

Module Descriptions

Module designation	Microbial Physiology (course code MPB 2217)
Semester(s) in which the module is taught	2
Person responsible for the module	Prof.Dr.Dra.Siti Khotimah, M.Si
Lecture (s)	Prof.Dr.Dra.Siti Khotimah, M.Si Rahmawati, S.Si, M.Sc Rikhsan Kurniatuhadi, M.Si
Language	Indonesian language
Relation to curriculum	Elective
Teaching methods	lecture and discussion
Workload (incl. contact hours, self-study hours)	Total workload: 4.38 ECTS Lecture: 26,6 hours (0,99 ECTS) Assignment: 46.5 hours (1.72 ECTS) Self-study: 44.9 hours (1.67 ECTS) Self-study hours are estimation numbers of hours; each student will approach studying in different ways.
Credit points	2 unit
Required and recommended prerequisites for joining the module	Microbial systematics (course code MPB 2107)
Module objectives/intended learning outcomes	Intended Learning Outcomes (ILO) Knowledge (ILO-2) Able to integrate and apply biological science and other scientific fields that support the development of biological science General Skill (ILO-3) Able to collaborate effectively within a team and to communicate actively, both orally and in writing, in the domain of biology. Course learning outcomes (CLO) CLO 08: The ability to analyze the relationship between the structure and function of the cells, tissues, and organs that constitute living organisms. CLO 17: The ability to collaborate within a team to successfully complete case studies or projects in the field of biology and to present the findings effectively...

Content	The Microbial Physiology course is a study of the basic concepts and applications of microbiology which include: Basic understanding and scope of Physiology; Microbes related to other sciences; Cytochemistry of microbial cells (physical and chemical composition of microbial cells); Comparison of structural properties of prokaryotic and eukaryotic cells; Microbial subcellular structure and function: Outer layer:- capsule and cell wall; Comparison of gram-positive and gram-negative bacterial cell walls, Pili and Chemotaxis; Cytoplasmic membrane, Role of the cytoplasmic membrane; Genetic material, Plasmids, Spores and Storage granules; Formation of microbial cell structures: Formation of bacterial cell walls, Teichoic acid synthesis, Peptidoglycan synthesis; Formation of gram-negative bacterial cell walls (exopolysaccharide synthesis); Implications of Nutritional Physiology, Growth and death, Substrate uptake mechanisms; Differentiation and Morphogenesis in microbes; Catabolic and Bioenergetic metabolism: Mechanism of substrate-level phosphorylation, Electron transport, Mechanism of ATP formation; The importance and mechanism of Protein Synthesis; Molecular microbial genetics and physiology; Microbial ecology as an application of microbial physiology, Microbial interactions as modifiers of the environment, Metabolism as a modifier of ecology..
Examination forms	1. Midterm 30% 2. Final Exams 40% 3. Assignment (quiz, literature review, academic paper) 20% 4. Activity 10%
Study and examination requirements	Re-registration and 75% attendance.
Reading list	1) Caldwell, D. R. (2020). Microbial Physiology and Metabolism. Academic Press. 2) <u>Lansing M. Prescott, John P. Harley, Donald A. Klein</u>. 2005. Microbiology. <u>McGraw-Hill Higher Education</u> 3) Madigan, M. T., Martinko, J. M., Bender, K. S., Buckley, D. H., & Stahl, D. A. (2018). Brock Biology of Microorganisms (15th ed.). Pearson. 4) Suryani, Y. (2022). Fisiologi Mikroorganisme. Gunung Djati Publishing. 5) Moat, A. G., Foster, J. W., & Spector, M. P. (2019). <i>Microbial Physiology</i> (5th ed.). Wiley-Liss.