

**OPEN ELECTIVE COURSE FOR M.TECH & M.Sc STUDENTS OF
OTHER DEPARTMENTS**

MBL-551/MNL-551: INTRODUCTION TO BIOTECHNOLOGY (4+0)

M.M.: 70

Time: 3 h

Unit-I

Cellular and molecular basis of life: An introduction, General structure of bio molecules, Fundamental principles governing structure of bio molecules, Importance of covalent and non covalent bonds. Diversity of cell (cell size and shape). Cell wall, Dynamics of cell organelles (a brief account of endoplasmic reticulum, mitochondria, chloroplast, golgi-complex, lysosomes, vacuoles, micro bodies, nucleus and nucleolus. concepts of evolution, cellular reproduction, Mendelian genetics, modern genetics, and genetic engineering.

Unit-II

Biotechnology: An overview-definition, scope and importance. Historical Background, recent advances and future aspects, Applications of Biotechnology in different fields- Agriculture, medical applications, Environmental applications, Food processing, Safety, Health and environmental issues, Societal implications and ethical issues in Biotechnology

Unit-III

Microbial Biotechnology: A brief account of microbes in industry and agriculture.

Environmental Biotechnology: (A brief account) Role of biotechnology in pollution control, Sewage treatment, Energy management, Bioremediation, Restoration of degraded lands and Conservation of biodiversity.

Medical Biotechnology: Biotechnology in medicine, Vaccines, Diagnostic, Forensic, Gene therapy.

Unit-IV

Plant Biotechnology: Introduction to plant tissue culture and its applications, Gene transfer methods in plants, Transgenic plants (A brief introduction).

Animal Biotechnology: *In-vitro* fertilization and embryo transfer in humans and livestock, Transfection techniques and transgenic animals. Cloning of animals, Hybridoma technology and Monoclonal antibodies.

Bioinformatics: (A brief account) Importance, Scope of Bioinformatics, world wide web as a tool, Bioinformatics institutes and databases, Bioinformatics training & limitations.

Bio-business and Bio-safety, Biotechnology for developing countries and IPR

Recommended Books:

1. Gupta P.K. (2003), Biotechnology and Genomics, Rastogi Publications Meerut.
2. Das H.K. (2004), Textbook of Biotechnology, Willy Dreamtech. Pvt. Ltd, New Delhi.
3. Singh B.D. (1998), Biotechnology, Kalyani Publication.
4. Natesh S., Chopra V.L. and Ramachandran S. (1987), Biotechnology in Agriculture Oxford & IBH, New Delhi.
5. Kumar H.D. (2004), A Text Book of Biotechnology, Eastern Willey Press, New Delhi.

(Examiner will set Nine questions in all, Q. No. 1 will be compulsory & based on the entire syllabus. It will contain 7 short answer type questions each of 2 marks. Among the 8 questions are to be given two question from each unit. Candidates are required to attempt other four questions in all by selecting at least one from each unit. All question carry equal marks)

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Manmohan
24/7/2015