	UNIVERSITAS PADJADJARAN **FACULTY OF MATHEMATICS AND NATURAL SCIENCES** **MASTER OF SCIENCE IN BIOLOGY**	**COURSE CODE: D20D1103**

Module designation	**Molecular Biology**
Semester(s) in which the module is taught	2
Person(s) responsible for the module	Annisa, M.Si., Ph.D Febri Doni, Ph.D Dr. Sri Rejeki R
Medium of instruction	Indonesian
Relation to curriculum	Compulsory Master of Science in Biology
Teaching methods	Lecture, discussion, inquiry learning, and cooperative learning
Workload	Total workload: 5440 minutes (90,67 hours) **CLASS** Lecture, discussion, inquiry learning and cooperative learning : 2 x 50'x 16 weeks = 1600 minutes (26.67 hours) Exercise : 2 x 60'x 16 weeks = 1920 minutes (32 hours) Private study : 2 x 60'x 16 weeks = 1920 minutes (32 hours)
Credit points	2.00 SKS (3.62 ECTS)

Required and recommended prerequisites for joining the module	-

Module objectives/intended learning outcomes	1. Able to explain molecular elements and processes in prokaryotic and eukaryotic cells; 2. After completing this course, the student will master in using molecular biology tools and instruments and explain various methods for molecular analysis that can be used for biomolecular research, 3. Able to understand the molecular concepts in the field of biological applications, especially in agrobiology and the environment.
Contents	This course discusses the differences in molecular concepts in prokaryotic and eukaryotic organism cells. The focus of the discussion is on the basic biomolecular concepts, namely the Central Dogma of Molecular Biology which involves genetic expression starting from transcription, replication, and protein synthesis, as well as the processes that occur in post-transcription; post-translation in prokaryotes and eukaryotes and genomics and proteomics. Aspects of molecular technology are presented to explain genomic and proteomic technologies and methods of molecular analysis such as DNA and RNA isolation, PCR-RAPD methods, molecular markers, blotting and hybridization techniques, DNA sequencing, electrophoresis & mass analysis, and bioinformatics. To increase knowledge, we will discuss the application of molecular methods in biological applications, especially in the fields of health, agrobiology and the environment.

Examination forms	Essay and written examination
Study and examination requirements	Minimum attendance at lectures is 80%. Final score is evaluated based on assignment and group case study reports (20%), Assignment (20%), mid semester exam (30%), and end semester exam (30%).

Reading lists	1. Bruce Alberts, Alexander Johnson,Julian Lewis, David Morgan,Martin Raff, Keith Roberts, Peter Walter. 2015. Molecular Biology of the Cell, 6th Edition. Garland Science. NY. 2. Harvey Lodish; Arnold Berk; Chris A. Kaiser; Monty Krieger; Anthony Bretscher; Hidde Ploegh; Kelsey C. Martin; Michael Yaffe; Angelika Amon. 2021. Molecular Cell Biology, 9th Edition. W. H. Freeman. NY. 3. Jocelyn E. Krebs, Elliott S. Goldstein, Stephen T. Kilpatrick. 2018. Lewin's Gene XII. Jones & Bartlett. Massachusetts