description of what will be done</b>                                                                                                                                                                                                |  |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

This course introduces undergraduate students to the development of biology learning resources and instructional materials, with **the objective** of equipping them with basic skills in designing and producing learning media for biology education. Upon completion of the course, students are expected to demonstrate **competencies** in identifying and selecting appropriate learning resources and materials, designing instructional media, and developing media products that can be used effectively in biology teaching and learning processes in conventional and digital formats, both offline and online. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the concepts and types of biology learning resources and materials, introduction to instructional media, benefits and applications of learning media, basic competencies in biology and science education, principles of developing learning resources such as worksheets (LDS/LKS), books, modules, models, and educational games, as well as the use of digital platforms and tools such as Edmodo, Facebook, blogs, learning videos, Flash, PowerPoint, and graphic design software (e.g. CorelDRAW).

#### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in applying the fundamental concepts of developing Biology learning resources and materials. (A2)
2. CLO 2: Analyze the basic principles of applying Information and Communication Technology (ICT) in instructional planning, implementation, evaluation, and classroom management. (C4)
3. CLO 3: Apply logical, critical, and innovative thinking in the development of Biology learning resources and materials in accordance with biology learning problems and contemporary developments. (C3, P4)
4. CLO 4: Select appropriate Biology learning resources and materials to solve instructional problems based on current needs and developments. (C4)
5. CLO 5: Develops Biology learning resources and materials that support the biology learning process and innovates in the development of such resources to enhance the quality of education. (C6, P5)

#### **Core readings:**

1. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press.
2. Srinivasan, V. (2022). AI & learning: A preferred future. *Computers and Education: Artificial Intelligence*, 3, 100062.
3. Umeohana, T. E. (2025). Assessment of instructional material relevance and availability for biology education. *Indonesian Journal of Teaching in Science*, 5(1), 93-100.
4. Chengere, A. M., Bono, B. D., Zinabu, S. A., & Jilo, K. W. (2025). Enhancing secondary school students' science process skills through guided inquiry-based laboratory activities in biology. *PLoS one*, 20(4), e0320692.

5. Vranic, S., Kurapati, R., Kostarelos, K., & Bianco, A. (2025). Biological and environmental degradation of two-dimensional materials. *Nature Reviews Chemistry*, 9(3), 173-184.
6. Wang, Q., Hu, Z., Li, Z., Liu, T., & Bian, G. (2025). Exploring the application and prospects of synthetic biology in engineered living materials. *Advanced Materials*, 37(31), 2305828.
7. Anyanwu, L., Ogunsina, A. F., Ohiri, Q. F., & Onyewuchi, I. (2025). Green Technology and Environmental Innovation: Biodegradable Materials Development and Environmental Monitoring Systems Through Industrial Innovation and Policy Integration. *Preprint, January*. [https://doi.org/10.13140/RG.2\(19518.55363\)](https://doi.org/10.13140/RG.2(19518.55363)).
8. Hidayat, M. L., Mahatama, D. S., Suryani, T., & Sari, S. K. (2025). Pengembangan Aplikasi Mobile Plant-tagging ~ Pelurutaloka™ sebagai Media Pembelajaran Biologi Keanekaragaman Hayati. *Bioscientist: Jurnal Ilmiah Biologi*, 13(2), 1298-1318.
9. Jariyah, A., Wele, M. K., & Ngama, Y. E. (2025). Perkembangan Holistik: Pemahaman, Ciri, Dan Prinsip Perubahan Biologi Kognitif, Serta Psikososial. *Jurnal Genta Mulia*, 16(2), 234-238.
10. Nurwahyunani, A., Isnaeni, W., Alimah, S., & Marianti, A. (2025, October). IDENTIFIKASI MATERI SULIT DALAM PEMBELAJARAN BIOLOGI: HASIL ANGKET GURU PPG DALJAB BIOLOGI 2024. In *Prosiding Seminar Nasional Biologi* (Vol. 13, pp. 1-10).
11. Hartono, A., Indriaty, I., Mahlianurrahman, M., & Anas, N. (2025, November). Etnosains sebagai Basis Pembelajaran Biokonservasi. In *Prosiding Seminar Nasional Biologi* (Vol. 4, pp. 1-7).
12. Huda, I. Z. N., Rusd, R., & Ristanto, R. H. (2026, February). ANALISIS KEBUTUHAN PENGEMBANGAN BAHAN AJAR BERBASIS WEBSITE TERINTEGRASI PBL PADA PEMBELAJARAN BIOLOGI. In *Seminar Nasional Pendidikan IPA Ke III Tahun 2025* (Vol. 3, No. 1, pp. 548-563).
13. Safitri, T., Meicitra, K. A., Astuti, W., & Alonemarera, A. A. (2026). PEMANFAATAN LINGKUNGAN SEBAGAI SUMBER BELAJAR BIOLOGI. *Batanghari Academia Journal*, 1(2), 1-13.
14. Pribadi, P. A., Nugroho, A. S., & Hayat, M. S. (2026). Potential Application of ESD-Oriented Differentiated Learning Website on Biotechnology Materials. *Quagga: Jurnal Pendidikan dan Biologi*, 18(1), 1-11.

## Technology Based Entrepreneurship

|                                                                                                                                                                                                                                                                                                                                    |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>322524 2 613                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Technology Based Entrepreneurship |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                | <b>Semester / Rotation</b><br>4/ Even                   | <b>Student capacity</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Teaching methods</b><br>Lectures, Discussions,<br>Presentations, Project-Based<br>Learning, Guided Practice                                                                                                                                                                                                                     | <b>Prerequisites for attendance</b><br>-                | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Assignments (8%)</li> <li>2. Quiz (2%)</li> <li>3. Discussion (10%)</li> <li>4. Project report (25%)</li> <li>5. Presentation (25%)</li> <li>6. Mid-term exam (10%) 200 Minutes</li> <li>7. Final exam (20%) 200 Minutes</li> </ol> |                                                         | <b>CREDIT HOURS (+Workload in hours)</b><br>4 Credit Hours<br>Theory (13 hours of face to face + 16 hours of structured assignment + 16 hours of self-study (Total 45 hours))<br><br>Practice (2 Credit Hours) (90 hours of practice)<br><br>Field Study (1 Credit Hours) (45 hours of field study) (Total 180 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>6 ECTS Theory (13 hours of face to face + 16 hours of structured assignment + 16 hours of self-study (Total 45 hours))<br><br>Practice (3 ECTS) (90 hours of practice)<br><br>Field Study (1.5 ECTS) (45 hours of field study) (Total 180 hours) |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd                                                                                                                                                                                                                                                                        |                                                         | <b>Semester week hours</b><br>180 hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Additional teacher involved</b> <ol style="list-style-type: none"> <li>1. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> <li>2. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.</li> </ol>                                                                                                                                                    |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

3. Dr. Muhammad Syaipul Hayat S.Pd, M.Pd

### Syllabus

**This course aims** to develop students' entrepreneurial mindset and digital business competencies to design, develop, and launch innovative ventures in the digital era. The course builds integrated competencies in identifying opportunities, responding to information and emerging trends, collaborating effectively in entrepreneurial processes, and planning and establishing innovative business ventures individually or in groups. The scope of the course includes design thinking, mentoring and assistance sessions, business model development using the Business Model Canvas, prototyping, and participation in expo and investor pitching activities. Students study marketing management concepts such as segmentation, targeting, positioning (STP), marketing mix, SWOT analysis, digital marketing, and branding, as well as human resource and operational management including job analysis and supply chain fundamentals. Financial planning topics include financial projections and working capital requirements, followed by business plan development and feasibility analysis. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The course also includes** visits to partner MSMEs, business communication, and startup funding analysis to strengthen real-world entrepreneurial experience. Learning activities emphasize project-based and collaborative learning, reflective practice, and real business development processes from ideation to pitching. Students develop business prototypes and present them to potential stakeholders.

### Learning goals and qualifications.

In this module students learn to:

1. Respond to all available information, events, and opportunities (A2)
2. Adapt, make decisions, and contribute actively in group discussions and collaborative activities during the entrepreneurship process (A3)
3. Demonstrate responsibility, empathy, and a learning spirit in completing the stages of the entrepreneurship process (A3)
4. Plan and establish innovative new business ventures individually or in groups (C6, P5)
5. Develop a personal orientation toward creating a business and demonstrate confidence to achieve goal-oriented tasks (C3, P3, A4)
6. Identify, evaluate, and take action on opportunities (C5)

### Core readings:

1. Uriarte, S., Baier-Fuentes, H., Espinoza-Benavides, J. & Inzunza-Mendoza, W. (2026). Artificial intelligence technologies and entrepreneurship: a hybrid literature review. *Review of Managerial Science*, 20(1), 251-299.
2. Swidan, A., & Kishk, A. A. (2026). THE IMPACT OF TECHNOLOGY ON MODERN DAY ENTREPRENEURSHIP. *European Journal of Economic and Financial Research*, 10(1).
3. Hasan, M., Supatminingsih, T., Tahir, T., Guampe, F. A., Huruta, A. D., & Lu, C.Y.(2025). Sustainable agricultural knowledge-based entrepreneurship literacy in agricultural SMEs: Triple bottom line investigation. *Journal of Open*

- Innovation: Technology, Market, and Complexity*, 11(1), 100466.
4. Umrani, W. A., Tariq, B., Bodolica, V., Nawaz, A., & Pahi, M. H. (2026). Corporate entrepreneurship in banks: The role of technology self-efficacy and technology-based customer relationship management. *Journal of General Management*, 51(2), 158-170.
  5. Dote-Pardo, J., Ortiz-Cea, V., Peña-Acuña, V., Severino-González, P., Contreras-Henríquez, J. M., & Ramírez-Molina, R. I. (2025). Innovative entrepreneurship and sustainability: A bibliometric analysis in emerging countries. *Sustainability*, 17(2), 658.
  6. Lingfu, K., Bano, S., Saraih, U. N., Shah, N., & Soomro, B. A. (2025). Digital technology and entrepreneurship: unveiling the bridging role of digital innovation. *European Journal of Innovation Management*, 28(7), 2940-2968.
  7. Kasman, R. (2026). Kewirausahaan Biologi Berbasis Potensi Lokal. *AMU Press*, 1-252.
  8. Ferida Nauw, F. (2025). *Persepsi Mahasiswa Terhadap Kegiatan Kewirausahaan Berbasis Mbkm Pada Program Studi Pendidikan Biologi* (Doctoral dissertation, Universitas Pendidikan Muhammadiyah Sorong).
  9. Rachmawati, R. C., Ridlo, S., Sumarni, W., Isnaeni, W., Rusilawati, A., & Susilaningsih, E. (2025, August). Pengembangan Instrumen Karakter Entrepreneurship Struktur Perkembangan Tumbuhan Di Pendidikan Biologi Upgris. In *Proceeding Seminar Nasional IPA* (pp. 525-534).

**5th Semester**  
**Odd 2025/2026**

## Biology Lesson Planning

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| <b>Module number</b><br>3225331622                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Biology Lesson Planning                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                              | <b>Semester / Rotation</b><br>5/ Odd                                                                                                                                                                                         | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations                                                                                                                                                                                                                                            | <b>Prerequisites for attendance</b><br>Educational psychology, student development, basic of biology learning, biology learning strategies, biology learning assessment, Biology Learning Resources and Material Development | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (20%)</li> <li>2. Case report (20%)</li> <li>3. Presentation (15%)</li> <li>4. Assignment (15%)</li> <li>5. Quiz (15%)</li> <li>6. Mid-term exam (5%) 150 Minutes</li> <li>7. Final exam (10%) 150 Minutes</li> </ol> |                                                                                                                                                                                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 SKS)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (3 ECTS)<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Dr. Fenny Roshayanti, M.Pd.                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                              | <b>Semester week hours</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Prasetiyo, M.Pd.</li> <li>2. Dr. M. Syaipul Hayat, M.Pd.</li> <li>3. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> </ol>                                                                                                                           |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### Syllabus

This course introduces undergraduate students in the Biology Education programme to the principles and practices of Biology lesson planning, with **the objective** of equipping them with the ability to understand the school curriculum and design effective biology learning plans aligned with current curricular requirements. Upon completion of the course, students are expected to demonstrate **competencies** in analysing curriculum documents and developing comprehensive instructional plans, including annual programmes and semester programmes, biology syllabi, lesson plans (RPP), authentic assessment instruments, student worksheets (LKPD), teaching materials, and learning media for senior high school biology. Students are also able to integrate assessment meaningfully into biology instruction and select appropriate learning resources to support effective teaching. **The materials** covered in this course include the development of annual and semester programmes, senior high school biology syllabi, lesson plans, authentic assessment, student worksheets, teaching materials, and biology learning media. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate adaptability in learning instructional planning concepts through project-based activities. (A4)
2. CLO 2: Explain instructional planning concepts through literature review. (C2)
3. CLO 3: Identify solutions to instructional problems based on instructional planning concepts through case-based activities. (C4)
4. CLO 4: Analyze solution for school-based learning problems by designing biology instructional plans utilizing science and technology through project-based activities. (C4, P4)
5. CLO 5: Apply instructional planning concepts and internalizing entrepreneurial values through reference studies in biology classroom learning. (C3, A3)

### Core readings:

1. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2022). Regulation of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 4 of 2022 concerning graduate competency standards for early childhood education, primary education, and secondary education. Jakarta, Indonesia: Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.
2. Koberstein-Schwarz, M., & Meisert, A. (2022). Pedagogical content knowledge in material-based lesson planning of preservice biology teachers. *Teaching and Teacher Education*, 116, 103745.
3. von Kotzebue, L. (2022). Beliefs, self-reported or performance-assessed TPACK: What can predict the quality of technology-enhanced biology lesson plans?. *Journal of Science Education and Technology*, 31(5), 570-582.
4. Koberstein-Schwarz, M., & Meisert, A. (2023). Facilitating preservice biology teacher development through material-based lesson planning. *Education*

- Sciences*, 14(1), 42.
5. Großmann, L., & Krüger, D. (2023, July). Biology Teachers' Lesson Plans. In *Fostering Scientific Citizenship in an Uncertain World: Selected Papers from the ESERA 2021 Conference* (p. 95). Springer Nature.
  6. Farhang, Q., Hashemi, A. P. S. S. A., & Ghorianfar, A. P. S. M. (2023). Lesson plan and its importance in teaching process. *International Journal of Current Science Research and Review*, 6(08), 5901-5913.
  7. Kawuwung, F. R., & SP, M. S. (2025). *Perencanaan Pembelajaran Biologi*. Selat Media.
  8. Asifa, N. A., Oktaviana, A., Salsabela, I. & Maryani, M. (2026). Desain Pembelajaran Biologi: Tinjauan Teoretis dan Implikasinya Terhadap Pengembangan Kurikulum. *DIKKESH: Jurnal Penelitian Pendidikan dan Kesehatan*, 2(1), 38-44.
  9. Sukaesih, S., Marianti, A., Saptono, S., Sriyadi, S., Lemmuela, L. H., Zahra, S. N. F., & Masrikhah, R. (2025, October). Penguatan Kompetensi Profesional Guru Biologi Dalam Implementasi Pembelajaran Deep Learning Berbasis Tik Melalui Pelatihan Terprogram. In *Prosiding Seminar Nasional Biologi* (Vol. 13, pp. 148-153).
  10. Roshayanti, F., Marfiana, T., & Indiaty, I. (2026, February). Student Response to the Use of the "Make a Mangrove" Game in Learning the Ecosystem Concept. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 475-486). Atlantis Press.
  11. Roshayanti, F., Pramasdyahsari, A. S., Burhanudin, A., & Ha, M. (2024). Literacy Profile of Flood and Rob Disaster Mitigation Among Sciences Teachers in Central Java. *KnE Social Sciences*, 591-598.

## Cell and Molecular Biology

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| <b>Module number</b><br>3225321640                                                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Cell and Molecular Biology                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                              | <b>Semester / Rotation</b><br>5/ Odd                                                             | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum.                                                                                                                                                                                                                                                         | <b>Prerequisites for attendance:</b><br>General biology, biochemistry, Basic Chemistry, Genetics | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (30%)</li> <li>2. Assignment (5%)</li> <li>3. Practicum report (20%)</li> <li>4. Case report (10%)</li> <li>5. Presentation (10%)</li> <li>6. Quiz (5%)</li> <li>7. Midterm exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                                                                                  | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Dyah Ayu Widyastuti, S.Si., M.Biomed.                                                                                                                                                                                                                                                                                               |                                                                                                  | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> <li>2. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.</li> <li>3. Reni Rakhmawati, S.Pd., M.Pd.</li> <li>4. Prof. Dr. Endah Rita Sulistya Dewi, M.Si.</li> </ol>                                                                                 |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Syllabus/Description of what will be done**

This course introduces undergraduate students to the fundamental concepts of Cell Biology, with the objective of developing a comprehensive understanding of cell structure, function, and dynamics as the basis of life processes. Upon completion of the course, students are expected to demonstrate **competencies** in explaining cell concepts and theories of cell development, distinguishing cell types based on complexity, and analysing the structure, function, and activities of prokaryotic and eukaryotic cells. Students are also able to explain the chemical structure of cells, compare plant and animal cells, analyse membrane structure and transport mechanisms, and describe the roles of cellular organelles including the nucleus, endoplasmic reticulum, ribosomes, mitochondria, chloroplasts, Golgi apparatus, lysosomes, cytoskeleton, glyoxysomes, and peroxisomes in metabolism and protein synthesis. Further competencies include understanding cell division, growth, intercellular communication, and cell death processes such as apoptosis and necrosis. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include introductory cell biology concepts, theories of cell development, cell classification, cell chemical structure, plant and animal cell structure and function, membrane systems and transport, organelle function, cellular metabolism, cell division and growth, cell communication, and cell death.

**Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in participating in Cell and Molecular Biology learning activities (A2)
2. CLO 2: Examine the concepts of Cell and Molecular Biology in depth in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Apply concepts of Cell and Molecular Biology through the utilization of science and technology (IPTEKS) and local wisdom, and demonstrates the ability to develop oneself and adapt to encountered situations (C3, P3, A3)
4. CLO 4: Integrate Cell and Molecular Biology concepts into laboratory practical activities while adhering to bioethical principles as well as occupational health and safety (K3) standards (C5, P5, A3)
5. CLO 5: Take responsibility for individual tasks and is entrusted with accountability for the achievement of work outcomes in the field of Cell and Molecular Biology (A4, P4)

**Core readings:**

1. Widyastuti, D. A., Minarti, I. B. M., & Ula, N. (2022). Pengaruh Variasi Massa Ragi *Saccharomyces Cerevisiae* dan Lama Fermentasi terhadap Densitas dan Rendemen Bioetanol Alang-Alang (*Imperata Cy-lindrica*). (*JITEK Jurnal Ilmiah Teknosains*, 8(1/Mei), 48-55.
2. Cooper, G. M., & Adams, K. W. (2023). *The cell: a molecular approach*. Oxford University Press.
3. Hallal, S., Túzesi, Á., Grau, G. E., Buckland, M. E., & Alexander, K. L. (2022). Understanding the extracellular vesicle surface for clinical molecular biology.

- Journal of extracellular vesicles*, 11(10), e12260.
4. Wang, M., Kim, R. Y., Kohonen-Corish, M. R., Chen, H., Donovan, C., & Oliver, B. G. (2025). Particulate matter air pollution as a cause of lung cancer: epidemiological and experimental evidence: Cellular and Molecular Biology. *British journal of cancer*, 132(11), 986-996.
  5. Müller, L., Di Benedetto, S., & Müller, V. (2025). From homeostasis to neuroinflammation: insights into cellular and molecular interactions and network dynamics. *Cells*, 14(1), 54.
  6. Carson, S., Miller, H. B., Witherow, D. S., & Srougi, M. C. (2025). *Molecular biology techniques: A classroom laboratory manual*. Academic Press.
  7. Cui, H., Tejada-Lapueta, A., Brbić, M., Saez-Rodriguez, J., Cristea, S., Goodarzi, H., ... & Wang, B. (2025). Towards multimodal foundation models in molecular cell biology. *Nature*, 640(8059), 623-633.
  8. Ardiputra, M. A., Rosalina, R., Simanullang, R. H., Sitepu, N. E., Novitasari, D., Mahyuni, S., Puspita.D., & Judijanto, L. (2025). *Biologi Sel dan Molekuler*. PT. Sonpedia Publishing Indonesia.
  9. Saputri, D. H. A. A. (2025). Pengembangan Modul Ajar Interaktif Berbasis Video Pendek untuk Materi Konversi Energi Mata Kuliah Biologi Sel Dan Molekuler. In *Prosiding Seminar Nasional Hayati* (Vol. 3, No. 1).
  10. Pratiwi, S. R. R., Juanengsih, N., & Mulyah, E. (2025, June). Keterampilan Proses Sains Siswa pada Praktikum Biologi Konsep Sel. In *Prosiding Seminar Nasional Fakultas Ilmu Tarbiyah dan Keguruan UIN Syarif Hidayatullah Jakarta* (Vol. 2, No. 1, pp. 193-207).
  11. Agustianingrum, S., Nugraheni, I. A., Bimantara, A., & Fardhani, D. M. (2025, March). Identifikasi molekuler isolat bakteri endofit potensial antibakteri tanaman ciplukan (*Physalis angulata* L.) berdasarkan gen 16S rDNA. In *Prosiding Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat LPPM Universitas' Aisyiyah Yogyakarta* (Vol. 3, pp. 999-1007).
  12. Priyaningsih, E., Yuliatin, E., & Kusuma, R. (2025). Potensi Cell Free Supernatant Dari Konsorsium Rhizobakteri Lokal Sebagai Biostimulator Pertumbuhan Aklimatisasi Anggrek Kelip (*Phalaenopsis bellina*). In *Prosiding Seminar Nasional Biologi* (Vol. 4, pp. 1-13).
  13. Mandasari, A. A., Maryam, S. A., Firdausi, C., Maulana, M. I., Kurnia, M. H., Widyastuti, D. A., & Herawati, D. (2025). Impact of Nicotine and Nicotine-Free E-Cigarettes on Body Weight, Erythrocyte Dynamics, Sperm Morphology, and Molecular Outcomes in Mice.

## Evolution

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225321639                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Module name</b><br>Evolution                                                                     |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Semester / Rotation</b><br>5 / Odd                                                               | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Prerequisites for attendance</b><br>General biology<br>Animal Biodiversity<br>Plant Biodiversity | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (23%)</li> <li>2. Assignment (7%)</li> <li>3. Quiz (10%)</li> <li>4. Cased report (20%)</li> <li>5. Presentation (20%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                     | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Reni Rakhmawati, S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Praptining Rahayu, S.Si., M.Pd.</li> <li>2. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> <li>3. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.</li> <li>4. Dyah Ayu Widyastuti, S.Si., M.Biomed.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental principles and mechanisms of evolution, with <b>the objective</b> of providing a scientific basis for understanding biological diversity and changes in organisms over time. The course examines the history of evolutionary thought, evidence supporting evolution, genetic variation, natural selection, mutation, gene flow, genetic drift, speciation, and patterns and rates of evolution. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining evolutionary mechanisms, analysing evolutionary processes using biological evidence, and interpreting patterns of biodiversity within an evolutionary framework. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is |                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |

conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the history of evolutionary theory, evidence of evolution, sources of genetic variation, mechanisms of evolution, speciation processes, and evolutionary patterns and rates.

**Learning goals and Qualifications in this module students learn to:**

1. CLO 1: Demonstrate an adaptive and enthusiastic attitude in participating in Evolution learning activities (A2)
2. CLO 2: Examine in depth the changes that occur in living organisms over time covering aspects of evolution, theories of evolution, evidence of evolution, mechanisms of evolution, and their implications in various fields in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Apply concepts related to changes in living organisms over time, including aspects of evolution, theories of evolution, evidence of evolution, mechanisms of evolution, and their implications in various fields through the utilization of science and technology and local wisdom (C3, P3, A3)
4. CLO 4: Integrate concepts and principles of evolutionary change, covering aspects of evolution, theories of evolution, evidence of evolution, mechanisms of evolution, and their implications in various fields into laboratory and field practical activities while adhering to bioethical principles as well as Occupational Health and Safety standards (C5, P5, A3)
5. CLO 5: Analyse alternative solutions to problems related to evolutionary changes in living organisms, individually and collaboratively, while internalizing entrepreneurial values (C4, A4, P4).

**Core readings:**

1. Hartelt, T., & Martens, H. (2025). How Accurate Are Students in Self-Assessing Their Conceptions of Evolution?. *Science Education*, 109(3), 965-989.
2. Goldbecker, E. S., & de Vries, J. (2025). Systems biology of streptophyte cell evolution. *Annual Review of Plant Biology*, 76(1), 493-522.
3. Ascensao, J. A., & Desai, M. M. (2026). Experimental evolution in an era of molecular manipulation. *Nature Reviews Genetics*, 27(1), 81-95.
4. Chazot, N., Braga, M. P., Aubier, T. G., Llaurens, V., Willmott, K. R., & Elias, M. (2025). Bending the course of evolution: how mutualistic interactions affect macroevolutionary dynamics of diversification in mimetic *Ithomiini* butterflies. *The American Naturalist*, 206(1), 1-15.
5. Griesemer, J. R., & Wimsatt, W. C. (2025). Picturing Weismannism: A case study of conceptual evolution. In *Scaffolding: Selected Contributions of James R. Griesemer to History, Philosophy, and Biology* (pp. 61-117). Cham: Springer Nature Switzerland.
6. Hermawan, B. J., Rahmawati, I., & Santoso, A. M. (2025). PROFIL AKTIVITAS BELAJAR SISWA MAN 2 KOTA KEDIRI PADA PEMBELAJARAN BIOLOGI PADA TOPIK EVOLUSI. In *Prosiding Seminar Nasional Hayati* (Vol. 3, No. 1, pp. 39-43).
7. Budiharjo, A., & Rachmawati, D. (2025). *Evolusi antara Fakta dan Teori*. UGM

PRESS.

8. Yusrizal, Y. (2026, January). Evolusi dan Struktur Penelitian Industri Hijau: Sebuah Tinjauan Bibliometrik Global. In *Prosiding Seminar Nasional APTISI Riau Komda Dumai Duri* (Vol. 1, No. 1, pp. 89-98).
9. Akmal, M. H., Harahap, K. M., Panggabean, A. A., & Aulia, R. R. (2025). Analisis Pola Evolusi Hominid Berdasarkan Data Morfometrik Menggunakan Principal Component Analysis. In *Prosiding Seminar Nasional Amikom Surakarta* (Vol. 3, pp. 15-25).

## Microbiology

|                                                                                                                                                                                                                                                                            |                                    |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>322533 2 636                                                                                                                                                                                                                                       | <b>Module name</b><br>Microbiology |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                        |                                    | <b>Semester / Rotation</b><br>5 / Odd                                                                                                 | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                    |                                    | <b>Prerequisites for attendance</b><br><b>Basic Biology</b><br>General biology, biochemistry<br>Cell Biology<br>Laboratory Techniques | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (20%)<br>2. Presentation (15%)<br>3. Assignment (10%)<br>4. Quiz (5%)<br>5. Practicum report (15%)<br>6. Case report (15%)<br>7. Mid-term exam (10%) 150 Minutes<br>8. Final exam (10%) 150 Minutes |                                    |                                                                                                                                       | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Prof. Dr. Endah Rita Sulistya Dewi, M.Si.                                                                                                                                                                                                     |                                    |                                                                                                                                       | <b>Semester week hours</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b><br>1. Atip Nurwahyunani, S.Si., S.Pd., M.Pd.<br>2. Dyah Ayu Widyastuti, S.Si., M.Biomed.                                                                                                                                               |                                    |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Syllabus/Description of what will be done**

This course introduces undergraduate students to the fundamental concepts of Microbiology, with **the objective** of developing a comprehensive understanding of microorganisms and their roles in natural and applied contexts. The course examines microorganisms including bacteria, yeasts, and fungi, as well as viruses and Protista that are closely related to other microorganisms. Topics covered include the history and development of microbiology from the pioneering, golden, and modern periods; bacterial morphology and structure of Eubacteria and Archaeobacteria; bacterial reproduction, growth, and roles in human life; characteristics and roles of Protista; and the structure, reproduction, and significance of viruses. Upon completion of the course, students are expected to demonstrate **competencies** in explaining microbial structure, metabolism, and environmental interactions, analysing biosynthetic and bioenergetic processes, understanding microbial toxins, and evaluating the applications of microbiology in food, industry, agriculture, environment, animal husbandry, and health. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include microbial history, morphology and structure, growth and reproduction, metabolism and biosynthesis, environmental influences on microbial activity, microbial toxins, and applied microbiology.

**Learning goals and Qualifications in this module students learn to:**

1. CLO 1: Demonstrate an enthusiastic character in the learning process within the scope of Microbiology studies (A2)
2. CLO 2: Examine the principles and concepts of Microbiology in depth in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solve problems critically and wisely by applying Microbiology concepts through the utilization of science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P3, A4)
4. CLO 4: Integrate Microbiology concepts and their developments into laboratory practical activities while adhering to bioethical principles and Occupational Health and Safety (K3) standards (C5, P4, A4)
5. CLO 5: Make decisions and selects various alternative solutions in solving problems in the field of Microbiology, both individually and collaboratively, while internalizing entrepreneurial values (C5, A4, P3)

**Core readings:**

1. Wang, X. W., Wang, T., & Liu, Y. Y. (2026). Artificial intelligence for microbiology and microbiome research. *Cell Systems*, 17(2).
2. Mairi, A., Hamza, L., & Touati, A. (2025). Artificial intelligence and its application in clinical microbiology. *Expert Review of Anti-infective Therapy*, 23(7), 469-490.
3. Khalaf, W. S., Morgan, R. N., & Elkhatab, W. F. (2025). Clinical microbiology and artificial intelligence: Different applications, challenges, and future prospects. *Journal of Microbiological Methods*, 232, 107125.
4. Nwakoby, I. P., Iheukwumere, I. H., Iheukwumere, C. M., Nwakoby, N. E.,

- Idigo, M. A., & Ike, V. E. (2025). The Intersection of Microbiology and Product Liability Law: Case Studies and Implications. *IPS Journal of Applied Microbiology and Biotechnology*, 4(4), 237-242.
5. Purwaningrum, S. I. (2025). Buku ajar mikrobiologi lingkungan.
  6. Purwanti, A., & Hidayati, S. (2025). Petunjuk Praktikum Mikrobiologi.
  7. Bawamenewi, T. A., & Lase, N. K. (2025). Peran Mikrobiologi dalam Pengolahan Limbah Pertanian Menjadi Pupuk Organik. *Hidroponik: Jurnal Ilmu Pertanian Dan Teknologi Dalam Ilmu Tanaman*, 2(1), 53-63.
  8. Febriani, P., Famalia, P., Utami, R. D., Rahma, N. A., Sahrul, S., Sari, M., & Soleha, S. (2025, December). Diferensiasi Sel Bakteri: Kajian Eksperimental Melalui Praktikum Mikrobiologi. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 485-490).
  9. Ma'mun, M. A., Haryati, S., & Meata, B. A. (2026). Karakteristik Kimia, Sensori Dan Mikrobiologi Terasi Dari Jenis Bahan Baku Yang Berbeda.
  10. Sonia, S., Reha, D., Yuliasari, S., Ferbet, A. N., Hafidzin, M., & Soleha, S. (2025, December). KARAKTERISASI ISOLAT TP04 BERDASARKAN UJI FISILOGI DAN BIOKIMIA DALAM PRAKTIKUM MIKROBIOLOGI. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 562-568).
  11. Dewi, E. R. S., Ulfah, M., & Nugroho, A. S. (2025). Optimization of *Saccharomyces cerevisiae* Dose in Eco-Enzyme Fermentation: Effects on pH, BOD, DO, Nitrite, and Nitrate. *Advance Sustainable Science Engineering and Technology*, 7(4), 02504028-02504028.

## Ecology

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| <b>Module number</b><br>322533 1 634                                                                                                                                                                                                         | <b>Module name</b><br>Ecology |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                          |                               | <b>Semester / Rotation</b><br>5 / Odd                                                                            | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                      |                               | <b>Prerequisites for attendance</b><br>General biology, Laboratory Techniques, Plant Diversity, Animal Diversity | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (30%)<br>2. Assignment (5%)<br>3. Quiz (5%)<br>4. Case report (20%)<br>5. Presentation (20%)<br>6. Mid-term exam (10%) 150 Minutes<br>7. Final exam (10%) 150 Minutes |                               |                                                                                                                  | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Dr. Ary Susatyo Nugroho, M.Si.                                                                                                                                                                                  |                               |                                                                                                                  | <b>Semester week hours</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Additional teacher involved:</b><br>1. M. Anas Dzakiy, S.Si., M.Sc.<br>2. Dr. Ling. Maria Ulfah, S.Si., M.Pd.<br>3. Fibria Kaswinarni, S.Si.,M.Si.<br>4. Prof. Dr. Endah Rita Sulistya Dewi, M.Si.                                        |                               |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syllabus/Description of what will be done</b><br><b>This course</b> introduces undergraduate students to the fundamental concepts and                                                                                                     |                               |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

approaches of ecology, with the objective of developing a comprehensive understanding of ecological principles and their application to natural ecosystems. The theoretical component of the course examines the history of ecology, ecological approaches, basic ecosystem concepts, principles of energy and matter flow in ecosystems, environmental factors, habitat and ecological niche, organismal adaptation, ecosystem productivity, ecological succession, ecosystem types, population ecology, and community ecology. Upon completion of the course, students are expected to demonstrate **competencies** in analysing ecological processes and interactions within ecosystems, interpreting relationships between organisms and their environment, and applying ecological concepts to environmental problem-solving. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The practical** component focuses on analysing physicochemical factors in aquatic and terrestrial ecosystems, examining ecosystem characteristics, conducting ecosystem analyses, assessing ecosystem productivity and population size, and understanding wildlife conservation concepts in Indonesia.

**Learning goals and Qualifications in this module students learn to:**

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process of Ecology (A2)
2. CLO 2: Examine in depth the changes and developments in Ecology in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solves problem related to Ecology critically and wisely by utilizing science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Implement Ecology concepts in laboratory and field practical activities while adhering to Occupational Health and Safety (K3) standards (C3, P5, A3)
5. CLO 5: Make decisions and selects various alternative solutions in solving problems in the field of Ecology, both individually and collaboratively, while internalizing entrepreneurial values (C5, A4)

**Core readings:**

1. Nugroho, A. S., Dewi, E. R. S., & Ulfah, M. (2023). Adaptation of four strawberry varieties at an altitude of 900 meters above sea level with different shading levels. *Bioma: Jurnal Ilmiah Biologi*, 12(1), 45–56.
2. Corley, J. C., & Villacide, J. M. (2025). Ecology and biological control. In *Biological Control of Insect Pests in Plantation Forests* (pp. 95-113). Cham: Springer Nature Switzerland.
3. Van Cleemput, E., Adler, P. B., Suding, K. N., Rebelo, A. J., Poulter, B., & Dee, L. E. (2025). Scaling-up ecological understanding with remote sensing and causal inference. *Trends in Ecology & Evolution*, 40(2), 122-135.
4. Abbasi, E. (2025). Innovative approaches to vector control: integrating genomic, biological, and chemical strategies. *Annals of Medicine and Surgery*, 87(8), 5003-5011.
5. Mérillon, J. M., & Ramawat, K. G. (Eds.). (2025). *Plant specialized metabolites: phytochemistry, ecology and biotechnology*. Springer Nature.

6. Carneiro, L., Leroy, B., Capinha, C., Bradshaw, C. J., Bertolino, S., Catford, J. A., & Courchamp, F. (2025). Typology of the ecological impacts of biological invasions. *Trends in Ecology & Evolution*, 40(6), 563-574.
7. Ziraluo, Y. P. B. (2025). Merekonstruksi Literasi Ekologi: Tantangan dan Peluang bagi Kalangan Mahasiswa Calon Guru Biologi. *Jurnal Pendidikan Biologi Undiksha*, 12(2), 81-95.
8. Sari, R., & Saputra, A. (2025). Model Literasi Ekologi Integratif Berbasis Komunitas untuk Mahasiswa Calon Guru Biologi: Desain, Implementasi, dan Evaluasi. *Insight of Biology*, 1(3), 69-74.
9. Nur'aini, F., Heryana, P. S., Rahmawati, C., & As'ari, R. (2026, February). Membangun Kepedulian Lingkungan melalui Literasi Ekologis pada Mahasiswa Pendidikan Geografi Universitas Siliwangi. In *Prosiding Seminar Nasional Pendidikan, Ilmu-Ilmu Sosial, dan Hukum (SENPISSHUM)* (Vol. 1, No. 1).
10. Harahap, D. P., & Haq, A. M. (2026). Penguatan Kesadaran Ekologi Melalui Pembelajaran Fisiologi Hewan Berbasis Studi Kasus Adaptasi Satwa Terancam Punah. *Bioed: Jurnal Pendidikan Biologi*, 14(1), 38-47.

## Research Methods in Biology Education

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Module number</b><br>322533 1 648                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Module name</b><br>Research Methods in Biology Education |                                                                                                                                                                                                                                                                                                                                     |  |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Semester / Rotation</b><br>5/ Odd                        | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                      |  |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Prerequisites for attendance:</b>                        | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                  |  |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (20%)<br>2. Assignment (10%)<br>3. Quiz (10%)<br>4. Case report (20%)<br>5. Presentation (20%)<br>6. Mid-term exam (10%) 150 Minutes<br>7. Final exam (10%) 150 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study<br><br>Total 135 hours |  |
| <b>Module coordinator</b><br>Eko Retno Mulyaningrum, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                  |  |
| <b>Additional teacher involved:</b><br>1. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.<br>2. Ipah Budi Minarti, M.Pd.<br>3. M. Anas Dzakiy, S.Si., M.Sc.<br>4. Dr. Ling. Maria Ulfah, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             |                                                                                                                                                                                                                                                                                                                                     |  |
| <b>Syllabus/Description of what will be done</b><br><b>This course</b> introduces undergraduate students to the methodology of research in biology education, with <b>the objective</b> of developing a comprehensive understanding of research paradigms and methods used in educational research. The course examines the scope of biology education research, research paradigms, research variables, conceptual frameworks, sampling techniques, data collection methods, and the development of research instruments. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in analysing various research designs, including qualitative and quantitative |                                                             |                                                                                                                                                                                                                                                                                                                                     |  |

research, pre-experimental, true experimental, quasi-experimental, and factorial designs, as well as classroom action research (PTK) through design and simulation, and research and development (R&D) approaches. Students are also able to prepare a complete biology education research proposal. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include biology education research methodology, research paradigms, variables and conceptual frameworks, sampling techniques, data collection and instrument development, experimental research designs, classroom action research design and simulation, research and development design, and research proposal preparation.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate enthusiasm and integrity in studying research methodology in order to solve problems in the fields of Biology and Biology Education (A2)
6. CLO 2: Examine research methodology in depth to address problems in the fields of Biology and Biology Education (C4)
7. CLO 3: Solve problems in the fields of Biology and Biology Education through the application of research methodology (C5, P4)
8. CLO 4: Communicate research design outcomes in the fields of Biology and Biology Education using technology (C3, P4, A3)
9. CLO 5: Take responsibility for work outcomes related to research methodology in the fields of Biology and Biology Education (A4, P4)

**Core readings:**

1. Sugiyono. (2021). *Educational research methods: Quantitative, qualitative, and R&D approaches*. Bandung, Indonesia: Alfabeta.
2. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2024). *Guidelines for the Student Creativity Program (PKM): Social and Humanities Research (RSH)*. Jakarta, Indonesia: Direktorat Jenderal Pendidikan Tinggi, Riset, dan Teknologi.
3. Fakultas Pendidikan Matematika, Ilmu Pengetahuan Alam, dan Teknologi Informasi. (2020). *Undergraduate thesis guidelines*. Semarang, Indonesia: Universitas PGRI Semarang.
4. Sumarno, S., Prasetyo, P., & Ibrahim, M. (2020). Model Pembelajaran MRSA dan Pengaruhnya Terhadap Kinerja Penalaran Mers dan Keterampilan Pemodelan Sistem Kompleks Mahasiswa . *Bioscientist: Jurnal Ilmiah Biologi*, 8(1), 86–94.
5. Wicaksono, A. G. C., & Korom, E. (2023b). The role of inductive reasoning, gender, learning satisfaction, and educational and career preferences in predicting scientific competency in high school. *Thinking Skills and Creativity*, 49, 101376.
6. Almaas, A. F., Paidi, P., Mualimin, M., & Prakarsa, T. B. P. (2025). Research Trends E-Module Development in SINTA Indexed Indonesian Journal of Biology Education 2: A Literature Review. *Journal of Biological Education*

- Indonesia (Jurnal Pendidikan Biologi Indonesia)*, 11(1), 326-335.
7. Idlebird, C., Campbell-Montalvo, R., McDowell, G. S., Blosser, E., Harvey, R., Zha, Y., & Marcette, J. (2025). The illusion of inclusion: structural and methodological gaps in biology education research. *Journal of Microbiology and Biology Education*, 26(3), e00181-25.
  8. Cao, J., Song, Q., Yang, H., & Bai, Y. (2025). Design and Practice of Experimental Teaching for Research Methods and Technologies in Cell Biology Based on Demand-Oriented Education. *Biochemistry and Molecular Biology Education*, 53(5), 489-499.
  9. Hidayat, S., Saputri, W., & Astriani, M. (2025). *Metodologi penelitian biologi*. Deepublish.
  10. Hossimah, N., Khairulnisa, K., & Mutmainnah, M. (2025). Perbandingan Metode Pendekatan Kualitatif dan Pendekatan Kuantitatif dalam Penelitian Pendidikan Biologi. *JBIOEDRA: Jurnal Pendidikan Biologi*, 3(2).
  11. Aisyah, S., & Sumo, M. (2025). Metodologi pendekatan kualitatif dan kuantitatif dalam konsep pembelajaran biologi: Sebuah analisis perbandingan. *Jurnal Teknologi Pendidikan Dan Pembelajaran* | E-ISSN: 3026-6629, 3(2), 883-890.
  12. Dewi, T. M., Sumarni, W., Ridlo, S., & Marianti, A. (2025, October). INTEGRASI ETNO-SDGs DALAM PEMBELAJARAN BIOLOGI: VALIDASI INSTRUMEN LITERASI LINGKUNGAN UNTUK PEMBANGUNAN BERKELANJUTAN. In *Prosiding Seminar Nasional Biologi* (Vol. 13, pp. 11-16).
  13. Eliyah, E., & Aslan, A. (2025, June). Stake's Evaluation Model: Metode Penelitian. In *Prosiding Seminar Nasional Indonesia* (Vol. 3, No. 2, pp. 117-129).

## Innovation in Digital Learning Media

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| <b>Module number</b><br>3225322652                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Module name</b><br>Innovation in Digital Learning Media                                 |                                                                                                                                                                                     |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Semester / Rotation</b><br>5/ Odd                                                       | <b>Student capacity:</b><br>30                                                                                                                                                      |
| <b>Teaching methods:</b><br>Lectures, Project-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Prerequisites for attendance</b><br>Biology Learning Resources and Material Development | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                  |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (20%)</li> <li>2. Project report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (10%)</li> <li>6. Mid exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                            | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Practice<br>(90 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Practice (90 hours of practice) |
| <b>Module coordinator</b><br>Ipah Budi Minarti, S.Pd., M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                            | <b>Semester week hours</b><br>90                                                                                                                                                    |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. M. Syaipul Hayat, M.Pd.</li> <li>2. Dr. Azizul Ghofar C W, M.Pd</li> <li>3. Dr. Ling. Maria Ulfah, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                            |                                                                                                                                                                                     |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and practices of digital learning, with <b>the objective</b> of developing competencies in designing, developing, and implementing digital learning applications and assessments. The course examines core concepts of digital learning, the role of computers and the internet in digital education, digital learning models and competencies, and the development of digital learning content. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in analysing learning needs, designing and developing presentation-based and video-based digital learning applications, creating digital learning evaluations, and developing interactive multimedia learning applications for Android and iOS platforms. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The materials</b> covered in this course include basic concepts of digital learning, computers and the internet in |                                                                                            |                                                                                                                                                                                     |

digital education, digital learning models and competencies, digital learning content, development of presentation-based learning applications (analysis, design, development, and utilisation stages), development of video-based learning applications (analysis, design, development, and utilisation stages), development of digital-based learning evaluation, and development of interactive multimedia learning applications for mobile operating systems.

**Learning goals and Qualifications in this module students learn to:**

1. CLO 1: Demonstrates an enthusiastic character in implementing innovations in digital learning media (A2)
2. CLO 2: Critically analyzes the principles of innovation and development of digital learning media in accordance with learning needs and problems, and in relevance to contemporary developments (C4)
3. CLO 3: Apply logical, critical, and innovative thinking in the context of developing and innovating digital learning media in response to Biology learning problems and in alignment with current developments (C5, P4)
4. CLO 4: Make decisions in innovating digital learning media to solve Biology learning problems in accordance with needs and contemporary developments (C5, P4, A4)
5. CLO 5: Innovate technology-based multimedia learning media oriented toward bioedupreneurship in the fields of education and entrepreneurship (C6, P4, A4)

**Core readings:**

1. Burgos, D., Tlili, A., & Tabacco, A. (2021). *Radical solutions for education in a crisis context: COVID-19 as an opportunity for global learning*. Singapore: Springer.
2. Bishop, M. J., Boling, E., Elen, J., & Svihla, V. (2020). *Handbook of research in educational communications and technology: Learning design* (5th ed.). Cham, Switzerland: Springer.
3. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press.
4. Muklis, M. (2025). The Influence of Innovation Management on the Effectiveness of Digital Learning Media Development. *International Journal of Educational Insights and Innovations*, 2(3), 69-74.
5. Nurhasanah, A., Handoyo, E., Widiyatmoko, A., & Rusdarti, R. (2025). Digital-based learning media innovation: Improving motivation and science learning outcomes. *International Journal on Social and Education Sciences*, 7(2), 185-194.
6. Sitorus, L. S., Sipahutar, M. I., Nasution, S. N., Purnama, L., & Iskandar, T. (2025). Literature Review on the Use of Technology-Based Learning Media in the Context of Distance Learning. *Jurnal Medika: Medika*, 4(3), 283-289.
7. Galanti, T., & Fantinelli, S. (2025). Managing the future of talents: digital innovation in learning organizations. *The Learning Organization*, 32(4), 554-580.
8. Puteri, A. R., Nasution, W. N., & Nasution, M. I. P. (2025). Integrasi teknologi informasi dan komunikasi dalam pendidikan: konsep, perkembangan, dan inovasi media pembelajaran. *Jurnal Pendidikan Indonesia: Teori, Penelitian*,

- dan Inovasi*, 5(4).
9. Dita, S. U. N., Daningsih, E., & Candramila, W. (2025). E-Flipbook Untuk Materi Fitoplankton: Inovasi Media Pembelajaran Digital Biologi. *Didaktika Biologi: Jurnal Penelitian Pendidikan Biologi*, 9(2), 75-88.
  10. Azhari, M. H., Utami, N. H., & Arsyad, M. (2025, August). Analisis Deskriptif Potensi Komik Digital sebagai Media Pembelajaran pada Materi Keanekaragaman Hayati. In *Seminar Nasional Pendidikan Sarjanawiyata Tamansiswa* (Vol. 2, No. 1, pp. 321-327).
  11. Huda, I. Z. N., Rusd, R., & Ristanto, R. H. (2026, February). Analisis Kebutuhan Pengembangan Bahan Ajar Berbasis Website Terintegrasi Pbl Pada Pembelajaran Biologi. In *Seminar Nasional Pendidikan IPA Ke III Tahun 2025* (Vol. 3, No. 1, pp. 548-563).
  12. Wahyuni, M. D., Isfaeni, H., & Komala, R. (2026, February). E-Modul Berbasis Contextual Teaching And Learning Melalui Bioinformatika Untuk Literasi Biologi: Sebuah Kajian Bibliometrik. In *Seminar Nasional Pendidikan IPA Ke III Tahun 2025* (Vol. 3, No. 1, pp. 486-500).
  13. Muhaimin, A., Utami, N. H., & Ajizah, A. (2025, August). Studi Deskriptif Penggunaan Media Pembelajaran oleh Guru Biologi dan Potensi Komik dalam Materi Keanekaragaman Makhluk Hidup. In *Seminar Nasional Pendidikan Sarjanawiyata Tamansiswa* (Vol. 2, No. 1, pp. 275-281).

## Horticulture

| Module number<br>322533 2 656                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Module name<br>Horticulture                                                                                                   |                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | <b>Semester / Rotation</b><br>5/ Odd                                                                                          | <b>Student capacity:</b><br>35                                                                                                                                                                       |
| <b>Teaching methods</b><br>Lectures, Project-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>Prerequisites for attendance</b><br>Laboratory Techniques, Structure and Development of Plants and Fungi, Plant Physiology | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                   |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (25%)</li> <li>2. Project report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                               | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Practice (90 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Practice/Laboratory activity (90 hours of practice) |
| <b>Module coordinator</b><br>Dr. Ary Susatyo Nugroho, M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                               | <b>Semester week hours</b><br>90                                                                                                                                                                     |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Lussana Rosita Dewi, M.Pd.</li> <li>2. Rivanna Citraning Rachmawati, M.Pd.</li> <li>3. Praptining Rahayu, S.Si., M.Si.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                               |                                                                                                                                                                                                      |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and applications of horticulture, with <b>the objective</b> of equipping them with the knowledge and skills to analyse horticultural issues professionally and apply horticultural theory and practice effectively in the field. The course integrates local wisdom and local potential while emphasising entrepreneurial values in horticultural management. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in understanding horticultural fundamentals, applying plant propagation and nursery techniques, managing plant protection and fertilisation, implementing urban farming practices, cultivating vegetable, fruit, ornamental, and medicinal plants, and conducting post-harvest handling and processing. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka</i> ) |  |                                                                                                                               |                                                                                                                                                                                                      |

*Belajar*) platform at <https://simekar.upgris.ac.id>. The materials covered in this course include basic horticulture concepts, plant propagation and nurseries, plant protection, fertilisation, urban farming, cultivation of various horticultural crops, and post-harvest management.

Learning goals and qualifications in this module students learn to:

1. CLO 1: Demonstrate an enthusiastic attitude in carrying out Horticulture learning activities (A2)
2. CLO 2: Examine Horticulture concepts in depth in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solve problems critically and wisely by applying Horticulture concepts through the utilization of science and technology and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Integrate Horticulture concepts and their developments into field practice activities while adhering to Occupational Health and Safety principles (C5, P5, A3)
5. CLO 5: Select alternative solutions in solving problems in the field of Horticulture, both individually and collaboratively, while internalizing an entrepreneurial spirit (C5, A4, P4)
6. CLO 6: Apply local wisdom-based Horticulture cultivation techniques in entrepreneurial activities grounded in bioedupreneurship (C3, P5, A4)

Core readings:

1. Ulfah, M., Dewi, L. R., & Rachmawati, R. C. (2021). Urban farming as an alternative horticultural learning model in higher education. *Jurnal Pendidikan Biologi Indonesia*, 7(3), 271–280.
2. Pearson, S. (2025). Artificial intelligence in horticulture. *The Journal of Horticultural Science and Biotechnology*, 100(5), 564-570.
3. Yuan, X., Hu, J., Marcelis, L. F., Heuvelink, E., Peng, J., Yang, X., & Yang, Q. (2025). Advanced technologies in plant factories: exploring current and future economic and environmental benefits in urban horticulture. *Horticulture Research*, 12(5), uhaf024.
4. Fanourakis, D., Tsaniklidis, G., Makraki, T., Nikoloudakis, N., Bartzanas, T., Sabatino, L. & Ntatsi, G. (2025). Climate Change Impacts on Greenhouse Horticulture in the Mediterranean Basin: Challenges and Adaptation Strategies. *Plants*, 14(21), 3390.
5. Király, A., Farkas, D., & Dobránszki, J. (2025). Ultrasound in plant life and its application perspectives in horticulture and agriculture. *Horticulturae*, 11(3), 318.
6. López, E., Oliveira, M. D. F., & Reis, P. (2025). The use of circular economy in horticulture research: a bibliometric analysis. *Sustainability*, 17(7), 3272.
7. Christie, C. D. Y., Lestari, N. A., Mardatilla, I., & Sitorus, J. (2025). Pengembangan Buku Ajar Budidaya Tanaman Hortikultura Berbasis Soal Hots. *Jurnal Pendidikan Biologi*, 16(2), 85-92.
8. Ariga, F. D. S., & Razak, A. (2025, December). Pengaruh Faktor Lingkungan Terhadap Pertumbuhan dan Produksi Tanaman Cabai (*Capsicum* spp Kelompok Tani Lubuk Ramang) Di Dinas Pertanian BPP Koto Tangah, Sumatra Barat. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 805-814).
9. Erwanti, P. E., & Indriyanti, D. R. (2025, October). Keanekaragaman Serangga Pada Tanaman Jeruk Siam Madu (*Citrus nobilis*). In *Prosiding*

*Seminar Nasional Biologi* (Vol. 13, pp. 80-86).

10. Rahmadhani, N. (2025, December). Literature Review: Ekstrak Daun Pepaya Sebagai Biopestisida Dalam Mengendalikan Hama Ulat Grayak (*Spodoptera litura* F.) Pada Berbagai Tanaman. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 437-447).
11. Putri, G. D., & Fevria, R. (2025, December). Budidaya dan Produksi Tanaman Pakcoy (*Brassica rapa* L.) menggunakan Pupuk AB Mix dengan Sistem DFT. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 815-824).
12. Nurkhutmaidah, N., Nugroho, A. S., & Rachmawati, R. C. (2025). Pemanfaatan Tumbuhan Sebagai Obat Tradisional Oleh Masyarakat Kecamatan Tambakromo Kabupaten Pati. *EDUBIOPRENA: Jurnal Ilmiah Pendidikan Biologi, Biologi, & Bioentrepreneurship*, 2(1), 1-13

**6th Semester**  
**Even 2025/2026**

## Curriculum Review

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                    |
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| <b>Module number</b><br>3225331625                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Module name</b><br>Curriculum Review                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Semester / Rotation</b><br>6 / Even                                                                                                                                                                                        | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Prerequisites for attendance</b><br>Student development, biology learning strategies, basic of biology learning, biology learning assessment, Biology Learning Resources and Material Development. Biology lesson planning | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Case report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (5%)</li> <li>6. Mid-term exam (10%) 150 Minutes</li> <li>7. Final exam (20%) 150 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS Theory (40 hours of Lecture + 47.5 hours of structured assignment + 47.5 hours of self-study)<br><br>Total 135 hours |
| <b>Module coordinator</b><br>Dr. Prasetyo, M. Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Enny Hartadiyati W.H., M.Si.Med.</li> <li>2. Ipah Budi Minarti, S.Pd., M.Pd</li> <li>3. Eko Retno Mulyaningrum, M.Pd.</li> <li>4. Dr. Azizul Ghofar Candra Wicaksono, M.Pd</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and development of the school curriculum, with <b>the objective</b> of developing their understanding of curriculum theory and practical curriculum analysis. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining the definition and functions of the curriculum, analysing curriculum development in schools, and conducting curriculum analysis that includes task analysis and content analysis. Students are also able to formulate learning objectives and indicators of achievement through case-based learning and discussion-oriented instructional approaches. In this course, <b>the learning process</b> is carried out using a |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                    |

hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the concept and definition of curriculum, stages and models of curriculum development, curriculum analysis techniques, task and content analysis, and the formulation of learning objectives and achievement indicators.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process related to the development of the operational curriculum for Biology content covering objectives, content, learning experiences, assessment within the operational curriculum, curriculum development aligned with professional responsibilities, and operational curriculum management (A2)
2. CLO 2: Examine in depth the development of the operational curriculum for Biology content covering objectives, content, learning experiences, assessment within the operational curriculum, curriculum development aligned with professional responsibilities, and operational curriculum management in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solve problems critically and wisely by applying conceptual principles of operational curriculum development for Biology content covering objectives, content, learning experiences, assessment within the operational curriculum, curriculum development aligned with professional responsibilities, and operational curriculum management through the utilization of science and technology (IPTEKS) and local wisdom (C5, P4, A3)
4. CLO 4: Take responsibility for individual tasks and is entrusted with accountability for achieving work outcomes related to the development of the operational curriculum for Biology content, including objectives, content, learning experiences, assessment, curriculum development aligned with professional responsibilities, and operational curriculum management (A4, P4)

### **Core readings:**

1. Minarti, I. B., & Rachmawati, R. C. (2023). Task and content analysis in curriculum implementation for science learning. *Jurnal Review Pendidikan dan Pengajaran*, 6(2), 210–219.
2. Rahmi, S. N., Megawati, M., Alberida, H., & Fadilah, M. (2025). Assessment of biology learning outcomes in education: A systematic literature review. *Biosfer: Jurnal Pendidikan Biologi*, 18(1), 10-25.
3. Mpate, H. (2025). Biology teachers' implementation of the competence based curriculum in Tanzania: challenges and opportunities. *Journal of Biological Education*, 59(1), 16-36.
4. Deriba, F. G., & Sanusi, I. T. (2025). Artificial intelligence in Ethiopian school curriculum: Educators' practices, challenges, and recommendations. *Computers and Education Open*, 8, 100251.
5. Suhenda, A. (2026). *Pengembangan Kurikulum Pendidikan Tinggi dengan Pendekatan Outcome-Based Education (Teori dan Praktik Pengembangan Kurikulum Program Studi)*. Deepublish.

6. Harnita, Y., Hidayat, T., Herlina, M., & Nasral, N. (2025, July). Pemberdayaan Guru Biologi dalam Penyusunan Modul Ajar Biologi Berbasis Kurikulum Merdeka. In *Prosiding Seminar Nasional ADPI Mengabdikan Untuk Negeri* (Vol. 6, No. 1, pp. 105-109).
7. Fuadi, T. M. (2022, June). Konsep merdeka belajar-kampus merdeka (MBKM): Aplikasinya dalam pendidikan biologi. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 9, No. 2, pp. 38-55).
8. Niken, J. D. W., AP, M. Y., Wulandari, K. N., Herawati, E., & Santoso, A. M. (2024, October). Pengembangan LKPD Biologi Fase E Kurikulum Merdeka Keanekaragaman Hayati Tingkat Gen. In *Prosiding Seminar Nasional Kesehatan, Sains dan Pembelajaran* (Vol. 4, No. 1, pp. 681-692).
9. Oksari, A. A., Susanty, D., Wardhani, G. A. P. K., & Nurhayati, L. (2022). Analisis Implementasi Kurikulum Merdeka Belajar-Kampus Merdeka (MBKM) Program Studi Biologi Universitas Nusa Bangsa. *Jurnal Studi Guru Dan Pembelajaran*, 5(1), 78-85.
10. Nidia, E. (2022). *Relevansi Kurikulum Merdeka Dengan Model Pembelajaran Biologi Berbasis Abad 21 Dalam Perkembangan Era Society 5.0* (Doctoral dissertation, UIN RADEN INTAN LAMPUNG).

## Microteaching

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| <b>Module number</b><br>322532 2 623                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <b>Module name</b><br>Microteaching                                                                                                                                                                                                                   |                                                                                                                                                                                                      |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Semester / Rotation</b><br>6 / Even                                                                                                                                                                                                                | <b>Student capacity</b><br>30                                                                                                                                                                        |
| <b>Teaching methods</b><br>Practice-based learning,<br>Discussions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <b>Prerequisites for attendance</b><br>Educational psychology, student development, biology learning strategies, basic of biology learning, biology learning assessment, Biology Learning Resources and Material Development, Biology lesson planning | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                    |
| <b>Type of examination (Final Grade Composition)</b><br>1. Teaching practice assessment (50%)<br>2. Final teaching practice assessmen (30%)<br>3. Discussios<br>4. Teaching portfolio (10%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                                                                                       | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Practice (2 Credit Hours)<br>(90 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Practice (90 hours of practice) |
| <b>Module coordinator</b><br>Dr. Prasetiyo S.Pd, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                       | <b>Semester week hours:</b><br>90                                                                                                                                                                    |
| <b>Additional teacher involved:</b><br>1. Ipah Budi Minarti, S.Pd., M.Pd.<br>2. Dr. M.Syaipul Hayat, S.Pd., M.Pd.<br>3. Eko Retno Mulyaningrum, S.Pd., M.Pd.<br>4. Dr. Enny Hartadiyati W.H., M.Si.Med.<br>5. Dr. Azizul G. Candra W, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                      |
| <b>Syllabus</b><br>Microteaching is a practice-oriented course designed to equip undergraduate students with conceptual understanding and practical skills in conducting professional teaching activities through limited-scale teaching practice. <b>The objective</b> of this course is to prepare prospective teachers to integrate pedagogical knowledge, subject matter mastery, and essential teaching skills prior to engaging in real classroom teaching. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in applying basic teaching skills, including opening and closing lessons, explaining content, questioning techniques, providing reinforcement, classroom management, guiding discussions, using |  |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                      |

instructional media and technology, and conducting learning assessment. Students will be able to design and implement effective lessons based on clear objectives and performance indicators. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The scope of the course** covers fundamental teaching skills and the principles, stages, and procedures of microteaching, including lesson planning, short teaching simulations, observation, feedback, and reflective improvement.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrates professional behavior in every microteaching session (A4)
2. CLO 2: Designs lesson plans in accordance with pedagogical theories (C6, P4)
3. CLO 3: Conducts microteaching effectively (C3, P5)
4. CLO 4: Carries out microteaching practice independently and responsibly in accordance with the lesson plan (P5, A4)

### Core readings:

1. Pusat Sumber Belajar, Kurikulum, dan PPL. (2023). Guidelines for School-Based Teaching Practice II (PLP II handbook). Semarang, Indonesia: Lembaga Pengembangan Profesi.
2. Kementerian Riset, Teknologi, dan Pendidikan Tinggi Republik Indonesia. (2015). Regulation of the Minister of Research, Technology, and Higher Education of the Republic of Indonesia Number 44 of 2015 concerning national standards for teacher education. Jakarta, Indonesia: Kementerian Riset, Teknologi, dan Pendidikan Tinggi.
3. Kementerian Riset, Teknologi, dan Pendidikan Tinggi Republik Indonesia. (2017). Regulation of the Minister of Research, Technology, and Higher Education of the Republic of Indonesia Number 55 of 2017 concerning teacher education standards. Jakarta, Indonesia: Kementerian Riset, Teknologi, dan Pendidikan Tinggi.
4. Nursyahidah, F., Albab, I. U., & Mulyaningrum, E. R. (2023). Learning design of quadrilateral STEM-based through lesson study. *Eurasia Journal of Mathematics, Science and Technology Education*, 19(11), em2352.
5. Iliasova, L., Nekrasova, I., Mena, J., & Estrada-Molina, O. (2025, July). Microteaching on pre-service teachers' education: literature review. In *Frontiers in Education* (Vol. 10, p. 1562975). Frontiers Media SA.
6. Kazeem, S., Alhassan, N., & Falalu, M. K. (2025). Cultivating the pedagogical competence of pre-service science teachers through microteaching. *Indonesian Journal of Teaching in Science*, 5(1), 21-30.
7. Rafti, M., Milakis, E. D., Argyrakou, C. C., Vangeli, D. G., & Katsarou, M. C. (2025). Hands-on STEAM programming: Microteaching with Micro: Bit for enhanced learning. *Journal of Hypermedia & Technology-Enhanced Learning*, 3(2), 108-127.
8. Mukuka, A., & Alex, J. K. (2024). Review of research on microteaching in

mathematics teacher education: Promises and challenges. *Eurasia Journal of Mathematics, Science and Technology Education*, 20(1), em2381.

9. Fitri, R., Asril, Z., Sabri, A., Remiswal, R., Firdaus, F., & Zalnur, M. (2025). Implementation of Microteaching Based on Self-Directed Learning. *International Journal of Islamic Studies Higher Education*, 4(1), 68-78.
10. Bawamenewi, A., Waruwu, T., Dewianawati, D., Afifah, S., Takdir, N., Selia, A. K. W., Yumelking, M., Rusmayani, N, G., A., L., Alinda, M., Fr, D., A., Dewi, K., A., K., Waruwu, Y., Harefa, A., R., & Janggo, W. O. (2023). *Microteaching*. CV. Intelektual Manifes Media.

## Biostatistics

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| <b>Module number</b><br>322532 1 646                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Module name</b><br>Biostatistics      |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <b>Semester / Rotation</b><br>6 / Even   | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <b>Prerequisites for attendance</b><br>- | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                                                                                                  |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (30%)<br>2. Assignments (10%)<br>3. Quiz (10%)<br>4. Case report (15%)<br>5. Presentation (10%)<br>6. Mid-term exam (10%) 100 Minutes<br>7. Final exam (15%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>M. Anas Dzakiy, S.Si., M.Sc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                          | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b><br>1. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.<br>2. Dyah Ayu Widyastuti, S.Si., M.Biotech.<br>3. Atip Nurwahyunani, S.Si.,S.Pd.M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                          |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus/Description of what will be done</b><br>This course introduces undergraduate students to the fundamental concepts and applications of Statistics, with <b>the objective</b> of developing knowledge and understanding of statistical principles used in research and their application in biology education and educational practice. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in organising and presenting data systematically, applying measures of central tendency, position, dispersion, skewness, and kurtosis, selecting appropriate sampling techniques, conducting assumption tests such as normality and homogeneity, and performing statistical hypothesis testing including mean and proportion tests, simple linear regression, correlation analysis, and one-way analysis of variance. Students are also able to apply descriptive statistics, probability distributions, and comparative and associative statistical tests for one-sample, two-sample, and multi-sample data, as well as utilise statistical software such as SPSS and Microsoft Excel to analyse and interpret data accurately. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through |  |                                          |                                                                                                                                                                                                                                                                                                                                    |

face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the concepts of statistics and statistica, data organisation and presentation, frequency distributions, descriptive statistics, probability distributions, sampling techniques, assumption testing, hypothesis testing, regression and correlation analysis, and analysis of variance.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process of Biostatistics (A2)
2. CLO 2: Apply statistical methods in the fields of Biology and Biology Education, including types of biostatistics, data collection, research data processing, data presentation, data analysis, data interpretation, and the use of statistical software (C3, P4)
3. CLO 3: Solve problems in Biology and Biology Education critically using statistical methods supported by software (C5, P4)
4. CLO 4: Evaluate alternative decisions in solving problems in the fields of Biology and Biology Education using statistical methods (C5, P4)

### **Core readings:**

1. Pagano, M., Gauvreau, K., & Mattie, H. (2022). *Principles of biostatistics*. Chapman and Hall/CRC.
2. Friedrich, S., Groll, A., Ickstadt, K., Kneib, T., Pauly, M., Rahnenführer, J., & Friede, T. (2023). Regularization approaches in clinical biostatistics: A review of methods and their applications. *Statistical Methods in Medical Research*, 32(2), 425-440.
3. Husar, P., & Gašpar, G. (2023). Biostatistics. In *Electrical Biosignals in Biomedical Engineering: Medical Sensors, Measurement Technology and Signal Processing* (pp. 355-440). Berlin, Heidelberg: Springer Berlin Heidelberg.
4. Cook, R. J., & Moodie, E. E. (2024). A retrospective and prospective study of biostatistics in Canada. *Canadian journal of public health*, 115(6), 839-843.
5. Mishra, A., & Khan, M. M. (2024). The science and art of biostatistics: a comprehensive overview. *Asian Journal of Hospital Pharmacy*, 45-51.
6. Simbolon, I., NS, S., NED, P. D., Limbong, A., Tambunan, E. H., Kp, S., ... & Simanjuntak, S. M. (2023). *Biostatistik*. CV. Green Publisher Indonesia.
7. Setiawan, H. (2016). *Prosiding Seminar Nasional from Basic Science to Comprehensive Education Makassar*.

## Biotechnology

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                               |                                                                                                                                                                                                                                                                                                                                 |
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| <b>Module number</b><br>3225331637                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | <b>Module name</b><br>Biotechnology                           |                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | <b>Semester / Rotation</b><br>6/ Even                         | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>Prerequisites for attendance</b><br>Microbiology, Genetics | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (25%)<br>2. Case report (25%)<br>3. Presentation 20%)<br>4. Assignment (5%)<br>5. Quiz (5%)<br>6. Mid exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                               | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Prof. Dr. Endah Rita, S.Si., M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                               | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                |
| <b>Additional teacher involved:</b><br>1. Dyah Ayu Widyastuti, S.Si., M.Biotech.<br>2. Atip Nurwahyunani, S.Si.,S.Pd.M.Pd.<br>3. Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                               |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus</b><br>This course introduces undergraduate students to the development of Biotechnology from conventional approaches to modern biotechnology, with <b>the objective</b> of developing an understanding of the principles and applications of contemporary biotechnological techniques. The course focuses on fundamental concepts of modern biotechnology, including molecular analysis of genes and proteins using basic bioinformatics techniques, recombinant DNA technology, cloning, and hybridoma technology. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in explaining core principles of modern biotechnology, analysing molecular biological data at a basic level, and evaluating applications of biotechnology in various fields such as health, agriculture, industry, and environmental management. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to- |  |                                                               |                                                                                                                                                                                                                                                                                                                                 |

face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include the development of biotechnology, principles of modern biotechnology, basic bioinformatics analysis of genes and proteins, recombinant DNA technology, cloning techniques, hybridoma technology, and applications of modern biotechnology.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate an adaptive and enthusiastic attitude in participating in Biotechnology learning activities (A3)
2. CLO 2: Examine the principles and concepts of Biotechnology in depth in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solve problems critically and wisely by applying Biotechnology concepts through the utilization of science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Integrate Biotechnology concepts and their developments into laboratory practical activities while adhering to bioethical principles and Occupational Health and Safety (K3) standards (C5, P5, A3)
5. CLO 5: Make decisions and selects various alternative solutions in solving problems in the field of Biotechnology, both individually and collaboratively, while internalizing entrepreneurial values (C5, A4, P4)

**Core readings:**

1. Glick, B. R., Pasternak, J. J., & Patten, C. L. (2021). *Molecular biotechnology: Principles and applications of recombinant DNA* (5th ed.). Washington, DC: ASM Press.
2. Dewi, E. R. S., Widyastuti, D. A., & Nurwahyunani, A. (2021). *Biotechnology textbook*. Semarang, Indonesia: Universitas PGRI Semarang Press.
3. Kratz, R. F. (2020). *Molecular and cell biology for dummies* (2nd ed.). Hoboken, NJ: John Wiley & Sons.
4. Purbowati, R., Hasibuan, A. K. H., Nendissa, D. M., Hariri, M. R., Nendissa, S. J., Noviantari, A., & Chrisnawati, L. (2021). *Biotechnology*. Bandung, Indonesia: Widina Media Utama.
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7. Treinen, C., Peterzell, C., Noll, P., Magosch, O., Hausmann, R., & Henkel, M. (2025). Molecular process control for industrial biotechnology. *Trends in Biotechnology*.
8. Fushimi, K., Nakai, Y., Nishi, A., Suzuki, R., Ikegami, M., Nimura, R., Tomono, T., Hidese, R., Tagawa, Y., & Hasunuma, T. (2025). Development of the autonomous lab system to support biotechnology research. *Scientific Reports*, 15(1), 6648.
9. BIOTEKNOLOGI, P. D., Wahditiya, A. A., Zakiyah, M., Wardhani, H. A. K., Taihuttu, H. N., Fathurrahman, I., Habi, M.L., & Koto, S. K. (2025). *Pengenalan Dasar Bioteknologi: Konsep Dan Aplikasi*. Mmfast Publishing.

10. Hayati, R., & Mulyadi, M. (2026, February). Transformasi Akuakultur Melalui Rekayasa Genetik Dan Bioteknologi: Implikasi Terhadap Produksi Dan Kualitas Ikan. In *Prosiding Seminar Nasional Indonesia* (Vol. 3, No. 3, pp. 76-83).
11. Fuad, M., & Kasman, R. A. (2025, October). Transformasi Sistem Akuakultur Melalui Integrasi Teknik Genetika Dan Bioteknologi. In *Prosiding Seminar Nasional Indonesia* (Vol. 3, No. 1, pp. 48-54).
12. Renanda, J. D., Utami, B., Herawati, E., Sulistiono, S., & Hariyadi, R. (2025, September). Pengembangan Panduan Praktikum Bioteknologi Berbasis Hasil Fermentasi Tepache Nanas Kelud Varietas Lokal untuk Pembelajaran Biologi SMA. In *Prosiding Seminar Nasional Kesehatan, Sains dan Pembelajaran* (Vol. 5, No. 1, pp. 685-695).
13. Trimulyono, G., Asri, M. T., Lisdiana, L., Nafidiastri, F. A., & Prastyaningtias, S. D. (2025). Pelatihan Pembuatan Yoghurt Sebagai Penerapan Bioteknologi Pada Siswa SMA Labschool Unesa 1. In *Seminar Nasional Inovasi Penelitian dan Pembelajaran Biologi* (Vol. 9, pp. 48-57).
14. Nurwahyunani, A., Rahma Putri Andriani, D., Irmayanti, A., Mayada Nuraini, A., Nuryadi, A., Putri Amelia, S., Studi Pendidikan Biologi, P., & Pendidikan Matematika Ilmu Pengetahuan Alam dan, F. (2024). Pertumbuhan dan Kelangsungan Hidup Ikan Lele (*Clarias gariepinus*) pada Sistem Aquaponik Tanaman pada Kangkung dan Selada. *Jurnal Ilmiah Teknosains*, 10(2).

## Environment

| Module number<br>322533 1 642                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Module name<br>Environment                     |                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | <b>Semester / Rotation</b><br>6/ Even          | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <b>Prerequisites for attendance</b><br>Ecology | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination(Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (20%)</li> <li>2. Presentation (20%)</li> <li>3. Case report 20%)</li> <li>4. Assignment (15%)</li> <li>5. Quiz (5%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Ling. Maria Ulfah, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Ary Susatyo Nugroho, M.Si.</li> <li>2. Lussana Rossita Dewi, S.Si., M.Pd.</li> <li>3. M. Anas Dzakiy, S.Si., M.Sc.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br>This course introduces undergraduate students to fundamental environmental issues and management principles, with <b>the objective</b> of developing environmental awareness, analytical skills, and responsibility in addressing environmental problems. The course examines environmental problems and challenges, environmental legislation and regulations, environmental perspectives, analysis of environmental issues, environmental pollution and global warming, biodiversity loss, environmental ethics, principles of environmental management, human impacts on the environment, Environmental Impact Assessment (AMDAL/EIA), sustainable development, zero-waste concepts, and household waste management. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in analysing environmental problems critically, understanding regulatory and ethical aspects of environmental management, and proposing sustainable solutions based |  |                                                |                                                                                                                                                                                                                                                                                                                                    |

on scientific and social considerations. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The practical** component of the course is designed as a case-based assignment in the form of a mini environmental research that enables students to apply theoretical concepts to real environmental contexts.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrates an enthusiastic character in the teaching and learning process of Environmental Science (A2)
2. CLO 2: Examines in depth environmental and climate changes and developments in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solves problems critically and wisely by applying environmental and climate change concepts through the utilization of science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Integrates concepts of environmental change and development into laboratory and field practical activities while adhering to bioethical principles and Occupational Health and Safety (K3) standards (C5, P5, A3)
5. CLO 5: Makes decisions and proposes alternative solutions to problems related to environmental change and development, both individually and collaboratively, while internalizing entrepreneurial values (C5, A4, P4)

**Core readings:**

1. Nugroho, A. S., Dewi, E. R., & Ulfah, M. (2022). Pembuatan dan Pemanfaatan Eco Enzim Dalam Pengelolaan Lingkungan Sekolah di SMAN 8 Semarang. *Prosiding Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat (SNHP) LPPM Universitas PGRI Semarang*.
2. Turnhout, E. (2024). A better knowledge is possible: Transforming environmental science for justice and pluralism. *Environmental Science & Policy*, 155, 103729. <https://doi.org/10.1016/j.envsci.2024.103729>
3. Kotnala, S., Tiwari, S., Nayak, A., Bhushan, B., Chandra, S., Medeiros, C. R., & Coutinho, H. D. M. (2025). Impact of heavy metal toxicity on the human health and environment. *Science of the Total Environment*, 987, 179785.
4. van Rhijn, N., & Rhodes, J. (2025). Evolution of antifungal resistance in the environment. *Nature Microbiology*, 10(8), 1804-1815.
5. Saxena, R., Kotnala, S., Bhatt, S. C., Uniyal, M., Rawat, B. S., Negi, P., & Riyal, M. K. (2025). A review on green synthesis of nanoparticles toward sustainable environment. *Sustainable Chemistry for Climate Action*, 6, 100071.
6. Napper, I. E., & Thompson, R. C. (2023). Plastics and the Environment. *Annual Review of Environment and Resources*, 48(1), 55-79.
7. Widiyastuti, D. A., Nurtamara, L., & Ulimaz, A. (2024). Analisis kesadaran dan literasi lingkungan pada mahasiswa pendidikan biologi. *Journal on Education*, 6(4), 18987-18997.
8. Aryani, I., & Nugroho, P. A. (2022). Analisis penggunaan media pembelajaran schoology pada matakuliah praktikum biologi lingkungan terhadap hasil belajar mahasiswa di era pandemi covid-19. *Jurnal IPA &*

*Pembelajaran IPA*, 6(2), 145-155.

9. Amanda, T., Fajri, S. R., & Hajiriah, T. L. (2022). Evaluasi pemahaman konsep mahasiswa pendidikan biologi pada materi pengetahuan lingkungan. *Pedago Biologi: Jurnal Pendidikan dan Pembelajaran Biologi*, 10(1), 38-50.
10. Muhsan, R., Hanim, N., & Zuraidah, Z. (2022, August). Analisis Kelayakan Media Pembelajaran Interaktif Prezi Berbasis Metode Problem Solving pada Materi Perubahan Lingkungan. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 10, No. 2, pp. 57-65).
11. Fuadi, T. M. (2022, June). Konsep merdeka belajar-kampus merdeka (MBKM): Aplikasinya dalam pendidikan biologi. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 9, No. 2, pp. 38-55).
12. Mahrani, M., Idaheryana, A., Bariya, M. F., & Irawanto, R. (2025). Tingkat Pemahaman Mahasiswa terhadap Konservasi dan Pengelolaan Lingkungan. In *Prosiding Seminar Nasional Hayati* (Vol. 3, No. 1, pp. 72-80).
13. Subrata, I. M. (2023). Pembelajaran biologi berbasis lingkungan dalam upaya peningkatan literasi sains dan pelestarian kearifan lokal masyarakat bali. In *SEMBIO: Prosiding Seminar Nasional Biologi Dan Pendidikan Biologi* (Vol. 2, pp. 41-48).
14. Dewi, E. R. S., & Ulfah, M. (2022). Performa bioflok pada sistem bioflok-akuaponik ramah lingkungan. *BIOMA: Jurnal Ilmiah Biologi*, 11(1), 121-134.

## Development and Evaluation of Entrepreneurial Products

| Module number<br>322533 2 653                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | Module name<br>Development and Evaluation of Entrepreneurial Products |                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Semester / Rotation</b><br>6/ Even                                 | <b>Student capacity:</b><br>30                                                                                                                                                       |
| <b>Teaching methods</b><br>Lectures, Project-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | <b>Prerequisites for attendance</b><br>Market Analysis and Strategy   | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                   |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (15%)</li> <li>2. Project report (30%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (10%) 150 Minutes</li> <li>7. Final exam (10%) 150 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                       | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Practice (135 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS Practice<br>(135 hours of practice) |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                       | <b>Semester week hours:</b><br>135                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Lussana Rossita Dewi, S.Si., M.Pd.</li> <li>2. Dr. Azizul G.C.W., M.Pd.</li> <li>3. Rivanna Citraning Rachmawati, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                       |                                                                                                                                                                                      |
| <b>Syllabus</b><br>This course introduces undergraduate students to the development and evaluation of entrepreneurial products in the fields of biology education and applied biology, with the objective of equipping them with the ability to transform ideas into viable and market-ready products. The course focuses on the complete product development cycle, including idea generation, product design and production, product evaluation and improvement, marketing strategy development, and market testing. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in planning and developing educational and applied biology products, constructing and analysing a Business Model Canvas (BMC), managing production progress and basic business finance, conducting marketing research and product validation, and designing effective marketing and market testing strategies. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The materials</b> covered in this course include planning and development of biology education and applied biology products, BMC theory and preparation, BMC for biology education and applied biology products, production progress management, |  |                                                                       |                                                                                                                                                                                      |

business financial management, marketing research instruments and product validation, and marketing and market research strategies through exhibitions, conventional marketing, and online marketing.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrates an enthusiastic attitude in participating in learning activities on the Development and Evaluation of Entrepreneurial Products (A2)
2. CLO 2: Examines in depth the concepts of developing and evaluating entrepreneurial products in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solves problems critically and wisely by applying concepts of entrepreneurial product development and evaluation through the utilization of science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Makes decisions and selects various alternative solutions in solving problems in the field of entrepreneurial product development and evaluation, both individually and collaboratively, while internalizing entrepreneurial values (C6, A4, P4)

### **Core readings:**

1. Wang, J. X., Burke, H., & Zhang, A. (2022). Overcoming barriers to circular product design. *International Journal of Production Economics*, 243, 108346. <https://doi.org/10.1016/j.ijpe.2021.108346>
2. Ahmad, N. A., Rasul, M. S., Othman, N., & Jalaludin, N. A. (2022). Generating entrepreneurial ideas for business development. *Sustainability*, 14(9), 4905.
3. Murniati, D. E., Purwanti, S., Handayani, T. H. W., Harsana, M., Razzaq, A. R. A., & Rohiat, M. A. (2022). The influence of final project product development on students' entrepreneurial motivation. *Journal of Technical Education and Training*, 14(2), 119-132.
4. Lin, G. Y., Li, W. H., & Wang, Y. S. (2024). Developing and validating an instrument for assessing E-entrepreneurial idea feasibility. *The International Journal of Management Education*, 22(3), 101060.
5. Bezhovski, Z., Apasieva, T. J., & Temjanovski, R. (2024). Online methods for validating and testing entrepreneurial ideas: A new product development perspective. *Management Research and Practice*, 16(1), 26-45.
6. Devkota, N., Shreebastab, D. K., Korpysa, J., Bhattarai, K., & Paudel, U. R. (2022). Determinants of successful entrepreneurship in a developing nation: Empirical evaluation using an ordered logit model. *Journal of International Studies*, 15(1).
7. Sieg, P., Posadzińska, I., & Jóźwiak, M. (2023). Academic entrepreneurship as a source of innovation for sustainable development. *Technological Forecasting and Social Change*, 194, 122695.
8. Rachmawati, R. C., Ridlo, S., Sumarni, W., Isnaeni, W., Rusilawati, A., & Susilaningsih, E. (2025, August). Pengembangan Instrumen Karakter Entrepreneurship Struktur Perkembangan Tumbuhan Di Pendidikan Biologi Upgris. In *Proceeding Seminar Nasional IPA* (pp. 525-534).
9. Nurwahyunani, A., Rahayu, P., Rahayu, K. P. S., Hartanto, M. F. A., Saputri, A., Indriastuti, C. A., & Anwar, L. (2024). Pengaruh pemberian fermentasi

probiotik EM4 pada pelet ikan terhadap pertumbuhan dan kelangsungan hidup ikan lele (*Clarias sp.*) sistem aquaponik budikdamber tanaman kangkung. (*JITEK Jurnal Ilmiah Teknosains*, 10(1/Mei), 1-9.

## Plant Tissue Culture

|                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225332654                                                                                                                                                                                                                                                                                                                                  | <b>Module name</b><br>Plant Tissue Culture                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                 | <b>Semester / Rotation</b><br>6/ Even                                                                                           | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Teaching methods:</b><br>Lectures, Project-based Learning, Discussions, Presentations, Guided Practicum                                                                                                                                                                                                                                                          | <b>Prerequisites for attendance</b><br>Structure and Development of Plants and Fungi, Plant Physiology, Genetics, biotechnology | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of examination(Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Project report (20%)</li> <li>3. Practicum report (20%)</li> <li>4. Presentation (15%)</li> <li>5. Assignment (5%)</li> <li>6. Quiz (5%)</li> <li>7. Mid-term exam (10%) 150 Minutes</li> <li>8. Final exam (10%) 150 Minutes</li> </ol> |                                                                                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                        |                                                                                                                                 | <b>Semester week hours</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Lussana Rossita Dewi, S.Si., M.Si.</li> <li>2. Dyah Ayu Widyastuti, S.Si., M.Biomed.</li> <li>3. Dr. Azizul Ghofar Candra Wicaksono, M.Pd</li> </ol>                                                                                                                                  |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syllabus</b>                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

This course introduces undergraduate students to the scientific foundations and practical skills of plant tissue culture, with **the objective** of developing comprehensive knowledge and laboratory competence in in vitro plant propagation and biotechnology applications. The course examines the basic principles and scientific basis of plant tissue culture, including its historical development, tissue culture laboratory facilities and sterilisation principles, types and purposes of tissue culture, preparation and nutritional composition of culture media, sterilisation of equipment and explants, and the influence of internal plant factors and physical environmental factors on tissue growth and development. Upon completion of the course, students are expected to demonstrate **competencies** in applying tissue culture techniques such as micropropagation, embryo culture, tissue culture from non-embryogenic explants, cryopreservation, protoplast culture, haploid culture, and the production of genetically modified plants through tissue culture methods. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include fundamental and advanced plant tissue culture techniques, media preparation and modification, sterilisation procedures, and applications of tissue culture in plant biotechnology. Learning activities include project-based assignments involving the design and experimentation of modified culture media using natural materials, exploration of explants from superior local plant commodities in Central Java, and the design and optimisation of explant sterilisation techniques..

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate an enthusiastic attitude in carrying out Plant Tissue Culture learning activities (A2)
2. CLO 2: Examine Plant Tissue Culture concepts in depth in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solves problem critically and wisely by applying Plant Tissue Culture concepts through the utilization of science and technology (IPTEKS) and local wisdom, while demonstrating the ability to develop oneself and adapt to encountered situations (C5, P4, A3)
4. CLO 4: Integrate Plant Tissue Culture concepts into laboratory practical activities while adhering to bioethical principles and Occupational Health and Safety (K3) standards (C5, P5, A3)
5. CLO 5: Make decisions and selects various alternative solutions in solving problems in the field of Plant Tissue Culture, both individually and collaboratively, while internalizing entrepreneurial values (C6, A4, P4)
6. CLO 6: Apply local wisdom-based tissue culture techniques in entrepreneurial activities grounded in bioedupreneurship (C3, P5, A4)

**Core readings:**

1. Permadi, N., Akbari, S. I., Prismantoro, D., Indriyani, N. N., Nurzaman, M., Alhasnawi, A. N., Doni. F., & Julaeaha, E. (2024). Traditional and next-generation methods for browning control in plant tissue culture: Current insights and future directions. *Current Plant Biology*, 38, 100339.
2. Polivanova, O. B., & Bedarev, V. A. (2022). Hyperhydricity in plant tissue culture. *Plants*, 11(23), 3313.

3. Pasternak, T. P., & Steinmacher, D. (2024). Plant growth regulation in cell and tissue culture in vitro. *Plants*, 13(2), 327.
4. Zuzarte, M., Salgueiro, L., & Canhoto, J. (2024). Plant tissue culture: industrial relevance and future directions. In *Plants as factories for bioproduction: Recent developments and applications* (pp. 1-15). Cham: Springer International Publishing.
5. Norouzi, O., Hesami, M., Pepe, M., Dutta, A., & Jones, A. M. P. (2022). In vitro plant tissue culture as the fifth generation of bioenergy. *Scientific Reports*, 12(1), 5038.
6. Mehbub, H., Akter, A., Akter, M. A., Mandal, M. S. H., Hoque, M. A., Tuleja, M., & Mehraj, H. (2022). Tissue culture in ornamentals: cultivation factors, propagation techniques, and its application. *Plants*, 11(23), 3208.
7. Ozyigit, I. I., Dogan, I., Hocaoglu-Ozyigit, A., Yalcin, B., Erdogan, A., Yalcin, I. E., ... & Kaya, Y. (2023). Production of secondary metabolites using tissue culture-based biotechnological applications. *Frontiers in Plant Science*, 14, 1132555.
8. Ningrum, S. A., Asih, E., Vira, T. D., Firdhiana, W. P., Habsari, K. Y., & Rahayu, P. (2023). Konservasi Anggrek Melalui Kultur Jaringan Untuk menumbuhkan Sikap Peduli Lingkungan Pada Siswa. *BIOFAIR*, 45-68.
9. Tarigan, B. L., Pulungan, A. S., ButarButar, Y., Simanjuntak, R., & Situmorang, N. (2024). Penerapan Aspek Bioetika Kultur Jaringan Tanaman Anggrek Dendrobium Sp Terhadap Permasalahan Kontaminasi Mikroorganisme di Laboratorium Kultur Jaringan Upt. Pengembangan Benih Hortikultura. *Jurnal Biogenerasi*, 9(2), 1155-1160.
10. Rahmawati, L., Yuliana, Y., Zahara, M., & Jamaluddinsyah, J. (2023). Upaya Perbanyak Tanaman Jeumpa (*Magnolia Champaca*) Dengan Menggunakan Teknik Kultur Jaringan. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 11, No. 1, pp. 99-110).
11. Aqifa, A. N. (2025, March). Kultur jaringan anggrek *Cattleya* di Dinas Ketahanan Pangan dan Pertanian Kota Surabaya. In *Prosiding Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat LPPM Universitas Aisyiyah Yogyakarta* (Vol. 3, pp. 841-846).
12. Damayanti, A., Miharjo, E. S. R., Anggraini, N., SivaSolecha, F., Kholifah, S. N., & Rahayu, P. (2023). Analisis potensi penerapan steam pada pembelajaran kultur jaringan kurikulum merdeka SMA. *BIOFAIR*, 1-10.

## Orchid Cultivation

|                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225322655                                                                                                                                                                                                                                                                                                                                   | <b>Module name</b><br>Orchid Cultivation                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                  | <b>Semester / Rotation</b><br>6/ Even                                                                   | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided Practicum.                                                                                                                                                                                                                                                              | <b>Prerequisites for attendance</b><br>Structure and Development of Plants and Fungi, Plant Physiology, | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (15%)</li> <li>2. Case report (15%)</li> <li>3. Practicum report (15%)</li> <li>4. Presentation (10%)</li> <li>5. Assignment (15%)</li> <li>6. Quiz (10%)</li> <li>7. Mid-term exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                                                                                         | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd                                                                                                                                                                                                                                                                                                          |                                                                                                         | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Rivanna Citraning Rachmawati, M.Pd.</li> <li>2. Lussana Rossita Dewi, S.Si., M.Si.</li> <li>3. Dyah Ayu Widyastuti, S.Si., M.Biomed.</li> <li>4. Dr. Ling. Maria Ulfah, M.Pd.</li> </ol>                                                                                               |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syllabus</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

This course introduces undergraduate students to orchid cultivation from scientific and applied perspectives, with **the objective** of developing knowledge and practical skills in orchid biology, cultivation techniques, and orchid-based entrepreneurship. Upon completion of the course, students are expected to demonstrate **competencies** in identifying orchid types and morphology, selecting appropriate growing media, managing pests and diseases, applying fertilisers, hormones, and vitamins, and performing proper orchid care, maintenance, repotting, sorting, and grading. Students are also able to identify orchids and related pests and diseases, conduct seedling acclimatisation, and apply both generative and vegetative propagation methods, including tissue culture techniques. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include orchid morphology and classification, cultivation media, nutrition and growth regulators, pest and disease management, orchid maintenance practices, propagation techniques, and entrepreneurial aspects of orchid cultivation.

#### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process of Orchid Cultivation (A2)
2. CLO 2: Examine in depth the concepts of orchid cultivation, including orchid morphology, selection of growing media, orchid maintenance, pests and diseases, acclimatization, and repotting, in order to formulate procedural problem-solving strategies (C4)
3. CLO 3: Solve problems critically and wisely by applying the principles of orchid cultivation through the utilization of science and technology and local wisdom (C5, P4, A3)
4. CLO 4: Integrate orchid cultivation concepts and their developments into laboratory and field practical activities while adhering to bioethical principles and Occupational Health and Safety standards (C5, P5, A3)
5. CLO 5: Make decisions and proposes alternative solutions to problems related to functions and processes in orchid cultivation, both individually and collaboratively, while internalizing entrepreneurial values (C5, A4, P4)
6. CLO 6: Apply plant cultivation and tissue culture techniques based on local wisdom in entrepreneurial activities grounded in bioedupreneurship (C3, P5, A4)

#### **Core readings:**

1. Kismayanti, C. N., Ulfah, M., & Rachmawati, R. C. (2023). Respon Pertumbuhan Anggrek Dendrobium Fase Seedling terhadap Variasi Jenis Media Tanam. *Bioscientist: Jurnal Ilmiah Biologi*, 11(2), 1563-1570. .
2. Zuhriyah, F. (2024). *Proyeksi Skala Usaha Anggrek Bulan (Phalaenopsis amabilis L.) dengan Penerapan Variasi Media Tanam* (Doctoral dissertation, UNIVERSITAS PGRI SEMARANG).
3. Utami, N. R., Rahayuningsih, M., Suwarsi, E., Alighiri, D., & Yuwono, S. (2022). Aklimatisasi Anggrek Species Hasil Kultur Jaringan Melalui Pemberdayaan Masyarakat Dusun Gempol. *Sarwahita*, 19(01), 171-181.

4. Dewi, E. R. S., Nugroho, A. S., & Ulfah, M. (2020). Types of epiphytic orchids and their host plants on Mount Ungaran, Central Java. *International Journal of Social Sciences*, 5(2), 117–124.
5. Dewi, E. R. S., Nugroho, A. S., & Ulfah, M. (2018). A study on forest orchid conservation as a strategy for biodiversity preservation. In *Proceedings of the International Conference on Environmental Science and Renewable Energy (ICESRE)* (pp. 119–122).
6. Kismayanti, C. N., Ulfah, M., & Rachmawati, R. C. (2023). Respon Pertumbuhan Anggrek Dendrobium Fase Seedling terhadap Variasi Jenis Media Tanam. *Bioscientist: Jurnal Ilmiah Biologi*, 11(2), 1563-1570.
7. Filany, D. E., & Dzakiy, M. A. (2025). Pengaruh Perbedaan Pot Hitam dan Softpot terhadap Jumlah Anakan dan Panjang Akar Anggrek Dendrobium sonia ersakul. *Spizaetus: Jurnal Biologi dan Pendidikan Biologi*, 6(2), 180-186.
8. De, L. C., & Biswas, S. S. (2022). Adaptational mechanisms of epiphytic orchids: A review. *International Journal of Bio-resource and Stress Management*, 13(11), 1312-1322.

**7th Semester**  
**Odd 2025/2026**

## Scientific Publications

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                                                                                  |
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| <b>Module number</b><br>322532 1 649                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Module name</b><br>Scientific Publications                                                                              |                                                                                                                                                                                  |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Semester / Rotation</b><br>7/ Odd                                                                                       | <b>Student capacity:</b><br>30                                                                                                                                                   |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Prerequisites for attendance</b><br>Educational Research Methodology<br>Biology Research Methodology<br>Biology Seminar | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                               |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (30%)</li> <li>2. Case report (20%)</li> <li>3. Presentation 20%)</li> <li>4. Assignment (5%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                            | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Practice (90 hours of practice)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Practice<br>(90 hours of practice) |
| <b>Module coordinator</b><br>Lussana Rossita Dewi, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                            | <b>Semester week hours:</b><br>90                                                                                                                                                |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Dra. Mei Sulistyoningsih, M.Si.</li> <li>2. Dr. Ling. Maria Ulfah, M.Pd.</li> <li>3. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                            |                                                                                                                                                                                  |
| <b>Syllabus</b><br>This course introduces undergraduate students to the theory and practice of scientific writing and publication, with <b>the objective</b> of equipping them with the knowledge and skills required to produce high-quality scientific papers and publish them responsibly. Upon completion of the course, students are expected to demonstrate <b>competencies</b> in identifying concepts and types of scientific papers, applying appropriate structure and systematics of scientific writing, managing references using standard citation tools, and understanding ethics in scientific publication. Students are also able to recognise the characteristics of national and international journals and prepare manuscripts in accordance with journal guidelines. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at |                                                                                                                            |                                                                                                                                                                                  |

<https://simekar.upgris.ac.id>. The materials covered in this course include concepts and types of scientific papers, structure and conventions of scientific writing, reference management, ethics of scientific publication, and an overview of national and international journals.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate enthusiasm and integrity in studying types of scientific publications, principles of scientific writing, publication ethics, preparation of scientific papers, scientific presentations, and the use of OJS for publishing scientific articles (A3)
2. CLO 2: Examine types of scientific publications, principles of scientific writing, publication ethics, preparation of scientific papers, scientific presentations, and the use of OJS for publishing scientific articles (C4)
3. CLO 3: Solve problems related to types of scientific publications, principles of scientific writing, publication ethics, preparation of scientific papers, scientific presentations, and the use of OJS for publishing scientific articles by utilizing science and technology and local wisdom (C5, P4, A3)
4. CLO 4: Communicate research design outcomes in the fields of Biology and Biology Education by utilizing science and technology (C3, P4)
5. CLO 5: Take responsibility for work outcomes related to types of scientific publications, principles of scientific writing, publication ethics, preparation of scientific papers, scientific presentations, and the use of OJS for publishing scientific articles (A4, P4)

### **Core readings:**

1. Dewi, L. R., Satriani, S., Rahma, A., & Arimah, S. (2025). Inventarisasi Pteridophyta Epifit dan Asosiasi Pohon Inangnya di Hutan Desa Paninggaran, Pekalongan. *Jurnal Ilmiah Biologi UMA (JIBIOMA)*, 7(2), 134-146. <https://doi.org/10.31289/jibioma.v7i2.6661>
2. Minarti, I. B., Dewi, L. R., & Khasanah, E. (2021). Students' scientific writing skills development through structured writing workshops. *Jurnal Pendidikan Sains*, 9(2), 167–176.
3. Wicaksono, A. G. C., & Korom, E. (2023). Attitudes towards science in higher education: Validation of a questionnaire among science teacher candidates and engineering students in Indonesia. *Heliyon*, 9(9), 1–10
4. Flanagan, A., Bibbins-Domingo, K., Berkwits, M., & Christiansen, S. L. (2023). Nonhuman “authors” and implications for the integrity of scientific publication and medical knowledge. *Jama*, 329(8), 637-639.
5. Firdausiah, A. S., Fathonah, E. D., Kusuma, Y. D., Hasanah, S. N. K., & Fauzi, I. (2026). Variasi Struktur Artikel Penelitian Tindakan Kelas dalam Publikasi Ilmiah: Tinjauan Literatur Sistematis. *Jurnal Pendidikan dan Pembelajaran*, 5(01).
6. Nasution, M. K. (2022, November). Publikasi ilmiah-Artikel di jurnal bereputasi: Suatu strategi. In *Workshop Publikasi Artikel di Jurnal Internasional Bereputasi Terindeks Scopus*.
7. Sayekti, R. (2023). Memahami Tren Penelitian Artificial Intelligence di Perpustakaan Melalui Analisis Bibliometrik Pada Publikasi Ilmiah Internasional Tahun 2019-2023. *UNILIB: Jurnal Perpustakaan*.

## Internship - Curriculum Analysis

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| <b>Module number</b><br>3225424657                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Module name</b><br>Internship - Curriculum Analysis |                                                          |                                                                                                                                                                                                                                                        |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                        | <b>Semester / Rotation</b><br>7/ Odd                     | <b>Student capacity</b><br>30                                                                                                                                                                                                                          |
| <b>Teaching methods</b><br>Field Observation, Guided Apprenticeship, Supervision, Project-based Learning, Mentoring and Coaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                        | <b>Prerequisites for attendance</b><br>Curriculum Review | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                      |
| <b>Type of examination (Final Grade Composition)</b><br>1. Material Briefing / Orientation Assessment (10%)<br>2. Curriculum Analysis Report (20%)<br>3. Implementation Curriculum in Teaching Practice Performance (50%)<br>4. Reflective Implementation Curriculum in Teaching Practice (5%)<br>5. Mentoring Logbook (5%)<br>6. Critical Analysis of Implementation Curriculum in Teaching Practice (10%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                        |                                                          | <b>CREDIT HOURS (+Workload in hours)</b><br>2 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours)<br><br><b>ECTS (+Workload in hours)</b><br>3 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours) |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                        |                                                          | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b><br>All lecturers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                        |                                                          |                                                                                                                                                                                                                                                        |
| <b>Syllabus</b><br><b>This course aims</b> to provide practical experience in analysing school curricula in authentic educational settings to strengthen students' readiness for professional teaching practice. <b>Students are expected to</b> demonstrate integrity and analytical competence in reviewing the school's operational curriculum in accordance with their field of study. The course emphasises critical thinking, reflective practice, and evidence-based decision-making in curriculum development. <b>The scope of study includes</b> analysing curriculum goals, content, learning experiences, and assessment within school curriculum documents. Students examine the development and management of school-level curricula and identify strengths, challenges, and opportunities for improvement. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The course</b> also focuses on applying pedagogical principles to solve learning service issues through curriculum analysis. Students collaborate with school mentors and peers in conducting |                                                        |                                                          |                                                                                                                                                                                                                                                        |

curriculum observations and document analysis. Reflective activities support professional growth and continuous improvement. Students prepare analytical reports and present their findings to stakeholders. Emphasis is placed on decision-making and proposing alternative solutions for curriculum enhancement.

### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrate integrity in analyzing the school's operational curriculum according to the field of study to resolve learning issues and provide educational services (C2–C4, P3, A5)
2. CLO 2: Review the school's operational curriculum according to the field of study to resolve learning issues and provide educational services (C4, P3, A4)
3. CLO 3: Solve learning problems critically and wisely by applying pedagogical principles and field-related concepts in reviewing the school's operational curriculum (C3–C5, P4, A4)
4. CLO 4: Make decisions and select alternative solutions in resolving learning service issues through curriculum analysis according to the field of study (C5, P4, A4)

### **Core readings:**

1. Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>
2. Print, M. (2020). *Curriculum development and design* Routledge.
3. Rochamin, Rasiman, & Dwijayanti, I. (2023). Analisis Keterlaksanaan Penilaian Keterampilan Kurikulum 2013 Pada Guru SD Se-Kecamatan Batang. *JANACITTA Journal of Primary and Children's Education*, 6(1), 8–18.
4. Nuraida, I., & Retti, J. (2025, June). Kesesuaian Kurikulum dan Penilaian Kinerja Mahasiswa Magang Sebagai Penentu Employability Lulusan: Studi Kasus Pada Sekolah X. In *Seminar dan Konfrens APDOVI* (No. 1).
5. Kresnadi, H. (2025). Keterlaksanaan Program Magang Sekolah Penggerak dalam Rangka Implementasi Kurikulum Merdeka di Sekolah Dasar. *Journal of Educational Review and Research*, 8(1), 71-82.
6. Jufriadi, A., Huda, C., Aji, S. D., Pratiwi, H. Y., & Ayu, H. D. (2022). Analisis keterampilan abad 21 melalui implementasi kurikulum merdeka belajar kampus merdeka. *Jurnal Pendidikan Dan Kebudayaan*, 7(1), 39-53.

### Internship - Lesson Plan Development

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| <b>Module number</b><br>3225424658                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Module name</b><br>Internship - Lesson Plan Development      |                                                                                                                                                                                                                                                        |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Semester / Rotation</b><br>7/ Odd                            | <b>Student capacity</b><br>30                                                                                                                                                                                                                          |
| <b>Teaching methods</b><br>Field Observation, Guided Apprenticeship, Supervision, Project-based Learning, Mentoring and Coaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Prerequisites for attendance</b><br>Biology lesson Planning, | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                      |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Material Briefing / Orientation Assessment (10%)</li> <li>2. Lesson Plan Report (20%)</li> <li>3. Implementation Lesson Plan in Teaching Practice Performance (50%)</li> <li>4. Reflective Implementation Lesson Plan in Teaching Practice (5%)</li> <li>5. Mentoring Logbook (5%)</li> <li>6. Critical Analysis of Implementation Lesson Plan in Teaching Practice (10%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>2 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours)<br><br><b>ECTS (+Workload in hours)</b><br>3 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours) |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                 | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b><br>All lecturers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                                                                                                                                                                                                                                                        |
| <b>Syllabus</b><br><p><b>This course aims</b> to provide practical experience in developing lesson plans aligned with school curricula and classroom needs in mathematics education. Students are expected to demonstrate integrity and professionalism in designing lesson plans that integrate pedagogical principles, content knowledge, and assessment strategies. The course emphasises reflective practice, collaboration, and continuous improvement in instructional planning. <b>The scope of study includes</b> reviewing learning approaches, instructional models, teaching materials, and assessment strategies to support effective lesson design. Students apply information and communication technology in planning, implementing, and evaluating learning. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (<i>Sistem Pembelajaran Daring</i>), which is fully integrated within the SSO SIMEKAR (<i>Single Sign On Sistem Informasi Merdeka Belajar</i>) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a>. <b>The course also focuses</b> on improving learning quality based on process and outcome assessment. Students develop safe, comfortable, enjoyable, and challenging learning environments that encourage creativity and active participation. Collaborative activities with mentors and peers support professional growth. Students present, evaluate, and revise lesson plans</p> |                                                                 |                                                                                                                                                                                                                                                        |

based on feedback. Emphasis is placed on decision-making and selecting appropriate solutions to improve learning quality.

### **Learning goals and qualifications.**

In this module students learn to:

1. Demonstrate integrity in developing lesson plans (C2, P2, A5)
2. Review learning approaches, models, teaching materials, and assessments by applying ICT in lesson planning to formulate solutions for learning quality problems (C4, P3, A4)
3. Solve problems critically and wisely by applying pedagogical principles and content knowledge for planning effective learning experiences (C5, P4, A4)
4. Make decisions and select alternative solutions in lesson planning to solve learning quality problems (C5, P4, A4)

### **Core readings:**

1. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2022). Kurikulum Merdeka: Pedoman Pembelajaran dan Penilaian. Jakarta: Kemendikbudristek.
2. Rahmadani, F., & Kusumaningsih, W. (2025). The influence of work motivation, school culture, and school literacy on the professional competence of elementary school principals in Bodeh District, Pematang Regency. *At-Tuots: Jurnal Pendidikan Islam*, 7(2), 1216–1229.
3. Multahada, A. (2022). Pelatihan dan pendampingan penyusunan rencana pembelajaran Kurikulum 2013 bagi guru PAUD. *Jurnal Pengabdian Kepada Masyarakat*, 2(3), 155-161.
4. Sulastini, R., Irnawati, R., Agustini, T., & Stefanie, S. (2023). Pendampingan Penyusunan Dokumen Rencana Pembelajaran Berdiferensiasi dan Asesmen dalam KOSP Kurikulum Merdeka Sekolah Dasar di Kecamatan Ciranjang Kabupaten Cianjur. *Journal of Education Research*, 4(4), 2228-2235.
5. Salmawati, S. (2022). Peningkatan Kompetensi Pedagogik Guru SD Negeri 24 Lubuklinggau dalam Penyusunan Rencana Pembelajaran Melalui Supervisi Akademik Kepala Sekolah. *Edu Cendikia: Jurnal Ilmiah Kependidikan*, 2(01), 113-122.
6. Adilah, N. S., Hadjaratie, L., & Yusuf, R. (2022). Pengembangan Sistem Informasi Rencana Pembelajaran Semester dan Evaluasi Capaian Pembelajaran Lulusan Berbasis Progressive Web App. *Diffusion: Journal of Systems and Information Technology*, 2(2), 84-96.
7. Aziira, A. H., Kamil, H., & Kartika, A. D. (2023). Pembangunan Sistem Informasi Pengelolaan Rencana Pembelajaran Semester (RPS). *J. Nas. Teknol. dan Sist. Inf*, 9(2), 103-112.
8. Arsana, I. W., Irnawati, I., Suhartono, S., Widyatama, P. R., Ayulusiana, W. E., & Listanto, K. P. (2023). Pelatihan penyusunan rencana pelaksanaan pembelajaran dan bahan ajar berbasis kurikulum merdeka. *Manggali*, 3(1), 56-64.

## Internship - Learning Media Development

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225424659                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Module name</b><br>Internship - Learning Media Development                              |                                                                                                                                                                                                                                                        |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Semester / Rotation</b><br>7/ Odd                                                       | <b>Student capacity</b><br>30                                                                                                                                                                                                                          |
| <b>Teaching methods</b><br>Field Observation, Guided Apprenticeship, Supervision, Project-based Learning, Mentoring and Coaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Prerequisites for attendance</b><br>Biology learning resources and material development | <b>Language</b><br>Indonesia (regular)<br>English (international)                                                                                                                                                                                      |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Material Briefing / Orientation Assessment (10%)</li> <li>2. Learning Media Product (20%)</li> <li>3. Implementation Learning Media in Teaching Practice Performance (50%)</li> <li>4. Reflective Implementation Learning Media in Teaching Practice (5%)</li> <li>5. Mentoring Logbook (5%)</li> <li>6. Critical Analysis of Implementation Learning Media in Teaching Practice (10%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            | <b>CREDIT HOURS (+Workload in hours)</b><br>2 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours)<br><br><b>ECTS (+Workload in hours)</b><br>3 (45 contact hours in class + 45 hours of Internship Activity, total 90 hours) |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            | <b>Semester week hours</b><br>90 hours                                                                                                                                                                                                                 |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Ipah Budi Minarti, M.Pd.</li> <li>2. Dr. Eny Hartadiyati W.H., M.Si.Med.</li> <li>3. Dr. M.Syaipul Hayat, M.Pd.</li> <li>4. Eko Retno Mulyaningrum, M.Pd.</li> <li>5. Dr. Azizul Ghofar Candra Wicaksono, M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                            |                                                                                                                                                                                                                                                        |
| <b>Syllabus</b><br><p><b>This course aims</b> to provide practical experience in designing, implementing, and evaluating teaching media in authentic school settings to support effective mathematics learning. Students are expected to demonstrate integrity and professionalism in the development of instructional media aligned with pedagogical principles and curriculum needs. <b>The course emphasises</b> creativity, technological literacy, and reflective practice in media development. The scope of study includes reviewing learning theories, instructional approaches, and teaching materials as foundations for designing effective learning media. Students apply information and communication technology in planning and developing digital and non-digital instructional media. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (<i>Sistem Pembelajaran Daring</i>), which is fully integrated within the SSO SIMEKAR (<i>Single Sign On Sistem Informasi Merdeka Belajar</i>) platform at</p> |                                                                                            |                                                                                                                                                                                                                                                        |

<https://simekar.upgris.ac.id>. The course also addresses the alignment of teaching media with subject content and learner characteristics. Students collaborate with school mentors and peers to implement and evaluate the effectiveness of the developed media. Reflective activities support continuous professional growth and improvement. Emphasis is placed on solving learning quality problems through innovative media development. Students present and evaluate their teaching media projects in professional discussions.

### **Learning goals and qualifications.**

In this module students learn to:

1. Demonstrate integrity in the development of learning media (C2, P2, A5)
2. Review teaching materials and apply ICT in developing learning media to formulate solutions for learning quality problems (C4, P3, A4)
3. Solve problems critically and wisely by applying concepts of developing learning media within the field of study (C5, P4, A4)
4. Make decisions and select alternative solutions in developing learning media to solve learning quality problems (C5, P4, A4)

### **Core readings:**

1. Keputusan Badan Standar, Kurikulum, dan Asesmen Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 008/H/KR/2022 tentang Capaian Pembelajaran pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Menengah pada Kurikulum Merdeka.
2. Keputusan Badan Standar, Kurikulum, dan Asesmen Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 009/H/KR/2022 tentang Dimensi, Elemen, dan Sub-Element Profil Pelajar Pancasila pada Kurikulum Merdeka.
3. Keputusan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia Nomor 56/M/2022 tentang Pedoman Penerapan Kurikulum dalam Rangka Pemulihan Pembelajaran.
4. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2021). Panduan pengembangan proyek penguatan Profil Pelajar Pancasila jenjang pendidikan dasar dan menengah (SD/MI, SMP/MTs, SMA/MA). Jakarta: Kemendikbudristek.
5. Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 3 Tahun 2020 tentang Standar Nasional Pendidikan Tinggi.
6. Buchori, A., Sulianto, J., & Osman, S. (2023). Interactive learning media with augmented reality (AR) GeoGebra for teaching geometry in elementary school. *Profesi Pendidikan Dasar*, 17-30.
7. Chandra, M. F., Irfandi, I., & Yuhelman, N. (2023). Literatur Review: Pengembangan Media Kahoot Sebagai Media Pembelajaran Siswa. *Jurnal Ilmu Pendidikan Muhammadiyah Kramat Jati*, 4(1), 42-46.
8. Zahwa, F. A., & Syafi'i, I. (2022). Pemilihan pengembangan media pembelajaran berbasis teknologi informasi. *Equilibrium: Jurnal Penelitian Pendidikan Dan Ekonomi*, 19(01), 61-78.
9. Gulo, S., & Harefa, A. O. (2022). Pengembangan media pembelajaran interaktif berbasis powerpoint. *Educativo: Jurnal Pendidikan*, 1(1), 291-299.
10. Syahid, I. M., Istiqomah, N. A., & Azwary, K. (2024). Model ADDIE dan ASSURE dalam pengembangan media pembelajaran. *Journal of International Multidisciplinary Research*, 2(5).

### Internship - Teaching practice

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225344624                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Module name</b><br>Internship - Teaching practice                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Semester / Rotation</b><br>7/ Odd                                                                                                                                                                                                                                                                                                                                                            | <b>Student capacity:</b><br>15                                                                                                                                                                                                                             |
| <b>Teaching methods</b><br>Field Observation,<br>Guided<br>Apprenticeship,<br>Supervised Teaching<br>Practice, Reflective<br>Teaching Practice,<br>Project-based<br>Learning, Mentoring<br>and Coaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Prerequisites for attendance</b><br>Curriculum review, biology<br>lesson planning, biology<br>learning resources and<br>material development, biology<br>learning assessment, basic of<br>biology learning, biology<br>learning strategies, student<br>development, professional<br>ethics, classroom<br>management, educational<br>psychology, foundation of<br>education,<br>Microteaching | <b>Language</b><br>Indonesian (regular)<br>English<br>(international)                                                                                                                                                                                      |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Material Briefing / Orientation Assessment (10%)</li> <li>2. Microteaching Performance (15%)</li> <li>3. Report (20%)</li> <li>4. Teaching Practice Reflection (5%)</li> <li>5. Teaching Practice Performance (45%)</li> <li>6. Extracurricular Mentoring Logbook (5%)</li> <li>7. Critical Analysis of Teaching Practice (20%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>4 (45 contact hours in class + 135 hours of internship activity, total 180 hours)<br><br><b>ECTS (+Workload in hours)</b><br>6 (45 contact hours in class + 135 hours of internship activity, total 180 hours) |
| <b>Module coordinator</b><br>Dr. Prasetyo, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Semester week hours:</b><br>180                                                                                                                                                                                                                         |
| <b>Additional teacher involved:</b><br>All lecturers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                            |
| <b>Syllabus</b><br><b>This course aims</b> to provide authentic teaching experience in real school environments to prepare students for professional practice as mathematics teachers. Students are expected to demonstrate adaptability, enthusiasm, and integrity while implementing teaching practices in accordance with professional standards. The course develops competencies in analysing pedagogical concepts, understanding learner characteristics, and managing the operational curriculum to improve learning quality. <b>The scope of study includes</b> analysing learners' physical, psychological, social, and cultural characteristics to design appropriate instructional services. Students apply learning theories, teaching models, instructional materials, and assessment strategies in real classroom |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                            |

contexts. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The course also** emphasises the integration of information and communication technology in lesson planning, teaching implementation, evaluation, and classroom management. Students develop safe, supportive, and stimulating learning environments that encourage creativity and active participation. Reflective practice is used to improve learning quality based on assessment results and classroom experiences. Students engage in lesson planning, teaching implementation, classroom observation, and professional reporting under supervision. Emphasis is placed on decision-making and problem-solving to address learning challenges in school settings.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrate adaptability, enthusiasm, and integrity while implementing teaching practices (C2, P3, A5)
2. CLO 2: Analyze pedagogical concepts, essential program content, and learner characteristics in managing the operational curriculum to formulate solutions for learning quality problems while applying professional ethics (C4, P3, A4)
3. CLO 3: Analyze pedagogical concepts, essential program content, and learner characteristics in managing the operational curriculum to formulate solutions for learning quality problems while applying professional ethics (C4, P3, A4)
4. CLO 4: Solve learning quality problems critically and wisely by applying pedagogical concepts, essential program content, and an understanding of learners in managing the operational curriculum (C5, P4, A4)
5. CLO 5: Make decisions and select alternative solutions in managing the operational curriculum to address learning quality problems (C5, P4, A4)

**Core readings:**

1. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2022).
2. Jumriati, J., Erniati, E., Syukriady, D., Supriadi, S., Nurdiansyah, E., Musbaing, M., **Imran**, M., C., Mu'thy, A., Anisa, R., & Jumrita, J. (2026). Pendampingan Program Magang Pendidikan Sebagai Upaya Pengembangan Dan Optimalisasi Keterampilan Mengajar Mahasiswa. *Jurnal Abdimas Indonesia*, 6(1), 228-243.
3. König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects. *European Journal of Teacher Education*, 43(4), 608–622. <https://doi.org/10.1080/02619768.2020.1809650>
4. Sims, S., & Fletcher-Wood, H. (2021). Identifying the characteristics of effective teacher professional development. *School Effectiveness and School Improvement*, 32(1), 47–63. <https://doi.org/10.1080/09243453.2020.1772841>
5. Postholm, M. B. (2020). Teachers' professional development in school: A review study. *Cogent Education*, 5(1), 1–14. 1522781.
6. Handayani, E., Kusumaningsih, W., & Sulianto, J. (2026). The

implementation of child-friendly school management in the learning process. Jurnal Pendidikan Islam dan Multikulturalisme, 8(1),869-888

## Plant Propagation

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225422665                                                                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Plant Propagation                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                             | <b>Semester / Rotation</b><br>7 / Odd                                                                                                                               | <b>Student capacity:</b><br>35                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided practicum                                                                                                                                                                                                                                                        | <b>Prerequisites for attendance</b><br>Structure and Development of Plants and Fungi, Plant Diversity<br>Plant Physiology, plant tissue culture, orchid cultivation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (30%)</li> <li>2. Practicum report (20%)</li> <li>3. Case report (10%)</li> <li>4. Presentation (10%)</li> <li>5. Assignment (5%)</li> <li>6. Quiz (5%)</li> <li>7. Mid exam (10%) 100 Minutes</li> <li>8. Final exam (10%) 100 Minutes</li> </ol> |                                                                                                                                                                     | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Dyah Ayu Widyastuti, S.Si., M.Biomed                                                                                                                                                                                                                                                                                             |                                                                                                                                                                     | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Lussana Rosita Dewi, M.Pd.</li> <li>2. Dr. Azizul Ghofar Candra Wicaksono, M.Pd</li> <li>3. Rivanna Citraning Rachmawati, M.Pd.</li> <li>4. Praptining Rahayu, S.Si., M.Pd</li> </ol>                                                                                           |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Syllabus

**This course provides** students with fundamental knowledge and practical skills in the propagation and production of high-quality plant seedlings. **The course covers** principles of sexual and asexual propagation, seed biology and dormancy, germination techniques, vegetative propagation methods (cutting, grafting, budding, layering), nursery management, growing media selection, and seedling maintenance. Students analyze factors affecting seedling quality, apply appropriate propagation techniques, and utilize science and technology (IPTEKS) alongside local wisdom to enhance efficiency and sustainability in nursery operations. Practical activities include nursery establishment, seed testing, propagation practices, and quality control while adhering to bioethical principles and occupational health and safety (K3) standards. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The course also** fosters critical thinking, responsibility, and entrepreneurial skills to support sustainable plant production and bioedupreneurship initiatives.

### Learning goals and qualifications in this module students learn to:

1. CLO 1: Demonstrates an enthusiastic character in the teaching and learning process regarding nursery techniques for orchids and other horticultural crops (including orchids). (A3)
2. CLO 2: Critically examines in depth the nursery techniques for orchids and horticultural crops (including orchids). (C4)
3. CLO 3: Solves problems critically and wisely by applying conceptual principles of orchid and horticultural plant nursery techniques (including orchids), utilizing science and technology as well as local wisdom. (C4, P4)
4. CLO 4: Integrates the concepts of orchid and horticultural plant nursery techniques (including orchids) into laboratory and field practice activities while adhering to bioethical principles and Occupational Health and Safety (OHS) standards. (C5, P4, A4)
5. CLO 5: Makes decisions and selects alternative solutions to problems related to orchid and horticultural plant nursery techniques (including orchids), both independently and collaboratively, while internalizing entrepreneurial values. (C5, A4, P4)
6. CLO 6: Applies orchid and horticultural plant nursery techniques (including orchids) based on local wisdom in entrepreneurial activities grounded in bioedupreneurship. (C3, P4, A4)

### Core readings:

1. Kryukov, L. A., Vodolazhsky, D. I., & Kamenetsky-Goldstein, R. (2022). *Micropropagation of grapevine and strawberry: rapid production and genetic uniformity*. *Agronomy*, 12(2), 308. <https://doi.org/10.3390/agronomy12020308>
2. Encina, C. L. (2022). *Aspects of in vitro plant tissue culture and breeding for propagation of horticultural species*. *Horticulturae*, 8(5), 439. <https://doi.org/10.3390/horticulturae8050439>
3. Setianingsih, R., Putra, R., & Rahmannita, N. (2023). *Kembangkan pembibitan tanaman sayur guna mempercepat pembangunan di bidang*

- ketahanan pangan. *Community Development Journal*.
4. Simangunsong, I. S., et al. (2024). *Pembangunan dan pemanfaatan awal greenhouse sebagai sarana pembibitan tanaman*. Jurnal Masyarakat Madani Indonesia. <https://doi.org/10.59025/1tvekx19>
  5. Jurnal Pengabdian Masyarakat Indonesia (JPMI) (2022). *Proses pembibitan tanaman dalam persemaian dan media tanam*. <https://doi.org/10.52436/1.jpmi.354>
  6. Mashadi, et al. (2024). *Pemanfaatan rumah pembibitan desa untuk pembibitan tanaman hortikultura*. Bersama: Jurnal Pengabdian
  7. Rajamanickam, C., Subbiah, A., Rajangam, J., Muthuvel, I., Tamil Selvam, M., Vijai Selvaraj, K. S., Balasubramanian, P., Sivakumar, T., & Ragavan, T. (2021). *Principles & practices of plant propagation and nursery management*. Satish Serial Publishing House.
  8. Widyastuti, D. A., Santosa, D., Nuringtyas, T. R., & Rohman, A. (2024, June). Callus induction of red ginger (*Zingiber officinale* var. *rubrum*) with 2, 4-D and Kinetin combination to enhance total phenolic and flavonoid content. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1364, No. 1, p. 012051). IOP Publishing.
  9. Warisman, A. N. P., Dewi, A. W. F., Zuhriyah, F., Risnawati, L., Darillia, R. N., Kurniawati, S., & Dewi, L. R. (2023). Potensi bunga hias di Kendal sebagai media Healing flower. *ARMADA: Jurnal Penelitian Multidisiplin*, 1(7), 746-750.
  10. Fajar, M. T. I., Elhany, N. A., Suryaningsih, Y., Suhesti, E., Untari, W. S., Prayudi, S. N., Efendi, D.R., Mufid, A., & Rahman, I. (2024, July). Pengenalan Teknik Perbanyak Tanaman Kelor (*Moringa Oleifera*) Melalui Biji Dalam Fungsinya Sebagai Penyimpan Air Tanah Di Kecamatan Arjasa. In *PROSIDING SEMINAR NASIONAL UNARS* (Vol. 3, No. 1, pp. 277-284).
  11. Sarjan, M., Thei, R. S. P., Windaringsih, M., Haryanto, H., & Supeno, B. (2022). Intensitas serangan hama pada tanaman kentang yang dibudidayakan dengan perbanyak stek pucuk. *Prosiding SAINTTEK*, 4, 232-245.
  12. Mardhatillah, A. (2025, December). Literatur Review: Fisiologis Sambung Pucuk pada Tanaman Durian (*Durio zibethinus*): Tinjauan Hormon, Kompatibilitas Vaskular, dan Praktik Sambung Pucuk. In *Prosiding Seminar Nasional Biologi* (Vol. 5, No. 1, pp. 718-726).
  13. Rahmawati, L., Yuliana, Y., Zahara, M., & Jamaluddinsyah, J. (2023). Upaya Perbanyak Tanaman Jeumpa (*Magnolia Champaca*) Dengan Menggunakan Teknik Kultur Jaringan. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 11, No. 1, pp. 99-110).

## Plant Protection

| Module number<br>322542 1 666                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Module name<br>Plant Protection                                                                                                              |                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <b>Semester / Rotation</b><br>7/ Odd                                                                                                         | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | <b>Prerequisites for attendance</b><br>Structure and Development of Plants and Fungi, Horticulture, plant tissue culture, orchid cultivation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussion (30%)<br>2. Case report (20%)<br>3. Presentation (20%)<br>4. Assignment (5%)<br>5. Quiz (5%)<br>6. Mid exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Lussana Rossita Dewi, S.Si., M.Si.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                              | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                |
| <b>Additional teacher involved:</b><br>1. Praptining Rahayu, S.Si., M.Pd.<br>2. Dyah Ayu Widyastuti, S.Si., M.Biomed.<br>3. Rivanna Citraning Rachmawati, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus</b><br><b>The course provides</b> students with comprehensive knowledge and practical skills related to the identification, prevention, and control of plant pests and diseases. <b>The course covers</b> the principles of plant pathology and entomology, types and characteristics of pests, pathogens, and weeds, plant pest interactions, disease diagnosis, and integrated pest management (IPM). Students learn to analyze causes of plant damage, assess risk factors in agricultural ecosystems, and design effective and environmentally sustainable control strategies by integrating science and technology (IPTEKS) and local wisdom. In this course, <b>the learning</b> |  |                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                 |

**process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The course also** emphasizes critical thinking, problem-solving, and responsible decision-making to support sustainable agriculture and bioedupreneurship development.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrates an enthusiastic character in the teaching and learning process regarding maintenance techniques and pest and disease control of horticultural crops (including orchids). (A3)
2. CLO 2: Critically examines in depth the techniques of maintenance and pest and disease control of horticultural crops (including orchids). (C4)
3. CLO 3: Solves problems critically and wisely by applying conceptual principles of maintenance techniques and pest and disease control of horticultural crops (including orchids), utilizing science and technology as well as local wisdom. (C4, P4)
4. CLO 4: Demonstrates responsibility for individual tasks and is accountable for achieving work outcomes in the field of maintenance techniques and pest and disease control of horticultural crops (including orchids). (A4)
5. CLO 5: Applies maintenance and pest and disease control techniques for horticultural crops (including orchids) based on local wisdom in entrepreneurial activities grounded in bioedupreneurship. (C3, P4, A4)

**Core readings:**

1. Gullino, M. L., Albajes, R., & Nicot, P. C. (Eds.). (2020). *Integrated Pest and Disease Management in Greenhouse Crops*. Springer. <https://doi.org/10.1007/978-3-030-22304-5>
2. Haq, I. U., & Ijaz, S. (Eds.). (2020). *Plant Disease Management Strategies for Sustainable Agriculture through Traditional and Modern Approaches*. Springer. <https://doi.org/10.1007/978-3-030-35955-3>
3. Math, R. K. M., & Dharwadkar, N. V. (2022). Early detection and identification of grape diseases using convolutional neural networks. *Journal of Plant Diseases and Protection*, 129(2). <https://doi.org/10.1007/s41348-022-00589-5>
4. Aioub, A. A. A., Elesawy, A. E., & Ammar, E. (2022). Plant growth promoting rhizobacteria (PGPR) and their role in plant-parasitic nematodes control: a fresh look at an old issue. *Journal of Plant Diseases and Protection*, 129(7). <https://doi.org/10.1007/s41348-022-00642-3>
5. Wilyus, W., Novalina, N., & Nurdiansyah, F. (2022). *Study the Integrated Pest Management on Chili Cultivation to Control Aphis gossypii and Bemisia tabaci*. *Jurnal Lahan Suboptimal: Journal of Suboptimal Lands*, 11(2), 216–222. <https://doi.org/10.36706/jlso.11.2.2022.579>
6. Djiwanti, S. R., & Sri Rahayuningsih. (2022). *Seed Treatment with Pesticide, Bordeaux Mixture and Biological Agent for Ginger Rhizome-Borne Disease Suppression*. *Jurnal Fitopatologi Indonesia*, 17(5), 195–202. <https://doi.org/10.14692/jfi.17.5.195-202>
7. Yunik Istikorini et al. (2024). *Penyuluhan Hama dan Penyakit pada Tanaman Padi dan Hortikultura di Desa Cihamerang, Sukabumi*. *Jurnal Pusat Inovasi Masyarakat*, 7(1), 102–115. <https://doi.org/10.29244/jpim.7.1.102-115>

8. Suparman, S., Arsi, A., Gunawan, B., Umayah, A., & Yulia Pujiastuti. (2023). *The Evaluation of Implementation of Integrated Pest and Disease Control by Farmers of Food and Horticultural Crops in Banyuasin and Ogan Komering Ulu Timur*. *Sainmatika: Jurnal Ilmiah Matematika dan Ilmu Pengetahuan Alam*, 20(1). <https://doi.org/10.31851/sainmatika.v20i1.11144>
9. Bridayanti Gea et al. (2024). *Strategi Pengendalian Hama dan Penyakit Tanaman Secara Terpadu*. *Jurnal Ilmu Pertanian dan Perikanan*, 1(2), 199–205.
10. Danendro, R. D., & Pamekas, T. (2024, November). Eksplorasi, Identifikasi, dan Karakterisasi Cendawan Endofit Asal Tanaman Kacang Hijau. In *Prosiding Seminar Nasional Perlindungan Tanaman* (Vol. 2, pp. 135-140).
11. Pratama, N., Pamekas, T., & Ginting, S. B. (2024, November). Uji KETAHANAN TIGA VARIETAS KELAPA SAWIT (*Elais quineensis* Jacq) TERHADAP CENDAWAN GANODERMA BONINENSE PADA FASE MAIN NURSERY. In *Prosiding Seminar Nasional Perlindungan Tanaman* (Vol. 2, pp. 171-178).
12. Dewi, L. R., Juniarti, L. W., & Rahayu, P. (2026). Air Cucian Beras sebagai ZPT Hidroponik. *Biocaster: Jurnal Kajian Biologi*, 6(1), 508-514.
13. Arimah, S., & Dewi, L. R. (2025). Studi Literature: Potensi Jenis Air Leri terhadap Pertumbuhan Tanaman Sayuran. *Jurnal Biologi dan Pembelajarannya (JB&P)*, 12(1), 75-82.

## Post-Harvest Technology

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| <b>Module number</b><br>3225422669                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Module name</b><br>Post-Harvest Technology                                                                                                                                                                                                                                                                                   |                                                                    |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <b>Semester / Rotation</b><br>7 / Odd                                                                                                                                                                                                                                                                                           | <b>Student capacity:</b><br>35                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <b>Prerequisites for attendance</b><br>Structure and Development of Plants and Fungi<br>Horticulture<br>Biotechnology<br>plant tissue culture orchid cultivation                                                                                                                                                                | <b>Language</b><br>Indonesian (regular)<br>English (international) |
| <b>Type of examination (Final Grade Composition)</b><br><br>1. Discussion (15%)<br>2. Case report (20%)<br>3. Presentation (20%)<br>4. Assignment (15%)<br>5. Quiz (10%)<br>6. Mid exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |                                                                    |
| <b>Module coordinator</b><br>Dyah Ayu Widyastuti, S.Si., M.Biomed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                 | <b>Semester week hours:</b><br>90                                  |
| <b>Additional teacher involved:</b><br>1. Rivanna Citraning Rachmawati, M.Pd.<br>2. Praptining Rahayu, S.Si., M.Pd<br>3. Lussana Rossita Dewi, S.Si., M.Pd.<br>4. Atip Nurwahyunani, S.Si, M.Pd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                 |                                                                    |
| <b>Syllabus</b><br><b>This course examines</b> the principles and techniques used to maintain quality, reduce losses, and extend the shelf life of agricultural products after harvest. <b>The course covers</b> physiological and biochemical changes in harvested commodities, handling and storage systems, grading and standardization, packaging technology, cold chain management, processing methods, quality control, and postharvest loss analysis. Students analyze factors affecting product quality, apply appropriate postharvest treatments, and utilize science and technology and local wisdom to improve efficiency and sustainability in agribusiness systems. learning activities include the unsrstanding of laboratory testing, storage management, packaging design, and evaluation of product quality while adhering to food safety |  |                                                                                                                                                                                                                                                                                                                                 |                                                                    |

standards and occupational health and safety principles. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The course also** develops critical thinking, problem-solving, and entrepreneurial competencies to support value-added innovation and sustainable agroindustry development.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrates an enthusiastic attitude in carrying out learning activities related to postharvest technology. (A3)
2. CLO 2: Critically examines postharvest technology concepts in depth in order to formulate procedural problem-solving strategies. (C4)
3. CLO 3: Applies postharvest technology by utilizing science and technology as well as local wisdom, while demonstrating self-development and adaptability to encountered situations. (C3, P4, A4)
4. CLO 4: Integrates postharvest technology concepts and their developments into field practice activities while adhering to Occupational Health and Safety (OHS) principles. (C5, P4, A4)
5. CLO 5: Selects alternative solutions to problems in postharvest technology independently and collaboratively while internalizing an entrepreneurial spirit. (C5, A4)
6. CLO 6: Applies postharvest technology based on local wisdom in entrepreneurial activities grounded in bioedupreneurship. (C3, P4, A4)

### **Core readings:**

1. Zhang, C., Li, Q., Wang, J., et al. (2022). *Effect of modified atmosphere packaging on quality and shelf life of fresh produce: A review. Critical Reviews in Food Science and Nutrition*, 62(24), 6611-6632.
2. Nurdyansyah, Fafa, and Dyah A. Widyastuti. *Jahe Merah Senyawa Bioaktif, Manfaat, dan Metode Analisisnya*. Edited by Widyastuti, Dyah A. CV WIDINA MEDIA UTAMA, 2022.
3. Hayat, U., Li, W., Bie, H., Liu, S., Guo, D., & Cao, K. (2023). An overview on post-harvest technological advances and ripening techniques for increasing peach fruit quality and shelf life. *Horticulturae*, 10(1), 4.
4. Das, B., Hoque, A., Roy, S., Kumar, K., Laskar, A. A., & Mazumder, A. S. (2025). Post-harvest technologies and automation: AI-driven innovations in food processing and supply chains. *Int. J. Sci. Res. Sci. Technol*, 12(1), 183-205.
5. Mounika, K., Reddy, P. P., Singh, R. P., Pandey, A., Bharty, S. K., Kumar, A., & Jain, S. (2025). Post-harvest technologies and cold chain management: A review. *Plant Archives*, 25(1), 3275-3283.
6. Singh, A. K. (2023). *Horticultural practices and post-harvest technology*. Academic Guru Publishing House.
7. Kumar, D., Kumar, K., Roy, P., & Rabha, G. (2024). Renewable energy in agriculture: Enhancing aquaculture and post-harvest technologies with solar and AI integration. *Asian Journal of Research in Computer Science*, 17(12), 201-219.
8. Fathnur, F., & Larisu, M. A. (2024, March). Post-harvest quality improvement

technology horticulture fresh fruit. In *Proceeding international conference on religion, science and education* (Vol. 3, pp. 731-739).

9. Haryanto, D., Saidi, D., & Muryani, E. (2025, December). Pemanfaatan Teknologi Pasca Panen Untuk Meningkatkan Nilai Tambah Kwt Kenanga, Sutopadan, Cungkuk, Nestiharjo, Kasihan, Bantul Daerah Istimewa Yogyakarta. In *Prosiding Seminar Nasional Pengabdian Masyarakat* (pp. 536-545).
10. Triawan, E. (2026). Agricultural Technology Innovation and Its Implications for Achieving Zero Hunger: A Comparative Study of Developing Countries (Thailand and Indonesia). *Prosiding OASE*, 7(1), 175-177.
11. Sugiarto, B., Suranto, S., & Rahmawati, K. (2022, December). Implementasi Teknologi Pengolahan Empon-Empon Menjadi Serbuk Siap Seduh, Di Desa Kebakalan, Karanggayam, Kebumen, Jawa Tengah. In *Prosiding Seminar Nasional Pengabdian Masyarakat*.

## Learning Media Research

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| <b>Module number</b><br>3225422661                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Module name</b><br>Learning Media Research                                                        |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Semester / Rotation</b><br>7 / Odd                                                                | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                      |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Prerequisites for attendance</b><br>Digital learning media and innovation<br>Research methodology | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                  |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (20%)</li> <li>2. Case report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (5%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (10%) 100 Minutes</li> <li>7. Final exam (20%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                      | <b>ECTS (+Workload in CREDIT HOURS (+Workload in hours))</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Azizul Ghofar Candra W, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                      | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Ipah Budi Minarti, S.Pd., M.Pd.</li> <li>2. Dr. M.Syaipul Hayat, S.Pd., M.Pd.</li> <li>3. Eko Retno Mulyaningrum, S.Pd., M.Pd.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                      |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syllabus</b><br><b>This course equips</b> students with the knowledge and skills to design, conduct, and evaluate research related to the development and effectiveness of learning media. <b>The course covers</b> research paradigms and approaches, needs analysis, instructional design models, development research (R&D), experimental and quasi-experimental designs, instrument development and validation, data collection and analysis techniques, and interpretation of findings in the context of educational practice. Students critically examine current issues in learning media, design research proposals, develop and test media products, and evaluate their impact on learning outcomes. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face |                                                                                                      |                                                                                                                                                                                                                                                                                                                                                     |

classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. Emphasis is placed on the integration of science and technology (IPTEKS), ethical research practices, and the utilization of digital tools for data analysis and dissemination. Through case-based and collaborative activities, the course fosters critical thinking, methodological rigor, innovation, and responsibility in producing scholarly work that contributes to improving the quality of Biology education.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrates an enthusiastic character in the teaching and learning process. (A3)
2. CLO 2: Critically examines the principles of pedagogy, technology, and their developments in order to formulate procedural problem-solving strategies related to learning media research. (C4)
3. CLO 3: Solves learning media problems critically and wisely by applying pedagogical and technological principles and their developments, utilizing science and technology as well as local wisdom, while demonstrating self-development and adaptability to encountered situations. (C5, P4, A4)
4. CLO 4: Makes decisions and selects various alternative solutions in solving problems in the field of learning media, both independently and collaboratively, while internalizing entrepreneurial values. (C5, A4)
5. CLO 5: Evaluate digital technology-based multimedia oriented toward bioedupreneurship in the fields of education and entrepreneurship through research. (C5, P5, A4)

**Core readings:**

1. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press
2. Widyaningrum, F. A., Maryani, I., & Vehachart, R. (2022). A literature study on science learning media in Elementary School. *International Journal of Learning Reformation in Elementary Education*, 1(01), 1-11.
3. Kandia, I. W., Suarningsih, N. M., Wahdah, W., Arifin, A., Jenuri, J., & Suwarma, D. M. (2023). The strategic role of learning media in optimizing student learning outcomes. *Journal of Education Research*, 4(2), 508-514.
4. Afifa, K., & Astuti, T. (2024). The effect of digital learning media on motivation and learning outcomes of IPAS. *Jurnal Penelitian Pendidikan IPA*, 10(6), 3155-3165.
5. Lestari, T. A., Karnan, K., & Kusmiyati, K. (2023). Pengembangan kegiatan praktikum menggunakan alat dan bahan sederhana untuk mahasiswa prodi pendidikan biologi. *Jurnal Ilmiah Profesi Pendidikan*, 8(1b), 892-896.
6. Marlinda, A., Hanim, N., & Eriawati, E. (2023, June). Analisis Kelayakan Media Pembelajaran Atlas Jamur Makroskopis Pada Materi Kingdom Fungi. In *Prosiding Seminar Nasional Biologi, Teknologi dan Kependidikan* (Vol. 11, No. 1, pp. 81-89).
7. Aprilina, M., & Siswati, B. H. (2025). Revolusi Pembelajaran Biologi dengan media pembelajaran Assembler Edu melalui smart card berbasis Augmented Reality (AR). In *Prosiding Seminar Nasional Hayati* (Vol. 3, No. 1, pp. 44-51).

8. Alonemarera, A. A., Mutmainnah, N., & Tendrita, M. (2025, November). Belajar Lebih Seru dengan Canva: Video Interaktif untuk Mengatasi Kejenuhan Belajar Biologi Siswa SMP. In *Prosiding Seminar Nasional Pembangunan Ekonomi Berkelanjutan dan Riset Ilmu Sosial* (Vol. 2, No. 1, pp. 121-134).
9. Nabilla, N. W., Ariyunita, S., & Subchan, W. (2022, December). Pengembangan Video Pembelajaran Berbasis Riset Materi Bioakumulasi Polutan di Perairan. In *Prosiding Seminar Nasional Pendidikan Biologi* (Vol. 2, No. 1, pp. 87-94).

## Web Design

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| <b>Module number</b><br>3225422662                                                                                                                                                                                                                                                   |  | <b>Module name</b><br>Web Design                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                    |  | <b>Semester/ Rotation</b><br>7 / Odd                                         | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Guided Practice, Discussions, Presentations.                                                                                                                                                                              |  | <b>Prerequisites for attendance</b><br>Digital learning media and innovation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (20%)<br>2. Practice report (20%)<br>3. Case report (10%)<br>4. Presentation (10%)<br>5. Assignment (5%)<br>6. Quiz (5%)<br>7. Mid exam (10%) 100 Minutes<br>8. Final exam (20%) 100 Minutes                  |  |                                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (1 Credit Hours)<br>(14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 90 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (1.5 ECTS)<br>(14 hours of Lecture + 15.5 hours of structured assignment + 15.5 hours of self-study)<br><br>Laboratory activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 90 hours) |
| <b>Module coordinator</b><br>Eko Retno Mulyaningrum, M. Pd                                                                                                                                                                                                                           |  |                                                                              | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Additional teacher involved:</b><br>1. Dr. Prasetyo, M.Pd.<br>2. Dr. Muhammad Syaipul Hayat S.Pd, M.Pd.<br>3. Ipah Budi Minarti, S.Pd., M.Pd.                                                                                                                                     |  |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syllabus</b><br><b>This course provides</b> students with foundational knowledge and practical skills in designing and developing functional, user-friendly, and aesthetically effective websites. <b>The course covers</b> principles of user interface (UI) and user experience |  |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

(UX) design, layout composition, color theory, typography, responsive design, information architecture, and accessibility standards. Students learn front-end development fundamentals and web development tools. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. Emphasis is placed on integrating creativity with logical and systematic thinking to produce websites that are both visually engaging and technically sound. Through project-based learning, students design and develop web projects tailored to educational, business, or entrepreneurial needs, while considering usability, ethics, copyright, and digital professionalism. The course fosters innovation, collaboration, and digital competence relevant to the demands of the modern technological era.

### **Learning goals and Qualifications**

In this module students learn to:

1. CLO 1: Demonstrates an enthusiastic character in the teaching and learning process. (A3)
2. CLO 2: Examines the principles of pedagogy, essential biology, science, technology, and their developments in order to formulate procedural problem-solving strategies related to web design. (C4)
3. CLO 3: Solves web design-related problems critically and wisely by applying principles of pedagogy, essential biology, science, technology, and their developments, utilizing science and technology as well as local wisdom, while demonstrating self-development and adaptability to encountered situations. (C5, P4, A4)
4. CLO 4: Demonstrates responsibility for individual work and is capable of being entrusted with accountability for achieving work outcomes in the field of web design. (A4, P3)
5. CLO 5: Develops digital technology-based multimedia oriented toward bioedupreneurship in the field of biology education. (C6, P5, A4)

### **Core readings:**

1. Hassenzahl, M., & Tractinsky, N. (2022). *User experience—A research agenda*. *International Journal of Human-Computer Studies*, 162, 102816. <https://doi.org/10.1016/j.ijhcs.2022.102816>
2. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press
3. Nasution, F. P., Batubara, R. O., & Maulana, M. I. (2022). Dasar Pengenalan HTML pada Desain Web. *Publikasi Pengabdian Masyarakat*, 2(1), 86-91.
4. Wibowo, M. C. (2024). Prespektif Baru Dalam Desain Web. *Penerbit Yayasan Prima Agus Teknik*, 1-314.
5. Arnomo, S. A., & Adhiatma, N. (2025). Pelatihan Desain Web Programming yang Responsive Screen pada Multi Platform. *Puan Indonesia*, 6(2), 545-552.
6. Sany, N. (2026). Teknologi Pendukung Desain Web Modern. *FONDASI DESAIN WEB MODERN: Menguasai HTML dan CSS dari Dasar hingga*

*Responsif*, 10.

7. Kurniawan, E., Syafnur, A., Sirait, Z., & Alfiandi, W. (2025). MODEL DESAIN WEB SELF-PACED LEARNING UNTUK MICROLEARNING DENGAN PENDEKATAN HIGH-FIDELITY PROTOTYPING. *JOURNAL OF SCIENCE AND SOCIAL RESEARCH*, 8(4), 4076-4086.
8. Sriyadi, S., Hadiyanti, L. N., Suwarti, S., & Pambudi, R. (2025, October). PENGEMBANGAN CHATBOT LAYANAN DAN INFORMASI LABORATORIUM FISILOGI TUMBUHAN FMIPA UNNES BERBASIS TELEGRAM. In *Prosiding Seminar Nasional Biologi* (Vol. 13, pp. 49-55).
9. Mahrawi, M., Wahyuni, I., Ratnasari, D., & Istiana, Y. (2022). Pengembangan Rubi Web (Rumah Biologi Web) Dalam Konsep Keanekaragaman Hayati the Development of Rubi Web (Rumah Biologi Web) in Biodiversity Concept. *AL ULUM: JURNAL SAINS DAN TEKNOLOGI*, 8(1), 21-29.
10. Wahyuni, M. D., Isfaeni, H., & Komala, R. (2026, February). E-MODUL BERBASIS CONTEXTUAL TEACHING AND LEARNING MELALUI BIOINFORMATIKA UNTUK LITERASI BIOLOGI: SEBUAH KAJIAN BIBLIOMETRIK. In *Seminar Nasional Pendidikan IPA Ke III Tahun 2025* (Vol. 3, No. 1, pp. 486-500).
11. Dinihari, Y., Sari, T. A., & Nazelliana, D. (2022). Media Pembelajaran Biologi Berupa Aplikasi Kamus Latin-Indonesia Berbasis Android. In *SINASTRA: Prosiding Seminar Nasional Bahasa, Seni, dan Sastra* (Vol. 1, pp. 228-333).

## Innovation in Digital Biology Learning Resources and Materials

|                                                                                                                                                                                                                                                                       |                                                                                      |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225432660                                                                                                                                                                                                                                    | <b>Module name</b><br>Innovation in Digital Biology Learning Resources and Materials |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                     |                                                                                      | <b>Semester / Rotation</b><br>7 / Odd                                        | <b>Student capacity:</b><br>35                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Teaching methods</b><br>Lectures, Project-based Learning, Discussions, Presentations.                                                                                                                                                                              |                                                                                      | <b>Prerequisites for attendance</b><br>Digital learning media and innovation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (20%)<br>2. Project report (20%)<br>3. Presentation (20%)<br>4. Assignment (15%)<br>5. Quiz (5%)<br>6. Mid exam (10%) 150 Minutes<br>7. Final exam (10%) 150 Minutes                           |                                                                                      |                                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)<br>(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Atip Nurwahyunani, S.Pd., M.Pd.                                                                                                                                                                                                          |                                                                                      |                                                                              | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Additional teacher involved:</b><br>1. Dr. Muhammad Syaipul Hayat S.Pd, M.Pd.<br>2. Ipah Budi Minarti, S.Pd., M.Pd.<br>3. Eko Retno Mulyaningrum, M. Pd.                                                                                                           |                                                                                      |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syllabus</b><br><b>This course designed</b> to develop students' competencies in designing, developing, and evaluating innovative digital learning resources for Biology education. <b>The course covers</b> principles of instructional design, digital pedagogy, |                                                                                      |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

multimedia learning theory, content transformation into digital formats, interactive media development, open educational resources (OER), learning management systems (LMS), and the integration of emerging technologies in Biology learning. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **Students analyze** curriculum needs and learner characteristics, design technology-based teaching materials, and create interactive digital products such as e-modules, videos, simulations, and web-based learning media. Through project-based learning and collaborative activities, students apply logical, critical, and creative thinking while utilizing science and technology (IPTEKS) and considering ethical, accessibility, and copyright aspects. The course fosters adaptability, innovation, and a bioedupreneurship-oriented mindset to support effective, engaging, and future-ready Biology education.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrates an enthusiastic character in implementing innovations in digital-based Biology learning resources and materials. (A3)
2. CLO 2: Critically analyzes the principles of innovation and development of digital-based Biology learning resources and materials in accordance with learning needs and problems, and relevant to contemporary developments. (C4)
3. CLO 3: Applies logical, critical, and innovative thinking in the context of developing and innovating digital-based Biology learning resources and materials in response to Biology learning problems and contemporary developments. (C5, P4)
4. CLO 4: Makes decisions in innovating and developing digital-based Biology learning resources and materials to solve Biology learning problems in accordance with current needs and developments. (C5, A4)
5. CLO 5: Develops digital technology-based multimedia oriented toward bioedupreneurship in the fields of education and entrepreneurship. (C6, P5, A4)

**Core readings:**

1. Bates, A. W., & Poole, G. (2020). *Effective teaching with technology in higher education: Foundations for success*. Wiley.
2. Salmon, G. (2021). *Learning innovation and the digital age: Pedagogy, policy and practice in higher education*. Routledge
3. Babalola, E. O., Olumorin, C. O., Adetunji, B., & Omolafe, E. V. (2022). *Effect of low-cost technology on biology students' academic performance in Ilorin, Nigeria*. *Journal of Digital Learning and Education*, 2(1), 59–69. <https://doi.org/10.52562/jdle.v2i1.337>
4. Fariza Batyrkanovna. (2022). *Digital literacy in biology education through mobile learning technologies*. *Eurasian Science Review*. <https://doi.org/10.63034/esr-14>
5. Cartono, C. (2023). *Revitalizing biology learning: Innovation and challenges in the digital era*. *Jurnal Pendidikan Indonesia*. <https://doi.org/10.58471/ju-pendi.v2i01.375>

6. Pratama, A. T., Triatmanto, Subianto, A. W., Handziko, R. C., & Anazifa, R. D. (2023). *Development of digital biology teaching materials to revitalize post-COVID-19 biology learning*. *Journal of General Education Science*. <https://doi.org/10.62966/joges.v1i2.200>
7. Rosyadi, A. R., Afandi, A., & Wahyuni, E. S. (2022). *Digital age literacy profile of high school students and its implementation in biology learning*. *Assimilation: Indonesian Journal of Biology Education*.
8. Munawaroh, D. A. (2024). *Pengembangan e-modul pembelajaran berbasis kurikulum merdeka dan literasi digital materi keanekaragaman hayati SMA*. *Jurnal BIOEDUIN*.
9. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press.
10. Andini, N. A., & Saifuddin, M. F. (2023). *Learning media of digital booklets for class VIII junior high school*. *Biosfer: Jurnal Pendidikan Biologi*. <https://doi.org/10.21009/biosferjpb.25457>

## Multimedia Technology

|                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                             |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>322543 2 663                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Module name</b><br>Multimedia Technology |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                             |                                             | <b>Semester / Rotation</b><br>7 / Odd                                        | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations, Guided practice                                                                                                                                                                                                                                                                                                                                        |                                             | <b>Prerequisites for attendance</b><br>Digital learning media and innovation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (20%)<br>2. Case report (20%)<br>3. Presentation (20%)<br>4. Assignment (10%)<br>5. Quiz (10%)<br>6. Mid exam (10%) 150 Minutes<br>7. Final exam (10%) 150 Minutes                                                                                                                                                                                                     |                                             |                                                                              | <b>CREDIT HOURS (+Workload in hours)</b><br>3 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1 Credit Hours)<br>(45 hours of practice)<br>(Total 135 hours)<br><br><b>ECTS (+Workload in hrs)</b><br>4.5 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Laboratory Activity (1.5 ECTS)(45 hours of practice)<br>(Total 135 hours) |
| <b>Module coordinator</b><br>Dr. Muhammad Syaipul Hayat S.Pd, M.Pd.                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                                                              | <b>Semester week hours:</b><br>135                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Additional teacher involved:</b><br>1. Dr. Prasetyo, M.Pd.<br>2. Eko Retno Mulyaningrum, M. Pd<br>3. Ipah Budi Minarti, S.Pd., M.Pd.                                                                                                                                                                                                                                                                                                       |                                             |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syllabus</b><br><b>This course introduces</b> students to the principles, tools, and applications of multimedia in educational, business, and digital communication contexts. <b>The course covers</b> fundamental concepts of multimedia systems, including text, graphics, audio, video, animation, and interactive elements, as well as multimedia design principles, storytelling, user experience (UX), and interface integration. In |                                             |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **Students learn** to use multimedia authoring tools and software for image editing, audio and video production, animation development, and interactive content creation. Emphasis is placed on integrating creativity, technical skills, and pedagogical considerations to produce engaging and effective multimedia products. Through project-based learning, students design and develop multimedia projects tailored to instructional and entrepreneurial needs while considering ethical standards, copyright, accessibility, and digital professionalism. The course fosters innovation, collaboration, critical thinking, and digital competence to support technology-based learning and creative industries.

### **Learning goals and Qualifications**

In this module students learn to:

1. CLO 1: Demonstrates an enthusiastic character in developing multimedia technology. (A3)
2. CLO 2: Critically analyzes multimedia technology principles in accordance with learning needs and problems, and in relevance to contemporary developments. (C4)
3. CLO 3: Applies logical, critical, and innovative thinking in the development and innovation of multimedia technology in accordance with biology learning problems and current developments. (C3, C5, P4)
4. CLO 4: Makes decisions in innovating and developing multimedia technology to solve Biology learning problems in accordance with needs and contemporary developments. (C5, A4)
5. CLO 5: Develops multimedia technology oriented toward bioedupreneurship in the fields of education and entrepreneurship. (C6, P5, A4)

### **Core readings:**

1. Choi, J., Lee, H., & Kim, J. (2022). *Augmented reality-based multimedia learning systems and student engagement: A meta-analysis*. *Computers & Education*, 182, 104504. <https://doi.org/10.1016/j.compedu.2022.104504>
2. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press
3. Hidayat, M. L., Mahatama, D. S., Suryani, T., & Sari, S. K. (2025). Pengembangan Aplikasi Mobile Plant-tagging ~ Pelurutaloka™ sebagai Media Pembelajaran Biologi Keanekaragaman Hayati. *Bioscientist: Jurnal Ilmiah Biologi*, 13(2), 1298-1318.
4. Ardy, F. O. (2025). *Pengembangan multimedia pembelajaran interaktif pada materi ekosistem untuk Kelas 5 MIN 10 Blitar* (Doctoral dissertation, Universitas Islam Negeri Maulana Malik Ibrahim).
5. Trinita, N. P. A. (2024). *Pengembangan Media Interactive Virtual Laboratory Simulator (Invilator) menggunakan Adobe Animate pada Materi Sistem*

- Sirkulasi Kelas XI* (Doctoral dissertation, Universitas Pendidikan Ganesha).
6. Ningsih, T. F., Bahtiar, H., & Putra, Y. K. (2022). Pengembangan Media Pembelajaran Interaktif Berbasis Flash Pada Materi Klasifikasi Hewan Vertebrata Mata Pelajaran Biologi Kelas VII SMP. *Infotek J. Inform. dan Teknol*, 5(1), 30-41.
  7. Indriani, R., & Abidin, Z. (2022). Literature review: Pengembangan media pembelajaran augmented reality pada mata pelajaran biologi. *Jurnal Wahana Pendidikan*, 9(2), 139-148.
  8. Paat, M., Mokal, Y. B., Wowor, E. C., Tumewu, W. A., & Arundaa, R. (2023). Implementasi multimedia-pembelajaran ipa biologi model pbl untuk meningkatkan hasil belajar siswa. *SOSCIED*, 6(1), 280-287.
  9. Mardiana, C., & Kismiati, D. A. (2025, March). Efektifitas Penggunaan Video Pembelajaran Dalam Memvisualkan Objek Yang Sebenarnya Atau Specimen Dalam Penerapan Media Pembelajaran Berbasis Teknologi. In *Seminar Nasional Pendidikan Biologi* (Vol. 1, No. 1, pp. 67-76).
  10. Aripin, I., Gaffar, A. A., Jabar, M. B. A., & Yulianti, D. (2022, October). Digital herbarium sebagai media pembelajaran biologi. In *Prosiding Seminar Nasional Pendidikan* (Vol. 4, pp. 41-47).
  11. Alonemara, A. A., Mutmainnah, N., & Tendrita, M. (2025, November). Belajar Lebih Seru dengan Canva: Video Interaktif untuk Mengatasi Kejenuhan Belajar Biologi Siswa SMP. In *Prosiding Seminar Nasional Pembangunan Ekonomi Berkelanjutan dan Riset Ilmu Sosial* (Vol. 2, No. 1, pp. 121-134).
  12. Wahyuni, M. D., Isfaeni, H., & Komala, R. (2026, February). E-Modul Berbasis Contextual Teaching And Learning Melalui Bioinformatika Untuk Literasi Biologi: Sebuah Kajian Bibliometrik. In *Seminar Nasional Pendidikan IPA Ke III Tahun 2025* (Vol. 3, No. 1, pp. 486-500).

## Multimedia Project Management

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                             |                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>3225421664                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Module name</b><br>Multimedia Project Management                         |                                                                                                                                                                                                                                                                                                                                 |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <b>Semester / Rotation</b><br>7 / Odd                                       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                  |
| <b>Teaching methods:</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | <b>Prerequisites for attendance</b><br>Innovation in Digital Learning Media | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b><br>1. Discussions (35%)<br>2. Presentation (10%)<br>3. Case report (10%)<br>4. Assignment (20%)<br>5. Quiz (5%)<br>6. Mid exam (10%) 100 Minutes<br>7. Final exam (10%) 100 Minutes                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                             | <b>Semester week hours:</b> 90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b><br>1. Dr. Prasetyo, M.Pd.<br>2. Eko Retno Mulyaningrum, M. Pd<br>3. Ipah Budi Minarti, S.Pd., M.Pd.<br>4. Dr. Azizul Ghofar Candra W, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                             |                                                                                                                                                                                                                                                                                                                                 |
| <b>Syllabus</b><br><b>The objective</b> of this course is to equip students with the knowledge and skills to plan, organise, implement, and evaluate multimedia projects effectively and professionally. <b>The competencies</b> achieved by students include the ability to manage multimedia projects such as educational media, digital content, web applications, and interactive products using appropriate management tools and collaborative platforms; apply leadership, communication, problem-solving, and decision-making skills to ensure projects are completed on time, within budget, and |  |                                                                             |                                                                                                                                                                                                                                                                                                                                 |

according to quality standards; develop project proposals, create timelines, assign roles, monitor progress, and evaluate outcomes through case studies and project-based learning; adhere to ethical standards and professional responsibility; and demonstrate teamwork, strategic thinking, and entrepreneurial insight to support successful multimedia initiatives in educational and creative industries. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include project management principles, project life cycle, scope definition, scheduling, budgeting, resource allocation, risk management, quality assurance, and team coordination within multimedia production contexts.

### Learning goals and Qualifications

In this module students learn to:

1. Demonstrates an enthusiastic character in the learning process. (A3)
2. Analyzes the principles and stages of multimedia project management (planning, implementation, and project control in multimedia development). (C4)
3. Solves multimedia-related problems using a project management approach. (C5, P4)
4. Makes alternative decisions in solving problems in the field of biology education. (C5, A4)
5. Apply digital technology-based multimedia for learning purposes. (C3, P3)

### Core readings:

1. Zapata-Cáceres, P., Padilla-Montesinos, M., & López-Bas, E. (2022). *Project management approaches for creative multimedia development: An empirical study*. *International Journal of Project Management*, 40(8), 833–848. <https://doi.org/10.1016/j.ijproman.2022.05.005>
2. Putra, G. K. A. A. (2025). Pengembangan E-Lkpd Berbantuan Website Interaktif Berbasis Proyek Pada Materi Listrik Statis Untuk Melatih Kemampuan Berpikir Kreatif Peserta Didik.
3. Minarti, I. B., Wicaksono, A. G. C., Nurwahyunani, A., Rahmawati, R. C., & Mulyaningrum, E. R. (2026, February). Developing and Validating Diagnostic Instruments for Measuring AI Literacy and Problem-Solving in Higher Education. In *8th International Conference on Education and Social Science Research (ICESRE 2025)* (pp. 149-157). Atlantis Press
4. Swart, K., Bond-Barnard, T., & Chugh, R. (2022). Challenges and critical success factors of digital communication, collaboration and knowledge sharing in project management virtual teams: a review. *International Journal of Information Systems and Project Management*, 10(4), 84-103.
5. Holzmann, V., Zitter, D., & Peshkess, S. (2022). The expectations of project managers from artificial intelligence: A Delphi study. *Project Management Journal*, 53(5), 438-455.
6. Mustari, D., Nadeak, T. E. Y., & Ningsih, R. (2022). Analisis Manajemen Proyek Aplikasi Pembelajaran Biologi Berbasis Android. *JURSIMA*, 10(3), 91-101.
7. Yanti, F. D. (2023). Implementasi media pembelajaran video animasi

- berbasis aplikasi Canva pada materi struktur dan fungsi tumbuhan pada Prodi Biologi Universitas Al Washliyah Labuhanbatu. *Jurnal Teknologi Dan Manajemen Industri Terapan*, 2(2), 224-233.
8. Harfian, B. A. A., & Fadhillah, E. N. (2025, March). Penerapan Pembelajaran Berbasis Proyek dalam Menilai Kemampuan Kreativitas Mahasiswa Biologi. In *Seminar Nasional Pendidikan Biologi* (Vol. 1, No. 1, pp. 58-66).
  9. Himawan, A. Pengembangan Sistem Informasi Dan Manajemen Laboratorium Pada Program Studi Pendidikan Biologi Dengan Metode Mvc (Model, View, Controller). *EduNaturalia: Jurnal Biologi dan Kependidikan Biologi*, 6(1), 82-93.
  10. Sujarwanta, A., & Suseno, N. (2023, August). Perkuliahan Platform Dalam Jaringan Metode Project Base Learning Mata Kuliah Evaluasi Pembelajaran Biologi. In *Prosiding Seminar Nasional Penelitian Dan Pengabdian Kepadamasyarakat (Snppm) Universitas Muhammadiyah Metro* (Vol. 5, No. 1, pp. 135-142).
  11. Prihastuti, E., & Sukaesih, S. (2024, October). Efektivitas pengembangan e-modul interaktif berbasis project based learning materi sistem ekskresi manusia untuk meningkatkan literasi sains siswa SMA. In *Prosiding Seminar Nasional Biologi* (Vol. 12, pp. 1-9).

### Digital Agribusiness Entrepreneurship

|                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module number</b><br>322542 1 668                                                                                                                                                                                                                                                                                                                    | <b>Module name</b><br>Digital Agribusiness Entrepreneurship                                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                       | <b>Semester / Rotation</b><br>7/ Odd                                                                                                                                            | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                   | <b>Prerequisites for attendance</b><br>Market Analysis and Strategy, Horticulture, Entrepreneurial product development and evaluation, plant tissue culture, orchid cultivation | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Case report (25%)</li> <li>3. Presentation (25%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (5%)</li> <li>6. Mid-term exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                         |                                                                                                                                                                                 | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Praptining Rahayu, S.Si., M.Pd.                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                 | <b>Semester week</b><br>90 hours                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Dra. Mei Sulistyoningsih, M.Si.</li> <li>2. Dr. Ling. Maria Ulfah, M.Pd.</li> <li>3. Reni Rakhmawati, S.Pd., M.Pd</li> <li>4. Rivanna Citraning Rachmawati, M.Pd.</li> <li>5. Lussana Rossita Dewi, S.Si., M.Si.</li> </ol>                                           |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>The objective</b> of this course is to equip students with the knowledge and practical skills to develop and manage agribusiness ventures by integrating digital technology and entrepreneurial principles. <b>The competencies</b> achieved by students include the ability to analyse business opportunities, design innovative |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |

and sustainable agribusiness models, develop digital-based products and services aligned with market needs and local potential, utilise science and technology and local wisdom, create digital agribusiness business plans, implement online branding and marketing strategies, evaluate product feasibility and scalability, and demonstrate adaptability, creativity, collaboration, leadership, and a bioedupreneurship-oriented entrepreneurial mindset in the digital era. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include agribusiness systems, digital transformation in agriculture, e-commerce platforms, digital marketing strategies, financial technology, supply chain management, and data-driven decision-making in the agricultural sector.

### Learning goals and qualifications

In this module students learn to:

1. CLO 1: Demonstrate character and adab (proper conduct) reflecting adaptability, enthusiasm, and integrity as an expression of devotion to Almighty God. (A3)
2. CLO 2: Critically examine the conceptual principles of digital agribusiness entrepreneurship in depth in order to formulate problem-solving strategies. (C4)
3. CLO 3: Solves problem critically and wisely by applying the principles of digital agribusiness entrepreneurship utilizing science and technology and local wisdom, while demonstrating self-development and adaptability to encountered situations. (C4, P4, A4)
4. CLO 4: Make decisions and selects alternative solutions in solving digital agribusiness entrepreneurship problems independently and collaboratively, while internalizing entrepreneurial values. (C5, A4, P4)
5. CLO 5: Apply plant cultivation techniques based on local wisdom in entrepreneurial activities grounded in bioedupreneurship. (P4, C3)

### Core readings:

1. Raimi, L., Olatidoye, O. P., & Said, T. F. H. (Eds.). (2024). *Agripreneurship and the Dynamic Agribusiness Value Chain*. Springer.
2. Bello, S. M. (2024). Digital Transformation in Agribusiness and Agripreneurship. In L. Raimi et al. (Eds.), *Agripreneurship and the Dynamic Agribusiness Value Chain*. Springer.
3. Rahman, S. (2025). *Manajemen Agribisnis: Inovasi, Digitalisasi, dan Kewirausahaan*. PT Bukuloka Literasi Bangsa.
4. Basriwijaya, K. M. (2024). *Digital Marketing Produk Pertanian, Peternakan dan Perikanan*. PT Penamuda Media.
5. Jamil, M. (2021). *Pengantar Kewirausahaan (Transformasi Digital Entrepreneurship)*.
6. Baihaqi, A., Kesumawati, E., Hanafiah, M., et al. (2022). *Agribisnis Hidroponik Bagi Entrepreneur: Budidaya Hingga Pemasaran Digital*. Syiah Kuala University Press
7. Corrales-Garay, D., Mora-Valentín, E.-M., & Ortiz-de-Urbina-Criado, M. (2020). Entrepreneurship through open data: An opportunity for sustainable development. *Sustainability*, 12(12), Article 5148.

<https://doi.org/10.3390/su12125148>

8. Achmad, A., Karto, A., & Asril, A. (2024). Small business empowerment strategy in the agricultural sector through digital entrepreneurship. *International Journal of Management Science and Information Technology*, 4(2).
9. Berlian, M. (2025). Analysis of agricultural agribusiness development: Literature review of challenges and opportunities in the modern era. *Abdurrauf Science and Society*, 1(4).
10. Hanifah, R. U., & Nugraha, A. R. (2025). Entrepreneurial orientation, innovation, ecosystem, and digital literacy on venture growth. *Journal Economic Business Innovation*, 2(1).
11. Rafidah, A. S. (2024). Entrepreneurship management in the digital era for MSMEs in Indonesia. *International Journal of Economics, Business, and Entrepreneurship*, 7(2)

## Environmental Engineering in Plant Cultivation Systems

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| <b>Module number</b><br>3225421667                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Module name</b><br>Environmental Engineering in Plant Cultivation Systems                            |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Semester / Rotation</b><br>7/ Odd                                                                    | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Prerequisites for attendance</b><br>Plant Diversity<br>Plant Development<br>Structure<br>environment | <b>Language</b><br>Indonesian (regular)<br>English<br>(international)                                                                                                                                                                                                                                                              |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussions (30%)</li> <li>2. Case report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (5%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (10%) 100 Minutes</li> <li>7. Final exam (10%) 100 Minutes</li> </ol>                                                                                                                                                                                                          |                                                                                                         | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Dr. Ling. Maria Ulfah, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                         | <b>Semester week hours</b><br>90                                                                                                                                                                                                                                                                                                   |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Rivanna Citraning Rachmawati, M.Pd.</li> <li>2. Lussana Rossita Dewi, S.Si., M.Si.</li> <li>3. Dyah Ayu Widyastuti, S.Si., M.Biomed.</li> <li>4. Praptining Rahayu, S.Si., M.Pd.</li> </ol>                                                                                                                                                                                                                                                           |                                                                                                         |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>The objective</b> of this course is to examine the principles and applications of environmental control and engineering techniques to optimise plant growth and productivity. <b>The competencies</b> achieved by students include the ability to analyse environmental factors affecting plant growth, design appropriate cultivation environments, apply technological innovations to improve efficiency, sustainability, and resilience to climate change, demonstrate critical thinking, problem-solving, |                                                                                                         |                                                                                                                                                                                                                                                                                                                                    |

and entrepreneurial insight, and work collaboratively to develop solutions to real orchid cultivation problems based on local potential and local wisdom. In this course, **the learning process** is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA (*Sistem Pembelajaran Daring*), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. **The materials** covered in this course include microclimate management, soil and water engineering, irrigation and drainage systems, greenhouse technology, hydroponic and soilless cultivation systems, waste management, and sustainable resource utilisation in agricultural settings.

### **Learning goals and qualifications**

In this module students learn to:

1. CLO 1: Demonstrate an enthusiastic character in the teaching and learning process regarding the application of various techniques and methods to create optimal environmental conditions for plant growth and development, including soil, water, light, and temperature management, as well as an introduction to indoor farming and greenhouse planning. (A3)
2. CLO 2: Critically examine in depth the application of various techniques and methods to create optimal environmental conditions for plant growth and development, including soil, water, light, and temperature management, as well as indoor farming and greenhouse planning. (C4)
3. CLO 3: Solves problem critically and wisely by applying conceptual principles related to the implementation of various techniques and methods to create optimal environmental conditions for plant growth and development, including soil, water, light, and temperature management, indoor farming, and greenhouse planning, utilizing science and technology as well as local wisdom. (C4, P4)
4. CLO 4: Integrate concepts of environmental management techniques for optimal plant growth (soil, water, light, temperature, indoor farming, and greenhouse planning) into laboratory and field practice activities while adhering to bioethical principles and Occupational Health and Safety (OHS) standards. (C5, P4, A4)
5. CLO 5: Make decisions and selects alternative solutions to problems related to the application of techniques and methods for creating optimal plant growth environments (soil, water, light, temperature management, indoor farming, and greenhouse planning), both independently and collaboratively, while internalizing entrepreneurial values. (C5, A4, P4)
6. CLO 6: Apply various techniques and methods to create optimal environmental conditions for plant growth and development (including soil, water, light, temperature management, indoor farming, and greenhouse planning) based on local wisdom in entrepreneurial activities grounded in bioedupreneurship. (C3, P4, A4)

### **Core readings:**

1. Environment, Climate, Plant and Vegetation Growth (Springer, 2024). <https://doi.org/10.1007/978-3-031-69417-2>
2. Managing Plant Production Under Changing Environment (Springer, 2022). <https://doi.org/10.1007/978-981-16-5059-8>
3. Karanisa, T., Achour, Y., Ouammi, A. et al. (2022). Smart greenhouses as

the path towards precision agriculture in the food-energy and water nexus: case study of Qatar. *Environment Systems and Decisions*, 42, 521–546. <https://doi.org/10.1007/s10669-022-09862-2>

4. Ren, A., Jiang, D., Kang, M. et al. (2022). Evaluation of an intelligent artificial climate chamber for high-throughput crop phenotyping in wheat. *Plant Methods*, 18, 77. <https://doi.org/10.1186/s13007-022-00916-9>
5. Wahyudi, Afu Ichsan Pradana & Hanifah Permatasari. (2025). Implementasi sistem irigasi otomatis berbasis IoT untuk pertanian greenhouse. *Jurnal Pendidikan dan Teknologi Indonesia (JPTI)*. <https://doi.org/10.52436/1.jpti.656>
6. Samsul Arifin, Neny Kurniawati, Reni Agustiani & Gabriela Elsandika. (2025). Sistem monitoring kesuburan lahan pertanian berbasis IoT (sensor pH, suhu, cahaya, kelembapan tanah). *Jurnal Riset Fisika Indonesia*. <https://doi.org/10.33019/jrfi.v5i2.5334>
7. Ihsan, M., & Elsi, Z. R. S. (2025). Assessment of Plant Growth in Aeroponic Systems Integrated with Smart Farming Compared to Conventional Methods. *JURNAL TEKNOLOGI DAN ILMU KOMPUTER PRIMA (JUTIKOMP)*, 8(1), 40-52.
8. Dika Satria Dika et al. (2024). Perancangan sistem pertanian vertikal terintegrasi panel surya berbasis IoT. *JITEL. Jurnal Ilmiah Telekomunikasi, Elektronika, dan Listrik Tenaga*.
9. Ulfah, M., Kurniawati, S., Nurwahyunani, A., & Wijaya, A. T. (2025). Phytoremediation of TSS and TDS from Landfill Leachate by *Equisetum hyemale*. *BIOMA: Jurnal Ilmiah Biologi*, 14(1), 94-105.
10. Supriyo, A. (2022). Inovasi Pertanian Ramah Lingkungan Terhadap Produktivitas Padi Sawah. *Proceedings Series on Physical & Formal Sciences*, 4, 146-154.

## Soil Biology

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| <b>Module number</b><br>322542 1 670                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Module name</b><br>Soil Biology                          |                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of course</b><br>Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Semester / Rotation</b><br>7 / Odd                       | <b>Student capacity:</b><br>30                                                                                                                                                                                                                                                                                                     |
| <b>Teaching methods</b><br>Lectures, Case-based Learning, Discussions, Presentations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Prerequisites for attendance</b><br>Ecology, environment | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                                                                                                                                 |
| <b>Type of examination(Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Discussion (15%)</li> <li>2. Case report (20%)</li> <li>3. Presentation (20%)</li> <li>4. Assignment (10%)</li> <li>5. Quiz (5%)</li> <li>6. Mid exam (15%) 100 Minutes</li> <li>7. Final exam (15%) 100 Minutes</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             | <b>CREDIT HOURS (+Workload in hours)</b><br>2 Credit Hours<br>Theory (27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br><b>ECTS (+Workload in hrs)</b><br>3 ECTS Theory<br>(27 hours of Lecture + 31.5 hours of structured assignment + 31.5 hours of self-study)<br><br>Total 90 hours |
| <b>Module coordinator</b><br>Lussana Rossita Dewi, S.Si., M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             | <b>Semester week hours:</b><br>90                                                                                                                                                                                                                                                                                                  |
| <b>Additional teacher involved:</b> <ol style="list-style-type: none"> <li>1. Dr. Dra. Mei Sulistyoningsih, M.Si.</li> <li>2. Dr. Ling. Maria Ulfah, M.Pd.</li> <li>3. M. Anas Dzakiy, S.Si., M.Si</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                                                                                                                                                                                                                                                                                                    |
| <b>Syllabus</b><br><b>The objective</b> of this course is to explore the diversity, functions, and ecological roles of living organisms in the soil ecosystem and their influence on soil fertility and plant productivity. <b>The competencies</b> achieved by students include the ability to analyse biological processes in soil systems, evaluate factors affecting soil biodiversity and activity, apply science and technology to enhance sustainable soil management, and demonstrate critical thinking, environmental awareness, and problem-solving skills to support sustainable agriculture and ecosystem management. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The materials</b> covered in this course include soil |                                                             |                                                                                                                                                                                                                                                                                                                                    |

microorganisms, soil fauna, microbial metabolism, nutrient cycling, soil organic matter dynamics, plant microbe interactions, rhizosphere ecology, and biological indicators of soil health.

**Learning goals and qualifications in this module students learn to:**

1. CLO 1: Demonstrates enthusiasm in learning Soil Biology. (A3)
2. CLO 2: Analyzes the relationship between climate change and soil biological dynamics through a scientific approach. (C4)
3. CLO 3: Applies concepts of soil biology, climate change, and science and technology to formulate procedural alternative solutions. (C3, P3)
4. CLO 4: Applies essential concepts of soil biology in laboratory and field practicum activities by adhering to bioethical principles and implementing Occupational Health and Safety (OHS). (C3, P4, A3)
5. CLO 5: Prepares comprehensive and systematic practicum reports that account for the results of soil biology analysis and observations conducted. (C6, P4)
6. CLO 6: Applies plant cultivation and tissue culture techniques based on local wisdom in soil biology practices and entrepreneurship, using a bioedupreneurship approach that emphasizes environmental sustainability. (C3, P5, A4)

**Core readings:**

1. Ulfah, M., Faizsyahrani, L. P., Sumarno, S., & Wijaya, A. T. (2025). Ammonia and Total Nitrogen Removal Using Equisetum hymale Based Phytoremediation in Landfill Leachate. *Jurnal Penelitian Pendidikan IPA*, 11(5), 813-820. <https://doi.org/10.29303/jppipa.v11i5.11009>
2. Whitman, T., Woollet, J., Sikora, M., Johnson, D. B., & Whitman, E. (2022). Resilience in soil bacterial communities of the boreal forest from one to five years after wildfire across a severity gradient. *Soil Biology and Biochemistry*, 172, Article 108755. <https://doi.org/10.1016/j.soilbio.2022.108755>
3. Barbour, K. M., Weihe, C., Allison, S. D., & Martiny, J. B. H. (2022). Bacterial community response to environmental change varies with depth in the surface soil. *Soil Biology and Biochemistry*, 172, Article 108761. <https://doi.org/10.1016/j.soilbio.2022.108761>
4. Bhattacharyya, S. S., & Furtak, K. (2022). Soil–Plant–Microbe interactions determine soil biological fertility by altering rhizospheric nutrient cycling and biocrust formation. *Sustainability*, 15(1), 625.
5. Alamos, S., & Shih, P. M. (2023). How to engineer the unknown: Advancing a quantitative and predictive understanding of plant and soil biology to address climate change. *PLoS Biology*, 21(7), e3002190.
6. Creamer, R. E., Barel, J. M., Bongiorno, G., & Zwetsloot, M. J. (2022). The life of soils: Integrating the who and how of multifunctionality. *Soil Biology and Biochemistry*, 166, 108561.
7. Paul, E., & Frey, S. (Eds.). (2023). *Soil microbiology, ecology and biochemistry*. Elsevier.
8. Thies, J. E., & Grossman, J. M. (2023). The soil habitat and soil ecology. *Biological approaches to regenerative soil systems*, 69-84.
9. Setiawati, M. R., Nurhopipah, P., Fitriatin, B. N., & Suryatmana, P. (2024, October). Pengaruh Pupuk Hayati dan Briket Amelioran terhadap Bakteri Penambat N, N-Total, Serapan N, dan Bobot Kering Padi pada Tanah Salin. In *Prosiding Seminar Nasional Pembangunan dan Pendidikan Vokasi Pertanian* (Vol. 5, No. 1, pp. 1169-1187).

10. Prasetyo, H., Setyobudi, R. H., Adinurani, P. G., Vincēviča-Gaile, Z., Fauzi, A., Pakarti, T. A., Tonda. R., Minh. N.V., & Mel, M. (2022). Assessment of soil chemical properties for monitoring and maintenance of soil fertility in Probolinggo, Indonesia: Assessment of soil chemical properties in Probolinggo, Indonesia. *Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences*, 59(4), 99-113.
11. Bertham, Y. H., & Nusantara, A. D. (2023). PEMANFAATAN MIKROORGANISME INSITU UNTUK PENINGKATAN PERTUMBUHAN DAN HASIL PADI GOGO (Oriza Satipa) ORGANIK DI KAWASAN PESISIR BENGKULU. In *PROSIDING SEMINAR NASIONAL PERTANIAN PESISIR* (Vol. 2, No. 1, pp. 498-507).

**8th Semester**  
**Even 2025/2026**

### Community Service Programme

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| <b>Module number</b><br>3225244612                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Module name</b><br>Community Service Programme |                                                                                                                                                                                                                              |
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Semester / Rotation</b><br>8 / Even            | <b>Student capacity:</b><br>100                                                                                                                                                                                              |
| <b>Teaching methods</b><br>Experiential learning, project-based learning, field observation and social mapping, mentoring, supervision, collaborative team work, reflective learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Prerequisites for attendance</b><br>-          | <b>Language</b><br>Indonesian (regular)<br>English (international)                                                                                                                                                           |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>1. Community needs analysis &amp; program proposal (10%)</li> <li>2. Individual activity log (20%)</li> <li>3. Collaborative performance (20%)</li> <li>4. Field mentoring and supervision assessment (by DPL &amp; local stakeholders) (10%)</li> <li>5. Reflective reports (individual &amp; group) (10%)</li> <li>6. Final KKN report and presentation / expo (30%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                   | <b>CREDIT HOURS (+Workload in hours)</b><br>4 (45 contact hours in class + 135 project works, total 180 hours)<br><br><b>ECTS (+Workload in hours)</b><br>6 (45 contact hours in class + 135 project works, total 180 hours) |
| <b>Module coordinator</b><br>Arisul Ulumudin, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                   | <b>Semester week hours</b><br>180                                                                                                                                                                                            |
| <b>Additional teacher involved:</b><br>All lecturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                   |                                                                                                                                                                                                                              |
| <b>Syllabus</b><br><b>The objective</b> of this course is to develop students' social responsibility and their ability to apply academic knowledge to real community contexts through structured service-learning activities. <b>The competencies</b> achieved by students include the ability to foster nationalism, respect diversity, demonstrate responsible and ethical behaviour, collaborate with communities, apply leadership, communication, and problem-solving skills in authentic social settings, conduct community mapping, identify community needs, design work programmes, collaborate through inter-professional teamwork, apply science and technology in community development, manage change, motivate community groups, communicate effectively in diverse environments, engage in reflective activities, implement community projects, and evaluate their impact through structured reports and presentations. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA ( <i>Sistem Pembelajaran Daring</i> ), which is fully integrated within the SSO SIMEKAR ( <i>Single Sign On Sistem Informasi Merdeka Belajar</i> ) platform at <a href="https://simekar.upgris.ac.id">https://simekar.upgris.ac.id</a> . <b>The materials</b> covered in this course include digital literacy, inclusive and exclusive leadership, national insight, talent development, entrepreneurship, community problem solving, non-formal |                                                   |                                                                                                                                                                                                                              |

education, public speaking, and journalism as tools for community empowerment.

### **Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Possess a sense of nationalism, love for the homeland, and respect for diversity (C2, P2, A5)
2. CLO 2: Possess a responsible, honest, caring, and respectful personality (C2, P2, A5)
3. CLO 3: Manage, communicate, and motivate groups and communities in personal and environmental change (C3, P3, A4)
4. CLO 4: Collaborate to formulate potential, problems, and solutions through science, technology, and inter-professional collaboration (C4, P4, A4)
5. CLO 5: Design and apply work programs with full responsibility (C6, P4, A4)

### **Core readings:**

1. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2021). Panduan Implementasi MBKM. Jakarta: Kemendikbud Ristek.
2. Universitas PGRI Semarang. (2024). Pedoman Kuliah Kerja Nyata (KKN) MBKM UPGRIS Mengabdikan. Semarang: LPPM UPGRIS.
3. Syardiansah. (2020). Peranan Kuliah Kerja Nyata Sebagai Bagian Dari Pengembangan Kompetensi Mahasiswa (Studi Kasus Mahasiswa Universitas Samudra KKN Tahun 2017). *JIM UPB (Jurnal Ilmiah Manajemen Universitas Putera Batam)*, 8(1), 57–68.
4. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2021). *Panduan merdeka belajar–kampus merdeka: Program KKN tematik*. Kemendikbudristek.
5. Buchori, A., Prasetyowati, D., Widodo, S., Kusmantoro, A., & Bakti, S. M. (2025). Pemanfaatan biogas dari limbah ternak sapi sebagai solusi energi terbarukan dan peningkatan kesejahteraan masyarakat Desa Kuripan Kecamatan Karangawen Demak. *Journal of Dedicator Community*, 9(2), 139–150.
6. Khafsoh, N. A., & Riani, N. (2024). Implementation of Participatory Action Research (PAR) in community service program. *Jurnal Pengabdian Masyarakat*, 5(1), 237-253.
7. Widiyanto, W., Rusdiyana, E., Lestary, E., Setyowati, R., Anggraini, N. T., & Sugihardjo, S. (2025, June). The implementation of climate village program (Proklim) through Student Community Service (KKN): an action research. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1518, No. 1, p. 012025). IOP Publishing.
8. Hesti, M., & Markos, V. (2024). Exploring the Efficacy of Student Community Service Programs (KKN) in Higher Education Institutions: A Case Study in Indonesia. *Különleges Bánásmód-Interdiszciplináris folyóirat*, 10(2), 77-89.
9. Paputungan, F. (2023). Implementation of KKN as Community Service Activities in accordance with the Field of Science. *Journal of Education and Culture (JEaC)*, 3(2), 161-176.

## **Final Project**

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| <b>Module number</b><br>322576 5 650 | <b>Module name</b><br>Final Project |
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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of course</b><br>Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Semester / Rotation</b><br>8 / Even                                                     | <b>Student capacity:</b><br>35                                                                                                                                                                                                                                                                                                                                         |
| <b>Teaching methods</b><br>Research supervision meetings, Independent research work. Literatur riview, Data collection and analysis, Research consultation sessions, Scientific writing guadance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Prerequisites for attendance</b><br>Biostatistic, Research methods in Biology Education | <b>Language</b><br>English (international)<br>Indonesia (regular)                                                                                                                                                                                                                                                                                                      |
| <b>Type of examination (Final Grade Composition)</b> <ol style="list-style-type: none"> <li>The research proposal contributes (20%)</li> <li>The research implementation and progress under supervision contribute (30%)</li> <li>The written thesis manuscript contributes (30%)</li> <li>The thesis defense (oral examination) contributes (20%)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                            | <b>CREDIT HOURS (+Workload in hours)</b><br>6 Credit Hours<br>(90 contact hours in Supervision and consultation + 180 hours of independent research work, total 270 hours)<br><br><b>ECTS (+Workload in hours)</b><br>9 ECTS<br>Final Project (9 ECTS)<br>(90 contact hours in Supervision and consultation + 180 hours of independent research work, total 270 hours) |
| <b>Module coordinator</b><br>Praptining Rahayu, M.Pd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            | <b>Semester week hours</b><br>270                                                                                                                                                                                                                                                                                                                                      |
| <b>Additional teacher involved:</b><br>All lecturers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syllabus</b><br><b>The objective</b> of this course is to provide undergraduate students with comprehensive and in-depth learning experiences through independent and systematic scholarly work, enabling them to apply theoretical knowledge, research skills, and academic ethics in conducting independent research and producing a scientific thesis. <b>The competencies</b> achieved by students include the ability to integrate prior learning experiences with rigorous research methodology, address a research problem independently and responsibly, demonstrate academic integrity, critical thinking, and methodological competence, and complete a valid, systematic, and academically accountable undergraduate thesis. In this course, <b>the learning process</b> is carried out using a hybrid learning method. Hybrid learning is conducted through face-to-face classroom sessions according to the academic schedule and structured online learning activities facilitated by the Learning Management System SPADA |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                        |

(Sistem Pembelajaran Daring), which is fully integrated within the SSO SIMEKAR (*Single Sign On Sistem Informasi Merdeka Belajar*) platform at <https://simekar.upgris.ac.id>. The materials covered in this course include research proposal preparation, independent research or scholarly inquiry, data collection and analysis, formulation of conclusions, and the writing of a comprehensive and coherent scientific report.

**Learning goals and qualifications.**

In this module students learn to:

1. CLO 1: Demonstrates adaptability, enthusiasm, and integrity in completing the final thesis. (A4)
2. CLO 2: Critically examines concepts relevant to the context of the thesis using fundamental principles of scientific methodology in depth. (C4)
3. CLO 3: Formulates problem-solving strategies based on the context of the thesis through research activities. (C6)
4. CLO 4: Solves problems using concepts of biology education, biology, or other relevant contexts aligned with the thesis focus by utilizing science and technology as well as local wisdom through research activities. (C5, P4)
5. CLO 5: Communicates research findings, both orally and in writing, related to the thesis focus by utilizing science and technology. (C4, P4)
6. CLO 6: Integrates essential biological concepts and their developments in laboratory and field activities while adhering to bioethical principles and Occupational Health and Safety (OHS) standards in conducting thesis research. (C5, P5, A4)
7. CLO 7: Makes decisions in solving problems according to the context of the thesis research based on research findings. (C5)
8. CLO 8: Demonstrates responsibility throughout the process of preparing the thesis through research activities. (A4)

**Core readings:**

1. Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed-methods approaches* (6th ed.). SAGE Publications.
2. Lee, I., & Murray, R. (2022). Writing academic research texts: A process-oriented approach. *Higher Education Research & Development*, 41(3), 673–687.
3. Saunders, M., Lewis, P., & Thornhill, A. (2023). *Research Methods for Business Students* (9th ed.). Pearson Education.
4. Hess, T., Riedl, R., & Becker, L. (2024). Digital business as a field for research and education: Conceptual integration and future directions. *Electronic Markets*, 34, Article 46.