

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



Programme	BS	Course Code	MMG 201	Credit Hours	3(2+1)
Course Title	ECOSYSTEM				
COURSE INTRODUCTION					
This course introduces the students to basic concepts about the structure and function of ecosystems to conserve the environment. This course is about exploring ecological concepts and scientific research to understand the interactions in nature at the organismal, population, community, ecosystem, and global levels.					
LEARNING OUTCOMES					
On the completion of the course, the students will be able to:					
<ol style="list-style-type: none"> 1. Become familiar with the interactions of organisms with the physical and the biological environment. 2. Understand the workings of ecological systems at different spatial and temporal scales. 3. Apprehend how human survival depends upon the resources and benefits provided by natural ecosystems. 4. Explore how human activities can negatively affect natural ecosystems. 					
COURSE CONTENT					
Introduction, aims, and applications of ecology. Concept, structure, and components of Ecosystem. Energy flow in ecosystems and energy transformation in nature. Food chain, Food webs, Food cycle, Trophic levels, Ecological pyramids. Biogeochemical cycles (carbon, nitrogen, phosphorus). Productivity of ecosystems. Impact of man on ecosystem. Fundamental of population ecology. Pollution and its types, Climate change, Global warming, Greenhouse effect, Acid rain, Ecosystem management					
PRACTICALS					
Study of pond freshwater ecosystem. Study of vegetation profile grassland and forest. Study of some biotic and abiotic factors of the ecosystem. Study of different methods of sampling. Measurements and description of communities by different methods. Study of decomposition of leaf litter by organisms.					
TEXTBOOKS AND READING MATERIAL					
<ol style="list-style-type: none"> 1. Weathers, K.C., Strayer, D.L. & Likens, G.E. (2021). <i>Fundamentals of Ecosystem Science</i>. 2nd Edition, Academic Press. 2. David G.R & Christopher L.J. F. (2017). <i>Ecosystem Ecology: A New Synthesis</i>. Cambridge University Press, USA. 3. Rossi, S., Bramanti, L., Gori, A. & Orejas, S. V. C. (2017). <i>Marine Animal Forests: The Ecology of Benthic Biodiversity Hotspots</i>, Springer, Cham, Switzerland. 4. Enger, E.D. & Smith, B.F. (2016). <i>Environmental Science: A Study of Interrelationships</i>. McGraw Hill Education, New York, USA. 5. Starr, C., Taggart, R., Evers, C. & Starr, L., (2015). <i>Biology: The Unity and Diversity of Life</i>, 15th Edition, Wadsworth Publishing Company, USA 6. Manuel, M. (2012). <i>Ecology: Concepts and Application</i>. McGraw-Hill Science, USA 7. Larry, L. B. & Dian, E. W. (2011). <i>Microbial Ecology</i>. Wiley Blackwell, USA 					

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.