

DEPARTMENT OF BIOTECHNOLOGY

{Programme Outcome, Programme Specific Outcome and Course Outcome}

Overview:

The aim of the undergraduate degree in Biotechnology is to make students knowledgeable about the various basic concepts in wide ranging contexts which involve use of knowledge and skills of Biotechnology. B.Sc. Biotechnology is three year undergraduate programme covers wide range of basic and applied biotechnology courses as well as a course of interdisciplinary nature. The course is designed to build a strong Biotechnology knowledge base in the student, and furthermore, acquaints the students with the applied aspects of this fascinating discipline as well. The student is thus equipped to apply the skill learnt in the programme to solving practical societal problem.

Objectives:

After obtaining this degree, a Biotechnologist may enter into the job market or opt for undertaking further higher studies in the subject, The programme offers skill enhancement courses that prepare the student for an eventual job in academic or industry, public health and play their role as biotechnologist in a useful manner contributing their role in the development of the welfare of the society.

{A} Programme outcomes:

Upon completion of B. Sc. Biotechnology programme student will be able to:

PO-1: Graduate will acquire adequate knowledge and leadership skill for successful career.

PO-2: Will inculcate the scientific temperament in the students and outside the scientific community.

PO-3: become aware role of the microbiology in interdisciplinary research as well as daily life.

PO-4: Will be able to learn independently and develop critical thinking.

PO-5: Will acquire practical skills, plan and execute experimental techniques independently as well as to analyse and interpret data.

PO-6: Will accomplish ability to communicate effectively and able to understand ethical responsibilities.

PO-7: Can develop a broader perspective of the discipline of microbiology to enable them to identify challenging social problems and plan their professional career to develop innovative solution for such problems.

PO-8: Competent enough to use knowledge and skill of microbiology to analyze problems involving microbes articulate these with peers/ team members and undertake remedial measures.

PO-9: Will carry on to learn and to adopt in a world of constantly evolving technology.

{B} Programme Specific Outcomes:

***A graduate with B.SC. Biotechnology will have the ability to:
(Biotechnology, Chemistry, Zoology)***

PSO-1: Understand good laboratory practices and safety.

PSO-2: Introduce advanced techniques and ideas required in developing area of Chemistry.

PSO-3: Enhance students ability to develop mathematical models.

PSO-4: Gain the knowledge of Zoology through theory and practicals.

PSO-5: Study and understand the DNA Recombinant technology.

PSO-6: Understand the testing of hypothesis.

PSO-7: Use modern Zoological tools, Models, Charts and Equipments.

PSO 8 : Students will develop an ability to identify, organize and answer problems in Biotechnology.

PSO 9: Students will develop an ability to use skills and modern technological tools necessary for biotechnological practices.

PSO-10: Understand the concepts of Molecular biology and Genetic engineering.

***A graduate with B.SC.Biotechnology will have the ability to:-
(Biotechnology,Chemistry,Botany)***

PSO-1. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.

PSO-2. Identify chemical formulae and solve numerical problems.

PSO-3. Use modern chemical tools, Models, Chem-draw, Charts and Equipments.

PSO-4. Students acquire fundamental Botanical knowledge through theory and practicals.

PSO-5. To explain basis plant of life, reproduction and their survival in nature of different plants.

PSO-6. Helped to understand role of living and fossil plants in our life.

PSO-7. To create awareness about cultivation, conservation and sustainable utilization of biodiversity.

PSO-8. Understand good laboratory practices and safety.

PSO-9: Understand the concepts of Molecular biology and Genetic engineering.

PSO-10: Acquire depth knowledge of Environmental and Medical Biotechnology.

{C} Course Outcomes:

Name of Course & Code	Course Outcomes
BIOCHEMISTRY, BIOSTASTICS AND COMPUTERS	<p><i>Upon successful completion of the course students will be able to:</i></p> <p>CO1: Acquainted with the historical account and development of biochemistry as a scientific discipline.</p> <p>CO2: Will have a broad perspective of the scope of biochemitry.</p> <p>CO3: Will have depth knowledge of basic biochemistry.</p> <p>CO4: Will have acquired depth knowledge of diversity, classification structure, functional organization and economic importance of virus and bacteria.</p> <p>CO5: Will have detailed information on basics of biostatistics</p> <p>CO6: Will have gained knowledge of general characteristics,classification, of computers.</p> <p>CO7 : Will be thoroughly conversant with the structure of carbohydrates and proteins, their key properties and be able to detect their presence in samples by performing biochemical tests.</p>

<p>CELL BIOLOGY, GENETICS AND MICROBIOLOGY</p>	<p><i>Upon successful completion of the course students will be able to :</i></p> <p>CO1: Will be able to explain structure classification Diversity of Cell shape and size.</p> <p>CO2: Will be able to explain Function and ultra structure of cell Gram positive and Gram negative Bacteria, Plasma membrane, Flagella, Pili, Endospore and Capsule.</p> <p>CO3: Will be able to gain depth knowledge of structure and types of nucleotides (DNA& RNA).</p> <p>CO4: Will be able to understand structure, classification, and properties of enzymes.</p> <p>CO5: Will be able to understand General features and Economic importance of Fungi, Algae and Protozoa etc</p> <p>CO6: . Will be able to understand Chromosome variation in number and structure</p> <p>CO7: Will have learnt the basic concept of Growth physiology and Transport system.</p>
<p>PRACTICAL SYLLABUS</p>	<p>CO1: Will be able to do Amylase production test.</p> <p>CO2: Will be able to Determine bacterial growth curve, Extraction and separation of lipids, Estimation of proteins.</p> <p>CO3: Will be able Cellulose production test.</p> <p>CO4: Will be able to do</p> <p>CO5: Will be able to Estimation of Sugar in given solution.</p> <p>CO6: Will gain depth practical knowledge of various instruments used in microbiological laboratory.</p> <p>CO7: Will gain knowledge of preparation of culture media and pure culture isolation techniques.</p>

**RECOMBINANT DNA
TECHNOLOGY AND
GENOMICS**

Upon successful completion of the course students will be able to

CO1: Will be able to explain concept of Recombinant DNA technology.

CO2: Will gain depth information about properties, types and replication of DNA.

CO3: Will acquired with fundamental aspects of transposons, types and structure.

CO4: Will get acquainted with concept of genetic recombination, genetic analysis of recombination in bacteria.

CO5: Will have learnt types of repair systems of DNA.

CO6: Host controlled Restriction Modification System.

<p>MOLECULAR BIOLOGY & BIOPHYSICS</p>	<p><i>Upon successful completion of the course students will be able to:</i></p> <p>CO1: Will be able to understand Concept of Operator, Regulator and Promoter gene</p> <p>CO2: Will be able to explain Microscopy and Centrifugation.</p> <p>CO3: Will gain depth information about, LINEs and SINEs.</p> <p>CO4: Will understand principle of RFLP,RAPD.</p> <p>CO5: Will have learnt various types of electrophoresis and their application.</p> <p>CO6: Will get depth knowledge of sequencing of proteins and nucleic acids.</p>
<p>PRACTICAL SYLLABUS</p>	<p>CO1: Will gain practical knowledge of Agrose gel electrophoresis.</p> <p>CO2: Will gain practical knowledge of DNA and RNA isolation from plant and bacteria .</p> <p>CO3: Gain practical knowledge on chromatography,Absorption curve of dyes, Testing of Beer's law.</p>

**GENERAL
BIOTECHNOLOGY
(Plant, Environment
and Industrial
Biotechnology)**

Upon successful completion of the course students will be able to:

CO1: Gain fundamental information about edible vaccines

CO2: Will get acquainted with basic aspects of mutation.

CO3: Will gain depth information about, Concept of cellular differentiation.

CO4: Will be able to understand concept of Environmental pollution and its type

CO5: Able to understand concept Biofertilizer, Biopesticides, and IPR

<p>IMMUNOLOGY</p>	<p><i>Upon successful completion of the course students will be able to:</i></p> <p>CO1: Acquainted with the depth knowledge of Immune system and immunity.</p> <p>CO2: Will have a broad perspective of Antigen - Antibody and its type.</p> <p>CO3: Will have depth knowledge of Hypersensitivity.</p> <p>CO4: Will gain depth information about medical application of blood groups.</p> <p>CO5: Will have detailed information on Antigen - antibody interaction</p> <p>CO6: Will acquire with fundamental aspects of. Immunity of infection diseases.</p> <p>CO7: Will learnt thoroughly the concept of Autoimmune diseases, Organ transplantation and Immunodeficient diseases.</p>
<p>PRACTICAL SYLLABUS</p>	<p>CO1: Will gain practical knowledge of Sterilization of plant materials, Preparation of Tissue culture media, Plant tissue culture by plant parts.</p> <p>CO2: biochemical identification of biodegraded organic molecules, microbial assessment of potable water/BOD/COD.</p> <p>CO3: Will be able to gain practical knowledge of Blood grouping in relation to Antigen Antibody interaction, Rh factor determination. Widal Test VDRL Test, Double diffusion experiment and ELISA Test.</p>

CO - CURRICULAR ACTIVITIES:

- **Hall seminar should be organized for personality development of students.**
- **Project work given for enhancing their writing skill.**
- **Site visit/ study tour organized.**
- **Model/ Poster presentation organized.**
- **Lecture by experts organized.**

EXTRA - CURRICULAR ACTIVITIES:

- **Students participated in Quiz/ Essay writing Competition.**
- **Students take part in SVEEP programme.**
- **Students take part in sports and various cultural activities.**
- **Students participate in NCC/NSS/Science club activities.**
- **Students participate in environmental project/ Green Clean College /Swakshata abhiyan.**

Vivek gautam

Department of biotechnology

A.P.S.G.M.N.S. Govt. P.G. College kawardha (C.G.)