



V.K.V GOVERNMENT DEGREE COLLEGE KOTHAPETA

(Accredited by NAAC “B”Grade)



(An ISO 9001:2015 Certified College by HYM International Certifications Pvt.Ltd.)

DEPARTMENT OF ZOOLOGY

**V.K.V Government Degree College Kothapeta
Department Of Zoology**



B.Sc. PROGRAMME OUTCOMES

The B. Sc. programme enabled the student to enhance their critical thinking during their three year period of study and the curriculum stimulates the mental thoughts and assumptions of the students. This helps the students to take up practical work and compare the results with their assumptions, there by leading to accuracy and validity of the practical knowledge. This analysis leads to take decisions at intellectual, organization and personal from different perspectives of life.

Students of the programmable to learn all basic concepts in biological and chemical sciences which are very much the need of the hour as there is a dearth of good students in the area of basic sciences in the country. The students would be equipped to continue higher studies in any of the branches of Life Sciences and Chemical Sciences. The modules on tissue culture, molecular biology and genetics, taxonomy, economic botany, ethno pharmacology, analytical chemistry etc., make them fit to be employable in respected fields.

This course encourages the student to take up advanced studies and research in Botany, Zoology and Chemistry and pursue their goals.

CAREER OPPORTUNITIES FOR B Sc CBZ.

1. After completing B Sc degree, one can get employed in non scientific sectors in Addition to scientific sectors. They can seek out for career in forestry, horticulture, research laboratories, Government, Corporate,
2. The course has wide range of options available in terms of subjects, topics, Fields and associated area. B. Sc graduates can opt to join a post graduate level degree programme in their respective field or ailed subject to peruse further studies.
3. Some students have also been known to opt for non science master degree programme like journalism, animation, computer technology, management, business administration, hospitality sector and many others as their field of study after completion of their B.Sc. graduation.
4. Apart from this science graduates can also find jobs in business, BPO, marketing, banking and finance sectors and so on.

COURSE OUTCOMES ZOOLOGY PROGRAM OUTCOMES, PROGRAM SPECIFIC OUT COMES AND COURSE OUTCOMES

ZOOLOGY PROGRAM OUTCOMES:

1. Students perceive the knowledge and skill in the fundamentals of animal sciences, understands the interactions among various living organisms.
2. Interpret complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
3. Learner gains the knowledge about comparative anatomy and developmental biology
4. Correlates the physiological processes of animals and relationship of organ system, gains the knowledge about Human endoskeleton and anatomical features of organs.
5. Understands the ecologically important and harmful insects and various controlling methods of insect pest.
6. Understands about various concepts of genetics and its importance in human health and complex evolutionary processes.
7. Apply the knowledge of internal structure of cell, its functions, perceive the knowledge about immunology.
8. Gains the knowledge of agro based small scale industries like sericulture, fish farming, poultry, dairy industry.
9. Understands the importance about environmental conservation process, pollution control, toxicology, biodiversity and protection of endangered species.

PROGRAM SPECIFIC OUTCOMES:

1. Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.
2. Analyse the relationships among animals, plants and microbes.
3. Performs the procedure as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical Science, Tools and techniques of Zoology, Toxicology, Entomology, Nematology, Sericulture, Biochemistry, Aquaculture, Immunology and Research methodology.
4. Gains the knowledge about research methodologies through project work, thereby contributes the knowledge for welfare of the society.

COURSE OUTCOMES: ZOOLOGY MAJOR HONOURS

<p>B.Sc., SEMESTER I COURSE NO:3 PAPER I: Animal Diversity-I Biology of Non-Chordates CREDITS: 3</p>	<p>Describe concept of animal kingdom classification and general characters of Protozoa • Classify Porifera and Coelenterate with taxonomic keys • Classify Phylum Platy & Nematelminths using examples, parasitic adaptation</p>
<p>B.Sc., SEMESTER I COURSE NO:1 PRACTICAL PAPER I Animal Diversity-I Biology of Non-Chordates CREDITS: 2</p>	<p>To understand the importance of preservation of museum specimens • To identify animals based on special identifying characters • To understand different organ systems through demo or virtual dissections • To maintain a neat, labelled record of identified museum specimens</p>
<p>B.Sc., SEMESTER I COURSE NO:2 Animal Diversity-II Biology of Chordates CREDITS: 3</p>	<p>Describe general taxonomic rules on animal classification of chordates • Classify Protochordates to Mammalia with taxonomic keys • Understand Mammals with specific structural adaptations • Understand the significance of dentition and evolutionary significance</p>
<p>B.Sc., SEMESTER I COURSE-2 PRACTICAL PAPER Animal Diversity-II Biology of Chordates CREDITS:2</p>	<p>To understand the importance of preservation of museum specimens • To identify animals based on special identifying characters • To understand different organ systems through demo or virtual dissections • To maintain a neat, labeled record of identified museum specimens</p>
<p>B.Sc., SEMESTER II COURSE NO:3 Cell and Molecular Biology REDITS: 3</p>	<p>Understand the basic unit of the living organisms and to differentiate the organisms by their cell structure. • Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell. • Explain the cell cycle and bioenergetics of the cell • Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins</p>
<p>B.Sc., SEMESTER II PRACTICALS COURSE NO:3 Cell and Molecular Biology CREDITS: 2</p>	<p>1.Preparation of temporary slides of Mitotic divisions with onion root tips 2. Observation of various stages of Mitosis with prepared slides 3. Observation of various stages of Meiosis with prepared slides 4. Mounting of salivary gland chromosomes of Chironomus</p>
<p>B.Sc., SEMESTER II COURSE NO:4</p>	<p>Understand the historical perspective and concepts of embryology • Acquire</p>

Embryology CREDITS:3	knowledge on gametogenesis, fertilization and cleavage patterns • Understand the fate of germinal layers and extraembryonic membranes • Explain the process of regeneration in certain animals
B.Sc., SEMESTER II COURSE NO:4 Practical's Embryology CREDITS:2	<ul style="list-style-type: none"> • Must develop a critical understanding of the early embryological events • Acquire knowledge on the developmental stages of chick • Understand the histology of placenta
B.Sc., SEMESTER III COURSE NO:5 Animal Diversity-II Biology of Chordates CREDITS: 3	Describe general taxonomic rules on animal classification of chordates • Classify Protochordates to Mammalia with taxonomic keys • Understand Mammals with specific structural adaptations • Understand the significance of dentition and evolutionary significance
B.Sc., SEMESTER III COURSE-5 PRACTICAL PAPER Animal Diversity-II Biology of Chordates CREDITS:2	To understand the importance of preservation of museum specimens • To identify animals based on special identifying characters • To understand different organ systems through demo or virtual dissections • To maintain a neat, labeled record of identified museum specimens
B.Sc., SEMESTER III COURSE NO:6 Principles of Genetics CREDITS: 3	To understand the history of genetics, gain knowledge basic terminology of genetics • To acquire knowledge on interaction of genes, various types of inheritance patterns existing in animals with reference to non-Mendelian inheritance. • To acquire knowledge on chromosomal inheritance • Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination
B.Sc., SEMESTER III Principles of Genetics CREDITS:2	To acquire practical knowledge on the importance of Mendelian principles by solving the problems. • To provide the required knowledge on the gene interactions • To acquaint the students on Human karyotype & pedigree analysis basics
B.Sc., SEMESTER III COURSE NO:7 Animal Biotechnology CREDITS:3	Get knowledge of the Vectors and Restriction enzymes used in biotechnology • Describe the gene delivery mechanism and PCR technique • Acquire basic knowledge on media preparation and cell culture techniques • Understand the manipulation

	of reproduction with the application of biotechnology
B.Sc., SEMESTER II COURSE NO:7 PRACTICAL Animal Biotechnology CREDITS:2	Acquire knowledge on Cloning vectors widely used in biotechnology • Empower with the process of DNA quantification and amplification • Explain purification of biological compounds by paper chromatography • Get insight maintenance of laboratory apparatus • Understand principles of animal culture, media preparation
B.Sc., SEMESTER III COURSE NO:8 Evolution and Zoogeography CREDITS:3	Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals • Explain the different evidences of evolution • Understand the theories of evolution • Explain the various tools for evolution
B.Sc., SEMESTER III COURSE NO:8. PRACTICAL Evolution and Zoogeography CREDITS:2	Acquainting and skill enhancement in the usage of laboratory equipment • To apply the basic concept of inheritance for applied research • To get familiar with phylogeny ad geological history of origin & evolution of animals • To understand the zoogeographical distribution of animals
B.Sc., SEMESTER IV COURSE NO:9 Embryology CREDITS:3	Understand the historical perspective and concepts of embryology • Acquire knowledge on gametogenesis, fertilization and cleavage patterns • Understand the fate of germinal layers and extraembryonic membranes • Explain the process of regeneration in certain animals
B.Sc., SEMESTER IV COURSE NO:9 Practical's Embryology CREDITS:2	• Must develop a critical understanding of the early embryological events • Acquire knowledge on the developmental stages of chick • Understand the histology of placenta
B.Sc., SEMESTER IV COURSE NO:10 Animal Physiology: Life Sustaining Systems CREDITS:3	Understand the physiology of digestion and hormonal control of digestion • Develop a comprehensive picture of respiratory physiology • Acquire knowledge on the Renal physiology • Understand the physiology of Nerve and muscle • Understand the physiology of heart
B.Sc., SEMESTER IV COURSE NO:10	• To develop the ability to test the biological sample like saliva and urine. • To

<p>Practical's Animal Physiology: Life Sustaining Systems CREDITS:2</p>	<p>Effectively estimate the blood haemoglobin. • To Acquire skill to use the sphygmomanometer in recording blood pressure. • To observe the ECG</p>
<p>B.Sc., SEMESTER IV COURSE NO:11 Immunology CREDITS:3</p>	<p>Articulate the roles of innate recognition receptors in immune responses • Compare and contrast humoral versus cell-mediated immune responses • Distinguish various cell types involved in immune responses and associated functions; • Distinguish and characterize antibody isotypes, development, and functions • Understand the role of cytokines in immunity and immune cell activation;</p>
<p>B.Sc., SEMESTER IV COURSE NO:11 Practical's Immunology CREDITS:2</p>	<p>To study the histology of lymphoid organs • To acquaint with the process of blood grouping with kit • To acquaint with the ELISA test • To acquaint with the Widal test</p>
<p>B.Sc., SEMESTER V COURSE NO:12 Poultry Management-I (Poultry Farming) CREDITS:3</p>	<p>Evaluate the status of Indian Poultry Industry • Explain the Scientific Poultry keeping • Compare the diversified Poultry practices • Inspect the different breeds of chicken</p>
<p>B.Sc., SEMESTER V COURSE NO:12 Practical's Poultry Management-I (Poultry Farming) CREDITS:1</p>	<p>Identify different types of Poultry rearing practices • Evaluate the efficacy of different types of poultry practices in maximizing yield • Understand the importance of different hybrid breeds in poultry</p>
<p>B.Sc., SEMESTER V COURSE NO:13 Poultry Management-II (Poultry Production and Management) CREDITS:3</p>	<p>Suggest measure for Health care in Poultry • Evaluate the economics of poultry production • Elaborate the poultry Breeder flock management • Differentiate the poultry hatchery practices</p>
<p>B.Sc., SEMESTER V COURSE NO:13 Practical's Poultry Management-II (Poultry Production and Management) CREDITS:1</p>	<p>Identify Poultry diseases by observation • Analyse Poultry establishment feasibility • Understand the Poultry Records</p>
<p>B.Sc., SEMESTER V COURSE NO:14 Poultry Management-II (Poultry Production and Management) CREDITS:3</p>	<p>Evaluate the present status of aquaculture at the Global level and National level • Classify different types of ponds used in aquaculture • Demonstrate induced breeding of carps • Acquire critical knowledge on commercial importance of shrimps</p>

B.Sc., SEMESTER V COURSE NO:14 Sustainable Aquaculture Management CREDITS:3	Identify the characters of Fresh water cultivable species • Estimate physico chemical characteristics of water used for aquaculture • Examine the diseases of fin and shell fish • Suggest measures to prevent diseases in aquaculture
B.Sc., SEMESTER V COURSE NO:14 Practical's Sustainable Aquaculture Management CREDITS:2	Identify the characters of Fresh water cultivable species • Estimate physico chemical characteristics of water used for aquaculture • Examine the diseases of fin and shell fish • Suggest measures to prevent diseases in aquaculture
B.Sc., SEMESTER V COURSE NO:15(A) Post harvest technology of fish and fisheries CREDITS:3	Identify the types pf preservation methods employed in aquaculture. Choose the suitable processing methods in aquaculture.
B.Sc., SEMESTER V COURSE NO:15(A) Post harvest technology of fish and fisheries CREDITS:2	Maintain the standard quality controle protocols laid down in aqua industry. Identify the best sea food quality assurance systems.

CAREER OPPORTUNITIES:

1. After the completion of course student has the option to go for higher studies i.e. M.Sc and can do research for the welfare of mankind.
2. They can opt M.Sc in medical field and non medical field. In medical field one can perceive M.Sc in anatomy, physiology, medical biochemistry, medical microbiology, embryology, M.Sc in neuroscience , biotechnology ,forensic science, pharmacology ,medical biotechnology, cell and molecular biology and genetics.

In non medical field one can opt M.Sc in applied zoology, general zoology, bioscience, entomology, food and nutrition, environmental science, biostatistics and bioinformatics.
3. After higher studies student can join as scientist in central research institutions and in universities. They can even look for professional job oriented courses.
4. Graduates and post graduates can enter teaching field both in secondary and higher education departments.
5. Animal biologist can work as administrator in zoological parks, zoos and sanctuaries.
6. Under graduates can join as research assistant in animal tissue culture lab and fisheries research institution.
7. Students can opt jobs in clinical research canters, toxicology labs, forensic department, pollution control board and medical coding canters.

8. Student can get jobs as animal nutritionist, ecologist, environmental consultant, field trial officer, marine scientist, nature conservation officer, and research scientist in life science, science writer.

9. Aquaculture, poultry, , vermitechnology and dairy are agro based industries in India that enables students to get self employment.

10. Students have the option to join Indian civil services