

Phone : 08819 - 246126 / 246926

Website : www.svkpandksrajucollege.org.in



S.V.K.P. & Dr. K.S. RAJU ARTS & SCIENCE COLLEGE
(Autonomous)

Recognized by UGC as "College with Potential for Excellence"

Accredited by NAAC with "A" Grade

(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognised by Govt. of Andhra Pradesh)

PENUGONDA-534 320, West Godavari District., (A.P.)

I Semester Syllabus (w.e.f. 2019-20 Admitted Batch)

MICROBIOLOGY

FIRST YEAR SEMESTER -I

19MB1- INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 48 CREDITS: 4

UNIT-I No. of hours: 12

History and mile stones in microbiology.

Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky.

Importance and applications of microbiology.

Classification of microorganisms –Binominal classification, Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese.

Outline classification of bacteria as per the second edition of Bergey's Manual of Systematic Bacteriology.

UNIT – II No. of hours: 10

General characteristics of Bacteria, Archaea, Mycoplasmas and Cyanobacteria.

Ultra structure of Prokaryotic cell- Variant components and invariant components.

General characteristics of viruses(Discovery and general properties).

Morphology, Structure and replication of TMV and HIV.

UNIT-III No. of hours: 10

General characteristics and outline classification of cellular organisms (Fungi, Algae and Protozoa) and its Economic importance.

Principles of microscopy – compound microscopy (Bright field) and Electron microscopy (SEM and TEM) and its applications.

UNIT-IV No. of hours: 8

Staining Techniques –Simple and Differential (Gram Staining and Spore Staining).

Sterilization and disinfection techniques - Physical methods – autoclave, hot- air oven, pressurecooker, laminar air flow, filter sterilization, Radiation methods – UV rays, Gamma rays.Chemical methods – alcohols, aldehydes, fumigants, phenols, halogens and hypochlorites.

UNIT –V No. of hours: 8

Isolation of Microorganisms from natural habitats(Air,Water,Soil).

Pure culture techniques – dilution-plating, Streak-plate, Spread-plate, Pour-Plate and micromanipulator. Enrichment culturing.

Preservation Methodsof microbial cultures – subculturing, overlaying cultures with mineral oils,lyophilization, sand cultures, storage at low temperature.

19MB1P INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

1. Microbiology Good Laboratory Practices and Biosafety.
2. Preparation of culture media for cultivation of bacteria
3. Preparation of culture media for cultivation of fungi
4. Sterilization of medium using Autoclave
5. Sterilization of glassware using Hot Air Oven
6. Light compound microscope and its handling
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Cyanobacteria, Algae and Fungi.
8. Simple staining
9. Gram's staining
10. Hanging-drop method.
11. Isolation of pure cultures of bacteria by streaking method.
12. Preservation of bacterial cultures by various techniques.
13. Diagramatic or Electron photomicrographic observation of TMV, HIV, T4 phage and Adenovirus

Phone : 08819 - 246126 / 246926

Website : www.svkpandksrajucollege.org.in



S.V.K.P. & Dr. K.S. RAJU ARTS & SCIENCE COLLEGE
(Autonomous)

Recognized by UGC as "College with Potential for Excellence"

Accredited by NAAC with "A" Grade

(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognised by Govt. of Andhra Pradesh)

PENUGONDA-534 320, West Godavari District., (A.P.)

B.Sc MICROBIOLOGY (CBCS) SYLLABUS

FIRST YEAR – SEMESTER- II (w.e.f. 2019-20 Admitted Batch)

19MB2 : MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 48 CREDITS: 4

UNIT-I No. of hours: 10

Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides).

General characteristics of amino acids and proteins.

Structure of nitrogenous bases, nucleotides, nucleic acids.

Fatty acids (saturated and unsaturated)

lipids (sphingolipids, sterols and phospholipids).

UNIT-II No. of hours: 8

Principle and applications of -

Colorimetry

Chromatography (paper, thin-layer and affinity chromatography)

Spectrophotometry (UV & visible),

Centrifugation and

UNIT-III No. of hours: 10

Properties and classification of Enzymes.

Biocatalysis- induced fit and lock and key models.

Role of Coenzymes and Cofactors in enzyme activity.

Factors affecting catalytic activity of enzymes.

Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric.

UNIT-IV No. of hours: 10

Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells.

Nutritional groups of microorganisms- autotrophs, heterotrophs, mixotrophs.

Outlines of oxygenic and anoxygenic photosynthesis in bacteria

Growth media- synthetic, complex, selective, enrichment and differential media.

Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous,

biphasic growth. Factors influencing microbial growth. Methods for measuring microbial growth –

Direct microscopy, viable count estimates, turbidometry and biomass.

UNIT-V No. of hours: 10

Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport,oxidative and substrate level phosphorylation.

Anaerobic respiration (Nitrate).

Fermentation - Alcohol and lactic acid fermentations.

19MB2P: MICROBIAL BIOCHEMISTRY & METABOLISM

1. Qualitative Analysis of Carbohydrates
2. Qualitative Analysis of Aminoacids
3. Colorimetric estimation DNA by diphenylamine method
4. Colorimetric estimation of proteins by Biuret/Lowry method
5. Paper chromatographic separation of sugars / amino acids
6. Preparation of different media- Synthetic and Complex Media
7. Setting and observation of Winogradsky column.
8. Estimation of CFU count by spread plate method/pour plate method.
9. Bacterial growth curve.
10. Factors affecting bacterial growth – pH.
11. Factors affecting bacterial growth – Temperature.
12. Factors affecting bacterial growth –Salts