

( With effect from June, 1992 )

SYLLABUS FOR F.Y.B.Sc. MICROBIOLOGY

NORTH MAHARASHTRA UNIVERSITY,  
JALGAON.

MICROBIOLOGY PAPER-I

Term -I

- UNIT. 1. History of Microbiology.
- a) The Beginning.
  - b) The Golden Era.
  - c) The Modern Era.
  - d) List of Nobel Laurates & their Contributions in brief.
- UNIT. 2. Microscopy.
- a) Bright field Microscopy:
    - b) Defination, Magnification, Resolving power
    - \* Principle, Working and Construction of compound microscope.
    - \* Oil immersion lens.
    - \* Lens System & Aberrations.
  - b) Dark field Microscopy.
  - c) Micrometry.
- UNIT. 3. Morphology of Bacteria
- \* Detail Structure, function and Chemical Composition of the following in a bacterial Cell.
    - a) Cell Wall
    - b) Cell Membrane
    - c) Spores.
    - d) Capsule.
    - e) Flagella.
    - f) Fimbriae.
    - g) Nuclear Material
    - h) Ribosomes
    - i) Cell inclusions.

Term II

- UNIT. 4. Stains and Staining Procedures
- a) Types of Stains
  - b) Classification of Stains
  - c) Basic Staining Procedures.
    - \* Monochrome Staining
    - \* Gram's Staining
    - \* Negative Staining
    - \* Acid Fast Staining

(10)

...2/-

(2)

. 2 .

- UNIT. 5 Sterilization and Disinfection
- a) Sterilization
    - \* Principles & Mode of action of heat, Radiation, Filtration, & Chemicals.
  - b) Disinfection
    - \* Agents and their mode of action
    - \* Phenol coefficient
    - \* MIC
- UNIT. 6 Nutrition and Cultivation of Bacteria (15)
- a) Nutritional requirements of bacteria
  - b) Definition of nutritional Categories of bacteria.
  - c) Cultivation of bacteria
    - (i) Media and its types
    - (ii) Techniques of Cultivation of following:
      - \* Bacteria (Isolation methods)
      - \* Fungi (Slide culture Method)

UNIT. Nos. 1, 2, & 3 for term end Examination.

--XOX--

n/-

(3)

MICROBIOLOGY PAPER-II

TERM-I

- UNIT. 1. Classification & Identification of Bacteria (12)  
a) Introduction to bacterial Classifications  
b) Introduction to Identification of Bacteria.
- UNIT. 2. Out line Classification of Algae & Fungi (04)
- UNIT. 3. Studies on Viruses (14)  
a) Discovery  
b) Structure  
c) Cultivation with reference to tissue cultures chick embryo techniques.  
d) Classification on the basis of RNA & DNA
- UNIT. 4. Growth of Bacteria (10)  
a) Phases of Growth  
b) Growth rate & Generation time.  
c) Measurement of growth

Term - II

- UNIT. 5. Effect of Environmental factors on bacteria (12)  
a) Temperature  
b)  $p^H$   
c) Osmotic pressure  
d) Water activity  
e) Surfactants  
f) Radiations  
g) Gases
- UNIT. 6. Applied Microbiology (28)  
a) Water Microbiology  
\* Microflora of water  
\* Tests for potability of water  
\* Indicators of water pollution.  
b) Milk Microbiology  
\* Composition of Milk  
\* Microflora of Milk  
\* Spoilages of Milk  
\* Pasteurization  
c) Food Microbiology  
\* Microflora of food

...2/-

(4)

. 2 .

- \* Spoilages of food
- \* Preservation of food
- b) Air Microbiology
  - \* Microflora of Air
  - \* Enumeration of bacteria in air
  - \* Droplet & Droplet nucleil, Aerosoles.
  - \* Laminar Air flow
- e) Soil Microbiology
  - \* Texture of Soil
  - \* Types of Soil
  - \* Soil microflora
  - \* Rhizosphere
  - \* Role of microorganisms as biogeochemical agents in Soil.

UNIT Nos. 1, 2, 3, & 4 for term end examination.

n/-

PRACTICAL COURSE-I

1. Use of compound Microscope.
2. Demonstration of Laboratory Instruments.
3. Preparation of Nutrient broth/Agar
4. Preparation Mac Conkey's broth/Agar
5. Isolation of bacteria by the following  
Methods -
  - a) Streak Plate method
  - b) Pour plate method
  - c) Spread plate method
6. Study of cultural characters of the following bacteria.
  - a) E. Coli
  - b) Bacillus subtilis
  - c) Staphylococcus aureus
7. Staining procedures of bacteria.
  - a) Monochrome staining
  - b) Gram's staining
  - c) Negative staining
  - d) Acid fast Staining
8. Study of bacterial Motility by :
  - a) Hanging drop preparation
  - b) Swarming growth method
9. Study of following biochemical tests.
  - a) Sugar fermentations ( Glucose, lactose, maltose, Sucrose.)
  - b) H<sub>2</sub>S production.
  - c) IMVIC tests
10. Bacteriological examination of water.
  - a) Qualitative Examination
  - b) Quantitative Examination.

(6)

NORTH MAHARASHTRA UNIVERSITY,  
JALGAON.

List of Books

- 1) Salle A.J. Fundamental Principles of Bacteriology (1974)  
Tata Mc Graw Hill Publishing Co. New Delhi
- 2) Pleczar M.J. Reid R. D. Chan E.C.S.  
Microbiology 5th Edition (1986)  
Tata Mc Graw Hill Publishing Co New Delhi.
- 3) Frobisher M. Hindill & Others.  
Fundamentals of Microbiology 9th edition.  
W.B. Sanders & Co. Philadephia
- 4) Stanier, Roger Y., Adelberg & Others General Microbiology  
5th edition Mac Millan, London
- 5) Brock Thomas D, Brock Katherin M & others: Basic Microbiology  
with applications 3rd edition  
Prentice Hall, New Jersey 1986
- 6) Davis Bernard, Dubecco, & others  
Microbiology, 4th edition  
Harper & Row, Philadalphia 1980
- 7) Frazier C. William  
Food Microbiology 4th edition  
McGraw-Hill Book Company New York. (1988)
- 8) Alexopoulos, Constantine J.  
Introductory Mycology 2nd edition  
Willey Eastern New Delhi 1978
- 9) Alexander Martin  
Soil Microbiology
- 10) Luria S.E., Darnell James E & others  
-General Virology 3rd Edition  
John Willey & Sons, New York 1978
- 11) Jergy, Kreig, Noel R  
Manual of Systematic Bacteriology 9th edition  
William & Wilkings, London 1984
- 12) G. M. Smith  
Cryptogamic Botany Vol I

॥ अंतरी पेटू ज्ञानज्योत ॥

उत्तर महाराष्ट्र विद्यापीठ, जळगांव-४२५ ००१.

प्रथम वर्ष वाणिज्य : मराठी पाठ्यपुस्तक [सत्र प्रथम]

वाङ्. मधील मराठी [संपादित पाठ्यपुस्तक]

पाठ्यपुस्तकातील वेच्यांचा तपशील

१] आस्त्याधिक : अध्ययन अध्यापन उद्दिष्टे

१] ललित वाङ्. मय : स्वल्प व संकल्पना.

२] ललित वाङ्. मय : सामाजिक संदर्भ

३] ललित वाङ्. मय : अध्ययनाच्या दिशा

२] वि. द. घाटे : मराठी सापळाचे मन [निबंध]

३] आनंद वाढव : खताची गाडी [उत्था]

४] प्र. के. अन्न : महाराष्ट्राचे समाजवादी संत गाडगेमहाराज [चरित्र]

५] दुर्गा भागवत : अतन्मन शरण काही राणी [ललित लेख]

६] शांताबाई कृष्णाजी कांढे : भाइया जन्माची चित्तरुथा [आत्मचरित्र]

७] अनिल अचट : अधिर नगरी नि पाणी [ललित गद्य]

८] विठ्ठल रावजी विदि : येरफड्याच्या तुळंगातील रोजनिशी [दैनंदिनी]

९] गणेश चौधरी : काचेत रत्न [पद्य]

१०] वि. वि. जोशी : गुंड्यांभाऊचे लुखणे [किन्नोद]

११] अनांदाच पाटील : उत्तरकार्य [ललितगद्य]

१२] वि. वा. गिरवाडकर : नाटक बसते आहे [एकांजिका]

द्वितीय सत्र : उपयोजित मराठी [स्वतंत्र पाठ्यपुस्तक]

१] वाचन कौशल्ये

२] लेखन कौशल्ये

३] संवाद कौशल्ये

४] संपादन कौशल्ये

५] पत्रलेखन

६] सारलेखन

७] भाषांतर

८] जाहिरात लेखन

९] क्षेत्रीय परिवर्तनेचे उपयोजन इ.

x-x-x-x-x-x-x-x-x-x-x-

डी.बी. /