

12. Module XII: Microbial System I

12.1. Module Objectives

On completion of this module, the students will be able to:

- Define and describe the microbial evolution, diversity and habitat, interaction, biogeochemical cycle
- Evaluate the concept of diversity as a result of evolutionary influence (size, shape, metabolic, adaptation, survival)
- Describe adaptional strategies and microbial survival
- Describe the process of microbial interaction with other microorganisms, plants and animals

12.2. Module Data

Person in charge	Dr. Gede Suantika
Total Credits	3
Course	BM 2203 Microbial Ecology and Evolution
Course Examination	Written Test (theory and practical exercises)

12.2.1. Sub-module I: Microbial Ecology and Evolution

Lecturer	Dr. Gede Suantika
Semester	4
Type of submodule / course	Lecture with exercises
Credits	3 (1)
Workload	2 hours lectures, 2 hours structured activities, 3 hours labwork, 2 hours individual study, 16 weeks per semester, and total 144 hours a semester
Workload details	textbook reading, group discussion, paper review, presentation review,
Classification within the curriculum:	General Studies / Compulsory Course/ Elective Course
Type of assessment/examination	Written Test : Midterm exam, Final exam, Quizzes, Assignments, Presentation
Language	Bahasa Indonesia with some english instruction
Course Target / Outcome	Students will be able to: <ol style="list-style-type: none">1. describe Origin of Life and the Evolution of Microorganisms2. evaluate the concept of diversity as a result of

		<p>evolutionary influence (size, shape, metabolic, adaptation, survival)</p> <p>3. describe adaptional strategies and microbial survival</p> <p>4. describe the process of microbial interaction with other microorganisms, plants and animals</p> <p>5. identify microbial role and function in the biogeochemical cycle</p>
Teaching methods		(1) Regular weekly lectures accompanied by class discussion (2). Individual laboratory preparation by students, leading to written exam (3). Exposed on real ecological problems through practical exercises
Contents (SAP)		
	1	Introduction : course syllabus and general overview
	2	Beginnings and Road Forwards : origin of life, microbial evolution
	3	Diversity in Microorganisms : bacteria, archaea, protest
	4	Complexity and Simplicity of Cell Systems : size and shape, cellular characteristic (resistant structre, movement, energetic, storage, etc)
	5	Complexity and Simplicity of Cell Systems : size and shape, cellular characteristic (resistant structre, movement, energetic, storage, etc)
	6	The Microbial Habitat : aquatic, terrestrial, air, extreem condition
	7	The Microbial Habitat : aquatic, terrestrial, air, extreem condition
	8	The How of Microbial Ecology Studies : sampling, counting, molecular techniques analysis
	9	Mid-Term Test
	10	Microbial Interactions : Microorganisms-Microorganisms Interaction
	11	Microbial Interactions : Microorganisms-Plants Interaction
	12	Microbial Interactions : Microorganisms-Animals Interaction
	13	Biochemical Cycle : Carbon, Nitrogen, phosphorous, sulfur, iron
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	15	General review
	16	Final Exam
Literature / Sources		Barton, L.L and Northup D.E. 2011. Microbial Ecology. Wiley-Blackwell
Other specialties		-