

## Module Description

### MPK 3503 Biochemistry Laboratory

<b>Module Name</b>	<b>Biochemistry Laboratory</b>
<b>Module level, if applicable</b>	Undergraduate Programme
<b>Code, if applicable</b>	MPK 3503
<b>Subtitle, if applicable</b>	-
<b>Course, if applicable</b>	-
<b>Semester(s) in which the module is taught</b>	5 <sup>th</sup> Semester
<b>Module coordinator(s):</b>	Puji Ardiningsih, S.Si.,M.Si
<b>Lecturer</b>	Prof. Risa Nofiani,Ph.D., Puji Ardiningsih, S.Si.,M.Si
<b>Language</b>	Bahasa Indonesia
<b>Relation to curriculum</b>	<i>Compulsory</i> Courses for the undergraduate programme in Chemistry
<b>Type of teaching, contact hours</b>	<ul style="list-style-type: none"> <li>● Laboratory work: 9 meetings</li> <li>● Self-study: 5 meetings</li> <li>● Tutorial/assistance: 1 meeting</li> <li>● Examination: 1 meeting</li> </ul>
<b>Workload</b>	<p><i>(Estimated)</i></p> <p><i>Contact hours (laboratory work): 9 x 5,66 hours = 50,94 hours</i></p> <p><i>Self-study, including examination preparation, specified in hours: 5 x 5,66 hours = 28,3 hours</i></p> <p><i>Tutorial/assistance: 1 x 5,66 hours = 5,66 hours</i></p> <p><i>Examination: 1 x 5,66 hours = 5,66 hours</i></p> <p><i>Total workload: 90,56 hours per semester</i></p>
<b>Credit points</b>	2 (3.34 ECTS)
<b>Requirements according to the examination regulations</b>	Registered in this course 100% attendance in this course
<b>Learning goals/competencies:</b>	<b>Intended Learning Outcomes (ILO)</b> After taking this course, students will be able to: <ul style="list-style-type: none"> <li>● LO-1</li> <li>● LO-2</li> <li>● LO-4</li> </ul>

	<ul style="list-style-type: none"> <li>• LO-5</li> </ul>
<b>Module objectives</b>	<ul style="list-style-type: none"> <li>• Students are able to isolate DNA chromosomes.</li> <li>• Students are able to identify DNA using DNA electrophoresis.</li> <li>• Students are able to prove the occurrence of protein catabolism in bacterial cells.</li> <li>• Students are able to prove the occurrence of folding proteins</li> <li>• Students are able to prove the isoelectric point (pI) of proteins and identify types of amino acids qualitatively.</li> <li>• Students are able to extract and determine the kinetics of invertase enzymes from <i>Saccharomyces cereviceae</i> cells, as well as calculate their protein levels.</li> <li>• Students are able to determine the optimum temperature and pH for the activity of invertase enzyme extracts.</li> <li>• Students are able to isolate starch carbohydrates from cassava, prove starch hydrolysis with amylase enzymes, and measure sugar concentration using methods of spectrophotometry.</li> <li>• Students are able to extract and recognize the different types of lipids in cellular membranes.</li> </ul>
<b>Content:</b>	<ul style="list-style-type: none"> <li>• DNA isolation</li> <li>• DNA Electrophoresis</li> <li>• Protein Metabolism</li> <li>• Characterization of Protein Folding</li> <li>• Isolation of Casein Protein Fraction And Identification Test For Amino Acids</li> <li>• Isolation of Invertase Enzyme from Commercial Baker's</li> <li>• Characterization of the invertase enzyme</li> <li>• Isolation of starch and starch Hydrolysis by Amylase Enzyme</li> <li>• Lipid and membrane</li> </ul>
<b>Attribute Soft skill:</b>	Discipline, effort, collaboration, responsibility, and argumentation in the natural classroom setting
<b>Recommended prerequisites</b>	Fundamentals of Organic Chemistry Laboratory

<b>Study and examination requirements and forms of examination</b>	<p>Students are considered to be competent and pass if they get at least 50% of the maximum final grade. The final grade (NA) is calculated based on the following :</p> <table border="1" data-bbox="602 373 1122 743"> <thead> <tr> <th>Assessment Components</th><th>Percentage Contribution</th></tr> </thead> <tbody> <tr> <td>Pre-test/quiz</td><td>10%</td></tr> <tr> <td>Practical journal</td><td>20%</td></tr> <tr> <td>Practical skills</td><td>20%</td></tr> <tr> <td>Practical report</td><td>25 %</td></tr> <tr> <td>Final test</td><td>25%</td></tr> <tr> <td><b>Total</b></td><td><b>100%</b></td></tr> </tbody> </table> <p>Form of examination:  <b>Assignment and semester final test are carried out as an essay exam</b></p>	Assessment Components	Percentage Contribution	Pre-test/quiz	10%	Practical journal	20%	Practical skills	20%	Practical report	25 %	Final test	25%	<b>Total</b>	<b>100%</b>
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<b>Total</b>	<b>100%</b>														
<b>Learning Methods</b>	Case-Based Teaching Method for doing each laboratory work														
<b>Media employed</b>	Lab equipment, slide power point, and white board														
<b>Reading list</b>	<ul style="list-style-type: none"> <li>● Boyer,R.F. 1993. Modern Experimental Biochemistry. 2<sup>nd</sup> ed., The Benyamin/Cumming Publishing Company Inc, California.</li> <li>● Brewer, J. M., 1976, <i>Experimental Technique in Biochemistry</i>, Prentice-Hall.</li> <li>● Crandall, G. D., 1983, <i>Selected Exercise for The Biochemistry Laboratory</i>, Oxford University Press.</li> <li>● Plummer, D.T., 1978. An Introduction to Practical Biochemistry 3<sup>rd</sup>ed., Mc Graw-Hill Publishing Co Ltd, London</li> <li>● Rosenberg I,M. 196. Protein Analysis_and Purification. Benchtop Techniques. Birkhauser Boston.</li> </ul>														