

## ADVANCED BIOCHEMISTRY

Module designation	<i>Advanced Biochemistry</i>
Semester(s) in which the module is taught	2
Person responsible for the module	1. Dr. apt. Nuzul Wahyuning Diyah, M.Si( <b>Course Coordinator</b> ) 2. Prof. Dr. apt. Purwanto 3. Prof. Dr. apt. Juni Ekowati, M.Si. 4. Dr. apt. Riesta Primaharinastiti, S.Si., M.Si.
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory / elective / specialisation</i>
Teaching methods	<i>lecture, discussion, assignment</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: Contact hours (structured activities.): 90,67 hours Private study including independent learning activities: 90,67 hours</i>
Credit points	<i>2 SCU / 6 ECTS</i>
Required and recommended prerequisites for joining the module	NA
Module objectives/intended learning outcomes	<p>Students are:</p> <p>LO1: Able to realize excellence based on religious morals (excellence with morality), able to work together, and show a responsible attitude to work in their field of expertise independently</p> <p>LO2: Able to internalize the spirit of independence, struggle, and entrepreneurship</p> <p>LO3: Able to develop and build logical-critical-systematic-creative thinking and scientific conceptions through scientific research, design creation, or artworks of science and technology that pays attention to and applies humanities values through an interdisciplinary or multidisciplinary approach in the form of a thesis or other equivalent forms.</p> <p>LO4: Able to develop a pharmaceutical professional performance with analytical acumen in solving pharmaceutical problems and managing research in the pharmaceutical field related to national and global systems and policies, both inter and inter-disciplinary approaches.</p> <p>LO5: Able to access and review information through an Information and Communication Technology (ICT) system, decide on a specific subject of study, maintain the feasibility of implementing research designs, conduct research, analyze data, conclude research results comprehensively, and create strategic issues based on the study that reflect the latest updates in the field of pharmaceutical sciences, and communicate them in the media and scientific forums at the national and international level through an interdisciplinary or multidisciplinary approach in the form of a thesis or other equivalent forms.</p> <p>LO14: Able to build drug management systems from active pharmaceutical ingredients to finished products that are ready for therapeutic uses.</p>

Content	<p>The Advanced Biochemistry course covers topics on advanced aspects of the chemical properties, functions, and metabolism of major biomolecules, which include:</p> <p>a) important role of intermolecular interactions in biochemical processes.</p> <p>b) biomolecules belonging to protein groups (secondary and tertiary structures of proteins, conformation and protein folding, enzymes, hemoglobin, complementary protein-ligand interactions, carbohydrate groups (sugar derivatives, heteroglycans, proteoglycans, glycolipids, glucuronic acids); lipid groups (essential fatty acids), cholesterol and other sterols, glycolipids, phospholipids, eicosanoids), nucleic acid and nucleotide groups.</p> <p>c) Biological membranes and transport membrane (ion channels, ion pumps, transmembrane receptors), membrane proteins as transporters.</p> <p>d) Biosignaling includes signal transduction, GPCRs, second messengers, tyrosine kinase receptor, cycle cell regulation, oncogenes, tumor suppressor genes, and apoptosis.</p> <p>e) techniques in protein biochemistry: enzymatic assay,</p> <p>f) Common techniques in protein biochemistry: enzymatic assay, electrophoresis, protein purification, chromatography, ELISA.</p>
Exams and assessment formats	<i>Take-home written assignments</i>
Study and examination requirements	<i>the final grade in the module is composed of 30% discussion, 30% presentation, 30% take-home assignments, 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> <li>1. Murray, R.K., et al., 2009. <i>Harper's Illustrated Biochemistry. 28th ed. China: The McGraw-Hill Co.</i></li> <li>2. Nelson, D.L. and Fox, M.M., 2005. <i>Lehninger Principles of Biochemistry. 4th ed, New York: WH Freeman and Co.</i></li> <li>3. Berg, J.M., Tymoczko, J.L. and Stryer, L., 2006. <i>Biochemistry. 6th ed. New York: WH Freeman and Co.</i></li> <li>4. Wenk, M.R. and Fernandis, A.Z., 2006. <i>A Manual for Biochemistry Protocols. New Jersey: World Scientific.</i></li> </ol> <p>Laberge, M., 2008. <i>Biochemistry. New York: Chelsea House Publ.</i></p>