



**Diponegoro University**  
**Faculty of Science and Mathematics**  
**Undergraduate Program Of Chemistry**

Module designation	<b>Experimental in Biochemistry (PBiK)</b>
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. M. Asy'ari, M.Si,
Language	Indonesian
Relation to curriculum	Compulsory <del>/elective/</del> <del>specialisation</del>
Teaching methods	Labwork
Workload (incl. contact hours, self-study hours)	Face to Face: 1 x (1 x 50 min); Self Study : 1 x (1 x 60 min); Structured tasks : 1 x (1 x 60 min)
Credit points	1
Required and recommended prerequisites for joining the module	Bio1

Module objectives/intended learning outcomes	<ol style="list-style-type: none"><li>1. Demonstrate a responsible attitude towards work in their area of expertise independently (S9)</li><li>2. Able to apply logical, critical, systematic, and innovative thinking in the development or implementation of science and technology that pays attention to and uses humanities values by their field of expertise. (KU1)</li><li>3. Able to produce appropriate conclusions based on the identification, analysis, isolation, transformation, and synthesis of chemicals that have been carried out. (KK1)</li><li>4. Able to solve science and technology problems in general chemistry and uncomplicated scopes such as identification, analysis, isolation, transformation, and synthesis of micro-molecules through the application of knowledge of structure, properties, kinetics, and energetics of molecules and chemical systems, with methods analysis and synthesis in specific chemical fields, as well as the application of relevant technologies. (KK2)</li><li>5. Able to analyze several alternative solutions in identification, analysis, isolation, transformation, and synthesis of available chemicals and present analysis conclusions for appropriate decision making. (KK3)</li><li>6. Able to use software to determine the structure and energy of micromolecules, software to assist analysis and synthesis in general or more specific chemical fields (organic, biochemical, or inorganic), and for data processing (analytical chemistry). (KK4)</li><li>7. Mastering the theoretical concepts of structure, properties, changes, kinetics, and energetics of molecules and chemical systems, identification, separation, characterization, transformation, synthesis of micromolecular chemicals, and their application. (PP1)</li></ol>
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Content

1. Preparation of Practical Tools and Materials
2. Assistance
3. LIPID: Qualitative and Quantitative Analysis  
Qualitative Analysis:
  - Peroxide Test
  - Phosphate test on lecithin
  - Cholesterol test (Lieberman-Burchard)Quantitative Analysis:
  - Determination of the iodine number
  - Determination of the number of saponification
4. ENZYMES: Effect of Heating and Inhibitors on Enzyme Activity
  - Pancreatic amylase enzyme activity test
  - Pancreatic lipase enzyme activity test
5. URINE: Identification of Compounds in Urine  
Organic Compounds In Urine:
  - Breakdown of urea by urease
  - Test for reducing sugar
  - Test for creatinine
    - A. JAFFE Experiment
    - B. WEYL Experiment
  - Test for the presence of uric acid and its salts
    - A. Muroxide Experiment
    - B. Silver Reduction Experiment (SCHIFF)
  - Test for the presence of ketone compounds (Rhotern experiment)
  - Test for the presence of proteinInorganic Compounds In Urine:
  - Test for the presence of ammonia
  - Test for the presence of chloride
  - Test for the presence of phosphate and calcium
  - Test for sulfate
6. Microbiology: Isolation and cultivation of microbes
  - Manufacture of liquid nutrient medium
  - Preparation of nutrient agar medium
  - Bacterial isolation
  - Growing bacteria in a liquid nutrient medium
  - Planting bacteria on agar slanted
7. Isolation and Purification of the Early Stage of Alpha Amylase Enzyme
8. Determination of Specific Activity of -amylase Enzyme
  - Determination of Reducing Sugar Content by the Nelson Somogyi Method
  - Determination of Protein Content by Lowry Method
9. Isolation and Characterization of DNA  
Isolation of DNA with a Simple Method  
Characterization of DNA
10. Bioinformatics: phylogenetic analysis - Searching bioinformatics data through internet databases
  - Computational preparation of bioinformatics data

	- Phylogenetic analysis using BIOEDIT and MEGA 6 . software
Exams and assessment formats	Response
Study and examination requirements	
Reading list	<ol style="list-style-type: none"> <li>1. Benyamin, H., (1960), Laboratory Manual of Biochemistry, fifth edition W.B. Saunders Company, Philadelphia, London.</li> <li>2. Plummer T.D., (1978), An Introduction to Practical Biochemistry, Second edition, Tata McGraw-Hill Publishing Company Ltd, New Delhi.</li> <li>3. Capuccino, J. G. and Sherman, N., (2001), "Microbiological: A Laboratory Manual", Addison-Wesley Publishing Company, New York, Page: 456.</li> <li>4. Scopes, R.K., (1998), "Protein Purification", Springer-Verlag, New York, page: 45-54</li> <li>5. Colowick, S.P. and Kaplan, N.O. (1957) "Methods in Enzimology", vol. III, Acad. Press. Inc., New York, 448-450</li> <li>6. Doyle, J.J. and J.L. Doyle. 1987. A rapid DNA isolation procedure for small quantities of fresh leaf tissue. Phytochem. Bull. 19: 11-15</li> <li>7. Tamura, K., Stecher, G., Peterson, D., Filipski, A. &amp; Kumar, S. (2013): MEGA6: Molecular evolutionary genetics analysis version 6.0, Mol. Biol. Evol., 30 (12), 2725–2729.</li> </ol>