

## 1. Module XVIII: Microbial System II

### 1.1. Module Objectives

On completion of this module, the students will:

- Able to apply basic technique of microbiology, biochemical, and molecular related to microbial identification and classification
- Able to describe microbial evolution including virus and its relation to microbial biodiversity, taxonomy, and classification
- Able to describe the relationship between microbial diversity and its interaction
- "Have open mind and respectful to microbial diversity"
- Systematic thinking

### 1.2. Module Data

Person in charge	Ernawati A. Giri-Rachman
Credits	6
Course	BM3105 Virology
	BM3101 Microbial Biosystematic
Modules Examination	Written Test

#### 1.2.1. Sub-module I: Virology

Lecturer	Ernawati A.Giri-Rachman
Semester	5
Type of submodule / course	Compulsory
Credits	3
Workload – preparation	3 hours lectures, 3 hours structured activities, 3 hours individual study, 16 weeks per semester, and total 192 hours a semester
Workload Detail	Paper reading assignment, group discussion, presentation, paper review, small exhibition
Classification within the curriculum:	<del>General Studies / Compulsory Course/ Elective Course</del>
Type of assessment/examination	Written Test : Midterm exam, Final exam, Assignments Presentation
Language	Bahasa Indonesia
Course Target / Outcome	Students will be able to define and describe and define viral roles in life form
Teaching methods	Interactive Teaching
Contents (SAP)	
	1 Introduction of Virology

	2	Virus as biotechnology agent
	3	Viral type, characters, and structural forming
	4	Viral transmission process (animal and plant cell)
	5	Genetic characteristic and growth of virus
	6	
	7	Mid-Term Test
	8	Classification and pathogenicity of virus
	9	
	10	
	11	Bacteriophage : Types and infection mechanism.
	12	Immune system against viral infection
	13	Disease caused by virus.
	14	Prevention methods of diseases caused by virus
	15	Type of disease that caused by prion and its pathogenicity.
	16	Final Test
Literature / Sources		Flint J.S., Enquist EW., Racaniolle EV, 2009. Principles of Virology. American Society for Microbiology
Other specialties		

### 1.2.2. Sub-module II: Microbial biosystematic

Lecturer	I Nyoman P Aryantha
Semester	5
Type of submodule / course	Compulsory
Credits	3(1)
Workload – Class Lecture	2 hours lectures, 3 hours laboratory, 2 hours structured activities, 2 hours individual study, 16 weeks per semester, and total 144 hours a semester
Workload Detail	Paper reading assignment, group discussion, presentation, paper review, small exhibition
Classification within the curriculum:	<del>General Studies / Compulsory Course/ Elective Course</del>
Type of assessment/examination	Written Test : Midterm exam, Final exam, Assignments Presentation
Language	Bahasa Indonesia
Course Target / Outcome	Knowledge  Students will be able to:  - define the reason behind microbial classification and define the classification methods

	<ul style="list-style-type: none"> <li>- Differentiate between microbial phenotype and genotype characters.</li> <li>- Discover the progression in molecular technique and the usage of gene prob to microbial identifaction.</li> <li>- define and describe the evolution classification and relationship in microbial identification along with its beneficial in ecomics, medical,and environment.</li> <li>- report the microbial biosystematic in form of science writing and persentation</li> </ul> <p>Skill</p> <p>Students will be able to:</p> <ol style="list-style-type: none"> <li>1. Interprate the background of microbial classification and the way its were named.</li> <li>2. differentiate between microbial phenotypic and genotypic characters.</li> <li>3. demonstrate advances in molecular techniques and the use of gene probes for microbial identification.</li> <li>4. Inteprate both the theory and practice of microbial classification and identification</li> <li>5. Interprate the classification, evolutionary relationships and identification of the major microbial groups as well as the medical, economic and environmental importance of their members.</li> <li>6. Review, write and represent scientific articles in the field of microbial systematics.</li> <li>7. Define the methods in enumeration of microorganisms</li> </ol>
Teaching methods	Interactive Teaching
Contents (SAP)	
1	Introduction to microbial biosystematic and classification: background, concept, and development.
2	Basic knowledge and determination method in microbial biosystematic: Evolution
3	Methods in microbial biosystematic
4	Genetic aspect in microbial biosystematic determination
5	Principal of taxonomy, classification approach, classification system, Nomenclature system, Taksa level,
6	phylogentic tree
7	Mid-Term Test

	8	Principal of taxonomy, classification approach, classification system, Nomenclature system, Taksa level, phylogentic tree
	9	Microbial Classification
	10	
	11	Differentiation of Gram in Bacteria
	12	Speciation
	13	Cell membranes and cell walls in Bacteria and Archaea.
	14	Microbial identification and symbiotic relationship
	15	Microbial identification
	16	Final Test
Literature / Sources		1. Bergey's Manual of Systematic Bacteriology. 2005. Springer
		2. Madigan, M. T., J. M. Martinko & J. Parker, 2006. Brock Biology of Microorganisms, 11 <sup>th</sup> ed. Pearson Prentice Hall International, Inc., New Jersey
Other specialties		

