



Diponegoro University
Faculty of Science and Mathematics
Undergraduate Program Of Chemistry

Module designation	Biochemistry 1 (Bio1)
Semester(s) in which the module is taught	4
Person responsible for the module	Purbowatiningrum Ria S, S.Si., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory/ elective / specialisation
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Face to Face = 1x3x50" Structured tasks + Self Study = 1x(3x60"+3x60")
Credit points	3
Required and recommended prerequisites for joining the module	General Chemistry 2 (KD2)

<p>Module objectives/intended learning outcomes</p>	<p>(S9) Demonstrates an attitude of being responsible for work in his field of expertise independently</p> <p>(KU1) 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</p> <p>(KU2) Able to demonstrate independent, quality, and measurable performance</p> <p>(PP1) 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</p> <p>(M1) Able to explain, understand, and implement chemical concepts in the Cell Molecular Organization and Cell Structure Organization hierarchy</p> <p>(M2) Able to explain and understand the characteristics of the biomolecules that make up cells</p> <p>(M3) Able to explain, understand the characteristics of complex biomolecules that make up cell membranes and implement (P2) chemical concepts in the structure and function of biomolecules in cell membrane transport systems</p> <p>(M4) Able to explain, understand the characteristics of the amino acids that make up Protein and the three-dimensional structure of proteins, implement them in the application of chemical concepts in studying the three-dimensional structure of proteins</p> <p>(M5) Able to explain Protein as Biocatalyst (Enzyme): structure, mechanism, kinetics, and inhibition of enzymatic reactions</p> <p>(M6) Able to explain and understand the structure and function of nucleic acids</p> <p>(M7) Able to explain and understand the mechanism of the concept of protein synthesis</p>
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Content	<ol style="list-style-type: none"> 1. Overview of the Biological Chemistry course regarding the composition, structure, and function of the biomolecules that make up cells. 2. Structure, nature, and function of carbohydrates (amylose, amylopectin, cellulose, glycogen, etc.) as components of cell membranes and non-membranes. 3. The structure of the nature of complex carbohydrates (glycolipids, glycoproteins, proteoglycans, etc.) as components of the cell 4. Structure, properties, and function of simple lipids as components of cells 5. Complex lipids' structure, properties, and function as components of cell triglycerides, phospholipids, cholesterol, steroids, waxes, sphingolipids, prenolipids, sacarolipids polyketides, lipoproteins, etc. 6. The structure, properties, and functions of complex proteins as components of cells: triglycerides, phospholipids, cholesterol, steroids, waxes, sphingolipids, prenolipids, sacarolipids, polyketides, lipoproteins, etc. 7. The role of biomolecules that make up cell membranes in the transport system between cell membranes 8. Types and Properties of Amino Acids, Types and functions of proteins: fibrous and globular proteins. 9. Protein structure: primary, secondary, tertiary, and quaternary structure. Factors affecting the stability of protein structure. 10. Enzyme constituent components: holoenzyme, apoenzyme, cofactor, and coenzyme. Enzyme Classification 11. Enzymatic reaction mechanism Kinetics and inhibition of enzymatic reactions Structure and function of nucleic acids in cells - DNA structure and function - RNA structure and function 12. Protein
Exams and assessment formats	Mid-Semester Exam and Final Exam
Study and examination requirements	Participatory Activities -5% Project Results -30% Cognitive/Task Knowledge -20% Task -5% Mid-semester -20% Final exams -20%

Reading list

1. Devlin, T.M., (2010), Textbook of Biochemistry With Clinical Correlations, Nine Edition, Wiley-Liss, Inc, USA
2. Lehninger, (2013), Biochemistry, five edition, Worth Publisher, Inc, USA
3. Mathews, C.K., and Van Holde, K.E., (2013), Biochemistry, 4th edition, The Benjamin/Cummings Publishing Company, Inc, California, USA
4. Voet, D., and Voet, J.G., (2011), Biochemistry, John Wiley and Sons, New York, USA