



**UNIVERSITAS PADJADJARAN
FACULTY OF MATHEMATICS AND NATURAL
SCIENCES**

MASTER PROGRAM IN CHEMISTRY

**COURSE
CODE:
D20B.232**

Module designation	Bioinformatics
Semester(s) in which the module is taught	2
Lecturers	Dr. Shabarni Gaffar Muhammad Yusuf, Ph.D.
Medium of instruction	English and Indonesian
Relation to curriculum	Mandatory elective course Biomolecular Health and Food Sciences Master of Science in Chemistry
Teaching methods	Lecture and discussion
Workload	Total workload: 53.42 hours CLASS Lecture : 18.36 hours Tutorial : 3.35 hours Assignment : 1 hour Assessment : 5.01 hours Independent Study : 26.7 hours
Credit points	2 (2-0) 2 Credits = 3.62 ECTS

Required and recommended prerequisites for joining the module	<ol style="list-style-type: none">1. Structure and Function of Biomolecules2. Metabolism and Genetics Information
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Module objectives/intended learning outcomes	<ol style="list-style-type: none">1. Students are able to explain the principles and scope of bioinformatics. (C3)2. Students are able to use software for data retrieval and analysis in general or specific areas of bioinformatics. (C3)3. Students are able to analyze data using various bioinformatics software (C4)4. Students are able to design a bioinformatics research by applying logical, critical, systematic, and innovative thinking in the context of science development or implementation (C4)
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Contents	<p>After taking this course, students will be able to use online tools and various software for DNA and protein analysis. They will learn about designing primer oligonucleotides, determining and analyzing nucleotide sequences obtained from sequencing, and storing the data. Additionally, they will be able to determine the homology level of nucleotide sequences, compare them with a database, analyze DNA mutations, identify microorganisms using 16s/18s rDNA, and construct phylogenetic trees. Moreover, the course will cover studying the impact of mutations on protein structure and stability, protein modeling, docking, and molecular dynamics of proteins with ligands.</p>
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Examination forms	Test, Presentation, and Assignment
Study and examination requirements	<p>Minimum attendance at lectures is 80%. Final score is evaluated based on quiz (10%), individual assignment (20%), mid semester exam (35%), and end semester exam (35%).</p>
Reading lists	<ol style="list-style-type: none"> 1. Baxevanis, A.D. & Ouellete, B.F.R. 2001. Bioinformatics A practical Guide to the Analysis of Genes and Proteins. 2nd ed. Wiley- Inter-science. New York. 2. http://www.ncbi.nlm.nih.gov/ 3. http://www.rscbd.org/ 4. http://www.tcoffee.nl/

