

**SPACES DEGREE COLLEGE, PAYAKARAOPETA**  
**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-I**  
**COURSE 1: INTRODUCTION TO CLASSICAL BIOLOGY**

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**Course Outcomes:**

1. Learn the principles of classification and preservation of biodiversity
2. Understand the plant anatomical, physiological and reproductive processes.
3. Knowledge on animal classification, physiology, embryonic development and their economic importance.
4. Outline the cell components, cell processes like cell division, heredity and molecular processes.
5. Comprehend the chemical principles in shaping and driving the macromolecules and life processes.

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-I**  
**COURSE 2: INTRODUCTION TO APPLIED BIOLOGY**

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**Learning Outcomes:**

1. Learn the history, ultrastructure, diversity and importance of microorganisms.
2. Understand the structure and functions of macromolecules.
3. Knowledge on biotechnology principles and its applications in food and medicine.
4. Outline the techniques, tools and their uses in diagnosis and therapy.
5. Demonstrate the bioinformatics and statistical tools in comprehending the complex biological data

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-II**  
**COURSE 3: BIOMOLECULES AND ANALYTICAL TECHNIQUES**

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**Course Outcomes:**

On successful completion of the course, the students will be able to:

1. Learn about classification, structure and properties of Carbohydrates, Proteins and Lipids.
2. Learn about structure and function of DNA, RNA, Vitamins and Bioenergetics.
3. Learn about basic principles of Centrifugation, Chromatography and Electrophoresis.
4. Learn about principles of Spectroscopy, Microscopy and Techniques.
5. Learn about basics of Biostatistics.

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**SEMESTER-II**  
**COURSE 4: MICROBIOLOGY & CELL BIOLOGY**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about Scope and Techniques of Microbiology.
2. Learn about concept of Microbial species and strains,
3. Learn about cell structure and function.
4. Learn about cell signaling and control mechanisms.
5. Learn about genome organization of prokaryotic and eukaryotic organisms

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 5: PLANT AND ANIMAL BIOTECHNOLOGY**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to:

1. Learn about plant tissue culture techniques and secondary metabolites production.
2. Learn about transgenesis and molecular markers.
3. Learn about animal tissue culture techniques
4. Learn about transgenic animals and gene therapy.
5. Learn about Bioethics, Biosafety and IPR.

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 6: MOLECULAR BIOLOGY**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about genome structure and organization.
2. Learn about mechanism and enzymes of DNA replication.
3. Learn about enzymatic synthesis and features of transcription.
4. Learn about regulation of gene expression.
5. Learn about genetic code and protein synthesis.

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 7: GENETIC ENGINEERING**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to:

1. Learn about the history and tools of genetic engineering
2. Learn about vectors used in genetic engineering
3. Learn about Hybridization techniques
4. Learn about vectors and their screening techniques
5. Learn about gene editing tools

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 8: METABOLISM**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about Carbohydrate metabolism
2. Learn about Lipid metabolism
3. Learn about Amino Acid metabolism
4. Learn about nomenclature and specificity of enzymes
5. Learn about enzyme kinetics of enzyme

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 9: IMMUNOLOGY**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about types of immunity and cells of immunity
2. Learn about Antigen and Antibody
3. Learn about cell, humoral immunity and MHC molecules
4. Learn about Hypersensitivity and vaccines
5. Learn about immunological techniques

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 10: BIOINFORMATICS AND BIostatISTICS**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about concept and branches of bioinformatics
2. Learn about searching sequences using databases
3. Learn about computer phylogenetics
4. Learn about the measurement of central tendency
5. Learn about test hypothesis

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**DEPARTMENT OF BIOTECHNOLOGY**  
**SEMESTER-III**  
**COURSE 11: BIOINFORMATICS AND BIOSTATISTICS**

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**Learning Outcomes:**

On successful completion of the course, the students will be able to

1. Learn about diseases caused by microbial sources
2. Learn about epidemiology, pathogenicity, laboratory, diagnosis, prevention and control of bacterial diseases
3. Learn about fungal, viral and protozoan diseases
4. Learn about gene therapy and vectors used in gene therapy
5. Learn about drug discovery, therapeutic applications

  
**CO-ORDINATOR**  
**IQAC**  
**SPACES DEGREE COLLEGE**  
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