



# Govt. Digvijay Autonomous PG College Rajnandgaon (C.G.)

## Department of Biotechnology

### B.Sc. Programme

#### Programme Outcome

Upon completion of the B.Sc. Degree Programme the graduate will be have –

- Scientific attitude
- Open minded thinking
- Theoretical and practical knowledge of science
- Improved communication
- Disciplined, responsible and decision making
- Use of knowledge in society, institution, business, employment

#### Programme Specific Outcomes

B.Sc. (Biotechnology as one optional subject)

Upon completion of these courses the student would –

- Able to understand theoretical and practical aspects of cell biology, biochemistry, molecular biology, genetics, bioprocessing, immunology and environmental sciences.
- To get preliminary knowledge on bioinformatics
- Able to understand laboratory rules and bio-analytical tools
- Gather concept for the employment in tissue culture, water treatment, blood bank, dairy, food, diagnostics etc. area.
- Able to understand the use of bioproducts in society like alcohols, enzymes, acids, proteins, vaccines, antibodies, antibiotics etc.

#### Course Outcome

B. Sc. I

**Paper I: Biochemistry, Biostatistics and Computers**

- After the present course student will able to demonstrate on understanding of fundamental biochemical principle such as structure and function of biomolecules, metabolic pathway and the regulation at biological and biochemical pathway.

- Students will gain proficiency in basic biochemistry laboratory techniques such as analysis of protein, carbohydrate, lipid enzymes etc.
- Students will be able to find solution regarding problems of measurement of central tendency, probability and general computer awareness



### **Paper II: Cell biology, Genetics and Microbiology**

- Understand the basics of cell structure and functions of various cell organelle.
- Learn about the Practical knowledge on the division of cells and the Mendelian inheritance and chromosomal abnormalities.
- Student will get the fundamental knowledge on microbes, structure, classification and practical of media preparation, growth the characterization.

### **B.Sc. II**

#### **Paper I: Molecular Biology and Biophysics**

- By the End of the course, student understanding will become such that they will be able to describe and explain structure of DNA and RNA, molecular events like replication, transcription, translation and gene regulation.
- Student will gain insight into the most significant molecular based methods like chromatography, electrophoresis, ELISA, spectrophotometer etc.

#### **Paper II: Recombinant DNA Technology and Genomics**

- Reading recombinant DNA technology student will get a good idea of recombinant DNA, how rDNA is made, how it work. The tools related to its construction like restriction enzyme, reverse transcriptase, host cell, vector can also feed to the students.
- The student should also be able to see that rDNA technology has large impact on new technologies in gene therapies, vaccine production, production of GMOs, Bt plants, improve medicine, preventing genetic diseases, cancer treatment etc.

### **B.Sc. III**

#### **Paper I: General Biotechnology: Plant, Environment and Industrial Biotechnology**

- By the end of course student should be able to explain the various components of PTC media, technique of sterilization, rooting and shooting, Micropropagation. They can be able to know application of PTC in production of Bt plants, disease free plants, GMOs etc.
- Student will be able to understand microbial growth and production of desired product by fermentation using fermenter, types of fermenter and its components. They can also know by completing of this paper about environmental pollution, its reason, major pollutants and biotechnological control. Understanding about the food technology and its preservation can also be achieved by teaching this course.

#### **Paper II: Immunology, Animal and Medical Biotechnology**

- By the end of course students are able to explain cells and organs of immune system, structure and characteristics of antigen and antibody. Mechanism of immunity and defense against various foreign bodies.
- Various techniques such as ELISA, RIA, Precipitation, agglutination, immunoelectrophoresis are also very important areas of study in the course.



# Govt. Digvijay Autonomous PG College Rajnandgaon (C.G.)

## Department of Biotechnology

### M.Sc. Programme

#### Programme Outcome

Upon completion of the Post Graduate the student would have -

- Scientific temperament
- Leadership
- Visionary aptitude
- Ethical knowledge
- Employment ability
- Communication skill

#### Programme Specific Outcomes

Upon completion of these courses the student would -

Effective writing, communication and presentation

Command in language and analytical tools of biochemistry, molecular biology, immunology, microbiology, plant biotechnology, bioprocessing etc.

Perform statistical and computer oriented biological practices of bioinformatics.

Digital teaching and learning

Able to perform industrial oriented practicals like fermentation, waste water treatment, water quality analysis, plant tissue culture, microbial diagnosis, biochemistry test, food processing and preservation etc.

#### Course Outcome                      Paper 1: Cell Biology

This paper is designed to enable students to acquire knowledge on the structure, behaviour and functioning of cell constituents and outer cover. Cellular transport and division is added to understand the concept.

#### Paper 2: Genetics

By the end of course students are able to understand students to acquire knowledge on mendelian inheritance, mutation, chromosomal change and genetic system of some organisms.



### **Paper 3: Microbial Physiology**

Upon completion of these courses the student would acquire knowledge on the microbial classification, structure, metabolism, reproduction and disease caused by pathogens.

### **Paper 4: Bio-molecule**

This paper is design to gather knowledge on classification, structure and properties of biomolecules. Biochemical pathways based on the molecules are also included in the paper.

### **Paper 5: Biostatistics & Computer Application in Biotechnology**

This paper is centered to the basic knowledge on biostatistical analysis of data, tabular and graphical presentation and computer applications.

### **Paper 6: Molecular Biology**

Upon completion of these courses the student would know the depths of central dogma, diagnosis of DNA, molecular mapping and genome analysis.

### **Paper 7: Plant Biotechnology**

This paper is focused to provide knowledge on principle of plant tissue culture, different techniques and its applications.

### **Paper 8: Macromolecules and Enzymology**

By the end of course students are able to know about the role of macromolecules and enzymes in biological system.

### **Paper 9: Genetic Engineering**

Upon completion of these courses the student would know about the principle and process and genetic engineering. The paper also contains applications of genetic engineering in different areas.

### **Paper 10: Biology of immune system**

This paper is design to understand immune cells and its work, antigen antibody reactions, immunity against diseased etc.



### **Paper 11: Bioprocess Engineering & Technology**

Upon completion of these courses the student would get knowledge on principle of bioprocess engineering. It includes the media, potential microbes and bioreactors for production of metabolites. Downstream processing and ideology of production of some important products is also included in the paper.

### **Paper 12: Environmental Biotechnology**

By the end of course students are able to provide knowledge on environmental pollution and its control. The paper meets global environmental issues and its adverse effects.

### **Paper 13: Basic Concept of Bioinformatics and Nanobiotechnology**

This paper is focused with the biological data, its centre sources and application in different areas. The paper also aims to provide information about Nanobiotechnology.

### **Paper 14: Advanced techniques in Biotechnology**

This paper aims to provide information about advance tools and technique useful to perform different biotechnological experiments.

### **Paper 15: Animal Biotechnology**

This paper is design to provide knowledge on basic principles of animal tissue culture and its broad applications.

### **Paper 16: Functional Genomics & Proteomics**

Upon completion of these courses the student would get knowledge on genome mapping, sequencing and comparative analysis of genome of different organisms. The paper also includes advance tools techniques for analysis proteins.