Department of Zoology Sant Guru Ghasidas Govt. P. G. College Kurud, (C.G.)	
Program Outcome	Post-graduation Program in zoology is one of the most fundamental branches of basic sciences. This will provide sufficient opportunities for the students to explore different career options. The program also helps to develop scientific temper and attitudes in all. By the use of various bioinformatics and computational tools in modern sciences students will be able to qualitatively and quantitatively analyze evolutionary parameters. The program helps to understand the origin of life and evolution of various species on earth, which helps to make a basic understanding to all about various superstitions and non-scientific thoughts in the human society. The Theories of organic evolution may help to develop the scientific temper and knowledge in society which helps to build a better society and Nation. The study of anatomy and physiology make an understanding about different biological systems of body, their coordination and control, disorders and maintenance, response against environmental stress and strain. The study of parasitology and life cycle of animals will provide a strong data about various diseases and there control. The program will also become a platform for study of some genetic traits and diseases among populations and their inheritance. The students may able to observe the behavior and biological roles of the animals in the ecosystem. In the current scenario of the world ecosystem, many of the animals have been extinct and many more are in the category of threatened. The program will definitely aware the people to protect the ecosystem and every species in their habitat, which plays an important role as a trophic level, pollinator or indicator, etc. After the completion of under graduate and post graduate courses, the students have the option to go for higher studies, i.e., Ph.D. and then do research work for the sustainable development and welfare of life on earth. The career options in research are as scientist in various research intuitions like DRDO, CSIR, TIFR, etc. in India or abroad, or the students may join the education system as a professor, assistant professor, teacher, Animal Behaviorist, Conservationist, Wildlife Biologist, Zoo Curator, Wildlife Educator, Forensic experts, Lab technicians, Veterinarians etc. They can also join the professional institutions for competitive coaching institutions. The students may also join the Indian Civil Services, Indian Forest Service; Indian Police Service etc. The knowledge and experiences gained during practical will effectively build the skilled man power which will be helpful in designing different public health strategies for human beings and for all life on earth.
Program Specific Outcome	Students enrolled in under graduation degree in zoology with the combination of biotechnology may also have an extra opportunity to make their career in the field of biotechnology and industries based on bio techniques. They will find career options in government sector, or in

	various agencies, universities, colleges, and industries. The students of post-graduation degree have an option in their forth semester will study the ichthyology and fisheries sciences as a spatial paper. They can choose the government post as fisheries inspector, district fishery officer, or other designation. They can also start their own fish form with their knowledge gained during the program. There are abundant career prospects in public and private sector for students who have completed the course with proper attentions and dedications.
Course Outcome	
Name of Program: M. Sc. Zoology	
Semester – I	
Paper – I: Biosystematics, Taxonomy and Biodiversity	➢ To understand the concept of Biodiversity and conservation issues of life forms in earth. ➢ The knowledge about grouping of animals and there nomenclature system may useful to observe the local fauna and flora. ➢ It may increase the manpower to explore the untouched local habitat in and around the local population.
Paper – II: Structure and function of invertebrate.	➢ It will help to understand the body organization and other characteristics of invertebrate animals. ➢ Students may study the life cycle of various invertebrates like butterfly, worms, wasp, etc.
Paper – III: General and comparative endocrinology of vertebrates.	➢ The students may able to understand the body structure and regulation of body activities in vertebrate animals including human beings.
Paper – IV: Gamete biology and Reproduction physiology.	➢ Knowledge about reproductive system of vertebrate animals.
Lab Course – I & II	➢ To gain the practical knowledge about Theory papers
Semester – II	
Paper – I: Molecular cell biology and Biotechnology	➢ To understand the ultrastructure of cell and unit of life. ➢ Use and application of bio-techniques.
Paper – II: Tools and Techniques in biology	➢ To understand the various tools and techniques in biological study. ➢ To understand the principles and methods about tools in biology.
Paper – III: Quantitative biology and Computer application.	➢ To understand the application of computer in biological data analysis. ➢ To gain the knowledge about statistics and statistical tools to verify the data analysis of biological observation.

	➢ Test of significance. ➢ Hypothesis testing.
Paper – IV: immunology and Developmental Biology	➢ To understand the immune system of animal and human bogy. ➢ Knowledge about antibody-antigen system.
Lab Course – I & II	➢ To gain the practical knowledge about theory papers
Semester – III	
Paper – I: Comparative anatomy of vertebrates.	➢ Origin of chordate animals. ➢ Comparative study about anatomy and physiology of vertebrates.
Paper – II: Animal Behavior	➢ To gain the knowledge about behavioral aspects of animals. ➢ To study the communication, migration, etc. in vertebrate animals.
Paper – III: Environment physiology and Population ecology.	➢ To gain knowledge about demography. ➢ To gain knowledge about environmental adaptation, acclimatization, and adaptation in animals.
Paper – IV: Population Genetics and Evolution	➢ To understand the origin and evolution of life forms on earth. ➢ To understand the theories of Lamarck, Darwin, etc.
Lab Course – I&II	➢ To gain the practical knowledge about theory papers
Semester – IV	
Paper – I: Biochemistry, Metabolic Regulation and Cell Function.	➢ To gain knowledge about the Biochemistry of Nucleic acid, Enzyme, Protein, Fat and Carbohydrates. ➢ Metabolic Regulation and Cell Function
Paper – II: Neurophysiology and General Physiology	➢ To understand the Nervous and hormonal control of Vertebrate body.
Paper – III: Optional (A) Ichthyology	➢ To gain knowledge about structure and function of fish body.
Paper – IV: Optional (A) Pisci culture and economic importance of Fishes.	➢ To understand the procedure of collection, transportation of fish seed. ➢ To understand the pond management for aquaculture. ➢ To understand the economic importance of fish.
Lab Course – I&II	➢ To gain the practical knowledge about paper I & II
Name of Program: B. Sc. Zoology	

B. Sc. Part – I	
Paper – I: Cell Biology and Non Chordate	
Unit – I	➢ The Cell and Cell organization. ➢ Cell organelles ➢ Nucleolar organization
Unit – II	➢ Cell cycle ➢ Elementary idea about cancer & cell transfusion ➢ Elementary idea about immunity
Unit – III	➢ General idea about taxonomy of Protozoa, Prifera & Coelenterata
Unit – IV	➢ General idea about taxonomy of Platyhelminthes, Annelida & Arthropoda
Unit – V	➢ General idea about taxonomy of Mollusca & Echinodermata
Paper – I: Chordata & Embryology	
Unit – I	➢ General idea about taxonomy of Hemichordate & Chordata ➢ Comparative account of Protochordates
Unit – II	➢ General idea about Fish, Amphibia and Reptiles
Unit – III	➢ General idea about Birds and Mammals
Unit – IV	➢ General idea about gamete biology& developmental biology. ➢ Development of Frog
Unit – V	➢ Embryology. ➢ Development of chick ➢ Placenta
B. Sc. Part – II	
Paper – I: Comparative anatomy of various organ system of vertebrates	
Unit – I	➢ Structure, function and importance of Skin, Digestive system & respiratory system.
Unit – II	➢ Structure, function and importance of Endoskeleton, Circulatory system & Urinogenital system.
Unit – III	➢ Structure, function and importance of Nervous system, Sense organs, Gonads & genital ducts.
Unit – IV	➢ Physiology of digestion, circulation of blood & Respiration.
Unit – V	➢ Physiology of Excretion, Muscle constriction, Nerve impulse conduction & Synaptic transmission.
Paper – I: Vertebrate endocrinology, Reproductive Biology, Behavior, Evolution and Applied Zoology	
Unit – I	➢ Structure and Function of endocrine glands, ➢ Biosynthesis of hormones ➢ Hormonal disorders.
Unit – II	➢ Reproductive cycle and hormonal control of gametogenesis.
Unit – III	➢ Theories of Organic evolution. ➢ Evolution of horse.
Unit – IV	➢ Ethology ➢ Reproductive behavior ➢ Hormonal regulation of behavior

Unit – V	➢ Culture of prawn, bee, silkworm, fish, & Poultry keeping. ➢ Elements of pest control
B. Sc. Part – III	
Paper – I: Ecology, Environmental biology, Toxicology, Microbiology and medical zoology,	
Unit – I: Ecology	➢ Aims and scopes of Ecology. ➢ Major ecosystems of the world-Brief intruduction ➢ Population- Characteristics and regualtion of densities. ➢ Communities and Ecosystems. ➢ Biogeochemical cycles ➢ Air and water pollution ➢ Ecological succession
Unit – II :ENVIRONMENTAL BIOLOGY	➢ Laws of limiting factors ➢ Food chain in a freshwater ecosystem. ➢ Energy flow in ecosystem-Trophic levels ➢ Conservation of Natural resources ➢ Environmental impact Assessment
Unit – III : TOXICOLOGY	➢ Classification of toxicants ➢ Principle of systematic toxicology ➢ Toxic agents and their action- Metallic and inorganic agents ➢ Animal poisons - Snake-venom, Scorpion and bee poisoning ➢ Food pisoning
Unit – IV: MICROBIOLOGY	➢ General and Applied microbiology. ➢ Microbiology of Domestic water and sewage ➢ Microbiology of milk and milk products ➢ Industrial microbiology
Unit – V : MEDICAL MICROBIOLOGY	➢ Brief introduction to pathogenic micro-organisurs, Rickettsia, Spirochaetes and Bacteria. ➢ Brief account of life-history and pathogenicity of ▪ Entamoeba, Trypanosoma, and Giardia ▪ Schistosoma ▪ Nematode Pathogenic parasites ➢ Vector insects
Paper – II: BIOCHEMISTRY,BIOTECHNOLOGY AND BIOTECHNIQUES	
Unit – I : GENETIC'S	➢ Linkage and Linkage maps ➢ Varieties of gene expression - Multiple alleles ; lithogenesis ; Pleiotropic genes; gene interaction ; epistasis. ➢ Sexchromosome systems, and sex-linkage. ➢ Mutation and chromosomal alterations ; meiotic consequences. ➢ Human genetics - chromosomal and single gene disorders (somatic cell genetics)
Unit – II : CELL PHYSIOLOGY	➢ General idea about pH and Buffer. ➢ Transport across membrane - cell membrane; Mitochondria and Endoplasmic reticulum. ➢ Active transport and its mechanism; Active transport in Mitochondria and Endoplasmic reticulum.

	➢ Hydrolytic enzymes - Their chemical nature, Activation and specificity.
Unit – III : BIOCHEMISTRY	➢ Amino acids and Peptides - Basic structure and biological function. ➢ Carbohydrate and its metabolism - Glycogenesis; Gluconeogenesis; glycolysis, ➢ Glycogenolysis; Cosi-cycle. ➢ Lipid metabolism - Oxidation of glycerol; oxidation of fatty acid. ➢ Protein metabolism - Deamination,Transamination, Transmethylation; Biosynthesis of Protein;
Unit – IV : BIOTECHNOLOGY	➢ Biotechnology - Scope and importance. ➢ Recombinant DNA and Gene cloning. ➢ Cloned genes and other tools of biotechnology. ➢ Applications of biotechnology in (i) Pharmaceutical industry, and (ii) Food processing industry.
Unit – V : BIOTECHNIQUE	➢ Principles and techniques of pH meter Colorimeter ➢ Microscopy-Light microscopes, Phase contrast and Electron microscopes. ➢ Centrifugation ➢ Separation of biomolecules by chromatography, and Electrophoresis ➢ Histrochemical methods for determination of Protein, Lipids, and carbohydrate