	UNIVERSITAS PADJADJARAN **FACULTY OF MATHEMATICS AND NATURAL SCIENCES** **MASTER OF SCIENCE IN BIOLOGY**	**COURSE CODE: D20D2101**
Module designation	**Genetic Engineering**	
Semester(s) in which themodule is taught	2	
Person(s) responsible for the module	Annisa, M.Si., Ph.D Asri P. Wulandari, M.Sc., Ph.D	
Medium of instruction	Indonesian	
Relation to curriculum	Elective Master of Science in Biology	
Teaching methods	Lecture, discussion, inquiry learning, cooperative learning	
Workload	Total workload: 5440 minutes (90,67 hours) **CLASS** Lecture, discussion, inquiry learning, cooperative learning: 2 x 50'x 16 weeks = 1600 minutes (26.67 hours) Exercise (32 hours) : 2 x 60'x 16 weeks = 1920 minutes Private study (32 hours) : 2 x 60'x 16 weeks = 1920 minutes	
Credit points	2.00 SKS (3.62 ECTS)	

Required and recommended prerequisites for joining the module	-

Module objectives/intended learning outcomes	1. After completing this course, the student will able to explain elements and molecular processes in prokaryotic and eukaryotic cells. 2. After completing this course, the student will able to master the principles of using molecular biology tools and instruments. 3. Student will be able to explain various methods for molecular analysis that can be used for biomolecular research. 4. Student will able to explore studies with molecular concepts in the field of biological applications, especially in agrobiology and the environment.
Contents	This course will focus on explaining recombinant DNA technology including gene cloning, primers and primer design; Enzymes involved in the cloning process, Determination of cloning vectors and expression vectors of DNA transformation, Selection and detection of DNA, DNA sequencing and data interpretation & Bioinformatics; and Applications in cloning technology including gene manipulation in prokaryotes and eukaryotes, construction of gene libraries, isolation of genes and promoters; as well as gene expression in enzyme production; The application of this engineering is then given cases that have been applied to animals and plants, as well as the development of insights about the GMO case and the need for bioethical studies on genetically engineered products.

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. Glick, B.R and Pasternak, J.J. 2010. Molecular Biotechnology Principles and Application of Recombinant DNA 4th ed. ASM Press. Washington D.C. 2. Primrose, S.B. and R.M. Twyman, 2014, Principles of Gene Manipulation and Genomics 7th ed. Blackwell Publishing. Cornwall, UK. 3. 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.