Program : B.Sc. Biotechnology

PO(Program Outcome)

a. The Student of Biotechnology comes across the detailed study of various basics and advance subjects in course.
b. **Biotechnology** is the use of living systems and organisms to develop or make useful products, or "any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use"
c. It has a broad areas of application in the field like health care, agriculture, environment, pollution control, waste management, mining, energy production, forestry and aquaculture and food industrial processing. Most common applications of biotechnology are production of disease resistant and nutritionally enhanced crops, gene therapy, genetic screening and enzymes that act as industrial catalysts. Biotechnology is also applied in the areas of pollution control, waste management, mining, energy production, forestry and aquaculture. Your focus of work will be with DNA, tissues, micro-organisms, viruses, and complex proteins. You are working with DNA, tissues, micro-organisms, viruses, and complex proteins.
d. As it deals with the alteration gene of living organisms and plants, currently controversies have raised over the production of genetically modified organisms or food that may leads to damage the balance of nature in future, if applied indiscreetly.
e. Although the concept of Biotechnology is not new to the world but the areas of specializations are coming with modern terminology. As in recent years, the world is concentrating & funding mainly on biological research. Despite the world achieving a land mark in technological research, yet many health related problems such as Diabetes, Cancer and other health related problems are not yet fully solved. So Biomedical & Biotechnology has the greatest potential to resolve these problems. So currently & coming years there is great demand for professionals in both the fields in India and well as abroad.
    i. Basic Microbiology, Biochemistry, Immunology, and Genetics which will help in research and also in Industries
    ii. Basics of Botany, plant physiology, Animal physiology and Chemistry will help in industries.
    iii. Advance course paper like Analytical techniques, Genetic engineering, Bioinformatics, Plant tissue culture, Environmental biotechnology and Animal tissue culture.
    iv. Students are aware by practical related to subject so it will easy to understand theory and application of practical.

v. Subject elective paper also gives basics information about Biostatistics, Dairy and industrial biotechnology which will help to students in Job or Business.

vi. Environmental biotechnology subject give insight knowledge of pollution and its solution by the help of biotechnological tools.

vii. Plant tissue techniques help in the agriculture and edible vaccine concept.

viii. Animal tissue cultures which give knowledge of cell line preparation also help this knowledge in animal husbandry.

ix. Industrial biotechnology and Microbiology paper help application and utility of microbes in various industries.

Program : B.Sc. Biotechnology

PSO(Program Specific Outcome)

1. Biotechnology is a rapidly developing sector. Advancements are being made at good pace in this sector. Big firms are pouring in big money into it and new business opportunities are developing in this sector. These things have led to huge increase in job openings in this sector. In short, Biotechnology graduates are in huge demand these days.
2. After B.Sc. Biotechnology, one may go for M.Sc. Biotechnology or related to interest of the Masters course. M.Sc. course will take two years to complete. After completing B.Sc. and M.Sc. Degrees, one may venture into M.Phil,PhD also.
    a. Biotechnology is multidisciplinary branch so students can opt M.Sc. in own interest like Agriculture Biotechnology, Marine Biotechnology, Genetic engineering, Environmental biotechnology, Forensic Biotechnology, Marine Science, Industrial Biotechnology, Medical Biotechnology, Life science, Bioinformatics, Microbiology and Animal Biotechnology.

3. Another post graduate course that can be done after B.Sc. Biotechnology is M.B.A. It will take 2 years to get an M.B.A. Degree.
4. Student of B.Sc biotechnology also take part in various PG diploma hospital courses.

5. This is a rapidly developing field. Many private businesses are exploring in this field and heavily investing in it so new startups will be open and emerging entrepreneur will come.
6. Various prominent industries where Biotechnology professionals may find jobs are- Pharmaceuticals Industry, Healthcare sector, Chemical Industry and Research sector.
7. Research sector in particular is quite lucrative. One may build a rewarding career in this field.
8. After B.Sc. Biotechnology, one may go for B.ed in science and B.ed course will take two years to complete.
9. Along with an Educational Degree, the student can also appear for TET, TAT Primary and Secondary School Teachers Social Studies posts in Govt as well as Private Sector.
10. Apart from these National level exams, the student can also appear for other State level Competitive Examinations as well e.g. GPSC, Talati, Gram Sevak, Lok Sevak, various Police Service Exams etc.

11. Along with, a PG Biotechnology student can also go for NET/SLET Exams, and either get Assistant Professor posts or can opt for Research Fellowship for Ph.D. in any UGC recognized Universities of India.

Program : B.Sc. Biotechnology

CO(Course Outcome)

1. CBT 1-I: Introduction to Biotechnology and Cell biology
    a. Aims: The student gets information about the Basic of Biotechnology .
    b. The student gets acquainted with the Application of Biotechnology.
    c. The student learns about the Cell biology concept with its components
2. CC -1-II**:** Molecules of life
    a. The student gets the glimpses of Molecules of life
    b. The student learns about the various biomolecules and its classification
    c. The student comes across thermodynamics and basic biochemistry point.
3. CC – I-3: Cellular metabolism-I
    a. The student studies here about the various cell metabolism concept
    b. The student studies here about the mechanism of Sugar Metabolism.
    c. The student studies here about Enzyme, its classification with mechanism.
4. CC – I-4: Genetics and Analytical techniques
    a. The student studies the Classical genetics and Gene Mutation which help to understand molecular genetics
    b. The student studies the Spectroscopy method and its basic concept
    c. The student studies the basics Chromatography methods and its application in Industries
5. ECS**:** Biostatistics
    a. The student studies the statistics concept used in biology
    b. The student studies the data collection method and various tools for data analysis
    c. The student studies application of statistics in biotechnology
6. CC I-5 **:** Cellular metabolism-II
    a. The students will learn the process of Metabolism of various other bomolecules.
    b. The students will learn the various pathway of lipid , Nucleotide and Protein metabolism
    c. The students will learn the Photosynthesis process in organism .
7. CC – I-6 **:** Fundamentals of Microbiology
    a. The students will study Basics of Microbiology
    b. The students will learn the Role of Microbes in nature
    c. The students will learn the various disease caused by Microbes.
8. ECS– 4 **:** Plant Hormones
    a. The students will learn the plant Growth regulators and its effect on the plants.
    b. The students will learn the Role and application of various hormones in plants

c. The students will learn the use of hormones in laboratory.

9. CC –I-7 **:**Bioprocess And Biochemical Engineering
    a. The students work upon Industrial process and its concept for production of various biomolecules by the use of microbes.
    b. The students learn the Upstream and Downstream process of fermentation
    c. The students learn the Isolation, screening of industrial importance microorganisms.
    d. The students learn the preservation techniques for Industrial important Microbes.
10. CC – I-8: Molecular Genetics
    a. The students understand the structure and function of Genetic material
    b. The students understand the Genetic material synthesis in the cell and its function .
    c. The students learn the gene expression in the cell.
    d. The students learn the central dogma concept of the cell.
11. CC – I-9: Principles of Biotechnology Applied To Plants
    a. The students work upon the Plant tissue culture techniques.
    b. The students learn about Plant tissue culture concept and understand the basic requirement and needs of the plant for growth and Development.
    c. The students learn application of plant tissue culture in biotechnology.
12. CC –I-10: Principles of Biotechnology Applied To Animals
    a. The student studies here basics terminology of Animal tissue.
    b. The student studies here various media for Animal tissue culture.
    c. The student studies here application of Animal tissue culture like Monoclonal antibody and vaccine concept.
13. ES-3:Industrial Biotechnology
    a. The student studies here the various fermentative products.
    b. The student studies here Role of Microbes in various fermentation processes.
    c. The student studies Mechanism and downstream process of fermentative process.
14. CC –I-11: Fundamentals Of Immunology
    a. : The student gets information about the immunology.
    b. : The student gets knowledge about Antigen and Antibody Mechanism.
    c. : The student studies various concept and mechanism of hypersensitive.
15. CC –I-12: Genetic Engineering
    a. **:** The student studies here the rDNA Technology concept and its tools.
    b. **:** The student studies here various enzyme used in rDNA technology
    c. **:** The student studies here various Application of rDNA Technology.
16. CC –I-13: Environmental Biotechnology
    a. The student studies here The Environmental issues related to biotechnology.
    b. The student studies here waste water treatment and solid waste treatment.
    c. The student studies here Biofertilizer, Biopesticide and Bioremediation process.
17. CC – I-14 **:** Analytical Techniques In Biotechnology

a. The student gets information about Foot of GMP and GLP concept of Industries.
b. The student gets information about the Function and mechanism of analytical tools used in the industries
c. The student gets information about biosensor and Bioinformatics.

18. ES-32**:** Dairy Biotechnology

a. The student studies here basics of Dairy Biotechnology.
b. The student studies here starter culture and understand the process of dairy products
c. The student studies here role of microbes in the dairy products.