

MODULE HANDBOOK

Module Name :	Metabolism and Pathways of Genetics Information
Module level :	Bachelor
Course Code :	
Abbreviation, if applicable:	8420403034
Courses included in the module, if applicable:	-
Semester/Term	6 st /Third Year
Module coordinator(s)	Prof. Dr. Nuniek Herdyastuti, M.Si.
Lecturer(s):	Prof. Dr. Rudiana Agustini, M.Pd. Prof. Dr. Nuniek Herdyastuti, M.Si. Dr. Prima Retno Wikandari, M.Si. Mirwa Adiprahara A., M.Si.
Language:	Indonesian
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	Lecture: 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 Point:	2 CU x 1.59 = 4.77 ECTS
Requirements:	Structure and Function of Biomolecules
Learning goals/competencies:	1. Able to solve the problem of SCIENCE IN GENERAL CHEMISTRY and in simple spheres such as identification, analysis, isolation, transformation, and synthesis of micromolecules, through the application of structures, properties, molecular changes, energy and kinetics 2. Able to solve the science and technology in the field of biochemistry, especially related to metabolism and processing of genetic information, based on the study of science and methods of analysis and synthesis, as well as the application of relevant technologies. 3. Have knowledge of : a) metabolism and regulation of biomolecules of carbohydrates, lipides, and proteins, b) the process of transfer of electrons in photosynthesis as well as c) the process of processing genetic information. 4. Demonstrate the responsible attitude of his work in biochemical learning II independently

Content	Metabolic aspects and their role in living cells : Macro and micro metabolic aspects, energy cycles Carbohydrate Catabolism : Glycolysis, Glycogenesis, Anaerobic Reactions (Fermentation), Citric Acid Cycle, Oxidative Phosphorylation, ATP Calculation, Gluconeogenesis, Glyconeogenesis, Catabolism Control Photosynthesis : Dark reactions – light, Calvin Cycle, Hatch Cycle – Slack Amino acid catabolism and Purine - Pyrimidine : Intermediat pathways of amino acid catabolism, transaminases reactions, nitrogen secretion pathways in ammonotelism, ureotelic, and uricotelic, urea cycles. Synthesis of amino acids from ammonium through 3 enzymatic reactions and their regulation, synthesis of amino acids from glutamate transaminases reactions with α-keto acid, degradation and synthesis of Purines – Pyrimidine Lipide catabolism : Saturated fatty acid catabolism, Unsaturated fatty acid, and - oxidation, ketogenesis and control. Lipogenesis, anabolism in special fats, control Genetic Information Flow : Replication, Transcription, Translation and Lac Operon																																								
Attribute Soft skill:	Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class and outdoor setting																																								
Study/exam achievements:	The final grade (NA) is calculated based on the following ratio: <table><tr><th>Assessment Components</th><th>Percentage of contribution</th></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><th>Letter</th><th>Number</th><th>Grade interval</th></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>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%	Letter	Number	Grade interval	A	4.00	$85 \leq A \leq 100$	A-	3.75	$80 \leq A- < 85$	B+	3.50	$75 \leq B+ < 80$	B	3.00	$70 \leq B < 75$	B-	2.75	$65 \leq B- < 70$	C+	2.50	$60 \leq C+ < 65$	C	2.00	$55 \leq C < 60$	D	1.00	$40 \leq D < 55$	E	0.00	$0 \leq E < 40$
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Learning Methods :	Lecture using: Student-centered approach; and discussion; and presentations (structured activities)																																								

Form of Media:	Video, Module, power point
Literature (primary references):	1. Ayala, F.J. and Kieger, J.A. 1984. <i>Modern Genetics</i>. California: The Benjamin Cummings Publishing Company Inc.. 2. Koolman, J. and Roehm, K.H. 2005. <i>Color Atlas of Biochemistry</i>. 2nd edition. New York: Stutgard. 3. Lehninger. 1988. <i>Dasar-Dasar Biokimia</i> (I,II,III). Jakarta: Erlangga. 4. Mathew,C.K., van Holde, K.E., Ahern, K.G. 1999. <i>Biochemistry</i>. San Fransisco: Addison-Wesley Pub. Co. 5. Murray R.K., Granner R.K., Mayes P.A., and Rotwell V.W. 2003. <i>Harper's Illustrated Biochemistry</i>, The McGraw-Hill Companies 6. Nelson, D.L. and Cox, M.M. 2003. <i>Lehninger Principle of Biochemistry</i>. 4th edition. Madison: University of Winconsin. Styer, L., 1988. <i>Biochemistry</i>. 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