

# Module Description

## MPK 3503 Biochemistry Laboratory

<b>Module Name</b>	Biochemistry Laboratory
<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):</i> <math>9 \times 5,66 \text{ hours} = 50,94 \text{ hours}</math></p> <p><i>Self-study, including examination preparation, specified in hours:</i> <math>5 \times 5,66 \text{ hours} = 28,3 \text{ hours}</math></p> <p><i>Tutorial/assistance:</i> <math>1 \times 5,66 \text{ hours} = 5,66 \text{ hours}</math></p> <p><i>Examination:</i> <math>1 \times 5,66 \text{ hours} = 5,66 \text{ hours}</math></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>	<p><b>Intended Learning Outcomes (ILO)</b></p> <p>After taking this course, students will be able to:</p> <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="600 375 1122 745"> <thead> <tr> <th data-bbox="600 375 910 460">Assessment Components</th><th data-bbox="910 375 1122 460">Percentage Contribution</th></tr> </thead> <tbody> <tr> <td data-bbox="600 460 910 508">Pre-test/quiz</td><td data-bbox="910 460 1122 508">10%</td></tr> <tr> <td data-bbox="600 508 910 557">Practical journal</td><td data-bbox="910 508 1122 557">20%</td></tr> <tr> <td data-bbox="600 557 910 606">Practical skills</td><td data-bbox="910 557 1122 606">20%</td></tr> <tr> <td data-bbox="600 606 910 654">Practical report</td><td data-bbox="910 606 1122 654">25 %</td></tr> <tr> <td data-bbox="600 654 910 703">Final test</td><td data-bbox="910 654 1122 703">25%</td></tr> <tr> <td data-bbox="600 703 910 745"><b>Total</b></td><td data-bbox="910 703 1122 745"><b>100%</b></td></tr> </tbody> </table> <p>Form of examination:</p> <p><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>
Assessment Components	Percentage Contribution														
Pre-test/quiz	10%														
Practical journal	20%														
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Practical report	25 %														
Final test	25%														
<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>														