

PBT8J201

BIONANOTECHNOLOGY

PURPOSE

This course deals with applications resulting from the combination of biotechnology and nanotechnology in the fields of medicine and environment

INSTRUCTIONAL OBJECTIVES To focus on principles of Bionanotechnology and its applications

UNIT 1

INTRODUCTION TO BIONANOTECHNOLOGY 9 From Biotechnology to Bionanotechnology- Bionanomachines in action-Modern Biomaterials –The Legacy of Evolution

UNIT 2

BIOMOLECULAR DESIGN AND BIOTECHNOLOGY 9 Recombinant DNA technology- Monoclonal antibodies-Biomolecular structure determination-Molecular Medicine

UNIT 3

FUNCTIONAL PRINCIPLES OF BIONANOTECHNOLOGY 9 Information –Driven Nanoassembly- Energetics-Chemical transformation-Regulation-Biomolecular MotorsBiomolecular sensing- Self-replication- Machine –Phase Bionanotechnology

UNIT 4

NANOMEDICINE 9 Anti-AIDS drugs-Immunotoxins as cell killers-Artificial blood- Cyclic peptides from nanotubes

UNIT 5

APPLICATIONS OF BIONANOTECHNOLOGY 9 Harnessing molecular Motors-DNA computers- Molecular design using Biological selection-Artificial life-Hybrid materials-Biosensors

Total hours :45

TEXT BOOK:

1. Bionanotechnology by David S.Goodsell, 2004, Wiley Publications.