



THE MODULE HANDBOOK

FACULTY OF BIOLOGY

Microbiology

Module code	BIB 20501IUP
Module level	Undergraduate
Abbreviation, if applicable	-
Sub-heading, if applicable	-
Courses included in the module, if applicable	-
Semester/ term	Even
Module coordinator(s)	Dr. Endah Retnaningrum, M.Eng.
Lecture(s)	1. Dr. Endah Retnaningrum, M. Eng. 2. Dr. Miftahul Ilmi, M.Si.
Language	English
Classification within the Curriculum	Compulsory
Teaching format/ class hours per week during the semester	This course is organized in 3 credits for classical theory and 1 credit for practical work in laboratory.
Workload	Each credit course consist of 150 minutes/week (50 minutes for meeting in the class, 50 minutes for individual activities, and 50 minutes for organized activities). And for laboratory work in the laboratory need 9 hours/week (3 hours for activity at laboratory, 3 hours for organized activities, and 3 hours for individual activities.
Credit points	3-1credits
Requirements	Biochemistry (BIB 10101IUP)
Learning goals/ competencies	<p>1. Knowledge and understanding</p> <ol style="list-style-type: none">Explain the meaning or the basic concept of microbial ecology and its role in the process that takes place in everyday life and natural changes.Explain the basics to recognize the diversity of microbes and their impact on the environment and other living bodies..Explain the basic theory and equipment in the laboratory to carry out research laboratories and microbiology.Revealing the importance of various aspects of molecular microbiology in microbial classification and uncover the role of microbes. <p>2. Ability/intellectual skill</p>



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FACULTY OF BIOLOGY

- a. Analyse microbial diversity in nature based on the nutritional requirements.
- b. Analyse and search problem responses with develop the thought for microbial utilization.
- c. Mastering problems for planning and implementation of practicum and research in the field of microbiology.

3. Practical skill

- a. Applying the theory of the concept of microbiology in in the study of microbial utilization in all fields.
- b. Using the scientific literature to make assignments and practical reports scientifically.
- c. Using laboratory equipment to carry out the practicum or research with the proper technique.
- d. Prepare and maintaining aseptic conditions for microbial handling included isolation, growing (culturing), and identification of microorganisms.

4. Managerial and transferable skill

- a. Regulate time effectively and efficiently to accomplish.
- b. Communicate the opinions and adjust the principles of chemistry, physics and mathematics in the field of microbiology through scientific papers or seminar.
- c. Work in the team.
- d. Applying and integrating microbiology into another branch.
- e. Using information communication technology.

5. Attitude

- a. Take a position of curiosity.
- b. Appreciate the originality of ideas, concepts, and other inventions.
- c. Appreciate the interdisciplinary efforts in exploring, exploiting and preserving natural resources.
- d. Able to adapt to the existing environment.
- e. Pay attention, respect the view points and opinions of others.

Content

Microbiology covers the basic knowledge to know and to study the general biological concept of microbes comprehensively before studying related advanced topic. It contains basic recognition of cell biology, microbial cell structure, microbial metabolism and growth; microbial genetics and controlling of microorganisms; as well as basic of understanding about the importance and influence of microbes in the world. The main role of microbes has been developing rapidly to strengthen molecular biology and genetic engineerin as new technologies for industrial purposes. The course materials



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	<p>are delivered using Power Point Presentation through SCL (Student Center Learning) system that enrich with discussions and individual assignments. To increase knowledge and skills in microbial handling, students are required to attend practical work or exercise performed in the laboratory that equal in 1 credit. Laboratory activities include aseptic techniques application, cell staining and microscopical technique for observing microbial cell shape. Isolation and culturing techniques of microbes as well as identification methods are also introduced as a main competence for microbiologist. As the development of molecular biology and biotechnology, microbes broadly exploited to support human well-being and environmental health.</p>
Study/ exam achievements	<ol style="list-style-type: none">1. Midterm: 20 %2. Final examination: 40 %3. Assignments and class activities: 15 %4. Laboratory work: 25 %
Forms of media	White board, LCD
Literature	<ol style="list-style-type: none">1. Atlas, R.M. 1997. <i>Principles of Microbiology</i>, 2nd ed., Wm. C. Brown Publishers.2. Black J, 2008. <i>Microbiology; Principles And Exploration</i>, 8th ed., John Wiley & Sons, Inc.3. Madigan, M.T., Martinko, J.M. & Parker, J. 2000. <i>Biology of Microorganisms</i>, Prentice Hall International, Inc.4. Presott, L.M., Harley, J..P. & Klein, D.A. 2000. <i>Microbiology</i>, 5th ed., WCB McGraw-Hill.5. Solomon, E.P., Berg, L.R. & Martin, D.W. 1999. <i>Biology</i>. 5th Ed., Saunders College Publishing, Harcourt Brace College Publishers.