

**Course outcome -Post-graduate Zoology (Semester system)**

Name of the Programme	Year of Introduction	Core course	Paper	Course outcome
<b>Semester I</b>				
<b>M.Sc Zoology</b>	<b>2015</b>	<b>ZCT 101</b>	<b>Structure and functions of non-chordates</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Concept building on evolution of metazoans, feeding</li> <li>ii. Knowledge on biological and medicinal importance of different phyla</li> <li>iii. Knowledge on mechanics of invertebrate movement/ locomotion; muscular activity and skeletal system; invertebrate swimming and flight</li> <li>iv. Idea on their physiology like defense, thermoregulation etc</li> </ul>
		<b>ZCT 102</b>	<b>Structure and functions of chordates</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Introduction to structure and function of proto-chordates, chordates and their physiology</li> <li>ii. Concept building on the evolution of different systems and their adaptation</li> </ul>
		<b>ZCT103</b>	<b>Biology of Cell and Tissue</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Introduced to the concept of different cell-organelles, structure and function of animal tissues</li> <li>ii. Concept building on cell-cycle and cell-signalling</li> <li>iii. Idea of apoptosis and anoikis</li> <li>iv. Concept building on stains and dyes, their physical &amp; chemical classification, nomenclature, mordants, metachromasia</li> </ul> <p>Knowledge on tools and techniques in cell biology</p>
		<b>ZCT 104</b>	<b>Endocrinology and Neuroscience</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Concept building on pheromones, GI tract hormones, thymic hormones and cell immunity.</li> <li>ii. Introduction to pineal gland and other hormones associated with human health; molecular basis and therapeutics</li> </ul>
		<b>ZCP 105</b>	<b>Laboratory course (4 modules)</b> <input type="checkbox"/> Non-chordate anatomy	<ul style="list-style-type: none"> <li>i. Hands-on training in dissection and mounting of different non-chordates and chordates</li> <li>ii. Ability to identify live cells and</li> </ul>

			<input type="checkbox"/> Chordate anatomy <input type="checkbox"/> Cell Biology and Tissue chemistry <input type="checkbox"/> Endocrinology and Neurobiology (FM 50)	blood cells along oth histological sections iii. Hands-on training in tissue fixation, sectioning and staining
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<b>Semester II</b>				
<b>M.Sc Zoology</b>	<b>2015</b>	<b>ZCT 201</b>	<b>Ecological theories &amp; application</b> (FM 50)	i. Concept building on population ecology, community, evolutionary and behavioural ecology ii. Idea of Biodegradation and Bioremediation iii. Introduced to waste management iv. Introduction to ecology of invasive species, bioremediation and environmental biotechnology v. Concept on ecosystem services, biodiversity and ecological economics, biological control and ecological restoration
		<b>ZCT 202</b>	<b>Immunology, Microbiology and Parasitology</b> (FM 50)	i. Introduction to phylogeny of immune system to detail knowledge of how the system works in mammals ii. Introduction to the concepts of parasitism, human clinical and veterinary parasitology iii. Concept building on host parasite interaction, community medicine, vector biology
		<b>ZCT 203</b>	<b>Molecular biology and Biochemistry</b> (FM 50)	i. Introduction to biomolecules like carbohydrates, proteins, lipids, amino acids etc and their metabolism ii. Knowledge on free radicals and anti-oxidants iii. Concept building on Genomics, Proteomics & Bioinformatics iv. Idea of recombinant DNA technology, gene therapy and associated molecular techniques

		<b>ZCT 204</b>	<b>Genetics and Genetic Engineering</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Introduction to chromatin dynamics, DNA replication and regulation</li> <li>ii. Idea about regulation of gene expression, translation &amp; post translational events, recombination &amp; repair, microbial genetics</li> <li>iii. Concept building on Transposable Genetic Elements and Somatic cell genetics</li> </ul>
		<b>ZCP 205</b>	<b>Laboratory course (4 modules)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ecological methods</li> <li><input type="checkbox"/> Parasitology and Microbiology</li> <li><input type="checkbox"/> Molecular techniques</li> <li><input type="checkbox"/> Biochemistry</li> </ul> (FM 50)	<ul style="list-style-type: none"> <li>i. Study of comparative anatomy through models.</li> <li>ii. Analysis of habitats and communities.</li> <li>iii. Study of Drosophila genetic crosses etc</li> <li>iv. Ability to identify and stains parasites</li> <li>v. Introduction to molecular biology techniques like TLC</li> <li>vi. Determination of glucose, total protein from tissues of animal model</li> </ul>

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<b>Semester III</b>				
<b>M.Sc Zoology</b>	<b>2015</b>	<b>ZCT 301</b>	<b>Taxonomy and Biodiversity and Conservation</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Concept building on taxa, species, Phylogenetic reconstruction and associated statistics</li> <li>ii. Introduction to cooperation and conflict, foraging, aggression</li> <li>iii. Idea about wildlife habitat ecology, biomes, conservation biology</li> <li>iv. Concept building on behavioural biology, protected area concept and human participation in conservation</li> </ul>

		<b>ZCT 302</b>	<b>Biostatistics and Instrumentation</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Ability to identify data relating to variable/variables.</li> <li>ii. Apply hypothesis testing via some of the statistical distributions.</li> <li>iii. Arrange the results of the hypothesis testing and make a statistical decision.</li> <li>iv. Concept building on the basics of bioinformatics and different instrument related to biological research</li> </ul>
		<b>ZCT 303</b>	<b>Developmental Biology and Evolution</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Introduction to Principles of Developmental Biology including embryogenesis</li> <li>ii. Concept building on regenerative biology and how environment regulates the process</li> <li>iii. Introduction to natural selection and adaptation, evolutionary process, gene frequencies in population, patterns and trends in evolution, species and speciation</li> </ul>
		<b>ZCP 301</b>	<b>Laboratory course (5 modules)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Taxonomy and Biodiversity</li> <li><input type="checkbox"/> Animal Behaviour</li> <li><input type="checkbox"/> Developmental Biology</li> <li><input type="checkbox"/> Instrumentations and Techniques</li> <li><input type="checkbox"/> Biostatistics</li> </ul> (FM 50)	<ul style="list-style-type: none"> <li>i. Study on trait analyses of an invasive species, pollen transport by insect pollinator</li> <li>ii. Hands on training in water quality assessment, construction of phylogenetic tree</li> <li>iii. Analysis of enzymatic method for determining amylase activity</li> </ul>
		<b>ZET301-306</b> (Any one)	<b>Elective Paper (Unit I)</b> Ecology/ Entomology/ Genetics/ Parasitology and Immunobiology	
		<b>ZET 301 Ecology</b>	<b>Evolutionary and Behavioral Ecology</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Students gain insight about evolutionary and behavioural ecology</li> <li>ii. Concept building on ecology of population and</li> </ul>

				communities, competition theory
		<b>ZET 303 Entomology</b>	<b>Insect Organization and Physiology</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Introduction to feeding, excretory and respiratory and reproductive mechanism of insects</li> <li>ii. Concept building on insect immune defense, metamorphosis etc</li> <li>iii. Idea about stridulation and bioluminescence</li> </ul>
		<b>ZET- 305 Genetics</b>	<b>Genome organization and regulation of Gene Expression</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Concept building on acromolecules and organization, chromosome structure and nucleic acids</li> <li>ii. Study of the central dogma, gene expression in viruses, cell cycle and apoptosis</li> </ul>
		<b>ZET- 306 Parasitology and Immunobiology</b>	<b>Biology of parasitism and single cell eukaryotes</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Concept building on the classification and evolution of parasites</li> <li>ii. Study of the life history, pathogenicity, control measures of several parasites of human and veterinary importance</li> </ul>

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<b>Semester IV</b>				
<b>M.Sc Zoology</b>	<b>2015</b>	<b>ZCT 401</b>	<b>Animal physiology and Animal Behaviour</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Principles of animal physiology, evolutionary approaches and physiology of behaviour</li> </ul>
		<b>ZCT 402</b>	<b>Biotechnology and Applications</b> (FM 50)	<ul style="list-style-type: none"> <li>i. Knowledge on basic biotechnology and its application</li> <li>ii. Concept building on animal cell culture, reproductive biotechnology</li> </ul>

	ZET 401-06 and ZEP 401-06 (Any one)	<b>Elective Papers Unit II and Practical</b> Ecology/ Entomology/ Genetics/ Parasitology and Immunobiology	
	<b>ZET-401 Ecology</b>	<b>Ecosystem and Conservation Ecology</b> (FM 50)	i. Introduction to Habitat and Ecosystem Ecology ii. Concept building on conservation ecology and microbial ecology
	ZEP 401	<b>Laboratory Course on Ecology (FM 60)</b> + <b>Project and Review</b> (FM 40)	i. Hands on training in ecological sampling and census techniques, morphometric analysis ii. Practical knowledge in statistical and molecular method of ecological analysis
	<b>ZET-403 Entomology</b>	<b>Applied Entomology</b> (FM 50)	i. Introduced to agricultural entomology, pest, integrated pest management ii. Concept building on vector biology, parasitic arthropods
	<b>ZEP 403</b>	<b>Laboratory Course on Entomology</b> (FM 60) + <b>Project and Review</b> (FM 40)	i. Hands on training in insect diversity, dissection and mounting of different parts of insects ii. Study of social insects
	<b>ZET: 405 Genetics</b>	<b>Genetic Engineering, Oncogenes &amp; Cancer</b> (FM 50)	i. Concept building on genetic engineering techniques like gene cloning ii. Study of the genetic basis of cancer and oncogenes iii. Knowledge on techniques of gene manipulation and transposable elements
	<b>ZEP 405</b>	<b>Laboratory Course on Genetics</b> (FM 60) + <b>Project and Review</b> (FM 40)	Hands on training in chromosome preparation, gel electrophoresis, karyotyping, DNA isolation to name a few
	<b>ZET 406</b>	<b>Immunopathological and clinical aspects</b> (FM 50)	i. Study of vector biology ii. Concept building on infection and immunity, hypersensitivity, tolerance and autoimmunity,

				tumour and transplantation immunology, immunodeficiency and immunoprophylaxis
		<b>ZEP406</b>	<b>Laboratory Course on Parasitology and Immunobiology</b> (FM 60) + <b>Project and Review</b> (FM 40)	<ul style="list-style-type: none"> <li>i. Hands on training on isolation, identification and staining of different parasite</li> <li>ii. Ability to identify and isolate macrophages</li> <li>iii. Knowledge on parasite culture and micrometry</li> </ul>