Modul Description

Module name	Course Module
Module level, if applicable	Magister of Biology Education
Code, if applicable	34182014
Subtitle, if applicable	-
Course, if applicable	Genetic Molecular dan Biotechnology
Semester(s) in which the module istaught	I
Person responsible for the module	Lecturer of Courses
Lecturer	Dr. Tri Handayani, M.Si, Dr. Hanum Isfaeni, M.Si
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a mandatory course for Magister of Biology Education and offered in the 1st semester.
Type of teaching, contact hours	Teaching methods used in this course are: - Lecture (i.e., group investigation, small group discussion, case study, and video-based learning) - Structured assignments (i.e., essays and case study The class size for lecture is 30 students. Contact hours for lecture is 23 hours, assignments are 28 hours
Workload	For this course, students required to meet a minimum of 233.2 hours in one semester, which consist of: 32.2 hours for lecture : tutorial and discuss the subject 30.00 hours for Tutorials (preparation): three hours per tutorial (ten tutorials) 60.00 hours for literature studies 25 hours for Project 14 hours for Paper 63 hours for Lab Works 10 hours for structured assigment 1 ECTS = 30 hours 234.2 hours = 7.8 ECTS
Credit points	3 credit points (equivalent with 7.8 ECTS)

Requirements according to the examination regulations	Students must have attended all classes and submitted all class assignments that are scheduled before the final tests.
Recommended prerequisites	Students must have attended all classes and submitted all class assignments that are scheduled before the final tests.
Module objectives/intended learning outcomes	After completing the course and given with this case: **Learning Outcomes** **Social Competence :** 1. Have integrity and professional ethics, self-development, and make innovations to improve the quality of education and community lifelong learning (PLO1). 2. Able to apply analytical, critical, innovative, and abstraction thinking skills in the field of biology education (PLO2). **Specific Competence :** 1. Able to improve mastery of biological material in the fields of plant and animal structure, environment, bio-conservation, biomolecular, and biotechnology (PLO9). 2. Able to analyze and synthesize problem solutions in biology learning through interdisciplinary, transdisciplinary and multidisciplinary approaches (PLO10) .

Content	**Students will learn about:** The DNA, molecular Marker, biotechnology
Forms of Assessment	Assessment is carried out based on written examinations, assessment/evaluation of the learning process and performance with the following components: Project: 20%; Structured tasks: 20%; Mid Test: 30%; Final Test: 30%
Study and examination requirements and forms of examination	**Study and examination requirements:** - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get final grade. **Form of examination:** Written exam: Essay

Media employed	Direct Whiteboard, Power Point Presentation, online conference platform
Reading List	1. Blouin, M.S. 2003. DNA-based methods for pedigree reconstruction and kinship analysis in natural populations. Trends Ecol. Evol. 18: 503-511. 2. Brumfield, R.T., P. Beerli, D.A. Nickerson, and S.V. Edwards. 2003. The utility of single nucleotide polymorphisms in inferences of population history. Trends Ecol. Evol. 18: 249-256. 3. Doudna, J.A., & Charpentier, E. (2014). *The New Frontier of Genome Engineering with CRISPR-Cas9. Science*, 346(6213), 1258096 4. Marraffini, L. A., & Sontheimer, E. J. 2010. Self versus non-self discrimination during CRISPR RNA-directed immunity. *Nature*, 463(7280), 568-571. 5. Pennisi, E. (2013). *The CRISPR craze. Science*, 341(6148), 833-836. 6. Sander, J. D., & Joung, J. K. 2014. CRISPR-Cas systems for editing, regulating and targeting genomes. *Nature biotechnology*, 32(4), 347-355. 7. https://ghr.nlm.nih.gov/primer/genomicresearch/genomeediting