

## Module Handbook of Biochemistry

Module designation	The Biochemistry course is a compulsory general course for students of the Faculty of Agriculture. This course discusses the basic concepts of biochemistry and its role in living systems, as well as its relation and development in various fields of science. This course also studies the structure and biosynthesis of compounds including carbohydrates, lipids, amino acids, and fatty acids and their metabolic processes in organisms.
Semester(s) in which the module is taught	Second Semester
Person responsible for the module	Prof. Ir. Irfan D. Prijambada, M.Eng., Ph.D.
Language	Bahasa Indonesia/Indonesian Language
Relation to curriculum	<i>Compulsory Course</i>
Teaching methods	<p>Lecture are conducted in the class with 80-100 students. In every meeting, there will be delivered interactive lecture and discussion. In some topics there will be quizzes, individual and/or group assignment.</p> <p>Details:</p> <ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Assignment (Individual and Group)</li> <li>3. Discussion</li> <li>4. Midterm</li> <li>5. Final Exam</li> </ol>
Workload (incl. contact hours, self-study hours)	<ul style="list-style-type: none"> <li>- Lectures = 2 SKS x 50 minutes x 16 meetings = 1.600 minutes = 26,67 hours = 26,67 hours/27,1 hours = 0,98 ECTS</li> <li>- Assignment = 2 SKS x 60 minutes x 16 meetings = 1.920 minutes = 32 hours = 32 hours/27,1 hours = 1,18 ECTS</li> <li>- Self Study = 2 SKS x 60 minutes x 16 meetings = 1.920 minutes = 32 hours = 32 hours/27,1 hours = 1,18 ECTS</li> </ul> <p>Total Workload = 3,34 ECTS</p>
Credit points	<i>2/0 Credit Points</i>
Required and recommended prerequisites for joining the module	<i>None</i>

Module objectives/intended learning outcomes	<p><i>Program Learning Outcomes (PLO):</i></p> <p><i>PLO1: Able to explain theoretical concepts regarding plant production technology by giving attention to economic and social-humanitarian aspects to achieve quality, sustainable and profitable agriculture.</i></p> <p><i>PLO2: Able to explain theoretical concepts of biology microorganism and develop microbial-based technology to increase plant production and environmental services.</i></p> <p><i>PLO3: Able to identify, design, implement, and solve problems that arise in the implementation of agricultural businesses.</i></p> <p><i>Course Learning Outcomes (CLO):</i></p> <p><i>CLO1: Students can explain the basic concepts of biochemistry and its role in the biological system, as well as its relationships and development in various fields of science.</i></p> <p><i>CLO2: Students can explain the structure and biosynthesis of carbohydrate compounds, lipids, amino acids, nucleic acids.</i></p> <p><i>CLO3: Students can explain biochemical processes such as metabolism, metabolic catalysts, and their role in the biological system and their effect on agricultural activities.</i></p>
Content	<ol style="list-style-type: none"> <li><i>1. Basic Concepts of Biochemistry and Biochemical Reactions (1 meeting)</i></li> <li><i>2. Water and Buffer (1 meeting)</i></li> <li><i>3. Carbohydrate: Purpose, types, functions, monosaccharides reactions, glycosidic bonds (2 meetings)</i></li> <li><i>4. Amino acids and Proteins: general review, amino acids, amino acid biosynthesis, peptides, protein structures, protein biosynthesis, amino acids, amino acid and protein functions (2 meeting)</i></li> <li><i>5. Lipids: general review, saturated and unsaturated fatty acids, fatty acid reactions, fatty acid and lipid functions, oxidation and biosynthesis of fatty acids (2 meeting)</i></li> <li><i>6. Nucleic acids: General review, nucleoside, nucleotides, genetic information and biosynthesis of nucleotides (2 meetings)</i></li> <li><i>7. Enzymes: General review, classification of enzymes, coenzymes and cofactors, mechanisms of enzyme, enzyme kinetics, enzymatic reactions, and enzyme regulatory (2 meetings)</i></li> <li><i>8. Metabolism: general purpose, metabolic pathways, bioenergy and metabolic control (2 meeting)</i></li> </ol>

Examination forms	Multiple choice examination
	Grade and Score
	GradeScoreGradeScore
	A≥ 85C+64,0-66,9
	A-82,0-84,9C61,0-63,9
	A/B79,0-81,9C-58,0-60,9
	B+76,0-78,9C/D55,0-57,9
	B73,0-75,9D+52,0-54,9
	B-70,0-72,9D49,0-51,9
B/C67,0-69,9E<49	
Study and examination requirements	To be able to take the final exams, the minimum of student attendance is 70% out of effective meetings. From 14 meetings, students must take a minimum of 10 meetings to take the exam.
Reading list	<p>Main References:</p> <ol style="list-style-type: none"><li>John Moore and Richard Langley. 2008.Biochemistry for Dummies. (e-book available)</li><li>David L. Nelson and Michael M. Cox. 2004.Lehninger Principles of Biochemistry. W.H. Freeman &amp; Co. (e-book available)</li><li>Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer. 2002. Biochemistry. W.H. Freeman &amp; Co. (e-book available)</li><li>Trudy McKee and James McKee. 2003. Biochemistry: The Molecular Basis of Life. Third edition. McGraw-Hill, Boston.</li><li>Albert L. Lehninger. 1995. Dasar-dasar Biokimia. (Alih bahasa: Maggy Thenawidjaja). Penerbit Erlangga, Jakarta.</li><li>David S. Page. 1995. Prinsip-prinsip Biokimia. Penerbit Unair, Surabaya.</li><li>Soeharsono. 1982. Biokimia I dan II. Gadjah Mada University Press, Yogyakarta.</li></ol> <p>Additional References:</p> <ol style="list-style-type: none"><li>Scientific journal references on biochemistry</li></ol>