Program outcomes, program specific outcomes and course outcomes of Zoology Department

Subject specific outcomes	• Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms • Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms. • Analyze complex interactions among the various animals of different phyla, their distribution and their relationship with the environment • Understands the complex evolutionary processes and behaviour of animals • understand the physiological processes of animals and relationship of organ systems • Gain knowledge of Agro based Small Scale industries like sericulture, fish farming, and vermin-compost preparation. • Understands about various concepts of genetics, molecular biology and its importance in human health • Understand the physiological aspects of human and other vertebrates
Program specific outcomes	• Understand the nature and basic concepts of cell biology, genetics, molecular biology, taxonomy, physiology, ecology, diseases, disease spreading agents and applied Zoology • Understand the relationships among animals, plants and microbes • Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, molecular Biology, Immunology, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Entomology, Nematology Sericulture, Biochemistry, Fish biology, Animal biotechnology and research methodology • Understand the applications of biological sciences in Apiculture, Aquaculture, Agriculture and Medicine • Gains knowledge about research methodologies, effective communication and skills of problem solving methods

GONDWANA UNIVERSITY, GADCHIROLI
CBCS COURSES IN M. SC. ZOOLOGY

SEMESTER - I

PAPER CODE	TITLE OF THE PAPER	CREDIT
Core 1	STRUCTURE AND FUNCTION OF INVERTEBRATES	4
Core 2	GENERAL PHYSIOLOGY	4
Core 3	CELL BIOLOGY AND GENETICS	4
Core 4	ADVANCED REPRODUCTIVE BIOLOGY	4
Practical core 1 and core 2	BASED ON THEORY PAPER 1 AND 2	4
Practical core 3 and core 4	BASED ON THEORY PAPER 3 AND 4	4
Seminar 1	SEMINAR 1	1

SEMESTER - II

PAPER CODE	TITLE OF THE PAPER	CREDIT
Core 5	STRUCTURE AND FUNCTION OF VERTEBRATES	4
Core 6	COMPARATIVE ENDOCRINOLOGY	4
Core 7	MOLECULAR BIOLOGY AND BIOTECHNOLOGY	4
Core 8	ADVANCED DEVELOPMENT AL BIOLOGY	4
Practical core 5 and core 6	BASED ON THEORY PAPER 5 AND 6	4
Practical core 7 and core 8	BASED ON THEORY PAPER 7 AND 8	4
Seminar 2	SEMINAR 2	1

SEMESTER - III

PAPER CODE	TITLE OF THE PAPER	CREDIT
Core 9	PARASITOLOGY AND IMMUNOLOGY	4
Special Group 1	ANIMAL PHYISOLOGY 1	4
Special Group 2	ANIMAL PHYSIOLOGY 2	4
Foundation 1	FRESH WATER FISHERIES	4
Practical core 9	BASED ON THEORY PAPER 9	4
Practical special group 1 and 2	BASED ON THEORY PAPER SPECIAL GROUP 1 AND 2	4
Seminar 3	SEMINAR 3	1

SEMESTER - IV

PAPER CODE	TITLE OF THE PAPER	CREDIT
Core 10	BIOTECHNIQUE, BIOSTATISTICS, ETHOLOGY, TOXICOLOGY AND BIOINFORMATICS	4
Special Group 3	ANIMAL PHYISOLOGY 3	4
Special Group 4	ANIMAL PHYSIOLOGY 4	4
Foundation 2	APPLIED FRESH WATER FISHERIES	4
Practical special Group 3 and 4	BASED ON THEORY PAPER SPECIAL GROUP 3 AND 4	4
Practical Project	PROJECT	4
Seminar 4	SEMINAR 4	1

Scheme of Marks of Theory and Practical

Semester	Paper	Title	Marks		Total
			University Exam	Internal Assessment	
I	Core 1	STRUCTURE AND FUNCTION OF INVERTEBRATES	80	20	100
	Core 2	GENERAL PHYSIOLOGY	80	20	100
	Core 3	CELL BIOLOGY AND GENETICS	80	20	100
	Core 4	ADVANCED REPRODUCTIVE BIOLOGY	80	20	100
	Practical core 1 and 2	BASED ON THEORY PAPER 1 AND 2	80	20	100
	Practical core 3 and 4	BASED ON THEORY PAPER 3 AND 4	80	20	100
	Seminar 1	SEMINAR 1	25	-	25
II	Core 5	STRUCTURE AND FUNCTION OF VERTEBRATES	80	20	100
	Core 6	COMPARATIVE ENDOCRINOLOGY	80	20	100
	Core 7	MOLECULAR BIOLOGY AND BIOTECHNOLOGY	80	20	100
	Core 8	ADVANCED DEVELOPMENTAL BIOLOGY	80	20	100
	Practical core 5 and 6	BASED ON THEORY PAPER 5 AND 6	80	20	100
	Practical core 7 and 8	BASED ON THEORY PAPER 7 AND 8	80	20	100
	Seminar 2	SEMINAR 2	25	-	25
III	Core 9	PARASITOLOGY AND IMMUNOLOGY	80	20	100
	Special Group 1	ANIMAL PHYISOLOGY 1	80	20	100
	Special Group 2	ANIMAL PHYSIOLOGY 2	80	20	100
	Foundation 1	FRESH WATER FISHERIES	80	20	100
	Practical core 9	BASED ON THEORY PAPER 9	80	20	100
	Practical special group 1 and 2	BASED ON THEORY PAPER SPECIAL GROUP 1 AND 2	80	20	100
	Seminar 3	SEMINAR 3	25	-	25
IV	Core 10	BIOTECHNIQUE, BIOSTATISTICS, ETHOLOGY, TOXICOLOGY AND BIOINFORMATICS	80	20	100
	Special Group 3	ANIMAL PHYISOLOGY 3	80	20	100
	Special Group 4	ANIMAL PHYSIOLOGY 4	80	20	100
	Foundation 2	APPLIED FRESH WATER FISHERIES	80	20	100
	Practical special Group 3 and 4	BASED ON THEORY PAPER SPECIAL GROUP 3 AND 4	80	20	100
	Practical Project	PROJECT	80	20	100
	Seminar 4	SEMINAR 4	25	-	25

Course specific outcomes M.Sc. Zoology

Semester	Title	Course specific outcomes
I	STRUCTURE AND FUNCTION OF INVERTEBRATES	• Course will provide knowledge regarding the various Invertebrates species • Students gain knowledge in the areas of Systematic position, general organization and affinities of invertebrates • The students will be well equipped to become very competent in research or teaching fields after completion of this course
	GENERAL PHYSIOLOGY	• Compare the functioning of organ systems across the animal world. • Learn more about animal physiology and anatomy.
	CELL BIOLOGY AND GENETICS	• Understanding on the details of the basic unit of life at the molecular level. • Explain the fine structure and functions of cell organelles. • Introduce the new developments in genetics and its implications in human welfare. • Expose the learners to the basics of genetics, genetic diseases.
	ADVANCED REPRODUCTIVE BIOLOGY	• In this course, students will learn the biological processes of reproduction, including the endocrinology and physiology of male and female reproduction. • They will gain an understanding of the determinants of fertility and infertility, and how reproductive biotechnology is used to overcome poor fertility. • This course will also include a focus on the biology of normal and disordered pregnancy. • Students will explore how reproductive biology impacts other aspects of health, exploring implications of early life exposures for later health and of the biology of reproductive cancers. • Social and ethical implications of reproductive technologies and research will be discussed within appropriate topics.
	BASED ON THEORY PAPER 1 AND 2	• Practical based on paper 1 and 2
	BASED ON THEORY PAPER 3 AND 4	• Practical based on paper 3 and 4
	SEMINAR 1	• Improve the presentation skill

II	STRUCTURE AND FUNCTION OF VERTEBRATES	• Course will provide knowledge regarding the various vertebrates species • Students gain knowledge in the areas of Systematic position, general organization and affinities of vertebrates • The students will be well equipped to become very competent in research or teaching fields after completion of this course
	• COMPARATIVE ENDOCRINOLOGY	• Students understand how the endocrine system is functioning. • They will understand the structures and molecular modes of action of a large variety of vertebrate and invertebrate hormones • Students will understand how hormones can regulate animal behavior. • They will acquire understanding of the physiological importance of hormones, as well as on their possible use and abuse in animals and humans
	MOLECULAR BIOLOGY AND BIOTECHNOLOGY	• It gives insight into various cell/tissues culture techniques • Understanding of in vitro culturing of organisms and production of transgenic animals. • Understanding of cloning of mammals, large scale culture and production from recombinant microorganisms • Gains skills in medical, environmental biotechnology, biopesticides, Biotechnology of aquaculture and use of animals as bioreactors • This insight allows students to take into consideration about ethical issues involved in production transgenic animals and BT products.
	ADVANCED DEVELOPMENTAL BIOLOGY	• Students will learn development of animal from egg to adult and also learn the processes of blastula, gastrulation • Will learn fundamental molecular and cellular mechanisms contribute during development process. • Will learn how these different mechanisms integrate at the level of whole tissues,

		organs and organisms, and how they are functionally adapted in distinct developmental contexts.
	BASED ON THEORY PAPER 5 AND 6	• Practical based on paper 5 and 6
	BASED ON THEORY PAPER 7 AND 8	• Practical based on paper 7 and 8
	SEMINAR 2	• Improve the presentation skill
III	PARASITOLOGY AND IMMUNOLOGY	• Provides basics knowledge about immune system and parasites • Types of immunity, antigens-antibodies and their properties • Complement system, MHC's and immune responses • Understanding of types of hypersensitivity reactions and auto immune diseases • Ability to understand concepts of tumor immunology and transplantation immunology • Study of diverse ecto and endoparasites • Understanding of fundamental complement of numerous diseases which have significant impact on human health • Understanding of Insect vector host interactions of many important diseases like Malaria, Filaria, Dengue etc.
	ANIMAL PHYISOLOGY 1 PHYSIOLOGY OF DIGESTION AND EXCRETION	• Students will learn the detailed concepts of digestion, absorption, excretion • in depth knowledge of various physiological processes associated with digestion and excretion in the animal kingdom
	ANIMAL PHYSIOLOGY 2 PHYSIOLOGY OF CIRCULATION	• Understanding of the functions of effectors in the circulatory physiology and adaptations by animals to environment • Imparts knowledge about various metabolic and physiological mechanisms involved in circulation Gain knowledge about hormones and electrophysiology of circulatory system
	FRESH WATER FISHERIES	• Course provides them comprehensive understanding about aquatic ecosystem and various economical important fishes. • Students gain knowledge of integumentary system - basic structure of skin, dermal and epidermal pigments, fins, and scales. • Understanding of embryogenesis - Early

		development and post embryonic development • Understanding of fishes habits and habitats and their functional anatomy
	BASED ON THEORY PAPER 9	• Practical based on paper 9
	BASED ON THEORY PAPER SPECIAL GROUP 1 AND 2	• Practical based on paper 10 and 11
	SEMINAR 3	• Improve the presentation skill
IV	BIOTECHNIQUE, BIOSTATISTICS, ETHOLOGY, TOXICOLOGY AND BIOINFORMATICS	• Students gain knowledge about various tools & techniques used in biological systems and gives them insight about their use in research. • Biostatistics teaches them to use the best data analysis methods in their research projects • Students gains knowledge about statistical methods like measures of central tendencies, Probability • Learns about hypothesis testing and inferential statistics • Learns the problem-solving methods • Learns various aspects of bioinformatics
	ANIMAL PHYISOLOGY 3 PHYSIOLOGY OF BRAIN, NERVE AND MUSCLE	• Course provides students comprehensive understanding about neurobiology, neurophysiology, molecular neurobiology • It gives comprehensive understanding regarding brain, nerves and muscles and their structure and function.
	ANIMAL PHYSIOLOGY 4 PHYSIOLOGY OF RESPIRATION AND REPRODUCTION \	• Understanding of the functions of effectors in respiratory physiology and reproduction and adaptations by animals to environment • The students will be well equipped to become very competent in research.
	APPLIED FRESH WATER FISHERIES	• Students will applied value of fisheries • Learn about culturing and maintenance of fish culture, pearl culture, prawn culture
	PRACTICAL BASED ON THEORY PAPER SPECIAL GROUP 3 AND 4	• Practical based on paper 14 and 15
	PROJECT	• Make research proposal • Construct tool of data collection • Learn fieldwork modalities • Understand the process of data analysis • Writing research report.
	SEMINAR 4	• Improve the presentation skill