



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:	Laboratory Work for Enzimology
Module level, if applicable:	Undergraduate
Code:	BIM6184
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	Even
Module coordinator:	Evy Yulianti, M.Sc
Lecturer(s):	Evy Yulianti, M.Sc
Language:	Bahasa Indonesia
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	170 minutes Lab work per week
Workload:	Total workload is 46 hours per semester which consists of 170 minutes lab work per week for 16 weeks.
Credit points:	1SKS (1 ECTS)
Prerequisites course(s):	Biochemistry
Programme Learning Outcomes	<ol style="list-style-type: none">(PLO 4) Mastering the structure of biological sciences in depth (core biology) to solve problems faced in the field of biology (problem solving) and as capital in mastering other related science (related science).(PLO 5) Mastering biology laboratory techniques and equipment, as well as mastering biological scientific methodology used to obtain biological knowledge (how we know what we know).

	<p>3. (PLO 6) Adaptive, creative, and innovative in applying biology and related sciences.</p> <p>4. (PLO 7) Skill in applying biological techniques in the laboratory and daily life.</p> <p>5. (PLO 9) Able to pursue a career or create employment opportunities / entrepreneurship in the field of biology.</p> <p>6. (PLO 10) Having managerial ability to supervise and evaluate workers who are under their responsibility, and optimize network collaboration to develop professionalism.</p> <p>7. (PLO 11) Having scientific skills as a supporter of public speaking skills in local, national and international forums.</p>																				
Course Outcomes	<p>After taking this course, the students have ability to:</p> <p>CO1. Gain an understanding of the the basic principles of enzyme activity and their application.</p> <p>CO2. Demonstrate the basic lab technique for enzyme and implement scientific methods for experiments and hypotesis testing to do the qualitative test of enzyme activity from plant</p> <p>CO3. Demonstrate the basic lab technique for enzyme and implement scientific methods for experiments and hypotesis testing to do the qualitative test of enzyme activity from animal</p> <p>CO4. Demonstrate the basic lab technique for enzyme and implement scientific methods for experiments and hypotesis testing to do the qualitative test of enzyme activity from microbes</p> <p>CO5. Implement scientific method during the process of experiment and communicate the scientific reasoning and data analysis effectively in the oral and written forms</p>																				
Content:	<p>Lab Work of Enzymology study the mechanism of the enzyme activity. Selected topics include: Enzymes activity from plant, Enzymes activity from animal, Enzymes activity from microbes.</p>																				
Study / exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1" data-bbox="621 1575 1429 1869"> <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 CO5</td> <td>Observed attitudes , knolwedge, and skills</td> <td>Survey, test, rubrics and manuals</td> <td>60%</td> </tr> <tr> <td>2</td> <td>Review session</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 CO5	Observed attitudes , knolwedge, and skills	Survey, test, rubrics and manuals	60%	2	Review session			40%	Total				100%
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Total				100%																	

Forms of media:	Real object, chemicals
Reference:	<p>A. Berg, J. M., Tymoczko, J. L., Stryer, L., & Stryer, L. 2002. <i>Biochemistry</i>. New York: W.H. Freeman.</p> <p>B. Devlin, T.M., 1997. <i>Textbook of Biochemistry with Clinical Correlations</i>. 4th edition. WileyLiss, Inc., New York.</p> <p>C. Lehninger, A. L., Nelson, D. L., & Cox, M. M. 2000. <i>Lehninger principles of biochemistry</i>. New York: Worth Publishers</p> <p>D. Lieberman, M. and Peet A. 2018. <i>Marks' basic medical biochemistry: a clinical approach</i>. 5th edition. Wolters Kluwer. Philadelphia.</p> <p>E. Murray, R.K., Bender D. A., Botham, K.M., Kennelly,P.J., RodwellV. W., Weil, P. A. 2009. <i>Harper's Illustrated Biochemistry</i>. 28th edition. The McGraw-Hill Companies, Inc. New York.</p> <p>F. Nelson, D. L. and Cox,M. M. 2017. <i>Principles of Biochemistry</i>. 7th edition. W. H. Freeman and Company. New York.</p> <p>G. Frey, P. A. and Hegeman, A D. 2007. <i>Enzymatic Reaction Mechanisms</i>. Oxford University Press</p> <p>H. Illanes, A. 2008 . <i>Enzyme Biocatalysis Principles And Applications</i>. Springer Science</p> <p>I. Bisswanger, H. 2008. <i>Enzyme Kinetics Principles And Methods</i>. Wiley-Vch Verlag Gmbh & Co. Kga, Weinheim, Germany</p> <p>J. Taylor, K. B. 2004. <i>Enzyme Kinetics And Mechanisms</i>. Kluwer Academic Publishers</p>

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CO1				✓							
CO2				✓	✓		✓			✓	
CO3				✓	✓		✓			✓	
CO4				✓	✓		✓			✓	
CO5				✓	✓	✓	✓		✓	✓	✓