# *THE LEARNING OUTCOME FRAME OF UG COURSE OF BIOTECHNOLOGY*

# PSOs

## B. Sc. I Year (BIOTECHNOLOGY)

1. They can join R & D Department of any pharmaceutical industries.
2. They can work in aany Research Laboratory/ Intitute ( ICMR, NII, CCMB and any other CSIR Lab) as JRF/SRF/RA.
3. After getting degree in Biotechnology they can get opportunities in various fields:
   A. Medical Science Organizations
   B. Health care Organization
   C. Forensic Science Laboratory
   D. Food Industries
   E. NGOs
   F. They can develop plant tissue culture lab and can sale saplings in nursery
4. They can choose Lectureship and researches in Universities and institutes.
5. They can procure some very prestigious foreign fellowships like commonwealth (UK), DAAD (Germany).

## B. Sc. II Year (BIOTECHNOLOGY)

1. By the knowledge of instrumentation they can get job as technician and demonstrator in labs of any school.
2. They can join R & D Department of any pharmaceutical industries.
3. They can work in aany Research Laboratory/ Intitute ( ICMR, NII, CCMB and any other CSIR Lab) as JRF/SRF/RA.
4. After getting degree in Biotechnology they can get opportunities in various fields:
   A. Medical Science Organizations
   B. Health care Organization
   C. Forensic Science Laboratory
   D. Food Industries

E. NGOs
F. They can develop plant tissue culture lab and can sale saplings in nursery

5. They can choose Lectureship and researches in Universities and institutes.
6. They can procure some very prestigious foreign fellowships like commonwealth (UK), DAAD (Germany).

## B. Sc. III Year (BIOTECHNOLOGY)

1. Knowledge of genetic engineering enable students to work in field of research , higher education and technical support in various labs.
2. By the knowledge of instrumentation they can get job as technician and demonstrator in labs of any school.
3. They can join R & D Department of any pharmaceutical industries.
4. They can work in aany Research Laboratory/ Intitute ( ICMR, NII, CCMB and any other CSIR Lab) as JRF/SRF/RA.
5. After getting degree in Biotechnology they can get opportunities in various fields:
   A. Medical Science Organizations
   B. Health care Organization
   C. Forensic Science Laboratory
   D. Food Industries
   E. NGOs
6. They can develop plant tissue culture lab and can sale saplings in nursery
7. They can choose Lectureship and researches in Universities and institutes.
8. They can procure some very prestigious foreign fellowships like commonwealth (UK), DAAD (Germany).

# Course Out-Come

## B. Sc. I Year (BIOTECHNOLOGY)

## PAPER I: Cell Structure and Biology

- Students will learn about cell structure & function at microscopic and molecular level.
- They will also understand signaling pathways, transport processes, life cycle, chemical composition and interactions of the cell with their environment.
- They will know about nucleic acids and functions of various cell orgennels.
- They will study programmed cell death, necrosis, cancer and oncogenes
- Understanding and learning about cells supports the learning of other biological processes later on it will help them in higher studies and research.

## PAPER II: Microbiology

- Student will learn about basic structure, taxonomy of microbes, application and status of microbiology in India.
- They will also study microbes from normal and extreme environment
- Student will study factors affecting microbial growth and their control for human welfare
- Microbial disease in plants and animals
- Microbes of industrial importance

## B. Sc. II Year (BIOTECHNOLOGY)

## PAPER I: Biophysics & Biochemistry

- In this paper student will learn principles of physics applied in Biology
- Student will learn application and principles of thermodynamics in biological systems
- They will study general biophysical method which is necessary for practical work and operation of various instruments
- They will also learn about **Biochemistry** which is molecular logic of living beings
- In depth knowledge of biomolecules which are the structural functional component of our body

## PAPER II: Bioinstrumentation, Biostatistics and Bioinformatics

- They will learn about bioinstrumentation under which they will know about microscopy, chromatography, electrophoresis, spectrometry , southern, western and northern blotting techniques
- All above techniques are basic need for study and research aspects
- Biostatistics is a very effective tool for data analysis that's why teaching of central tendency, probability, standard deviation, statistical presentation of data is important and covered in this syllabus
- **Bioinformatics** is an interdisciplinary field in which student will learn storing, retrieving, organizing analyzing biological database sequences (EMBL, Gene Bank, UNIPROT), cluster and specialized database (KEGG etc.)

## B. Sc. III Year (BIOTECHNOLOGY)

## PAPER I: Molecular Biology and Genetic Engineering

- Student will study the structural and chemical detail of DNA & RNA at molecular level
- They will get knowledge about prokaryotic and eukaryotic genome and their methods of replication
- Student will study epigenetics, evolution of macromolecules and mendelian genetics
- They will learn r DNA technology, gene cloning, cloning and expression vectors & PCR
- Protein synthesis, splicing and mutation

## PAPER II: Applied Biotechnology

- Student will learn technologies applied to biology, molecular biology, genetics, and many other subfields of biology.
- Under microbial biotechnology they will learn about food preservation, contamination, production of industrially important product
- Various techniques of plant tissue culture and their application to meet scarcity
- Knowledge of immunology, animal biotechnology and organ culture technique
- Study of stem cell culture, bioreactors, production techniques of economically important transgenic animals
- Environmental biotechnology for sustainable development of living beings