**MODULE HANDBOOK**

| | | |
|---|---|---|
| | **UNIVERSITAS PADJADJARAN**<br>**FACULTY OF MATHEMATICS AND NATURAL SCIENCES**<br>**BACHELOR OF BIOLOGY PROGRAMME** | **COURSE CODE :**<br>**D10D-50609** |
| **Module designation** | Environmental Microbiology | |
| **Semester in which the module is taught** | 5 | |
| **Persons responsible for the module** | 1. Dr. Nia Rossiana<br>2. Prof. Ratu Safitri<br>3. Asri Peni Wulandari, Ph.D<br>4. Dr. Keukeu K. R<br>5. Dr. Mia Miranti | |
| **Medium of instruction** | Indonesian | |
| **Relation to curriculum** | Compulsory course | |
| **Teaching methods** | Lectures, discussions, collaborative learning, project based learning | |
| **Workload** | Total workload : 8160 minutes = 136 hours<br><br>Lecture, discussion, and collaborative learning : 3 x 50 minutes x 16 weeks = 2400 minutes = 40 hours<br>Exercises : 3 x 60 minutes x 16 weeks = 2880 minutes = 48 hours<br>Self-study : 3 x 60 minutes x 16 weeks = 2880 minutes = 48 hours | |
| **Credit points** | 3.00 (5.43 ECTS) | |
| **Required and recommended prerequisites for joining the module** | Basic Microbiology | |
| **Module objectives/intended learning outcomes** | 1. Able to apply systematic and innovative critical thinking in the context of developing or implementing science and technology that considers and applies humanities values appropriate to their field of expertise.<br>2. Able to demonstrate independent, high-quality, and measurable performance.<br>3. Able to identify and utilize environmental microorganisms to develop biotechnology solutions for sustainable waste management or pollution control.<br>4. Able to apply the principles of environmental microbiology in everyday life, such as managing organic waste with local microbes or utilizing biofilters to maintain environmental quality to provide direct benefits to the community.<br>5. Able to utilize environmental microorganisms to support specific biological resource management, such as in the process of composting bioremediation or increasing soil fertility. | |
| **Contents** | 1. Environmental Microbiology Learning and Learning Strategies<br>2. Characteristics of soil environments and interactions with microorganisms in soil<br>3. Characteristics of water environments and interactions with microorganisms in water<br>4. Characteristics of air environments and interactions with microorganisms in air<br>5. Contaminated Environment Management Technology: Soil bioremediation and wastewater treatment systems (SA)<br>6. CASE STUDIES (thematic project: Microorganisms in specific environments: indigenous waste, rumen, extremophiles (thermophiles, halophiles, etc.), endophytes<br>7. Process analysis methods and technologies, and Applications for Environmental Management | |

| | |
|---|---|
| **Examination forms** | Quiz, Midterm exam, Practice, Assignment, and Final exam |
| **Study and examination requirements** | The minimum attendance in lectures is 80%. Final grades are evaluated based on quiz (10%), midterm exam (15%), assignment (10%), final exam (15%), project and participation (50%) |
| **Reading lists** | 1. Introduction to Environmental Microbiology Publisher: Oficyna Wydawnicza Politechniki Wrocławskiej. Editor: Oficyna Wydawnicza Politechniki Wrocławskiej,ISBN: 83-7085-880-5.Barbara Kolwzan.<br>2. Maier, R. M., Pepper, I. L., & Gerba, C. P. (2024). Environmental Microbiology (Edisi ke-4). Academic Press (Elsevier).<br>3. Madigan, M. T., Bender, K. S., Buckley, D. H., Sattley, W. M., & Stahl, D. A. (2024). Brock Biology of Microorganisms (Edisi ke-16). Pearson. |