



DPG DEGREE COLLEGE

(Affiliated to MDU Rohtak)

Sector-34, Near Marble Market, Gurugram 122001

MSC PROGRAMMS

Program Outcomes and Course Outcomes

M.Sc. Zoology- Program outcomes listed as follows:

To trained in various tools and techniques used to gain insight into biological processes.

To make understand the structure and function of prokaryotic and eukaryotic cells, as whole entities and in terms of their subcellular processes.

To provide general understanding of the major types of biochemical molecules, including small, large and super molecular components found in cells.

To insight in to the molecular approaches to study the mechanism of action of hormones and related molecules involved in various physiological processes.

To appreciate the understanding of the integration of principles of genetics with concept of evolution at population level.

COURSE OBJECTIVES & COURSE OUT COMES

S.N o.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	M.Sc. (Zoology)- Ist SEMESTER	
	Paper: Techniques in animal science	
	<ol style="list-style-type: none">1. To give the students an opportunity to become familiar with, and to acquire a degree of skill in various techniques2. To learn the techniques involved in animal sciences.3. To develop the ability to use appropriate laboratory or field procedures, methods, and instrumentation for biological studies.4. To Develop breadth of knowledge in the biological sciences, including the fields of biochemistry, cell biology, ecology, evolution, molecular biology and genetics, and physiology.	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none">1. Trained in various tools and techniques used to gain insight into biological processes.2. Expertise techniques used for imaging, isolation, purification and characterization of various biological\substances.3. Gain basic knowledge of the underlying principles and practical strategy of the analytical and preparative techniques that are fundamental to study and understanding of life processes.

Paper: Diversity of life form-I	
<ol style="list-style-type: none"> 1. To understand the diversity in animal form and opportunity to become familiar with 2. various classes of animals 3. To Understand the agricultural importance and migration in different classes 4. To develop an ability to understand the different methods for wildlife conservation 5. 4. To develop breadth of knowledge about geographical distribution, migration and history of various classes of animals. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand how life evolved from simple to complex organization by division of labour & enhancing efficiency in Invertebrates. 2. The study of invertebrates reveals progressive evolutionary history of organisms 3. To understand adaptations of huge complex and diverse life forms.

Paper: : Animal cell biology	
<ol style="list-style-type: none"> 1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles 2. Students will understand how these cellular components are used to generate and utilize energy in cells. 3. Students will understand the cellular components underlying mitotic cell division. 4. Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Gain expertise in the ultra-structural information of animal cell besides the detailed views of the cell interior revealing the various events and actions of cell at the molecular level. 2. Understand the new discoveries about the structure and internal functioning of the cell due to technological improvements. 3. Increase powerful means of visualization in the field of cell biology.
Paper: Animal biochemistry and metabolism	

<ol style="list-style-type: none"> 1. This course provides an advanced introduction to the fundamental processes of animal and plant metabolism. 2. Topics will include protein structure and function, mechanisms and control of enzyme action, the biochemistry of carbohydrate, fat and protein metabolism, energy generation and ruminant specific biochemistry. 3. To demonstrate knowledge and understanding of the molecular machinery of living cells 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 4. Gain general understanding of the major types of biochemical molecules, including small, large and super molecular components found in cells. 5. Expertise in basic energy metabolism of cells and identify some of common reaction mechanisms in biochemical process. 6. Expertise to develop understanding of biological processes at chemical, biochemical and molecular level to perform wide range of analytical techniques to explore biological activities.
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	Paper: Molecular biology	
	<ol style="list-style-type: none"> 1. To provide comprehensive background of Salient features of Nucleic Acids and DNA model to the course learners. 2. To impart detailed understanding of key events of molecular biology comprising of mechanism of DNA Replication, Transcription and Translation in Prokaryotes and Eukaryotes. 3. To Develop breadth of knowledge in the biological sciences, including the fields of molecular biology. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Gain expertise in understanding the complex molecular mechanisms occurring in cell and the applications of molecular technologies for betterment of life. 2. The study of molecular biology provides the necessary information about the chemistry of life to allow the students to understand the basis of life. 3. The study of biology stands as a tribute to human curiosity for seeking to discover and to human creative intelligence for devising the complex instruments and elaborate techniques by which these discoveries can be made
2.	M.Sc. (ZOOLOGY) IIND SEMESTER	
	Paper: Developmental biology	
	<ol style="list-style-type: none"> 1. The subject explains the knowledge of Developmental patterns of organism from Prokaryotes to Eukaryotes 2. Students would have understood the concepts of growth and development of organisms in a variety of organism 4. Student will learn the process of Differentiation, Metamorphosis, Environmental regulation of normal development and Sex determination in different organism 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Gain expertise in explaining how a variety of interacting processes generate an organism's heterogeneous shapes, size and structural features that arise on the trajectory from embryo to adult or more generally throughout a life cycle. 2. Have a systematic and organized learning about the knowledge and concepts of growth and development of organisms. 3. Displays a rich array of material and conceptual practices of Developmental biology that could be analyzed to better understand the scientific reasoning exhibited in experimental life sciences.
	Paper: Inheritance biology	

	<ol style="list-style-type: none"> 1. To provide comprehensive information about Mendalian principles with respect to inheritance 2. To provide the detailed understanding of key events of gene interaction, gene mapping and mapping with molecular markers 3. To offer the information regarding microbial genetics along with quantitative genetics and pedigree analysis 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Gain expertise in explaining how a variety of interacting processes generate an organism's heterogeneous shapes, size and structural features that arise on the trajectory from embryo to adult or more generally throughout a life cycle. 2. Have a systematic and organized learning about the knowledge and concepts of growth, development and inheritance pattern among organisms. 3. Displays a rich array of material and conceptual practices of inheritance biology that could be analyzed to better understand the scientific reasoning exhibited in experimental life processes.
Paper: Diversity of life form-II		
	<ol style="list-style-type: none"> 1. To understand the basic concept of Biosystematics 2. To Understand the different kind of taxonomic keys, zoological nomenclature and formation of scientific names of various taxa 3. To develop an ability to understand the Salient Features and classification of chordates with respect to diversity in animals. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Gain expertise in explaining how a variety of interacting processes generate an organism's 2. heterogeneous shapes, size and structural features that arise on the trajectory from embryo to adult or more generally throughout a life cycle. 3. Have a systematic and organized learning about the knowledge and concepts of growth and development of organisms.
Paper: Evolutionary biology		
	<ol style="list-style-type: none"> 1. To explore the origin of life, evolutionary transitions of eukaryotes and multicellularity and diversity of forms of life on earth with new scientific evidences 2. To study the Evolutionary history and Paleontology and major events in evolutionary time scale with respect to animals 3. To study the microevolution and macroevolution and their mechanism 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Explore the origin of life, evolutionary transitions of eukaryotes and multicellularity and diversity of forms of life on earth with new scientific evidences. 2. Develop a better understanding about the nature and origin of life 3. The diversity of various living forms with unifying characteristic

	relationships between themselves and environment.
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	<p>Paper: Open elective (Environmental Biology)</p> <ol style="list-style-type: none"> 1. Students will lead to understand the global environmental issues and different problem related to population growth of the world and India 2. Students will understand the impact of deforestation on the environment 3. Students will be able to learn the Forest and Wildlife management in order to save the environment 	<p>After the completion of the course, Students will be able to</p> <ol style="list-style-type: none"> 1. Explain the effects of habitat degradation, exotic species, overexploitation, pollution and climate change on biodiversity in general 2. Analyse the conditions of the prevailing environment with a clearer perspective. 3. Assess the effects of our daily activities on environment.
	<p>Paper: Foundation elective (Communication Skills)</p>	
	<ol style="list-style-type: none"> 1. To study the objective of research process, design and scientific method of research writing 2. To develop research aptitude and a scientific advancement within students 3. To Reinvent the students in response to the changing demands of society with high moral values as a good citizen 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Understand the process of research proposal writing, scientific method and result analysis 2. Learn the Scientific presentation, their preparation and Order of material for presentation 3. Learn the concept of citations, copyright and Ethical issues in drafting, and Acknowledgment
3.	<p>M.Sc. (ZOOLOGY) IIIrd SEMESTER</p>	
	<p>Paper: Immunology</p>	
	<ol style="list-style-type: none"> 4. The students will be able to identify the cellular immune responsive. 5. The students will be able to describe the roles both maintain health and contributing to disease 6. Students will be able to describe immunologic triggered and regulated. 7. Students will be able to perform, analyse and observations in Immunology. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To provide an understanding of fundamental immunology and the immunological basis of treatments of some common diseases. 2. The students will have understanding about the immune system and various related mechanisms of cells and molecules involved in fighting pathogens. 3. Students would understand the cellular and molecular basis of inflammatory response

	<p>4. They will also gain knowledge about the autoimmune disorders and their preventions</p>
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	Paper: Advanced Physiology	
	<ol style="list-style-type: none"> 1. Students will learn chemical and electrical signaling in the nervous system 2. Students will understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems 3. Students will understand how different systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail 4. Students will be able to perform, analyse and report on experiments and observations in Physiology 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Students will be able to recognise and identify principal tissue structures. 2. Students will be prepared for a number of courses, principally Physiology, Development & Neuroscience, but also Pharmacology, Pathology and Zoology, among others 3. Students will be able to compare, contrast and integrate knowledge of the major organ- function and their complexity of the major body-systems.
	Paper: Molecular endocrinology	
	<ol style="list-style-type: none"> 1. Students will learn Biosynthesis of steroid hormones. 2. Students will understand scope of endocrinology 3. Students will understand Current developments in design and production of hormonal contraceptives, Recombinant protein hormones production and application. 4. Students will be able to perform, analyse and report on experiments and observations in Molecular endocrinology 	<ol style="list-style-type: none"> 1. Students would gain insight in to the molecular approaches to study the mechanism of action of hormones and related molecules involved i n various physiological processes. 2. Students will be able to describe major signalling pathways in target cells for each hormone including feedback relationships. 3. Students will be able to identify the organs involved in the endocrine function and an understanding of appropriate key human endocrine disorder will also be developed. 4. Students would be able to understand the current developments in design and production of hormonal contraceptives.
	Paper: Paper: Molecular endocrinology	

	<ol style="list-style-type: none">1. Students will able to explain core concepts in ecology and summarize our ecological understanding of environment problems2. Explain how human health is related to environment health3. Describe how humans need nature to survive4. Students will be able to perform, analyse and report on experiments and observations in Environment Biology.	<ol style="list-style-type: none">1. To make students understand the relationship between the variations, inheritance and the various evolutionary forces.2. To appreciate the understanding of the integration of principles of genetics with concept of evolution at population level.3. To determine the practical aspects of subject
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	Paper: Open Elective;Disaster management	
	<ol style="list-style-type: none"> 1. Explain disaster management basics and theory (cycle, phases, risk, crisis, emergency, disasters, resilience) 2. Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster 3. Compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster 4. Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction 	<ol style="list-style-type: none"> 1. Student will be able to understand disaster management basics and theory (cycle, phases, risk, crisis, emergency, disasters, resilience) 2. Student will be able to compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster 3. Student will be able to compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster
4.	M.Sc. (ZOOLOGY) IVth SEMESTER	
	Paper: Advances in Vermiculture	
	<ol style="list-style-type: none"> 1. Students will understand the structures and p ecological grouping – Epigeic species, Endo 2. Students will understand Role of earthworm sustainable soil fertility 3. Students will understand the Vermiculture – 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To explore the important of earthworms in agro-ecosystems 2. It will enhance students understanding of Earthworms for management of municipal/selected biomedical solid wastes 3. Students residing in cities can produce Vermicompost in small scale for garden/household plants
	Paper: Biosafety & Ethics in Science	

	<ol style="list-style-type: none"> 1. Students will understand the Mechanism of Radioactive Decay, Interactions of beta and gamma radiation with matter, electron capture, Decay schemes and energy level diagrams 2. Students will understand Social issues: genetic discrimination: insurance and employment, human cloning, foeticide, sex determination. 3. Students will understand the Ethical issues: somatic and germ line gene therapy, clinical trials, ethical committee function. Social and ethical issues 4. Students will apply their knowledge of Bio-safety issues related with GMOs; the risk of introducing genetically engineered organism to environment ecological safety; Indian government bio-safety guidelines; 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To explain the social and ethical issues such as genetic discrimination, foeticide, sex and genetic engineering involving human beings. 2. The focus is also on studying the use of hazardous substances with appropriate measures. 3. Students will develop understanding of large-scale loss of biological integrity, focusing both on ecology and human health. 4. Awareness about study of bioethics and biosafety, studying socio-economic aspects of biotechnologies and advising on their implementation and application.
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