

B.Sc. HONOURS BIOTECHNOLOGY

Program Outcome: Biotechnology teaches about biological sciences with engineering technologies that manipulate living organisms and biological systems to produce products that advance healthcare, medicine, agriculture, food, pharmaceuticals and environment control.

Students after completing graduation in biotechnology can opt for various governments, industrial and research sectors. Students can enroll for higher education program like M.Sc., MBA, and even M.Sc. & PhD integrated programs in different areas of Life Sciences. After clearing higher education students can opt for research field in the area of biotechnology. Moreover students after graduation can get opportunity in various government sectors like IAS, UPSC, and SSC. Students can opt for various other sectors like food corporations, forensic sciences, toxicology, medicine, healthcare and environmental sciences. Moreover students can apply for posts of quality analyst in various industrial sectors like food and pharmaceuticals to check quality parameters of raw materials and finished products.

Program specific outcome I: After completion of B.Sc. Honours Biotechnology 1st year, students will get the basic level knowledge about microorganisms, their structure and functions and their interactions with each other and to the environment.

BHBT 101: BASIC BIOLOGY: This subject provide students a broad perspective in the field of biology, to introduce them to major kind of organisms, their organization and interactions so that a background can be established for further study in advanced biology courses.

BHBT 102: GENERAL MICROBIOLOGY I: The outcome of this subject is to help students become familiar with the fundamental scientific concepts and basic skills utilized in microbiology. The subject includes an introduction to biology of microorganisms with their diversity, taxonomy and techniques for their identification.

BHBT 106: ENVIRONMENTAL STUDIES AND ROAD SAFETY AWARENESS: This subject enlightens students about various environmental factors sustaining life on this planet as well as environmental issues in the world and about road safety and traffic control measurements to avoid accidents.

BHBT 201: CELL BIOLOGY: This subject is designed for students to understand the structure and basic components of prokaryotic and eukaryotic cells and their sub cellular processes. They will apply their knowledge to study impact of environment or physiological changes on alteration or loose of cell function.

BHBT 202: GENERAL MICROBIOLOGY II: This course is intended to further understand microbial nutrition, culture (characteristics and media), genetics and their role in food poisoning. Students will also come to know about the microorganisms in interaction with human body.

GN-201: DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION: The outcome of this subject includes basic introduction to drugs and their effects on human body. Students also get awareness about signs and symptoms of drug of abuse and methods of their prevention.

Program specific outcome II: After completion of B.Sc. Honours Biotechnology 2nd year, students get aware about tools and techniques for estimation of biomolecules with their genetical and biochemical characteristics. Moreover students get insight into various diseases of human body and methods of their prevention and treatment.

BHBT301: GENETICS AND MOLECULAR BIOLOGY: The outcome of this subject is to make students understand the modes of inheritance that govern passage of genetic traits across generation. To understand basic structure and function of genetic material and to explain how the process of mutation occurs and generates phenotypic diversity.

BHBT302: BIOCHEMISTRY: This subject presents the chemical reactions or metabolic functions in the living system and their regulation. The outcome of this subject is to make the students understand the core principles and structures of biomolecules and their interactions with each other and their experimental basis.

BHBT303: IMMUNOLOGY: This subject will provide basic knowledge of diseases, their causes and various diagnostic methods to the students. This will make students aware of the health problems in daily life and enable them to think critically about them.

BHBT305A: BIOETHICS & BIOSAFETY: The outcome of this course is to provide basic knowledge of ethical, legal and social issues pertaining to biological research, medicine, health care and other areas of biotechnology. Students would know about different theories and approaches to bioethics and its associated conflicts with GMO. They will know about how human cloning is surrounded by different bioethical issues.

BHBT305B: BIOSTATISTICS: This subject will make students familiar with biostatistical concepts that will help in experimental set up and result interpretations.

BHBT401: RECOMBINANT DNA TECHNOLOGY: This subject will provide knowledge of various recombinant products produced using organisms. The students would learn to use various tools and techniques which will make students to work efficiently in industries and research laboratories in future.

BHBT402: BIOPHYSICS & BIOANALYTICAL TECHNIQUES: The outcome of this course is to study biological phenomena using physical principles. As Bioanalytical techniques have a prominent role to play in biological problems. Understanding of Bioanalytical techniques will make students use physical concepts and techniques to address problems in biotechnology.

BHBT403: DEVELOPMENTAL BIOLOGY: Be able to list the types of characteristics that make an organism ideal for the study of developmental biology. Some of these traits may be the

same ones that make organism ideal for genetic studies, but several species ill-suited for traditional genetic studies have other compensating features that are helpful to developmental biologists.

BHBT405 A: IPR AND ENTREPRENEURSHIP: This subject will help students to become familiar the students with basic fundamentals of business techniques to be used in setting up an industry. This will make students to aware of various funding sources and production systems.

BHBT405 B:MEDICAL MICROBIOLOGY: The outcome of this subject is to help the students become familiar with fundamental important terms in medical microbiology and diversity of clinically important microorganisms.

Program specific outcome III: After completion of B.Sc. Honours Biotechnology 3rd year, students will get fundamental knowledge about mechanism of production of useful industrial products using microorganism, plants and animals.

BHBT 501: ENVIRONMENTAL BIOTECHNOLOGY: The outcome of this subject is to make students aware of environmental issues and their possible remedies using ecofriendly methods. It will enable the students to handle lab apparatus in a skillful manner.

BHBT 502: BIOPROCESSENGINEERING: This subject will introduce an industrial approach in students. This subject also provides hands on training in techniques used in industries to make students efficient to handle them in reality.

BHBT 503A: BIOINFORMATICS: The outcome of the course is to provide a national bio-information network designed to bridge the inter-disciplinary gaps in biotechnology information and to establish link among scientists in organizations involved in R & D and manufacturing activities in biotechnology.

BHBT 503B: ENZYMOLOGY: The outcome of this course is to provide basic knowledge of enzyme kinetics, the parameters of the enzymatic reaction, mechanisms of action of enzymes and inhibitors, dependence on the temperature and pH of the enzymatic activity, knowledge of the structure of enzymes and amino acids that build active sites of enzymes.

BHBT 504C: PLANT BIOTECHNOLOGY: The outcome of the course is to give students new knowledge and widening of the knowledge acquired in other course by handling of classical and modern plant biotechnology processes, including breeding of healthy plants, plants with improved characteristics and plants for biomolecule production.

BHBT 601: TISSUE CULTURE TECHNOLOGY: This subject will give basic knowledge of growth of plants and animals in vitro conditions and their use in various agricultural and health issues. It will inculcate the skill of handling lab apparatus efficiently.

BHBT 602: MICROBIAL TECHNOLOGY: This subject will provide the knowledge of industrially important microbes and the process behind them. It will enable students to use biological things to produce industrially important products.

BHBT 603A: INDUSTRIAL FERMENTATION: This subject will enable students to think critically to use organisms to set up an industry with cost effective methods.

BHBT 603B: ANIMAL DIVERSITY: This subject will provide students with an in-depth knowledge of the diversity in form, structure and habits of invertebrates. It will enable students to learn basics of systematic and understand hierarchy of different categories.

BHBT 603C: PLANT DIVERSITY: This subject will provide students with an in-depth knowledge of range of plant diversity in terms of structure, function and environmental relationships. It will enable students to apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.