

MODULE HANDBOOK

Module Name	Metabolism and Pathways of Genetics Information
Module level	Bachelor
Abbreviation, if applicable	8420403034
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	6 th /Third Year
Module coordinator(s)	Prof. Dr. Lenny Yuanita, M.Kes
Lecturer(s)	Prof. Dr. Rudiana Agustini, M.Pd; Dr. Prima Retno Wikandari, M.Si; Dr. Nuniek Herdyastuti, 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:	3 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:	3 CU = 3 x 1.59 = 4.77 ECTS
Prerequisites course(s):	-
Targeted learning outcomes:	<p>CLO 1 Able to solve science and technology problems in the field general chemistry and in simple environments such as reporting, analysis, isolation, transformation, and synthesis of micromolecules, through the application of their structure, properties, molecular changes, energy and kinetics.</p> <p>CLO 2 Able to solve science and technology problems in the field of biochemistry, especially those related to metabolism and genetic information processing, based on scientific studies and analysis and synthesis methods, as well as the application of relevant technology.</p> <p>CLO 3 Have knowledge of: a) metabolism and regulation of carbohydrate, lipid and protein biomolecules, b) electron transfer processes in photosynthesis and c) genetic information processing.</p> <p>CLO 4 Demonstrate a responsible attitude in his work in learning Metabolism and Pathways of Genetics Information independently.</p>
Content:	<p>Metabolic aspects and their role in living cells: Macro and micro aspects of metabolism, energy cycles.</p> <p>Carbohydrate Catabolism: Glycolysis, Glycogenesis, Anaerobic reactions (Fermentation), citric acid cycle, Oxidative phosphorylation,</p>

	<p>ATP calculation, Gluconeogenesis, Glyconeogenesis, Catabolism control.</p> <p>Photosynthesis: Dark - light reaction, Calvin Cycle, Cycle Hatch – Slack</p> <p>Amino acid and purine catabolism - Pyrimidines: Intermediate pathways for amino acid catabolism, transaminase reactions, ammonothelic, oreothelic, and uricotelic nitrogen secretion pathways, urea cycle. Synthesis of amino acids from ammonium through 3 enzymatic reactions and its regulation, synthesis of amino acids from the reaction of glutamate transaminases with α-keto acid, degradation and synthesis of purines – pyrimidines.</p> <p>Lipid Catabolism: Saturated fatty acid catabolism, unsaturated fatty acid catabolism, and oxidation, ketogenesis and control. Lipogenesis, anabolism in specific fats and control.</p> <p>Genetic Information Flow: Replication, Transcription, Translation and Lac Operon.</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="608 965 1414 1205"> <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%
Assessment Components	Percentage of contribution										
Participation	20%										
Assignment	30%										
Mid-semester test	20%										
Final semester test	30%										
Media:	Computer, LCD, White board										
Learning Methods	Individuals assignment, group assignment, discussion, presentation										
Literature:	<ol style="list-style-type: none"> 1. Ayala, F.J. and Kieger, J.A. 1984. <i>Modern Genetics</i>. California: The Benyamin 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. 7. Styer, L., 1988. <i>Biochemistry</i>. New York: W.H. Freeman and Company 										

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>