B.Sc BIOTECHNOLOGY III YEAR

SEMESTER- V

GENERIC ELECTIVE (GE)

BS 503: BASICS IN BIOTECHNOLOGY

1. Unit: Agricultural Biotechnology

1.1. Plant tissue culture - media, sterilization, culture types

1.2. Micro-propagation, Synthetic seeds, Somatic hybrids and haploid plants

1.3. Transgenic plants - direct & indirect methods of gene transfer

1.4. Applications of transgenic plants - improving productivity & nutritional quality

1.5. Applications of transgenic plants - stress tolerant plants & molecular farming

1.6. Biofertilizers and biopesticides

2. Unit: Microbial and Industrial Biotechnology

2.1. Exploitation of micro-organisms and their products

2.2. Isolation, screening and selection of microorganisms for industrial products

2.3. Preservation of microorganisms

2.4. Strain development and improvement, strategies of strain improvement selection and recombination

2.5. Production of recombinant DNA vaccine, amino acids, vitamins

2.6. Single cell protein, dairy products, penicillin and streptomycin production

3. Unit: Animal and Medical Biotechnology

3.1. Cell culture technique and its applications

3.2. Animal breeding (selective breeding and cross breeding) and its limitations

3.3.In vitro techniques in animal improvement: in vitro fertilization & microinjection

3.4. Genetically modified animals: transgenic & knock-outs

3.5. Mouse models of disease: cancer and diabetes

3.6. Biotechniques: gel electrophoresis and PCR

4. Unit: Computer applications in Biotechnology

4.1. Scope of computer applications in Biotechnology

4.2. Biotechnology tools and resources- role of the internet, free online tools, downloadable free software

4.3. Biotechnology web portals – NCBI, EBI, ExPASy

4.4. Biological databases: classification of databases - the primary (Genbank), secondary (PIR) databases

4.5. Sequence databases - DNA sequence databases (ENA &DDBJ)

4.6. Protein sequence databases (Swissprot & PROSITE)