

Undergraduate Programme in Biology

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MODULE HANDBOOK

Module Name	Industrial Microbiology
Module level, if applicable	Bachelor
Code, if applicable	BIO414061
Subtitle, if applicable	-
Courses, if applicable	Microbiology (Mikrobiologi)
Semester(s) in which the module is taught	6 th (sixth)
Person responsible for the module	Chair of Microbiology Scientific Field
Lecturer(s)	Dr. Arifah Khusnuryani, M.Si./Lela Susilawati, S.Pd., M.Si., Ph.D.
Language	Indonesia
Relation to curriculum	Elective course in the third year (2 nd semester) Bachelor Degree
Type of teaching, contact hours	100 minutes lectures, 120 minutes structured activities, 120 minutes individual study, and 170 minutes laboratory practical per week.
Workload	Total workload is 90,67 hours per semester, which consists of 100 minutes lectures per week for 14 weeks, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	3 credits (4,5 ECTS)
Requirements according to the examination regulations	Students must meet a minimum attendance of 75% of the total meetings to be able to take the final exam.
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Able to explain the urgency and role of microbes in the industrial sector. CO 2. Able to identify the microbes that play a role and the nutrient requirements needed on a large scale (industry). CO 3. Able to analyse the metabolism that occurs in microbes and improvise microbial strains in the industrial field. CO 4. Able to analyse upstream and downstream processes in the industrial sector. CO 5. Able to analyse product development processes, regulations, and processing of waste produced in industry. CO 6. Able to demonstrate the process of making microbial-based products and analyze the quality of the products.
Content	1. Study and scope of industrial microbiology 2. Media and microbial nutrition 3. Microbial bioprocesses in industry 4. Industrial waste management

Study and examination requirements and forms of examination	The final mark will be weighted as follows:					
	NO		Assessment methods (components, activities)			Weight (percentage)
	1		Final Examination			30%
	2		Mid-Term Examination			30%
3		Class Activities : Quiz, Homework, etc.			40%	
The final assessment is expressed in the form of a letter value converted from a number value with the following categories:						
NO		Number Value	Letter Value	NO	Number Value	Letter Value
1		≥ 95	A	7	65-69.99	B/C
2		90-94.99	A-	8	60-64.99	C+
3		85-89.99	A/B	9	55-59.99	C
4		80-84.99	B+	10	50-54.99	C-
5		75-79.99	B	11	55-34.99	D
6		70-74.99	B-	12	<35	E
Media employed	White-board, LCD Projector, e-learning (https://daring.uin-suka.ac.id/)					
Reading list	1. Microbial Physiology, Albert G.Moat, 2002, John W. Foster, Michael P.Spector 2. A Microbiology Laboratory Manual, 2018, Cappucino JG, Welsh C. 3. Okafor, Nduka, 2007, Modern Industrial Microbiology and Biotechnology, Science Publishers, New Hampshire (ebook available) http://site.iugaza.edu.ps/mwhindi/files/Modern-Industrial-MicrobiologyBiotech nology.pdf 4. Waites, M.J., Neil L. Morgan, John S. Rockey, Gary Higton, 2001, Industrial Microbiology: an Introduction, Blackwell Science 5. Singh, R. (2017). Microbial Biotransformation: A Process for Chemical Alterations. <i>Journal of Bacteriology & Mycology: Open Access</i>, 4(2). https://doi.org/10.15406/jbmoa.2017.04.00085					

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1				√							
CO 2				√	√	√					
CO 3				√	√	√			√		
CO 4				√	√	√			√		
CO 5					√	√			√		
CO 6				√					√		