

SARDAR PATEL UNIVERSITY
S. Y. B. Sc. Microbiology
Semester IV
US04CMI01-Fundamental Microbiology
(03 Credits; 3 Hrs/week)
(Effective from June 2011)

Unit 1

Medical Microbiology-I

- Normal flora of human :
 - Origin of the normal flora
 - Distribution and occurrence of normal flora
 - Germ free and Gnotobiotic life

Unit 2

Medical Microbiology-II

- Pathogenic microorganisms:
 - Pathogenicity
 - Virulence
 - Microbial virulence factors -
 - Antiphagocytic factors
 - Exotoxin and Endotoxin
 - Other virulence factors
- Infection and natural resistance to infection

Unit 3

Air Microbiology:

- Micro flora of Air
- Enumeration of microorganisms in air
- Significance of microorganisms in air
- Control of Air borne microorganisms.

Unit 4

Industrial microbiology

- Role of microorganisms in industry
- Characteristics of industrially important microorganisms
- Introduction to fermentor design
- Major class of products and processes
 - Alcohol fermentation

Unit 5

Control of Microorganisms by Physical agents

- Fundamentals of control
- Conditions influencing antimicrobial agents
- Mode of action of antimicrobial action
- Physical agents:
 - High temperature, Low temperature, Dessication, Osmotic pressure, Radiation,
 - Surfactants, Filtration.

Unit 6

Control of Microorganism by Chemical agents

- Characteristics of an ideal antimicrobial chemical agents
- Definition of terms
- Selection of chemical agents
- Major groups of chemical Antimicrobial agents
- Evaluation of antimicrobial chemical agents

Reference Books:

1. Microbiology- Pelczar, Chan and Krieg, 5th Ed.
2. General Microbiology Vol-II- Powar and Dagainawala
3. Industrial Microbiology- L. E. Cassida

SARDAR PATEL UNIVERSITY
S. Y. B. Sc. Microbiology
Semester IV
US04CMI02-Applied Microbiology
(03 Credits; 3 Hrs/week)
(Effective from June 2011)

Unit 1

Microbiology of milk and milk products:

- Sources of microorganisms in milk
- Types of microorganisms in milk
- Milk borne diseases
- Microbiological examination of milk
- Pasteurization of milk

Unit 2

Food Microbiology

- Microbial flora of fresh foods
- Microbial spoilage of foods
- Microbiological examination of foods
- Preservation of foods.

Unit 3

Water Microbiology:

- Natural water and its types
- Bacteriological examination of domestic water
- Purification of water

Unit 4

Waste water microbiology

- Chemical and microbiological characteristics
- Waste water treatment and disposal
- Waste water treatment processes
 - Single dwelling units (septic tank)
 - Municipal treatment processes-primary, secondary and advance treatment
- Solid processing
 - Anaerobic sludge digestion
 - Composting

Unit 5

Soil Microbiology-I

- Normal flora of soil
- Methods of studying soil micro flora
- Rhizosphere
- Interaction among soil microorganisms

Unit 6

Soil Microbiology-II

- Biogeochemical cycle
Nitrogen cycle, carbon cycle, sulphur cycle
- Biochemical transformation of other elements

Reference Books:

1. Microbiology- Pelczar, Chan and Krieg, 5th Ed.
2. General Microbiology Vol-II- Powar and Dagainawala

SARDAR PATEL UNIVERSITY
S. Y. B. Sc. Microbiology
Fourth Semester
US04CMI03-MICROBIOLOGY PRACTICALS
(03 Credits; 6 Hrs/week)
(Effective from June 2011)

1. Enumeration of microorganisms by Pour plate method.
2. Study of morphological and cultural characteristics of Bacillis (*Bacillus subtilis*, *Bacillus megaterium*, *Bacillus cereus*)
3. Study of morphological and cultural characteristics of Pigment producing bacteria (*Micrococcus luteus*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Serratia marcescens*).
4. Study of morphological and cultural characteristics of coliforms (*E.coli*, *E. aerogenes*).
5. Study of Enzyme producers – Amylase, Catalase, Gelatinase, Caseinase.
6. Effect of environmental factors on the growth of microorganisms – pH and salt concentration.
7. Study of Oligodynamic action.
8. Effect of antibiotic on growth of test organisms.
9. Effect of antimicrobial agents on the growth of bacteria (Antibiotic, Phenol, Crystal violet).
10. Bacteriological analysis of Air.
11. Acid fast Staining.
12. Demonstration of culture preservation by paraffin wax and paraffin oil.