Institute of Zoology
Faculty of Life Sciences
University of the Punjab, Lahore

Course Outline

Programme	BS Zoology	Course Code	ZOOL-310	Credit Hours	1
Course Title	**Genetics-I (Lab)**				

Course Introduction

This laboratory course is designed to equip students with hands-on skills in methods and tools employed in classical genetics research. The labs will introduce students to maintain Drosophila culture, isolation of polytene chromosomes from salivary glands of drosophila. Moreover, this lab course will introduce students to determine blood group detection and make slides for studying fundamental principles of genetics including mitosis and meiosis. The course is composed of lab exercises and assignments that are designed to teach students how to run experiments, problem solve, critically evaluate and communicate their experimental results.

Learning Outcomes

On the completion of the course, the students will:

- Able to prepare slides for identification of mitotic and meiotic stages
- Able to construct gene map and calculate interference
- Able to predict inheritance of genetic disorder
- Able to determine their own blood group and Rh factor
- Able to maintain Drosophila culture and differentiate male and female Drosophila based on morphological characters

Course Content		Assignments/Readings
Week 1	• Problems related to concepts of Classical Genetics: • Determination of paternity using ABO and Rh blood group system	
Week 2	• Problems related to coat color in rabbit • Problems related to sex-linked inheritance	
Week 3	• Construction of gene map and calculation of interference	
Week 4	• Study of blood group polymorphisms in local population	
Week 5	• Human Pedigree analysis: Autosomal Inheritance	
Week 6	• Human Pedigree analysis: X-linked Inheritance)	
Week 7	• Human Pedigree analysis: Mitochondrial and Y-linked Inheritance	
Week 8	• Study of qualitative traits in humans: a survey of common physical heritable (monogenic) polymorphisms	
Week 9	• Drosophila culture techniques: preparation and maintenance of culture	
Week 10	• Identification of male and female fruit fly and isolation of virgin females	

Week 11	• Study of polytene chromosomes from the salivary glands of Drosophila melanogaster	
Week 12	• Mutation induction in Drosophila	
Week 13	• Human Chromosome karyotyping from photographs: paper cut out method	
Week 14	• Preparation of human metaphase chromosomes from blood lymphocytes	
Week 15	• Study of mitosis in plants by using onion root tip cells	
Week 16	• Study of meiosis in the testes of male grasshopper	

Textbooks and Reading Material

Books Recommended:

1. Snustad, D.P., Simmons, M.J. 2003. Principles of Genetics. 3rd Ed., John Wiley and Sons Ins. New York, USA.
2. Tamarin, R.H. 2001.Principles of Genetics. 7th Ed., WCB publishers USA.
3. Lewin, B. 2013. GENE-VIII. Oxford University Press. UK.
4. Gardener, E.J., Simmons, M.J., Snustad, D.P. 1991. Principles of Genetics. John Wiley and Sons Ins. New York, USA.
5. Strickberger, M.W. 2015. Genetics. McMillan, New York. USA.(9780024181206)
6. PRINCIPALS OF GENETICS Gardner E.J., Simmons M.J. and Snistad
7. A.P. (Latest available Addition)
8. Reference Books. Concepts of Genetics By Klug, W.S and Cummings M.R.
9. Willium S. Klug, 2014. Concept of Genetics, ISBN-11: 978-0321948915
10. Lewin's Gene XI BY Jocelyn E.Krebs et al. 2013, isbn-13:978-1449659851,ISBN-10:1449659853
11. 10. Gene- XI by Lewin's,2013,ISBN:978-1449659851
12. Concepts of genetics 11th edition, William S.Klug,2014,ISBN-13:978- 0321948915

Teaching Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos/films will be shown on occasion.

Assignments: Types and Number with Calendar

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance