

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



|   |   |                    |          |                     |  |
|---|---|--------------------|----------|---------------------|--|
| <b>Programme</b>  | BS Zoology  | <b>Course Code</b> | ZOOL-108 | <b>Credit Hours</b> | 2  |
| <b>Course Title</b>   | <b>Lab. Biological Techniques</b>                       |                    |          |                     |  |
| <b>Course Introduction</b>  |   |                    |          |                     |  |
| The course aims to:   |   |                    |          |                     |  |
| <ol style="list-style-type: none"> <li>1. Develop scientific-technical expertise, culture and work habits.</li> <li>2. Familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences</li> <li>3. Develop basic understanding of the equipment's usage</li> <li>4. Develop the skills to collect and preserved animals</li> </ol>   |   |                    |          |                     |  |
| <b>Learning Outcomes</b>  |   |                    |          |                     |  |
| After successfully completion of this course,   |   |                    |          |                     |  |
| <ol style="list-style-type: none"> <li>1. Students must be able to identify the instrument</li> <li>2. Able to use instrument for identification, measurement, fixing and cutting of tissue</li> <li>3. Able to apply a practical and research skill</li> <li>4. Able to operate use the lab equipment efficiently.</li> <li>5. Able to collect and preserved the specimen in dry and wet form.</li> <li>6. Developed expertise in Preservation techniques</li> </ol> |   |                    |          |                     |  |
| <b>Course Content</b>   |   |                    |          |                     | <b>Assignments/Readings</b>  |
| <b>Week 1</b>   | Parts of bright field microscope and its function       |                    |          |                     | De Robertis, 1987<br>Cheesbrough, 1998<br>Gallagher and Wiley, 2008<br>Jones et al., 1994<br>Class Lecture |
|   | Cleanliness and Maintenance of microscope               |                    |          |                     |  |
| <b>Week 2</b>   | How to use microscope                                   |                    |          |                     |  |
|   | Preparation of slides (dry mount)                       |                    |          |                     |  |
| <b>Week 3</b>   | Preparation of slides (wet mount)                       |                    |          |                     |  |
|   | Observation of wet mounts of human cheek cells          |                    |          |                     |  |
| <b>Week 4</b>   | Measurement of cell size                                |                    |          |                     |  |
|   | Parts of Electron microscopes and its function          |                    |          |                     |  |
| <b>Week 5</b>   | Histology of tissue of any available animal             |                    |          |                     |  |
|   | Histology of tissue of any available animal             |                    |          |                     |  |
| <b>Week 6</b>   | Histology of tissue of any available animal             |                    |          |                     |  |
|   | Hematoxylin and eosin staining                          |                    |          |                     |  |
| <b>Week 7</b>   | Study of tissue(s) using microscope                     |                    |          |                     |  |
|   | Study of tissue(s) using microscope                     |                    |          |                     |  |
| <b>Week 8</b>   | Gram's staining   |                    |          |                     |  |
|   | Liquid handling: proper use of pipettes and micropittes |                    |          |                     |  |
| <b>Week 9</b>   | Use of weighing balance and pH meter                    |                    |          |                     |  |
|   | Preparation of stock solutions of various strengths     |                    |          |                     |  |
| <b>Week 10</b>  | Preparation of stock solutions of various strengths     |                    |          |                     |  |

|   |  |  |
|---|--|--|
|   | Handling of centrifuge machines  |  |
| <b>Week 11</b>  | Paper Chromatography   |  |
|   | Paper Chromatography   |  |
| <b>Week 12</b>  | Thin layer chromatography of amino acids                                       |  |
|   | Thin layer chromatography of amino acids                                       |  |
| <b>Week 13</b>  | Parts of UV-VIS-Spectrophotometric and its functions                           |  |
|   | Spectrophotometric estimation of glucose                                       |  |
| <b>Week 14</b>  | Collection and Preservation of animals representative animals of various phyla |  |
|   | Collection and Preservation of animals representative animals of various phyla |  |
| <b>Week 15</b>  | Collection and Preservation of animals representative animals of various phyla |  |
|   | Collection and Preservation of animals representative animals of various phyla |  |
| <b>Week 16</b>  | Collection and Preservation of animals representative animals of various phyla |  |
|   | Collection and Preservation of animals representative animals of various phyla |  |
| <b>Textbooks and Reading Material</b>   |  |  |
| <ol style="list-style-type: none"> <li>1. Dean, J. R. 1999. Extraction Methods for Environmental Analysis. John Wiley and Sons Ltd. UK</li> <li>2. Cheesbrough, M. 1998. District Laboratory Practice in Tropical Countries. Part I. Cambridge University Press, UK.</li> <li>3. Cheesbrough, M. 1998. District Laboratory Practice in Tropical Countries. Part II. Cambridge University Press, UK.</li> <li>4. Curoso, M. 1997. Environmental Sampling and Analysis: Lab Manual. CRC Press LLC. USA.</li> <li>5. Curoso, M. 1997. Environmental Sampling and Analysis: For Technician. CRC Press LLC. USA.</li> <li>6. Slingsby, D., Cock, C. 1986. Practical Ecology. McMillan Education Ltd. London.</li> <li>7. Rob Reed/ David HOLMES, Jonathan Weyers/ Allan Jones Pearson, Practical skill in bio-molecular sciences.</li> <li>8. Gallagher, S.R. and Wiley E.A. 2008. Current protocols essential laboratory Techniques. John Wiley &amp; Sons Inc, USA.</li> <li>9. Jones, A. Reed, R and Weyers, J. 1994. Practical skills in Biology. Longman Singapore Publishers (Pte) Ltd.</li> <li>10. De Robertis, E. D. P., De Robertis Jr. E. N. F. 1987. Cell and Molecular Biology, Lea &amp; Febiger, New York.</li> </ol> |  |  |
| <b>Teaching Learning Strategies</b>   |  |  |
| Teaching will be a combination of class lectures, class discussions, and group work. Short videos/films will be shown on occasion.  |  |  |
| <b>Assignments: Types and Number with Calendar</b>  |  |  |
| The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.   |  |  |
| <b>Assessment</b>   |  |  |
| <b>As per University rules</b>  |  |  |