



# UNIVERSITAS NEGERI YOGYAKARTA

## FACULTY OF MATHEMATICS AND SCIENCE DEPARTMENT OF BIOLOGY EDUCATION

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### Bachelor of Science in Biology

### MODULE HANDBOOK

Module name:	Industrial Microbiology Laboratory Work
Module level, if applicable:	Undergraduate
Code:	BIM6294
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	5 <sup>th</sup>
Module coordinator:	Anna Rakhmawati, M.Sc.
Lecturer(s):	Anna Rakhmawati, M.Sc., Nur Aeni Ariyanti, Ph.D
Language:	Bahasa Indonesia
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	320 minutes structured activities, and 120 minutes individual study per week
Workload:	Total workload is 90 hours per semester which consists of 320 minutes structured activities, and 120 minutes individual study per week for 16 weeks.
Credit points:	2 SKS (3 ECTS)
Prerequisites course(s):	Biochemistry, Microbiology, and Mycology
Course Outcomes	After taking this course, the students have ability to: CO1. Isolate, screen and do strain improvement of microorganisms used in industry CO2. Do microbial cultivation and fermentation CO3. Use appropriate method to purify fermentation product CO4. Explain industrial waste management using microbes
Content:	This course will discuss about the isolation, selection and identification of industrial microorganisms and the factors effecting the productivity of those microbes and also the

	quality of the product.																				
Study / exam achievements:	The final mark will be weight as follow:																				
	<table border="1"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1 to CO4</td> <td>Observed attitudes , knolwedge, and skills</td> <td>Survey, test, rubrics and manuals</td> <td>60%</td> </tr> <tr> <td>2</td> <td>Finall test</td> <td></td> <td></td> <td>40%</td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1 to CO4	Observed attitudes , knolwedge, and skills	Survey, test, rubrics and manuals	60%	2	Finall test			40%	Total				100%
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2	Finall test			40%																	
Total				100%																	
Forms of media:	Direct sample and model																				
Reference:	<p>A. Okafor, N. 2007. <i>Modern Industrial Microbiology and Biotechnology</i>. USA: Science Publisher.</p> <p>B. Tortora, G.J., Funke, B.R. and Case, C. L. 2007. <i>Microbiology an introduction</i>, 9th ed. USA: Benjamin Cummings.</p> <p>C. Waites, M.J., Morgan, N. L., Rockey, J.S., and Higton, G. 2001. <i>Industrial Microbiology: an introduction</i>, UK: Blackwell Science.</p> <p>D. Madigan, M.T., Martinko, J.M. and Parker, J. 1997. <i>Brock Biology of Microorganisms</i>, 8th ed. USA: Prentice Hall International Inc.</p> <p>E. Ratledge, C., and Kristiansen, B. 2001. <i>Basic Biotechnology</i>. USA: Cambridge University Press.</p> <p>F. Stanbury P. F., Whitaker, A., and Hall, S. J. 1995. <i>Principles of fermentation technology</i>. USA: Elsevier Science ltd.</p>																				

### PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CO1				✓		✓					✓
CO2				✓		✓					✓
CO3				✓		✓			✓		✓