



**UNIVERSITAS NEGERI YOGYAKARTA**  
FACULTY OF MATHEMATICS AND NATURAL SCIENCES  
DEPARTMENT OF CHEMISTRY  
1 Colombo Street Yogyakarta 55281  
Phone (0274) 565411, Ext. 1398, Fax (0274)548203  
Website: <http://kimia.fmipa.uny.ac.id>, E-mail: [kimia@uny.ac.id](mailto:kimia@uny.ac.id)

**Bachelor of Science in Chemistry**

**MODULE HANDBOOK**

Module name:	Biochemistry
Module level, if applicable:	Undergraduate
Code:	KIM6413
Sub-heading, if applicable:	-
Classes, if applicable:	2
Semester:	4 <sup>th</sup>
Module coordinator:	Dr. Retno Arianingrum
Lecturer(s):	1. Dr. Retno Arianingrum 2. Dr. rer nat Senam 3. Dr. Das Salirawati
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	<ul style="list-style-type: none"><li>• Lectures: 150 minutes lectures, 180 structured activities and 180 individual study per week</li><li>• Laboratory work: 170 minutes includes the laboratory work and it's reporting per week</li></ul>
Workload:	Total workload of the activity is 181,33 hours per semester which consists of 150 minutes lectures, 180 structured activities and 180 individual study and also 170 minutes laboratory work with it's reporting per week for 16 weeks
Credit points:	4 SKS (7 ECTS) with the details of 3 SKS (5 ECTS) lectures and 1 SKS (2 ECTS)
Prerequisites course(s):	General Chemistry, Fundamentals of Organic Chemistry
Course Outcomes	After taking this course, the students have ability to: CO1. Students are able to describe basic concepts about the structure and function of chemical processes in cells (the smallest part of living things) CO2. Students are able to understand the metabolism of carbohydrates, fats, proteins and lipids CO3. Students can identify and study chemical processes through laboratory work CO4. Students are able to describe biochemical concepts about the flow of biological information including replication, transcription, and translation; and genetic engineering
Content:	This course studies the chemical structure, function, chemical processes in cells (the smallest part of living things) which consists of carbohydrates, fats, proteins, enzymes, minerals, vitamins and water in the chemical process (metabolism) of carbohydrates, lipids and proteins. Discussing about nucleic acids, genetic engineering, hormones, nutrition and food, as well as practice about the nature and chemical reactions of carbohydrates, lipids, proteins and enzymes.

Study/ exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1" data-bbox="643 286 1434 835"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td rowspan="5">1</td> <td rowspan="5">CO1, CO2, CO3, CO4</td> <td>Assessment &amp; Quiz</td> <td>Presentation, Written test</td> <td rowspan="4">70%</td> </tr> <tr> <td>Activity and attitude</td> <td>Discussion , observation</td> </tr> <tr> <td>Mid term exam</td> <td>Written test</td> </tr> <tr> <td>Final exam</td> <td>Written test</td> </tr> <tr> <td>Laboratory work</td> <td>Pre-test Laboratory work Report Post-test</td> <td>30%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1, CO2, CO3, CO4	Assessment & Quiz	Presentation, Written test	70%	Activity and attitude	Discussion , observation	Mid term exam	Written test	Final exam	Written test	Laboratory work	Pre-test Laboratory work Report Post-test	30%	Total				100%
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		Laboratory work	Pre-test Laboratory work Report Post-test	30%																					
Total				100%																					
Forms of media:	Board, LCD Projector, handouts, PPT slides, laboratory kits, and stationaries																								
Reference:	<p>A. David L. Nelson, Michael M. Cox, 2017, Lehninger Principles of Biochemistry, 7<sup>th</sup> ed., W.H. Freeman</p> <p>B. Jeremy M. Berg, John L. Tymoczko, Gregory J. Gatto Jr., Lubert Stryer, Biochemistry, 8<sup>th</sup> ed. W.H. Freeman</p> <p>C. Chen, S., Arsenault, C., Gingras, Y. et al., 2015, Exploring the interdisciplinary evolution of a discipline: the case of Biochemistry and Molecular Biology. <i>Scientometrics</i> 102, 1307–1323</p> <p>D. Fan, T.WM., Lane, A.N., 2011, Erratum to: NMR-based stable isotope resolved metabolomics in systems biochemistry. <i>J Biomol NMR</i> 49, 325</p> <p>E. Anna Poedjiadi; F.M. Titin Supriyanti. 2006. Dasar-Dasar Biokimia, Jakarta Edisi Revisi: Penerbit Universitas Indonesia</p> <p>F. Lehninger, A, (Alih bahasa Maggy Thenawijaya). 1990. Dasar-dasar Biokimia Jilid I, II, dan III. Jakarta : Penerbit Erlangga.</p> <p>G. Buku Petunjuk Praktikum Biokimia FMIPA UNY 2014</p> <p>H. Akhmaloka. 1990. Asam Nukleat Struktur dan Fungsi. Bandung : Penerbit ITB Bandung</p> <p>I. David W. Martin. Jr., MD at all (alih bahasa Dr. Iyan Darmawan). 1987 Biokimia Harper Edisi 20 (Harper's Review of Biochemistry)</p> <p>J. Soeharsono Martoharsono. Biokimia Jilid II. Yogyakarta: Gadjah Mada University Press</p>																								

## PLO and CO mapping

CO	PLO									
	Attitude	Generic Skills		Knowledge				Specific Skills		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1							√			
CO2							√			
CO3					√		√			√
CO4							√			