GUJARAT UNIVERSITY

Syllabus for First Year B. Sc. Semester I,

Microbiology (Discipline Specific Course - Minor)

Effective from June-2023

Paper name: History and Development of Microbiology

Ppaer code: DSC-M-MIC-113T

Credit:02 [02 hrs/week, Total 30 hrs]

Unit 1 The History of Microbiology

1.1. The Discovery of Microorganisms (05 h)

a) Microbiology and the origin of life
b) Contribution of A. v. Leeuwenhoek in the discovery of microscope
c) Spontaneous generation vs. biogenesis

1.2. The Golden Age of Microbiology (10 h)

a) Germ theory of fermentation
b) Germ theory of disease
c) Pure culture technique and Koch's Postulates
d) Contribution of Joseph Lister in Antisepsis
e) Contribution of Edward Jenner & Louis Pasteur in Immunology
f) The Birth of Modern Chemotherapy: Contribution of Paul Ehrlich, Alexander Fleming and Selman A. Waksman

Unit 2 The Development of Microbiology

2.1. Medical Microbiology (03 h)

a) Discovery of Phagocytosis, Toxins and Antitoxins, Types of Immunity and Interferons

2.2. Agricultural Microbiology (05 h)

a) Soil Microbiology: Contributions of Sergei N. Winogradsky and Martinus W. Beijerinck and Development of enrichment culture technique
b) Plant Pathology: 'Fire blight' of pears, 'peach yellows', transmission of the viral diseases of plants by insects, discovery of TMV

2.3. Microbial Genetics and Molecular Biology (05 h)

a) One Gene - One Enzyme Hypothesis: Contributions of George Beadle and Edward Tatum
b) DNA as Hereditary Molecule: Contributions of Frederick Griffith, Oswald Avery, Colin MacLeod, Maclyn McCarty

2.4. Microbiology As a Field of Biology (01 h)

2.5. Microbiology As a Science: Basic and Applied Microbiology (01 h)

Reference Books:

1. **Microbiology**: **An Introduction** G. J. Tortora, B. R. Funke, C. L. Case, 11th Edition (IndianEdition) (2016). Pearson India Education Services Pvt. Ltd., Noida (UP), India.
2. **Microbiology,** Pelczar JR., Chan ECS, Krieg NR, 5th Edition (1993), McGraw-Hill Book Company, NY.
3. **Microbiology: An Application Based Approach,** Pelczar JR., Chan ECS, Krieg NR, 3rdReprint (2011), Tata McGraw Hill Education Private Limited, New Delhi, India
4. **Principles of Microbiology**, R. M. Atlas, 2nd Edition (Indian Edition) (2015) McGraw Hill Education (India) Private Limited, New Delhi, India

Paper name: Microbiology Practicals (Minor)
Ppaer code: DSC-M-MIC-113P

Course DSC- M-MIC-113P: Microbiology Practicals

Credit:02 [4 hrs/week, Total 60 hrs]

1. Microbiology Good Laboratory Practices (GLP): Rules and Safety
2. Study of principle, component parts and operation of the compound light microscope
3. Study of principles and working of laboratory instruments: Autoclave, Hot air oven, Incubator, Water bath, Bacteriological Filters, Centrifuge, Rotary shaker, pH meter, Colorimeter
4. Introduction to size, shape, labeling (if required) and uses of laboratory glass wares/plastic wares: Test tube, Pipette, Conical flask, Petri dish, Measuring cylinder, Coplin Jar, Burette, Beaker, Glass spreader
5. Cleaning and preparation of glassware for sterilization
6. pH adjustment of media/solution by use of pH strip and pH meter
7. Preparation of Nutrient broth and Nutrient agar
8. Disposal of laboratory waste and cultures

Scheme of Practical Examination

No.	Title of The Exercise	Marks
Ex-1	(a) Preparation of Nutrient broth and Nutrient agar (b) pH adjustment of the given solution using pH strip (c) Principle and operation of the given laboratory instrument	**10**
Ex-2	Spotting	**10**
Ex-3	Viva-voce	**10**
Ex-4	Journal	**05**
	Total Marks	**35**