



# THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

## GENETICS

<b>Course code</b>	BIMB202209
<b>Course level</b>	Magister
<b>Semester/ term</b>	Odd
<b>Course coordinator(s)</b>	Dra. Tuty Arisuryanti, M.Sc., Ph.D.
<b>Lecture(s)</b>	1. Prof. Dr. Budi Setiadi Daryono, M.Agr.Sc 2. Dr. Niken Satuti Nur Handayani, M.Sc.
<b>Language</b>	Indonesia & English
<b>Classification within the Curriculum</b>	Compulsory for Laboratory of Genetics & Breeding
<b>Teaching format/ class hours per week during the semester</b>	This course is organised into 1 class and planned to have 14 teaching weeks and 2 weeks of examination.
<b>Workload</b>	Estimated working hour: 2 credits of theory
<b>Credits</b>	2-0 credits
<b>Requirements</b>	No requirements
<b>Program Learning Outcome</b>	<p><b>K1:</b> The graduates are demonstrating excellent knowledge in biological theories, includes all aspects of biological studies at various levels in the organization of life (Knowledge)</p> <p><b>K2:</b> The graduates are demonstrating excellent knowledge in appropriate biological research methods (Knowledge)</p> <p><b>GS5:</b> The graduates are able to use information technology in scientific development and implementing it in their area of expertise (General Skills)</p>
<b>Course Learning Outcome</b>	<p><b>CPMK1:</b> Students are able to explain the basic concepts of genetics, genetic material and genome; chromosome structure, cell cycle &amp; meiosis (including oogenesis and spermatogenesis) and the relationship between meiosis and Mendel's Law I and II as well as genetic recombination through crossing over, and inheritance of genetic material through cell cycle and meiosis</p> <p><b>CPMK2:</b> Students are able to explain molecular pathways in Mendelian inheritance and extension of Mendelian inheritance; describes the integration of sex determination with sex linkage and inheritance patterns in cytology and molecular levels as well as the combination of autosomal gene inheritance and sex-linked genes, and the sex</p>



# THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

	<p>influenced genes &amp; sex-limited genes; pedigree; inbreeding and its effect; linked (with and without crossing over) and their integration with meiosis</p> <p><b>CPMK3:</b> Students are able to explain family genes (definition, function and integration); chromosome and molecular mapping; molecular markers and their applications in genetics; and genetic applications in conservation, breeding, and health</p> <p><b>CPMK4:</b> Students are able to explain how to search GenBank database; genome-gen-protein annotations and the use of online software for genetic data analysis as well as the use of free software GeneStudio for consensus sequence and the use of Open Reading Frame for translation to amino acids and free software to design primer and to arrange 3D protein structure</p>
<b>Course Description</b>	<p>This genetic course explains the development of genetics at an advanced level. The course contain of the basic concepts of genetics, genetic material and genome; chromosomal structure, cell cycle and meiosis (including oogenesis and spermatogenesis) and the relation between meiosis and Mendel's Law I and II as well as genetic recombination through crossing over, inheritance of genetic material through cell cycle and meiosis; family genes (definition, function and integration); molecular pathway to Mendel inheritance and extension of Mendelian inheritance; integration of sex determination with sex linkage and inheritance patterns in cytological and molecular levels as well as a combination of autosomal gene inheritance and sex linked genes, andsex influenced gene and sex limited gene; linked genes (with or without crossing over) and their inheritance pattern integrated with meiosis; chromosome and molecular mapping; pedigree; inbreeding and its effect; molecular markers and their application in the field of genetics; genome-gen-protein annotations, the use of online software for genetic data analysis, the use of free software GeneStudio for consensus sequence and the use of Open Reading Frame for translation to amino acids, and free software for design primer and 3D protein structure</p>
<b>Assesments</b>	<p>Assignments = 30% Mid-exam = 30% Final exam = 40%</p>
<b>Study Media</b>	<p>Online google meet Self-learning using course slides, recording and tutorial video</p>



# THE MODULE HANDBOOK

Magister Biology Study Program

FACULTY OF BIOLOGY

## Literature

### A. Online Book (free)

NCBI Bookshelf website:

<http://www.ncbi.nlm.nih.gov/books>

### B. Text Books :

Griffith, A.J.F., S.R. Wessler, S.B. Carroll, J.Doebley.  
2015. Introduction to Genetic Analysis. Palgrave,  
Macmillan (UK)

Klug, W.S. and R. Cummings, C.A. Spencer, and M.A.  
Pallatini. 2012. Concept of Genetics. 10th.ed.  
Prentice Hall Inc., New Jersey (USA)

Pierce, B.A. 2016. Genetics: A Conceptual Approach.  
6th.ed. W.H.Freeman & Co Ltd., New York (USA)

Snustad, D.P. and Simmons, M.J. 2015. Principles of  
Genetics. 7th.ed. WCB. McGraw-Hill, New York  
(USA)

### C. Web Animasi : [www.dnaftb.org](http://www.dnaftb.org)