

**Shri Agrasen Kanya Post Graduate College  
Bulanala/Parmanandpur Varanasi**

**Department of Zoology (UG)**

<b>Programme/Class:</b> Certificate	<b>Year:</b> First	<b>Semester:</b> First
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050101T	<b>Course Title:</b> Cytology, Genetics and Infectious Diseases	
<p><b>Course outcomes:</b> The student at the completion of the course will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the structure and function of all the cell organelles.</li> <li>• Know about the chromatin structure and its location.</li> <li>• To be familiar with the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form new organisms.</li> <li>• How one cell communicates with its neighboring cells?</li> <li>• Understand the basic principles of genetics and how genes (earlier called factors) are inherited from one generation to another.</li> <li>• Understand the Mendel's laws and the deviations from conventional patterns of inheritance.</li> <li>• Comprehend how environment plays an important role by interacting with genetic factors.</li> <li>• How to detect chromosomal aberrations in humans and study the pattern of inheritance by pedigree analysis in families.</li> </ul>		

<b>Programme/Class:</b> Certificate	<b>Year:</b> First	<b>Semester:</b> First
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050102P	<b>Course Title:</b> Cell Biology & Cytogenetics Lab	
<p><b>Course outcomes:</b> At the completion of the course students will learn Hands-on:</p> <ol style="list-style-type: none"> <li>1. To use simple and compound microscopes.</li> <li>2. To prepare slides and stain them to see the cell organelles.</li> <li>3. To be familiar with the basic principle of life, how a cell divides leading to the growth of an organism and also reproduces to form new organisms.</li> <li>4. The chromosomal aberrations by preparing karyotypes.</li> <li>5. How chromosomal aberrations are inherited in humans by pedigree analysis in families.</li> <li>6. The antigen-antibody reaction.</li> </ol>		

<b>Programme/Class:</b> Certificate	<b>Year:</b> First	<b>Semester:</b> Second
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050201T	<b>Course Title:</b> Biochemistry and Physiology	
<b>Course outcomes:</b> The student at the completion of the course will learn: <ul style="list-style-type: none"> <li>• To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates</li> <li>• How simple molecules together form complex macromolecules.</li> <li>• To understand the thermodynamics of enzyme catalyzed reactions.</li> <li>• Mechanisms of energy production at cellular and molecular levels.</li> <li>• To understand systems biology and various functional components of an organism.</li> <li>• To explore the complex network of these functional components.</li> <li>• To comprehend the regulatory mechanisms for maintenance of function in the body.</li> </ul>		

<b>Programme/Class:</b> Certificate	<b>Year:</b> First	<b>Semester:</b> Second
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050202P/R	<b>Course Title:</b> Physiological, Biochemical & Hematology Lab	
<b>Course outcomes:</b> The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• Understand the structure of biomolecules like proteins, lipids and carbohydrates</li> <li>• Perform basic hematological laboratory testing,</li> <li>• Distinguish normal and abnormal hematological laboratory findings to predict the diagnosis of hematological disorders and diseases.</li> </ul>		

<b>Programme/Class:</b> Diploma	<b>Year:</b> Second	<b>Semester:</b> Third
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050301T	<b>Course Title:</b> Molecular Biology, Bioinstrumentation & Biotechniques	
<b>Course outcomes:</b> The student at the completion of the course will be able to have: <ul style="list-style-type: none"> <li>• A detailed and conceptual understanding of molecular processes viz. DNA to trait.</li> <li>• A clear understanding of the processes of central dogma viz. transcription, translation etc. underlying survival and propagation of life at molecular level.</li> <li>• Understanding of how genes are ultimately expressed as proteins which are responsible for the structure and function of all organisms.</li> <li>• Learn how four sequences (3 letter codons) generate the transcripts of life and determine the phenotypes of organisms.</li> <li>• How genes are regulated differently at different time and place in prokaryotes and eukaryotes.</li> </ul>		

<b>Programme/Class:</b> Diploma	<b>Year:</b> Second	<b>Semester:</b> Third
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050302P	<b>Course Title:</b> Bioinstrumentation & Molecular Biology Lab	
<b>Course outcomes:</b> The student at the completion of the course will be able to <ul style="list-style-type: none"> <li>• Understand the basic principles of microscopy, working of different types of microscopes</li> <li>• Understand the basic techniques of centrifugation and chromatography for studying cells and separation of biomolecules</li> <li>• Understand the principle of measuring the concentrations of macromolecules in solutions by colorimeter and spectrophotometer and use them in Biochemistry.</li> <li>• Learn about some of the commonly used advance DNA testing methods.</li> </ul>		

<b>Programme/Class:</b> Diploma	<b>Year:</b> Second	<b>Semester:</b> Fourth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050401T	<b>Course Title:</b> Gene Technology, Immunology and Computational Biology	
<b>Course outcomes:</b> The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• Understand the principles of genetic engineering, how genes can be cloned in bacteria and the various technologies involved in it.</li> <li>• Know the applications of biotechnology in various fields like agriculture, industry and human health.</li> <li>• To have an in depth understanding about Immune System &amp; its mechanisms.</li> <li>• Get introduced to DNA testing and utility of genetic engineering in forensic sciences.</li> <li>• Get introduced to computers and use of bioinformatics tools.</li> <li>• <b>Enable students to get employment in pathology/Hospital.</b></li> <li>• <b>Take up research in biological sciences.</b></li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Second	<b>Semester:</b> Fourth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050402P/R	<b>Course Title:</b> Genetic Engineering and Counselling Lab	
<b>Course outcomes:</b> The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• Understand the principles of genetic engineering with hands-on experiments in mutation detection, testing of infectious diseases like Covid 19.</li> <li>• Get introduced to DNA testing and utility of genetic engineering in forensic sciences.</li> <li>• Apply knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics existing software effectively to extract information from large databases and to use this information in computer modeling.</li> <li>• Use bioinformatics tools to find out evolutionary/phylogenetic relationship of organisms using gene sequences.</li> <li>• Get employment in Hospitals/Diagnostic and forensic labs/Counsel families with genetic disorders.</li> <li>• <b>Enable students to take up research in biological sciences.</b></li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Fifth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050501T	<b>Course Title:</b> Diversity of Non-Chordates and Economic Zoology	
<b>Course outcomes:</b> The student at the completion of the course will be able to: The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• demonstrate comprehensive identification abilities of non-chordate diversity</li> <li>• explain structural and functional diversity of non-chordate</li> <li>• explain evolutionary relationship amongst non-chordate groups</li> <li>• Get employment in different applied sectors</li> <li>• Students can start their own business i.e. self employments.</li> <li>• Enable students to take up research in Biological Science</li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Fifth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050502T	<b>Course Title:</b> Diversity of Chordates and Comparative Anatomy	
<b>Course outcomes:</b> The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• Demonstrate comprehensive identification abilities of chordate diversity</li> <li>• Explain structural and functional diversity of chordates</li> <li>• Explain evolutionary relationship amongst chordates</li> <li>• Take up research in biological sciences.</li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Fifth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050503P	<b>Course Title:</b> Lab on Virtual Dissection, Anatomy, Economic Zoology and Parasitology	
<b>Course outcomes:</b> The student at the completion of the course will be able to: <ul style="list-style-type: none"> <li>• demonstrate comprehensive identification abilities of chordate and non- chordates diversity</li> <li>• explain structural and functional diversity of chordates and non- chordates</li> <li>• explain evolutionary relationship amongst chordates and non- chordates</li> <li>• Generate self employment</li> <li>• Enable students to take up research in biological sciences.</li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Sixth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050601T	<b>Course Title:</b> Evolutionary and Developmental Biology	
<p><b>Course outcomes:</b> The student at the completion of the course will be able to:</p> <ul style="list-style-type: none"> <li>• Understand that by biological evolution we mean that many of the organisms that inhabit the earth today are different from those that inhabited it in the past.</li> <li>• Understand that natural selection is one of several processes that can bring about evolution, although it can also promote stability rather than change.</li> <li>• Understand how the single cell formed at fertilisation forms an embryo and then a full adult organism.</li> <li>• Integrate genetics, molecular biology, biochemistry, cell biology, anatomy and physiology during embryonic development.</li> <li>• Understand a variety of interacting processes, which generate an organism's heterogeneous shapes, size, and structural features.</li> <li>• Understand how a cell behaves in response to an autonomous determinant or an external signal, and the scientific reasoning exhibited in experimental life science.</li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Six
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050602T	<b>Course Title:</b> Ecology, Ethology, Environmental Science and Wildlife	
<p><b>Course outcomes:</b> The student at the completion of the course will learn:</p> <ul style="list-style-type: none"> <li>• Complexities and interconnectedness of various environmental levels and their functioning.</li> <li>• Global environmental issues, their causes, consequences and amelioration.</li> <li>• To understand and identify behaviours in a variety of taxa.</li> <li>• The proximate and ultimate causes of various behaviours.</li> <li>• About the molecules, cells, and systems of biological timing systems.</li> <li>• Conceptualizing how species profitably inhabit in the temporal environment and space out their activities at different times of the day and seasons.</li> <li>• To interpret the cause and effect of lifestyle disorders contributing to public understanding of biological timing.</li> <li>• To understand the importance of wildlife conservation.</li> </ul>		

<b>Programme/Class:</b> Degree	<b>Year:</b> Third	<b>Semester:</b> Sixth
<b>Subject:</b> ZOOLOGY		
<b>Course Code:</b> B050603P	<b>Course Title:</b> Lab on Ecology, Environmental Science, Behavioral Ecology & wildlife	
<p><b>Course outcomes:</b>  The student at the completion of the course will be able to:</p> <ul style="list-style-type: none"> <li>• To understand the basic concepts, importance, status and interaction between organisms and environment.</li> <li>• Get employment in forest services, sanctuaries, conservatories etc.</li> <li>• Enable students to take up research in wildlife.</li> </ul>		