**UNIVERSITAS NEGERI MALANG**

FACULTY OF MATHEMATICS AND NATURAL SCIENCES

SCIENCE EDUCATION STUDY PROGRAM

Jalan Semarang No 5, Malang 65145

Call: 0341-551312 Ext. 251, Fax: 0341-562180

Website: <http://fmipa.um.ac.id/>

**Bachelor of Education in Science MODULE HANDBOOK**

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| Module designation | Genetics and Evolution |
| Module level, if applicable | Undergraduate |
| Code, if applicable | PIPAUM6103 |
| Subtitle, if applicable | *-* |
| Courses, if applicable | *-* |
| Semester(s) in which the module is taught | Even semester |
| Person responsible for the module | Erti Hamimi, S.Pd, M.Sc |
| Lecturer | Erti Hamimi, S.Pd, M.Sc, Dr. Yayuk Mulyati, S.Si., S.Pd., M.Si, Prof. Dr. Agr. Moh. Amin, M.Si, Dra. Dwi Listyorini, M.Si., D.Sc. |
| Language | Bahasa Indonesia  |
| Relation to curriculum | Undergraduate degree program, elective, 4th semester. |
| Type of teaching, contact hours | Inquiry learning, 100 minutes of lecture and discussion, 120 minutes of structured activities. |
| Workload | 79.325 hours of 100 minutes of lecture and discussion, 120 minutes of structured activities, and 120 minutes of independent study for 14 weeks. |
| Credit points | 2 (3.173 ECTS cr-eq) |
| Requirements according to the examination regulations | A student must have attended at least 75% of the lectures to sit in the exams.  |
| Recommended prerequisites | Biochemistry |
| Module objectives/intended learning outcomes | After completing this module, a student is expectedto:mastering basic biology by using the nature of science (NOS) as a provision for the ability to design innovative and productive junior high school science learning by utilizing the potential of the local environment and IT developments |
| Content | This course covers the following three main topics: (1) the basic principle of inheritance; nucleic acids, mechanism of replication, mechanism of transcription; mechanisme of translation, cell division; 2) reproduction and offsping; gene inhetritance, extra-chromosomal inheritance, Mendelian inheritance, development of Mendel Law’s, mutation and crossing over, gene linkage, Hardy-Weinberg Law’s, 3) Biology evolution, adaptation, and speciation. The topics on the subject are focused to the following subtopics:1. Nucleic acid: DNA and RNA
2. DNA replication
3. Nucleic acid expression: transcription, modification post transcription, translation.
4. Cell division: mitotic and meiosis.
5. Gametogenesis.
6. Fertilization
7. Mendel Law’s
8. The development of Mendel Law’s
9. Mutation
10. Genetic material in population
11. Evolution in biology.
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| Study and examination requirements and forms of examination | Assessment of student’s competency achievement using assignment (laboratory report, answer of e-TEQ sheet, quiz), Middle Semester Exam and Semester Exam. |
| Media employed | Power point, e-TEQ sheet, laboratory tools, Sipejar. |
| Reading list | 1. Grotewold, E., Joseph, C., & Elizabeth, A.K. 2015. *Plant Genes, Genomes, and Genetics.* New York: Wiley Blackwell.
2. Hartwell, L.H., Michael, L.G., Janicem A.F., & Leory,H. 2018. *Genetics: From Genes to Genomes*: Six Edition. New York: McGraw-Hill Education.
3. Pierce, B.A. 2012. *Genetics: A Conceptual Approach*. Fourth Edition. New York: Kate Ahr Parker.
4. Stewart, C.N. 2008. *Plant Biotechnology and Genetics: Principles, Technique, and Application*. Canada: John Wiley & Sons, Inc.
5. Urry, L.A., Michael L.C., Steven, A.W., Peter V.M & Jane B.R. 2016. *Campbell Biology*. Eleventh Edition. New York: Pearson
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