

BHADRAK AUTONOMOUS COLLEGE, BHADRAK

POSTGRADUATE DEPARTMENT OF ZOOLOGY & MICROBIOLOGY

PG COURSE IN ZOOLOGY

COURSE CODE AND TITLE	COURSE OUTCOMES
PAPER-101 NON- CHORDATES, BIOSYSTEMATI CS AND TAXONOMY	<ol style="list-style-type: none">1. Learn about the importance of systematics, taxonomy and structural organization of animals.2. Appreciate the diversity of non-chordates living in varied habit and habitats. Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.3. Critically analyse the organization, complexity and characteristic features of non-chordates making them familiarize with the morphology and anatomy of representatives of various animal phyla.4. Comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem.5. Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.
PAPER-102 CELL BIOLOGY AND GENETICS	<ol style="list-style-type: none">1. Understand fundamental principles of cell biology.2. Learn the structure and functions of cell organelles involved in diverse cellular processes.3. Appreciate how cells grow, divide, survive, die and regulate these important processes.4. Comprehend the process of cell signaling and its role in cellular functions.5. Have an insight of how defects in functioning of cell organelles and regulation of cellular processes can develop into diseases.6. Learn the advances made in the field of cell biology and their applications.7. Have a deeper understanding of the varied branches of the biological sciences like microbiology, evolutionary biology,

	<p>genomics and metagenomics.</p> <ol style="list-style-type: none"> 8. Gain knowledge of the basic principles of inheritance. 9. Analyse pedigree leading to development of analytical skills and critical thinking enabling the students to present the conclusion of their findings in a scientific manner. 10. Know the mechanisms of mutations, the causative agents and the harmful impact of various chemicals and drugs being used in day to day life. 11. Find out the effects of indiscriminate use of various chemicals, drugs or insecticides in nature by studying their effect on various bacterial species in soil and water samples from different industrial or polluted areas.
PAPER-103 PHYSIOLOGY AND HISTOLOGY	<ol style="list-style-type: none"> 1. Know the principles of normal biological function in human body. 2. Knowledge of basic human physiology and correlate with histological structures. 3. Understand how animals maintain an internal homeostatic state in response to changes in their external environment.
PAPER-104 TECHNIQUES, INSTRUMENT ATION, STATISTICS AND BIOINFORMAT ICS	<ol style="list-style-type: none"> 1. Master the use the tools and techniques for project work/ research in biology 2. Get skills in Histological & biochemical techniques. 3. Learn the application of radiations in Medical treatments 4. Get exposure to the emerging field of bioinformatics and equip them to take up bioinformatics studies.
PAPER-201 BIOPHYSICS, BIOCHEMISTR Y AND MOLECULAR BIOLOGY	<ol style="list-style-type: none"> 1. Learn the biophysical properties and functioning of life processes 2. Acquire skills in tools and techniques available for studying biochemical and biophysical nature of life 3. Understand the chemical nature of life and life process 4. Develop an idea on structure and functioning of biologically important molecules 5. Intensify interest in the subject and help students explore the new developments in Biochemistry. 6. Create curiosity in antioxidants and their role in cure of diseases. 7. Develop an interest for further research

	<ol style="list-style-type: none"> 8. Get apprised of the new developments in molecular biology and its implications in human welfare 9. Provide a thorough knowledge on types and properties of Cancer and how normal cells become cancerous. 10. Learn new strategies in cancer treatments.
PAPER-202 MICROBIOLOGY AND IMMUNOLOGY	<ol style="list-style-type: none"> 1. Get an over view of the microbial world, its structure and function 2. Get familiarized with the applied aspects of microbiology 3. Acquire an intensive and in-depth knowledge to the students in immunology 4. Understand the role of immunology in human health and well-being 5. Develop familiarity with the new developments in immunology 6. Learn the way body fights foreign bodies. 7. Understand the risks in transplantation of organs.
PAPER-203 ENDOCRINOLOGY AND REPRODUCTIVE PHYSIOLOGY	<ol style="list-style-type: none"> 1. Comprehend the study of endocrine system their role in maintaining homeostasis of the human body 2. Gain knowledge of the pathological conditions associated with endocrine imbalances 3. Learn the concepts and process in developmental biology 4. Understand and appreciate the genetic mechanisms and the unfolding of the same during development 5. Become aware of new developments in embryology and its relevance to Man 6. Acquire knowledge on teratogenesis and generate awareness in society. 7. Understand the causes of infertility and can take preventive measures
PAPER-204 ENVIRONMENTAL BIOLOGY AND WILDLIFE	<ol style="list-style-type: none"> 1. Understand the basic theories and principles of ecology 2. Get acquainted with various disciplines in ecology 3. Learn current environmental issues based on ecological principles 4. Gain critical understanding of human influence on environment 5. Acquire skills to solve environmental issues. 6. Understand the environmental laws, wildlife behaviors and try to apply them in current issues.
PAPER-301	<ol style="list-style-type: none"> 1. Gain knowledge of the taxonomic position, characteristic

<p>CHORDATES, EVOLUTION AND PALEOZOOLOGY</p>	<p>features and distribution of different orders of the Aves and Mammals</p> <ol style="list-style-type: none"> 2. Have fundamental knowledge in the concepts of animal behavior which enable the student to conceptualize learning, communication, migration and biological rhythms 3. Understand the process and theories in evolutionary biology 4. Develop an interest in the debates and discussions taking place in the field of evolutionary biology
<p>PAPER-302 ECONOMIC ZOOLOGY AND AQUACULTURE</p>	<ol style="list-style-type: none"> 1. Know the physico-chemical environment, and its role in aquatic ecosystem. 2. Learn about adaptations exhibited by organisms to survive in these typical conditions. 3. Realize how human activities influence the physicochemical environment of water bodies, and devastating impact it has on aquatic organisms. 4. Learn about the laws governing the use of freshwater systems, as well as the local, state, federal, and international agencies that enforce these laws to protect endangered and vulnerable species. 5. Understand and apply relevant scientific principles in the area of aquatic biology and educate others or work to conserve our natural resources.
<p>PAPER-303 DEVELOPMENTAL BIOLOGY</p>	<ol style="list-style-type: none"> 1. Understand the events that lead to formation of a multicellular organism from a single fertilized egg, the zygote. 2. Acquire basic knowledge of the cellular processes of development and the molecular mechanisms underlying these. 3. Learn the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multicellular organisms. 4. Gain knowledge of the general mechanisms involved in morphogenesis and to explain how different cells and tissues interact in a coordinated way to form various tissues and organs. 5. Understand about the evolutionary development of various animals. 6. Know the process of ageing leading to interventions that can improve the overall health and quality of life in aged people. 7. Learn the importance of latest techniques like stem cell

	therapy, <i>in vitro</i> fertilization and amniocentesis etc. to be applied for human welfare.
PAPER 304 ANIMAL BEHAVIOUR AND ADAPTIVE PHYSIOLOGY	1. Gain fundamental knowledge in the concepts of animal behavior which enable the student to conceptualize learning, communication, migration, adaptation and biological rhythms
PAPER – 401 APPLIED ZOOLOGY AND BIOTECHNOL OGY	1. Use or demonstrate the basic techniques of biotechnology like DNA isolation, PCR, transformation, restriction digestion etc. 2. Make a strategy to manipulate genetic structure of an organism for the improvement in any trait or its well-being based on the techniques learned during this course. 3. Understand better the ethical and social issues
PAPER-402 MICROBIAL ECOLOGY AND MICROBIAL BIOTECHNOL OGY	1. Application of bacterial and eukaryotic plasmids in research and also focuses on rapidly evolving nature of taxonomy and systematics, techniques and instrumentation in microbiology 2. Principles of management and control of microbial processes and industrial processes (mycology, medical virology, microbial ecology, microbial bioremediation, genetic engineering, agricultural microbiology 3. Application of knowledge about the food processing, food preservation, food fermentation, food safety, quality control and validation.
PAPER-403 CONSERVATIO N BIOLOGY	1. Learn basic principles of ecology in wildlife conservation and management 2. Use knowledge gained from study of variations, genetic drift to ensure that conservation efforts for small threatened populations
PAPER-405 PROJECT	1. Develops the concepts of research and covers aspects such as skill to design and conduct experiment, successfully process and report observations in the form of scientific report/manuscript/thesis, biosafety, GLP, experimental protocol, presentation of Data and viva voce

	<ol style="list-style-type: none">2. Learn to develop critical and reflective thinking, concepts and evaluating ideas from unsolved issues of biological sciences with interdisciplinary approach with an objective of threading together the loose ends3. The skill of representation under proper heads such as Title, Introduction, review of literature, objective, rationale, methodology, analysis and result, discussion and conclusion.4. Learn use of internet and search tools, MSW, XL, PPT, statistical analysis and graphical representation, referencing and citation methods, and ethics in research
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Programme –M.Sc. Zoology

Sl. No.	Program Outcome	Program Specific Outcome
1	<ol style="list-style-type: none">1. Develop knowledge and understand living organisms at several levels of Zoological and Biological organization from the molecular, through cells and whole organisms to ecosystems in evolutionary perspectives.2. To have Innovative thinking, deeper understanding of the unsolved issues in Zoology.3. To foster Multidisciplinary and interdisciplinary approach of understanding, correlation, analysis and representation4. Learn ethical approach to thought, study, research, representation, conservation, sustainability and novel exploration	<ol style="list-style-type: none">1. Understand and analyse the ecological and evolutionary significance of different taxa.2. To analyse the mechanisms involved in life processes upto molecular level and to understand potential of various branches of Zoology3. To get equipped with laboratory skills as well as field based studies to become a successful entrepreneur.4. To comprehend the importance of biodiversity and its need of sustainability and conservation5. To conduct basic and applied research which will directly add to the 'Sthiti' of the earth and multiverse.6. To perform the analytical experiments in various fields of biological science.7. To identify a research problem and to formulate a scientific solution.

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UG –GE-COURSE – ZOOLOGY

COURSE CODE AND TITLE	COURSE OUTCOMES
GE-I Food, Nutrition and Health	<ol style="list-style-type: none">1. Have a better understanding of the association of food and nutrition in promoting healthy living2. Develop holistic view of the relationship between nutrition and health issues
GE-II Human Physiology	<ol style="list-style-type: none">1. Know the principles of normal biological function in human body.2. Learn basic human physiology and correlate with histological structures.3. Understand how animals maintain an internal homeostatic state in response to changes in their external environment