

**B.Sc. Biotechnology: Semester-II
BST 202 Microbiology**

Teaching Scheme
Lectures: 3 hrs/Week
Tutorials: 1 hr/Week

Credits: 4

Examination Scheme
Class Test -12Marks
Teachers Assessment - 6Marks
Attendance - 12 Marks
End Semester Exam - 70 marks

Prerequisite: - General knowledge of Microbiology of intermediate level.

Course Objectives:

1. To give an overview of Classification of Microorganisms, Role of Microorganisms in Disease, Study of Microbial Structure
2. To give basic knowledge of Prokaryotic & Eucaryotic Cell: Structure Size, Shape and Function
3. To have an overview of Microbial Nutrition and Microbial Growth
4. To explain about the different Types of Media, Isolation of Pure Cultures, Growth Curve, measurement of Microbial Growth, Cell Numbers & Cell Mass.
5. To explain the General Characteristics, Cultivation & Purification, Structure of Viruses
6. To explain about the different types of Antimicrobial Agents, Antibacterial Drugs, Antifungal Drugs, Antiviral Drugs, Drug Resistance

Course Outcomes:

After completing the course, students will be able to:

- CO1: Understand various applications of microbes in our day to day life
- CO2: Study and isolate the different types of microbes on the basis of staining techniques
- CO3: Identify different types of growth media and factors affecting growth of microbes
- CO4: Control of Microorganisms by Physical and Chemical Agents
- CO5: Drug Resistance and the Mechanisms of Drug Resistance

Detailed Syllabus:

UNIT-1 History and Scope of Microbiology

History and Scope of Microbiology, Classification of Microorganisms, Role of Microorganisms in Disease, Study of Microbial Structure (Microscopy), Prokaryotic & Eucaryotic Cell: Structure Size, Shape and Function, Prokaryotic Cell Wall, Peptidoglycan Structure, Gram-Positive Cell Walls, Gram-Negative Cell Walls, Mechanism of Gram Staining, Capsules, Slime Layers, and S-Layers, Pili and Fimbriae, Flagella and Motility, Chemotaxis, Bacterial Endospore

UNIT-2 Microbial Nutrition and Microbial Growth

Head

Department of Biotechnology,
Invertis University, Bareilly (U.P.)

Dean

Faculty of Science
Invertis University, Bareilly (U.P.)

Registrar
Invertis University,
Bareilly

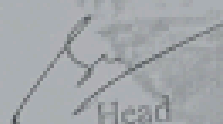
Microbial Nutrition and Microbial Growth: Nutrient Requirements (C, H, O, N, P, S), Nutritional Types of Microorganisms, Growth Factors, Uptake of Nutrients by the Cell, Group Translocation, Iron Uptake, Types of Media, Isolation of Pure Cultures, Growth Curve, Measurement of Microbial Growth, Cell Numbers & Cell Mass, Chemostat & Turbidostat, Sterilization, Control of Microorganisms by Physical and Chemical Agents, Antimicrobial Agent Activity & Evaluation, Bacterial Recombination: General Principles, Bacterial Plasmids, DNA Transformation, Transduction, Recombination and Genome

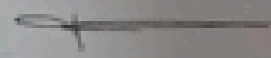
UNIT-3 Viruses


Viruses: Introduction, General Characteristics, Cultivation & Purification, Structure of Viruses, Virion Size, Structural Properties, Helical Capsids, Icosahedral Capsids, Principles of Virus Taxonomy. Antimicrobial Drugs, Dilution Susceptibility Tests, Disk Diffusion Tests, MIC, Mechanisms of Action of Antimicrobial Agents, Antibacterial Drugs, Antifungal Drugs, Antiviral Drugs. Drug Resistance, Mechanisms of Drug Resistance, Clinical Microbiology, Microbiology of Food, Industrial Microbiology and Biotechnology

Text and Reference Books

1. Powar C. B. and H. F. Dagainawala (2003), General Microbiology Vol.II; Himalaya Publishing House.
2. Dubey R. C. and D. K. Maheshwari (2004). A Text book of microbiology, 1st Edition; S. Chand and Company Ltd.
3. H.C. Dube (2005) A Textbook of Fungi, Vikas Publishing House.
4. A Textbook of Fungi- Vashistha (2003) S. Chand and Company Ltd.
5. Davis and Harper, General Microbiology
6. Alexopoulos C. J. and C. W. Mims (1996). Introductory Mycology, 4th Edition; John Wiley and Sons, Inc. USA.
7. Stanier, R.Y., J.L. Ingraham, M.L. Wheelis and P.R. Painter (1987) 7th edition. General Microbiology, Macmillan Press Ltd.


Head
Department of Biotechnology
Invertis University, Bareilly (U.P.)


Dean
Faculty of Science
Invertis University, Bareilly (U.P.)


Regional
Invertis University
Bareilly