MODULE HANDBOOK

Module Name :	Biotechnology
Module level :	Bachelor
Course Code :	4720102020
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term	7/ Fourth Year
Module coordinator(s)	Prof. Dr. Nuniek Herdyastuti, M.Si.
Lecturer(s):	Prof. Dr. Nuniek Herdyastuti, M.Si. Mirwa A. Anggarani, M.Si.
Language:	Indonesian
Classification within the curriculum:	~~Compulsory~~/ Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	Lecture: 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester. 79.33 total hours per semester ~ 3.18 ECTS**
Credit Point:	2 CU x 1.59 = 3.18 ECTS
Requirements:	-
Learning goals/competencies:	CLO 1 Students can understand about treatment techniques for microorganisms and their metabolic products CLO 2 Students can understand about concept of several types of metabolic regulation in microorganisms CLO 3 Students have basic concepts of genetic engineering/gene cloning, cloning vectors and restriction enzymes can understand about fermentation process CLO 4 Students have good morals, ethics and personality in biotechnology independently or in groups and are responsible for communicating the results CLO 5 Students can understand about gene cloning strategy using plasmid vectors, especially pBR322 and pUC8 and identification of recombinant clones CLO 6 Students understand about fermentation process

<table>
<tr><td>Content</td><td>This course studies basic principles of biotechnology, modern and conventional technique of biotechnology, metabolic regulation, cloning and bioinformatics. This course is presented in theory, practice, and simple engineering through literacy, discussion, and assignments.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class and outdoor setting</td></tr>
<tr><td>Study/exam achievements:</td><td>The final grade (NA) is calculated based on the following ratio:
<table>
<tr><td>Assessment Components</td><td>Percentage of contribution</td></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
</table>
Grade Conversion of 0-100 scale into 0-4 scale is set as below:
<table>
<tr><td>Letter</td><td>Number</td><td>Grade interval</td></tr>
<tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr>
<tr><td>A-</td><td>3.75</td><td>$80 \leq A- < 85$</td></tr>
<tr><td>B+</td><td>3.50</td><td>$75 \leq B+ < 80$</td></tr>
<tr><td>B</td><td>3.00</td><td>$70 \leq B < 75$</td></tr>
<tr><td>B-</td><td>2.75</td><td>$65 \leq B- < 70$</td></tr>
<tr><td>C+</td><td>2.50</td><td>$60 \leq C+ < 65$</td></tr>
<tr><td>C</td><td>2.00</td><td>$55 \leq C < 60$</td></tr>
<tr><td>D</td><td>1.00</td><td>$40 \leq D < 55$</td></tr>
<tr><td>E</td><td>0.00</td><td>$0 \leq E < 40$</td></tr>
</table></td></tr>
<tr><td>Learning Methods :</td><td>Individuals assignment, group assignment, discussion, presentation, and practicum</td></tr>
<tr><td>Form of Media:</td><td>Computer, LCD, White board</td></tr>
<tr><td>Literature (primary references):</td><td>1. Glick, B.R., and Pasternak, J.J., 1994, Molecular Biotechnology : Principles and Application of Recombinant DNA, Washington, D.C : ASM Press
2. Mousdale, D.M. 2008. Biofuels Biotechnology, Chemistry and Sustainable Development, Taylor & Francis Group, LLC
3. Judoamidjojo, Darwis dan Said, 1992, Teknologi Fermentasi, Jakarta : C.V. Rajawali Pers.
4. Aehle W, 2007, Enzyme in industry : Production and Application, 3rd edition, Wiley-VCH Verlag GMBH & Co. KgaA Netherland Stanlury and Whitaker, 1984, Principles of Fermentation Technology, New York : Pergamon Press Ltd.</td></tr>
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Notes:	*1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018. For lab activity: 1 sks in learning process = two periods consist of: (a) scheduled lab activity (100 minutes); (b) structured lab activity (70 minutes);
	**1 sks = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019