



ADMINISTRATIVE MANAGEMENT COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

Program: M.Sc. Biotechnology

COURSE OUTCOME

Program: M.Sc. Biotechnology

Semester: I Semester

Course: Cell biology [BTH 101]

Upon completion, students should be able to:

- CO - 1** Exhibit knowledge base in anatomy and physiology of cell.
- CO - 2** Demonstrate the knowledge of common cytoskeletal structure.
- CO - 3** Understand the cell signalling molecules.
- CO - 4** Understand the structure and functions of specialised cells.(muscle and nerve cell)
- CO - 5** Learn the antioxidant defence system and senescence.
- CO - 6** Understand transport across the membrane.

Program: M.Sc. Biotechnology

Semester: I Semester

Course: Molecular Genetics [BTH 102]

Upon completion, students should be able to:

- CO - 1** Understand concepts of physical basis of heredity and extra chromosomal inheritance.
- CO - 2** Genetic recombination and mutations
- CO - 3** Knowledge and understanding of population genetics.
- CO - 4** The concept of molecular basis of human evolution.

CO - 5 Concept of organisation of genes in DNA.

Program: M.Sc. Biotechnology

Semester: I Semester

Course: General Microbiology [BTH 103]

Upon completion, students should be able to:

CO - 1 Gain knowledge on the concept of microbial classification and systemics.

CO - 2 General properties, structure and reproduction of eukaryotic microorganisms.

CO - 3 General properties, structure and reproduction of prokaryotic microorganisms.

CO - 4 Classification, cultivation and diseases of Virus.

CO - 5 Physical, chemical and biological control of microorganisms.

Program: M.Sc. Biotechnology

Semester: I Semester

Course: Biochemistry [BTH 104]

Upon completion, students should be able to:

CO - 1 Gain knowledge on the concept of bioenergetics and laws of thermodynamics.

CO - 2 Concepts of oxidative phosphorylation and electron transport chain.

CO - 3 Classification, structure and properties of carbohydrates.

CO - 4 Concept of carbohydrate metabolism.

CO - 5 Amino acids structure and proteins.

CO - 6 Structure of lipids and its metabolism.

CO - 7 Structure and properties of nucleic acids with its metabolism.

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Semester: II Semester

Course: Biochemical Techniques and Enzymology [BTH 201]

Upon completion, students should be able to

CO - 1 Demonstrate the concepts and applications of spectroscopy and scattering of light

CO - 2 Understand the concepts and applications of centrifugation and mass spectroscopy.

CO - 3 Understand the basic principle and applications of chromatography

CO - 4 Demonstrate the basic principle and applications of electrophoresis

CO - 5 Understand concepts of enzyme catalysis, inhibition and mechanism

CO - 6 Understand the salient features of Enzyme Kinetics and Co-enzymes.

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Semester: II Semester

Course: Immunology and immunotechnology [BTH 202]

Upon completion, students should be able to

CO - 1 Understand the concepts of immune system and types of immunity

CO - 2 Structure of antigen and antibody

CO - 3 Learn histocompatibility and tissue transplantation

CO - 4 Understand hypersensitivity reactions

CO - 5 Knowledge on autoimmunity and immunomodulation

CO - 6 Demonstrate immunological techniques

CO - 7 Types of vaccine and immunization

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Semester: II Semester

Course: Molecular Biology [BTH 203]

Upon completion, students should be able to

CO - 1 Exhibit knowledge base in structure and properties of DNA and RNA.

CO - 2 Demonstrate the knowledge of common and advanced laboratory practices in molecular biology.

CO - 3 Understand the replication, transcription and translational mechanism.

CO - 4 Understand the protein localization and target, DNA damage and repair and gene silencing

CO - 5 Learn the antioxidant defence system and senescence.

CO - 6 Learn the regulation of gene expression.

Program: M.Sc. Biotechnology

Semester: II Semester

Course: Environmental Biotechnology [BTH 204]

Upon completion, students should be able to

- CO - 1 Demonstrate concepts of renewable and non-renewable resources.
- CO - 2 Demonstrate concepts of waste water and solid waste management.
- CO - 3 Production of biofuel.
- CO - 4 Understand the concept and implications of bioremediation.
- CO - 5 Bio waste treatment using microbes

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Semester: III Semester

Course: Plant and Agricultural Biotechnology [BTH 301]

Upon completion, students should be able to

- CO - 1 Demonstrate concepts of scope and importance of plant tissue culture.
- CO - 2 Demonstrate mechanism of DNA transfer methods in plants.
- CO - 3 Understand the concepts of production of useful chemicals and secondary metabolites.
- CO - 4 Understand the concept of plant growth regulators.
- CO - 5 Understand the strategies for engineering and GM technology.

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Semester: III Semester

Course: Animal Biotechnology [BTH 302]

Upon completion, students should be able to

- CO - 1 Demonstrate concepts of culture and maintenance of primary and established cell lines.
- CO - 2 Demonstrate concept of stem cell and tissue engineering.
- CO - 3 Understand the concepts of production and applications of transgenic animals
- CO - 4 Understand the concept of animal cloning and IVF.
- CO - 5 Understand the strategies for bioethics and biosafety.

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Semester: III Semester

Course: Genetic Engineering [BTH 303]

Upon completion, students should be able to

- CO - 1** Understand the tools of genetic engineering.
- CO - 2** Understand the basic principle of in vitro construction of recombinant DNA molecules.
- CO - 3** Understand concepts of gene libraries.
- CO - 4** Understand the salient features of transformation, screening and expression of recombinant molecule.
- CO - 5** Understand Techniques such as PCR, Hybridization production of recombinant molecules.
- CO - 6** Understanding the concepts of chemical synthesis of genes and PCR.

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Semester: IV Semester

Course: Bioprocess Engineering [BTH 401]

Upon completion, students should be able to

- CO - 1** Demonstrate the concepts and applications development and strain improvement of industrially important microorganisms.
- CO - 2** Understand the concepts of bioreactors and structure of advanced Bioreactor and their working mechanism with Design features.
- CO - 3** Understand the basic principle of Fermentation media and Fermentation Process
- CO - 4** Demonstrate the basic principle and applications of downstream processing.
- CO - 5** Understand concepts of Immobilization and Biotransformation.
- CO - 6** Understand the salient features of Production of Industrially important products.
- CO - 7** Demonstrate the concepts and applications of development Intellectual Property Rights (IPRs) and Entrepreneurship.

Program: M.Sc. Biotechnology

Semester: IV Sem

Course: Medical biotechnology [BTH 402]

Upon completion, students should be able to:

- CO - 1 Knowledge on microbial diseases
- CO - 2 Understand types of cancer and its treatment
- CO - 3 Learn about human diseases and evaluation of organ functions
- CO - 4 Understand the concept of nanotechnology
- CO - 5 Demonstrate molecular therapeutics
- CO - 6 Knowledge on drug discovery
- CO - 7 Concept of clinical research and ethical issues

Program: M.Sc. Biotechnology

Semester: IV Semester

Course: Genomics and proteomics [BTH 403]

Upon completion, students should be able to

- CO - 1 Demonstrate the concepts and applications of genome sequencing and its types.
- CO - 2 Understand the concepts of genome mapping.
- CO - 3 Understand the expression profile in human diseases.
- CO - 4 Understand concepts of protein interaction.
- CO - 5 Understand the proteomics database and analysis.