

Institute of Microbiology and Molecular Genetics
Faculty of Life Sciences
University of the Punjab, Lahore
Course Outline



Programme	BS	Course Code	MMG102	Credit Hours	3(2+1)
Course Title	GENERAL GENETICS				
COURSE INTRODUCTION					
<p>This course provides an introductory overview of general and basic topics in genetics. The objective is to provide students with a broadly-based and fundamental understanding of the principles of genetics. This course provides students with an understanding how biological information is stored, expressed, changed, and transmitted in organisms.</p>					
LEARNING OUTCOMES					
<p>On the completion of the course, the students will be able to understand</p> <ol style="list-style-type: none"> 1. Basic and general principles of genetics 2. Chromosome transmission to predict patterns of inheritance 3. DNA structure, replication, mutation, repair, genetic code, sex linkage and inheritance 					
COURSE CONTENT					
<p>Introduction and History of Genetics, Chromosome, Cell cycle: Mitosis and meiosis, Chromosomal theory of inheritance, Mendelian genetics, Extensions of Mendelian genetics: Incomplete dominance, Codominance and multiple allele, penetrance and expressivity, Pleiotropy, Epistasis, gene vs environment, twin studies, Quantitative inheritance, DNA structure, organization and replication, Chromosome mutations and repair, The genetic code, Sex determination and sex linked inheritance, Extra-nuclear-inheritance, Linkage and crossing over, Gene mapping in bacteria, Genetics of population</p>					
PRACTICALS					
<p>Problems related to Mendelian inheritance, gene interaction, and sex linkage. Blood groups-ABO and Rh factors, Study of mitosis and meiosis in living cells, Preparation of culture medium, and maintenance of Drosophila cultures in laboratory</p>					
TEXTBOOKS AND READING MATERIAL					
<ol style="list-style-type: none"> 1. Klug, W.S., Cummings, M.R., Spencer, C.A., & Palladino, M.A. (2021). <i>Essentials of Genetics</i>, 10th edition, Printice Hall, NJ. 2. Pierce. B.A. (2017). <i>Genetics: A conceptual approach</i>, 7th edition, WH Freeman and Company, NewYork, NY. 3. Brooker, R.J. (2021). <i>Genetics: Analysis and Principles</i>, 6th edition, McGraw-Hill Book Co. New York, NY. 4. Costa, L.G. & Eaton, D.L. (2006). <i>Gene-Environment Interactions: Fundamentals of Ecogenetics</i>, John Wiley and Sons, NY. 5. Snustad, D.P. & Simmons, M.J. (2011). <i>Principles of Genetics</i>, 6th edition, John Wiley and Sons, NY. 6. Griffiths, A.J.F., Doebley, J., Peichel, C & Wassarman, D.A. (2015). <i>Introduction to Genetic Analysis</i>, 12th edition, W.H. Freeman and Company, NY. 					

7. Hartl, D.L. & Jones, E.W. (2002). *Essentials of Genetics*, 3rd edition. Jones and Bartlett Publishers, Sudbury.
8. Hedrick, P.W. (2010). *Genetics of Population*, 4th edition, Jones and Bartlett Publisher, Sudbury.
9. Tamarin, R.H. (2004). *Principles of Genetics*, 7th edition, McGraw-Hill Science, Boston.
10. Srrickberger, W.M. (2001). *Genetics*, 3rd edition, McMillan Publishing Co. NY.

ASSESSMENT

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on activities, short tests, projects, practicals, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, fieldwork , report writing etc.