

GAUTAM BUDDHA UNIVERSITY, GREATER NOIDA

SYLLABUS FOR M.Sc. GENOMICS AND GENOME ENGINEERING: GBU-ET

Life Sciences: Organization of unicellular organisms, invertebrates and vertebrates. Nucleic acids, protein synthesis, Mendelian genetics. Morphology of angiosperms.

Cell Biology: Cell structure and function; Ultrastructure of plant and animal cells, chromosomes, Mitosis, Meiosis, crossing over, chromosomal abnormalities.

Genetics: Genotype and Phenotype, nucleic acid structure, Mutations and their role in evolution, Genetic Disorders, population genetics, Mendelism and extension of Mendelism

Molecular Biology: Central dogma of molecular biology, Properties of nucleic acids, DNA replication, damage and repair, Gene structure in prokaryotes and eukaryotes, Coding and non-coding DNA & RNA, Transcription, RNA processing, Protein synthesis, Gene regulation: lac operon, Molecular mechanisms of recombination, Transposons and rearrangement of DNA, DNA damage and repair, Post transcriptional and post-translational modification.

Genetic Engineering: Enzymes in Genetic Engineering, Cloning vectors, gene cloning strategies, mutagenesis, Cloning & expression of transgenes in Prokaryotic & Eukaryotic systems, DNA sequencing, PCR technologies, gene transfer in plant and animals, Applications and impact of recombinant DNA technology.

Biochemistry protein synthesis; genetic code; DNA & RNA; carbohydrate, protein and lipid metabolism, clinical biochemistry; In born errors of metabolism; hormones and their function. Enzymes- classification, nomenclature, kinetics etc., Metabolism & regulation of: carbohydrates, proteins, fats & nucleic acids, Metabolic disorders,

Microbiology: Classification and taxonomy of microorganisms; Growth and physiology; Laboratory cultivation of microbes, Methods of microbial enumeration; Microbial metabolism, photosynthesis, fermentation, aerobic & anaerobic respiration, Pathogenic microorganisms, Microbial genetics.

Immunology: Cells of the immune system, lymphoid tissues, complement, antibodies, hybridoma technology, applications of monoclonal antibodies, antigen recognition, processing and presentation, cell mediated immunity, cytokines, hypersensitivity, vaccines & vaccine technology, auto-immunity, transplantation, immune responses to various infections, Immunotechnology.