



THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

BIOPROCESS AND BIOMOLECULAR BACTERIA

Course code	BIMB202230
Course level	Magister
Semester/ term	Odd
Course coordinator(s)	Dr. Endah Retnaingrum, M. Eng
Lecture(s)	1. Dr. Endah Retnaningrum, M. Eng 2. Dr. Rarastoeti Pratiwi, M. Sc
Language	English
Classification within the Curriculum	Elective courses Subjects for Microbiology laboratory
Teaching format/ class hours per week during the semester	This course is organized into 15 teaching weeks and 2 weeks of examination.
Workload	Estimated working hour: 2 credits of theory and 1 credit of laboratory work.
Credits	2-1 credits
Requirements	-
Program Learning Outcome	CPL AT1: The students are intended to internalize the academic values, norms, and ethics as well as demonstrate independent, responsible attitudes in their field of expertise (Attitude) CPL KN2: The graduates are demonstrating knowledge and comprehend biological system and bio-engineering methods to solve tropical biodiversity problems (Knowledge) CPL GS1: The graduates are able to develop logical, critical, systematic, and creative thinking through scientific concept and research (General Skills) CPL SS2: The graduates are able to solve problems related to biological resources through an inter- and / or multidisciplinary approaches beneficial to society and scientific community (Specific Skills).
Course Learning Outcome	CPMK1: Students are able to understand the character and role of bacterial extremophiles in global health CPMK2: Students are able to understand the virulence of pathogenic bacteria and controlling it with antibacterial Actinobacteria CPMK3: Students are able to analyze microbial characters and explain the character's relationship to the activity, diversity and distribution of microbes



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	CPMK4: Students are able to apply prebiotic theory and the synbiotic effect of probiotic bacteria in functional food applications
Course Description	<p>The basic concepts and principles of bioprocessing and bio-molecular bacteria are presented and studied based on the activity and molecular of bacteria in nature. The activities of various bacterial processes in nature determine the quality of environmental health which greatly affects human health. In addition, the abiotic and biotic stress responses in nature will determine the type and character of the bacteria studied, both harmful and beneficial bacteria. The activity of these bacteria is studied and studied more deeply in the laboratory through isolation and screening methods. The bacterial activity was further studied in both consortium and single isolates and further studied in the molecular structure of the associated bacteria. The study of bacteria that are detrimental to human health is also being studied in terms of increasing resistance to antibiotics and detection of resistance-related genes through PCR and microarray techniques so that resistance patterns are identified and resistance reduction methods. In addition, studies of local Indonesian non-microbial and microbial based natural preservatives were explored and studied to replace antibiotics and reduce cases of high resistance. Immobilization and encapsulation methods are also studied for the utilization and development of these bacteria for human life</p>
Assesments	<ol style="list-style-type: none">1. Quiz : 52. Assigment : 103. Midterm exam : 404. Final exam : 40
	Notebook and LCD
Literature	<ol style="list-style-type: none">1. Cocolin, L., Ercolini, D. 2008. Molecular Techniques in the Microbial Ecology of Fermented Foods. Springer Science+Business Media, LLC, 233 Spring Street, New York, NY10013, USA.2. Dion, P., Nautiyal, C. S. 2008. Microbiology of Extreme Soils. Springer-Verlag Berlin Heidelberg, German.3. Liongm, M., Steinbu"chel, A. 2015. Beneficial Microorganisms in Food and Nutraceuticals. Springer, Cham Heidelberg New York Dordrecht London4. Martin R. Adams, M. R., Moss, M. O. 2008. Food Microbiology. The Royal Society of Chemistry. Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, UK.5. Paul, E. A. 2015. Soil Microbiology, Ecology, and Biochemistry. Academic Press is an imprint of Elsevier, Jamestown Road, London, UK



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6. Wolinsky, I., Hickson, J. F. 2005. Inulin-Type Fructans
Functional Food Ingredients. CRC PRESS Boca Raton
London New York Washington, D.C.
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