Modul Description

Module name	Course Module of Contemporary Issues of Biology and Biology Education
Module level, if applicable	Magister of Biology Education
Code, if applicable	34182042
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module istaught	II
Person responsible for the module	Lecturer of Courses
Lecturer	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 2nd 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 52 hours, assignments are 32 hours
Workload	For this course, students required to meet a minimum of 155.6 hours in one semester, which consist of: 19.6 hours for lecture : tutorial and discuss the subject 17.00 hours for structured assignments : doing exercises and problem solving or project, 70.00 hours for independent study : reading references, group discuss, finish the exercises 34 hours for Project 15 hours for Paper 1 ECTS = 30 hours 155.6 hours = 5.2 ECTS -
Credit points	2 credit points (equivalent with 5.2 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 Competences:** 1. Have integrity and professional ethics, self-development, and make innovations to improve the quality of education and lifelong learning for the community (PLO1) 2. Able to apply analytical, critical, innovative, and abstraction thinking skills in the field of biology education (PLO2) **Specific Competences:** 1. able to analyze the basic philosophy and theory in the study of biology and biology learning philosophical concepts in compiling scientific knowledge (PLO4). 2. Able to analyze and synthesize problem solutions in biology learning through interdisciplinary, transdisciplinary and multidisciplinary approaches (PLO10)

Content	**Students will learn about:** The Contemporary issues of biology and biology education; Industry 4.0 and education, TPCK, artificial intelligent, Adaptive learning, Genomic, Nanotechnology, Bioprospecting
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. Mateo, Nicolas & Nader, Werner & Tamayo, Giselle. (2001). Bioprospecting. in Encyclopedia of Biodiversity, Publisher Academic Press, 471-488 2. Blouin, M.S. 2003. DNA-based methods for pedigree reconstruction and kinship analysis in natural populations. Trends Ecol. Evol. 18: 503-511. 3. 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. 4. Doudna, J.A., & Charpentier, E. (2014). *The New Frontier of Genome Engineering with CRISPR-Cas9. Science*, 346(6213), 1258096 5. Marraffini, L. A., & Sontheimer, E. J. 2010. Self versus non-self discrimination during CRISPR RNA-directed immunity. *Nature*, 463(7280), 568-571. 6. Mishra, P., and M. J. Koehler. 2006. "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge." *Teachers College Record* 108 (6): 1017–1054. 7. Morais, Michele & Martins, Vilásia & Steffens, Daniela & Pranke, Patricia & Costa, Jorge Alberto. (2014). Biological Applications of Nanobiotechnology. Journal of nanoscience and nanotechnology. 14. 1007-17. 10.1166/jnn.2014.8748. 8. Pennisi, E. (2013). *The CRISPR craze. Science*, 341(6148), 833-836. 9. Sander, J. D., & Joung, J. K. 2014. CRISPR-Cas systems for editing, regulating and targeting genomes. *Nature biotechnology*, 32(4), 347-355. 10. Capecchi, M. R. (2005). Gene targeting in mice: functional analysis of the mammalian genome for the twenty-first century. Nat Rev Genet, 6(6), 507-512. doi:10.1038/nrg1619 11. Ramsden, Jeremy. (2016). What is nanotechnology?. 10.1016/B978-0-323-39311-9.00007-8.