



JOGJAKARTA STATE UNIVERSITY
MATHS AND SCIENCE FACULTY

SYLLABUS

FRM/FMIPA/063-01
18 February 2011

Faculty	: Maths and Science
Study program	: Biology Education and Biology
Course / Code	: BIC 223
Credits	: Practical = 1
Semester	: IV
Pre-requisite course / code	: Practical General Biology
Lecturers	: Victoria Henuhili, M.Si., Suratsih, M.Si., Paramita C.K., M.Sc.

I. Course Description

This practical develops the knowledge and skill by : practice in artificial crossing (monohybrid cross) of the yard-long bean plant, explain the genetic variation in humans by observing the phenotype using the genetic disc, know the fruit fly (*Drosophila* sp.) as a model organism that can be used in artificial crosses in genetic experiments, know different types of the *Drosophila* mutants and able to carry out monohybrid and dihybrid crosses using them, explain linkage and crossing over, autosome gene expression which expression is controlled by an individual's sex, study the modification of the phenotypic ratio due to gene interaction, know human characters that are caused by multiple alleles, specific gene in a family by using pedigree analysis, and understand the method and theory of the colorblind test.

II. Standard Competencies of The Course

At the end of the course, students should be able to :

1. Carry out artificial hybridization of the yard-long bean plant and study the genotype and phenotype in the parents and the F1 generation
2. Explain the genetic diversity in humans by observing the phenotype and using the genetic disc
3. Describe the fruit fly (*Drosophila* sp.) by : its breeding, difference in sex, and the life cycle
4. Describe the specific characters of the mutant *Drosophila*
5. Carry out artificial cross using the *Drosophila*
6. Explain about linkage and crossing over
7. Explain autosome gene expression with phenotype caused by an individual's sex
8. Explain the modification of the phenotypic ratio that is caused by interactions between genes
9. Explain the characters in humans caused by multiple alleles
10. Explain that there are specific genes causing specific traits in a family, using the pedigree analysis
11. Understand and able to perform the colorblind test

III. Lesson Plan

Meetings	Basic Competencies	Topics	Practical strategy	Reference
1	Understand the rules applied during the practical, the topics that will be covered and the genetic concepts that will be discussed	Introduction	General lecture/explanation on the practical	3,5,6,7
2	Carry out artificial hybridization of the yard-long bean plant and study the genotype and phenotype in the parents and the F1 generation	Monohybrid cross on the Yard-long bean plant (<i>Vigna unguiculata</i> subsp. <i>Sesquipedalis</i>)		
3	Explain the genetic diversity in humans by observing the phenotype and using the genetic disc	Human diversity		
4-5	Describe the fruit fly (<i>Drosophila</i> sp.) by : its breeding, difference in sex, and the life cycle	Introduction to the <i>Drosophila</i>		
6	Describe the specific characters of the mutant <i>Drosophila</i>	Introduction to the mutant <i>Drosophila</i>		
7-9	Carry out artificial cross using the <i>Drosophila</i>	Artificial cross of the <i>Drosophila</i>		
10	Explain about linkage and crossing over	Linkage and crossing over		
11	Explain autosome gene expression with phenotype caused by an individual's sex	Sex controlled gene expression		
12	Explain the modification of the phenotypic ratio that is caused by interactions between genes	Artificial cross in corn		
13	Explain the characters in humans caused by	Multiple alleles		

	multiple alleles			
14	Explain that there are specific genes causing specific traits in a family, using the pedigree analysis	Pedigree analysis		
15	Understand and able to perform the colorblind test	Colorblindness		
16	Responsi (Final Test)			

IV. References

1. Avers, C.J. 1984. Genetics, Second edition, Pindle, Weber, and Schmidt, Boston
2. BSCS, 1985. Biological Science-A Molecular Approach. Blue Version. Fifth Edition. D.C.Heath and Co. Lexington. Toronto
3. Klug, W.S., M. R. Cummings, C. A. Spencer, 2006, *Concepts of Genetics*, Pearson Education international, London
4. Djoko T. Iskandar. 1987. Penuntun Praktikum Genetika. PAU Ilmu Hayati dan Jurusan Biologi ITB
5. Suryo, 1984, *Genetka*, Gadjah Mada University Press, Yogyakarta
6. _____, 1989, *Genetika Manusia*, Gadjah Mada University Press, Yogyakarta
7. Syukur, M., S.Sujiprihati, dan R.Yunianti. 2012. Teknik Pemuliaan Tanaman. Penerbit Swadaya. Bogor.

V. Evaluation

The evaluation will be done based on the practical reports and final test of the practical. The percentages of each components are as follows :

No	Component of evaluation	Percentage (%)
1	Practical reports	50
2	Final Test	50
	TOTAL	100%

Head of Departement
Biology Education Department

Yogyakarta, Februari 2012
Lecturer

Dr. Slamet Suyanto
NIP 19620702 199101 1 001

Paramita Cahyaningrum Kuswandi, M.Sc.
NIP 19781022 201012 2 001

