



THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

POPULATION GENETICS

Course code	BIMB202227
Course level	Magister
Semester/ term	Odd
Course coordinator(s)	Dra. Tuty Arisuryanti, M.Sc., Ph.D.
Lecture(s)	1. Prof. Dr. Budi Setiadi Daryono, M.Agr.Sc. 2. Dr. Drh. Hery Wijayanto, M.P.
Language	Indonesia & English
Classification within the Curriculum	Elective
Teaching format/ class hours per week during the semester	This course is organised into 1 class and planned to have 14 teaching weeks and 2 weeks of examination.
Workload	Estimated working hour: 2 credits of theory (including 2 assignments and 1 project)
Credits	2-0 credits
Requirements	No requirements
Program Learning Outcome	K1: The graduates are demonstrating excellent knowledge in biological theories, includes all aspects of biological studies at various levels in the organization of life (Knowledge) K2: The graduates are demonstrating excellent knowledge in appropriate biological research methods (Knowledge) GS5: The graduates are able to use information technology in scientific development and implementing it in their area of expertise (General Skills)
Course Learning Outcome	CPMK1: Students are able to explain: Basic concepts of Population Genetics; principles, assumptions and application of Hardy Weinberg's Law; Allele frequency and genotype frequency (both on phenotype to the molecular level) and the relationship between the allele frequency and genotype frequency; and Microevolutionary Forces (mutation, selection, migration, genetic drift, and nonrandom mating) CPMK2: Students are able to explain: Isolation mechanism (pre-zygotic isolation & postzygotic isolation) and



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	<p>speciation (types and patterns of speciation) and the relationship between isolation mechanism and speciation; Application of Population Genetics in the conservation of genetic resources</p> <p>CPMK3: Students are able to explain: genetic diversity of a population, survival species, and population estimation size and its implications in conservation; and able to explain molecular markers (allozyme-isozyme, DNA fingerprint, DNA sequences and microsatellite) for analysis of genetic variation and population structure.</p> <p>CPMK4: Students are able to use free software (MEGA, MESQUITE, DnaSP, PopART, NETWORK, GENALEX) to examine genetic data and analyze the genetic variations of a population and population structure</p>
Course Description	<p>This course explains the basic concepts of Population Genetics; Principles, assumptions and application of Hardy Weinberg's Law; Allele frequency and genotype frequency (both on phenotype to molecular levels) and the relationship between allele frequency and genotype frequency; Microevolutionary Forces; Isolation mechanism and speciation; Application of Population Genetics in the conservation of genetic resources; Genetic diversity of a population, survival species, and population estimation size and its implications in conservation; Utilization of molecular markers (allozyme-isozyme, DNA fingerprint, DNA sequences and microsatellite) for analysis of genetic variation and population structure. In addition, this course contains how to use free software (MEGA, MESQUITE, DnaSP, PopART, NETWORK, GENALEX) to examine genetic data and analyze genetic variation and population structure</p>
Assesments	<p>Assignment = 5% Project = 25% Mid-exam = 30% Final exam = 40%</p>
Study Media	<p>Online google meet Self-learning using course slides, recording and tutorial video</p>
Literature	<p>A. Online Book (free)</p> <p>NCBI Bookshelf website: http://www.ncbi.nlm.nih.gov/books</p> <p>B. Text Books :</p>



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1. Allendorf and Luikart. 2012. Conservation and The Genetic Populations. 2nd Edition. Blackwell Publishing (UK)
2. Campbell, N.A., L.G. Mitchell, and J.B. Reece. 2017. Biology. Concept and Connection. 9th Edition. The Benjamin Cummings Publ.Co.Inc., California (USA)
3. Gillespie, J.H. 2004. Population Genetics. A Concise Guide. 2nd Edition. The Johns Hopkins University Press, London
4. Griffith, A.J.F., J.F. Miller, D.T. Suzuki, R.C. Lewontin, and W.M. Gelbart. 2015. An Introduction to Genetic Analysis. 11th Edition. W.H. Freeman & Co., New York (USA)
5. Fox, C.W. 2006. Evolutionary Genetics: concept and case studies. Oxford University Press
6. Solomon, E.P., L.R. Berg, D.W. Martin. 2014. Biology. 10th.ed Thomson Brooks, Australia
7. Templeton, R. 2006. Population Genetics and Microevolutionary Theory. A John –Wiley and Sons, Inc., Publ., New Jersey (USA)
8. Weiss, K.M. and A.V. Buchanan. 2004. Genetics and The Logic of Evolution. Wiley-Liss. A John Wiley and Sons, Inc. Publ., New Jersey
9. Säll, T. and Bengtsson, B.O. 2017. Understanding Population Genetics . Wiley-Blackwell Publisher

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