

## MODULE HANDBOOK

Module Name	Structure and Function of Biomolecules
Module level	Bachelor
Abbreviation, if applicable	8420402037
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	5 <sup>th</sup> /Third Year
Module coordinator(s)	Prof. Dr. Leny Yuanita, M.Kes.
Lecturer(s)	Prof. Dr. Leny Yuanita, M.Kes.; Prof. Dr. Hj. Rudiana Agustini, M.Pd.; Dr. Nuniek Herdyastuti, M.Si.; Dr. Prima Retno Wikandari, M.Si.; Mirwa Adiprahara Anggarani, S.Si., M.Si.
Language	Indonesian
Classification within the curriculum	Compulsory Course
Teaching format/class hours per week during the semester:	2 hours lecturers (50 min per hours)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit points:	2 SCU = 2 x 1.59 = 3.18 ECTS
Prerequisite course(s):	Organic Chemistry II
Targeted learning outcomes:	<p>CLO 1. Students have knowledge of the structure of macro molecules: carbohydrates, proteins, fats, nucleic acids; the function or role of macromolecules and vitamins, minerals, hormones in organism.</p> <p>CLO 2. Students mastering the concept of structure and function of macromolecules carbohydrate, protein, fat, nucleic acid; as well as vitamins and minerals in organism.</p> <p>CLO 3. Students have the ability to utilize learning resources and ICT to support mastery of concepts and theories of Biochemistry.</p> <p>CLO 4. Students have the ability to solve science and technology problems in biochemistry and in a simple scope through the application of knowledge of the structure and function of macromolecules, and relevant technology.</p> <p>CLO 5. Students have responsibility and independent in their attitude in their expertise field</p>
Content:	<b>The molecules of organisms and their composition:</b> Characteristics of living matter, Biochemistry in living matter, Cells as the smallest unit of life, Basic structure of cells and their functions, Organization of molecules in cells, Energy for living systems <b>Structure and function of</b>

	<p><b>carbohydrates:</b> Classification of carbohydrates, structure of carbohydrates, function of carbohydrates in biological systems,</p> <p><b>Structure and function of proteins:</b> The structure and properties of amino acids, Peptide bonds and functions, Separation and purification of amino acids, Homologs protein, Structure of protein, Fibrous and globular proteins, Protein genetic disorders</p> <p><b>Structure and function of enzymes:</b> Structure, properties and functions of enzymes. Enzyme nomenclature, Enzymatic reaction kinetics, Factors affecting enzyme activity, Enzyme inhibition, Multi-enzyme systems.</p> <p><b>Structure and function of vitamins and minerals:</b> Types of vitamins, Structure and role in enzyme function, Inorganic elements needed in nutrition and their role in enzyme function.</p> <p><b>Structure and function of nucleic acids:</b> Components of nucleosides, Nucleosides, Nucleic acids, Structure of nucleic acids, Free nucleotides, Properties of DNA, RNA, Role of nucleic acids in protein synthesis</p> <p><b>Structure and function of lipids and bio- membranes:</b> Structure and function of lipids; the main component of Membrane.</p>										
Study / exam achievements:	<p>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:</p> <table border="1" data-bbox="643 1099 1449 1339"> <thead> <tr> <th>Assessment Components</th> <th>Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> </tr> <tr> <td>Assignment</td> <td>30%</td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> </tr> <tr> <td>Final semester test</td> <td>30%</td> </tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%
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Final semester test	30%										
Media:	Computer, LCD, White board										
Learning Methods	Individuals assignment, group assignment, discussion and presentation.										
Literature:	<p>Koolman, J and Roehm K.H, 2005, <i>Color Atlas of Biochemistry 2nd edition</i>. Stutgard New York</p> <p>Lehninger, 1988, <i>Dasar-dasar Biokimia</i>, jilid 1, Terjemahan Maggi Thenawidjaya, Penerbit Erlangga, Jakarta</p> <p>Mathews,C.K and Van Holde K.E, 2000, <i>Biochemistry</i>, second ed., The Benjamin Cumming company, Inc.</p> <p>Nelson D.L., and Cox M.M., 2003, <i>Lehninger Principle of Biochemistry</i>, 4<sup>th</sup> edition, University of Winconsin- Madison</p> <p>Stryer, L., 1988, <i>Biochemistry</i>, third ed., New York : W.H. Freeman and company</p>										

Notes:	<p>*1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</p> <p>**1 CU = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019</p>
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