MODULE HANDBOOK

Module Name :	Structure and Function of Biomolecules
Module level :	Bachelor
Course Code :	
Abbreviation, if applicable:	8420402037
Courses included in the module, if applicable:	-
Semester/Term	5 th/Third Year
Module coordinator(s)	Prof. Dr. Rudiana Agustini, M.Pd.
Lecturer(s):	Prof. Dr. Rudiana Agustini, M.Pd. Prof. Dr. Nuniek Herdyastuti, M.Si. Dr. Prima Retno Wikandari, M.Si. Mirwa Adi Prahara, M.Si
Language:	Indonesian
Classification within the curriculum:	Compulsory/ ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	Lecture: 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester. 79.33 total hours per semester ~ 3.18 ECTS**
Credit Point:	2 sks (3.18 ECTS)
Requirements:	Organic chemistry II
Learning goals/competencies:	1. Students have knowledge of the structure of macromolecules: carbohydrates, proteins, fats, nucleic acids; the function or role of macromolecules and vitamins, minerals, hormones in organisms. (CLO 1) 2. Students mastering the concept of structure and function of macromolecules carbohydrate, protein, fat, nucleic acid; as well as vitamins and minerals in organisms. (CLO 2) 3. Students have the ability to utilize learning resources and ICT to support mastery of concepts and theories of Biochemistry.(CLO 3) 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. (CLO 4) 5. Students have responsibility and independent attitude in their expertise field (CLO 5)
Content	**The molecules of organisms and their composition:** 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 **Structure and function of carbohydrates:** Classification of carbohydrates, structure of carbohydrates, function of carbohydrates in biological systems,

<table>
<tr><td></td><td>Structure and function of proteins: 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
Structure and function of enzymes: Structure, properties and functions of enzymes. Enzyme nomenclature, Enzymatic reaction kinetics, Factors affecting enzyme activity, Enzyme inhibition, Multi-enzyme systems.
Structure and function of vitamins and minerals: Types of vitamins, Structure and role in enzyme function, Inorganic elements needed in nutrition and their role in enzyme function.
Structure and function of nucleic acids: Components of nucleosides, Nucleosides, Nucleic acids, Structure of nucleic acids, Free nucleotides, Properties of DNA, RNA, Role of nucleic acids in protein synthesis
Structure and function of lipids and biomembranes: Structure and function of lipids; the main component of Membrane.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class and outdoor setting</td></tr>
<tr><td>Study/exam achievements:</td><td>The final grade (NA) is calculated based on the following ratio:
<table>
<tr><td>Assessment Components</td><td>Percentage of contribution</td></tr>
<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>
</table>
Grade Conversion of 0-100 scale into 0-4 scale is set as below:
<table>
<tr><td>Letter</td><td>Number</td><td>Grade interval</td></tr>
<tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr>
<tr><td>A-</td><td>3.75</td><td>$80 \leq A- < 85$</td></tr>
<tr><td>B+</td><td>3.50</td><td>$75 \leq B+ < 80$</td></tr>
<tr><td>B</td><td>3.00</td><td>$70 \leq B < 75$</td></tr>
<tr><td>B-</td><td>2.75</td><td>$65 \leq B- < 70$</td></tr>
<tr><td>C+</td><td>2.50</td><td>$60 \leq C+ < 65$</td></tr>
<tr><td>C</td><td>2.00</td><td>$55 \leq C < 60$</td></tr>
<tr><td>D</td><td>1.00</td><td>$40 \leq D < 55$</td></tr>
<tr><td>E</td><td>0.00</td><td>$0 \leq E < 40$</td></tr>
</table></td></tr>
<tr><td>Learning Methods :</td><td>Lecture using: Student-centered approach; and discussion; and presentations (structured activities)</td></tr>
<tr><td>Form of Media:</td><td>Video, Module, power point</td></tr>
<tr><td>Literature (primary references):</td><td>1. Koolman, J and Roehm K.H, 2005, Color Atlas of Biochemistry 2nd edition. Stutgard New York
2. Lehninger, 1988, Dasar-dasar Biokimia, jilid 1, Terjemahan Maggi Thenawidjaya, Penerbit Erlangga, Jakarta
3. Mathews,C.K and Van Holde K.E, 2000, Biochemistry, second ed., The Benjamin Cumming company, Inc.</td></tr>
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	4. Nelson D.L., and Cox M.M., 2003, *Lehninger Principle of Biochemistry*, 4th edition, University of Wisconsin-Madison Stryer, L., 1988, *Biochemistry*, third ed., New York : W.H. Freeman and company
Notes:	*1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom (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. For lab activity: 1 sks in learning process = two periods consist of: (a) scheduled lab activity (100 minutes); (b) structured lab activity (70 minutes);
	**1 sks = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019