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

Programme	BS Zoology	**Course Code**	**ZOOL-104**	**Credit Hours**	1
Course Title	**Lab. Cell Biology**				

Course Introduction

This course introduces the methods of working in cell biology Lab.
The objectives of the course are:-
1. To explain the basic concepts of cell biology and use of lab instruments in cell biology.
2. To understand cellular structure, composition of the organelles, cell growth and cell division and types of staining.

Learning Outcomes

On the completion of the course, the students will:
1. **ACQUIRE** the basic concepts of cell biology.
2. **UNDERSTAND** the working in a cell biology lab to explore the structure and functional processes of cells in terms of cellular organelles, membranes, and biological molecules.
3. **ABILITY** to understand the role of cell components or cells in the living system.
4. **FORMULATE** the critical thinking skills and knowledge on cell.

Course Content		**Assignments/Readings**
Week 1	**Lab 1:** • Microscopy Basic Introduction	
Week 2	**Lab 2:** • Microscopy Applications	Familiarize working with the Microscope
Week 3	**Lab 3:** • Hemocytometer Study	Understand the grids and chambers of hemocytometer and the volume each chamber holds
Week 4	**Lab 4:** • Staining techniques (Gram's staining)	Understand the importance of Gram's Staining
Week 5	**Lab 5:** • Staining techniques (H and E staining)	Read about the purpose of H and E staining
Week 6	**Lab 6:** • Identification of cell organelles (prepared slides)	
Week 7	**Lab 7:** • Identification of cell organelles (prepared slides)	Lab Notebook (Soft or Hard form) needs to be Checked.
Week 8	**Lab 8:** • RBC Count Using Hemocytometer	
Week 9	**Lab 9:** • RBC Count Using Hemocytometer	
Week 10	**Lab 10:** • WBC Count Using Hemocytometer	
Week 11	**Lab 11:** • Differential Leukocyte Count	Understand the function of each W.B.C in normal and diseased condition.

Week 12	**Lab 12:** • Preparation of temporary whole mount.	
Week 13	**Lab 13:** • Preparation of permanent whole mount.	
Week 14	**Lab 14:** • Squash preparation of onion root tip for mitotic stages.	
Week 15	**Lab 15:** • Study of mitotic (prepared slides)	
Week 16	**Lab 16:** • Study of meiotic stages (prepared slides)	

Textbooks and Reading Material

Textbooks.

1. Karp G, Iwasa J, Marshall W. Karp's Cell Biology, Global Edition. John Wiley & Sons; 2018.

Suggested Readings

2. Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K., Watson, J. D. 2017. Molecular Biology of the Cell. 6th Edition. Garland Publishing Inc., New York.
3. Lodish H., Berk A., Kaiser C., Krieger M., Bretscher A., Ploegh H., Martin K., Yaffe M., Amon A. 2021. Molecular Cell Biology. W. H. Freeman; 9th ed. edition (Jan. 27, 2021) 978-1319208523
4. Articles in Journal of Cell Biology ISSN: 0021-9525
5. Bain B.J., Bates I., Laffan M.A. 2016. Dacie and Lewis Practical Haematology. 12th Edition. ISBN: 9780702069307. Elsevier

Teaching Learning Strategies

1. Use of Technology resources.
2. Use of Google Classroom management and Tools Resources
3. Provision of Handouts
4. Demonstration of the concepts using animations of cellular processes
5. Group activity of the students for problem solving skills

Assignments: Types and Number with Calendar

1. Lab Manual/Notebook: Due before the week of Final Term Examination