**PROPOSED SYLLABUS (2019-20) for B.Sc Microbiology**

**Code: BS 104, DSC**

**B.Sc I year: I Semester Paper-I Theory**

**Paper Title: Introductory Microbiology**

**4HPW-credits: 4**

**1st Credit: Introduction**


Microbiological Techniques: Sterilization and Disinfection - Physical methods (dry and moist heat), filtration, radiation. Chemical methods (alcohols, phenols, aldehydes, fumigants)

**2nd Credit: Microscopy and Staining methods**

Principles and applications of Microscopy-Bright field, Dark field, Phase-contrast, Fluorescent and Electron microscopy (SEM and TEM). Ocular and stage micrometry.

Principles and types of stains-Simple stain, Differential stain, Negative stain.

Structural stain: spore, capsule, flagella

**3rd Credit: Classification, Isolation and Identification of Microorganisms**

Classification of living organisms; Haeckel, Whittaker and Carl Woese systems.

Differentiation of prokaryotes and eukaryotes. Classification and identification of bacteria as per the second edition of Bergey’s manual of systematic bacteriology. Classification of protozoa, microalgae and fungi.

Growth media – synthetic, semi- synthetic, selective, enrichment and differential media.

Isolation of Pure culture techniques - Enrichment culturing, Dilution plating, streak plate, spread plate, Micromanipulator. Preservation of Microbial cultures – Sub culturing, overlaying cultures with minerals oils, sand cultures, lyophilization, storage at low temperature.

**4th Credit: Structure and General Characteristics of Microorganisms**


General characteristics of eukaryotes: protozoa, microalgae and fungi.

General characteristics and classification of virus. Morphology and structure of lambda bacteriophage (lytic and lysogeny), TMV and HIV.
References:

I-Semester Practical Paper-I

Introductory Microbiology 2HPW-Credits-1

5th Credit: Practicals

1. Compound microscope and its handling.
2. Sterilization techniques: Autoclave, Hot air oven and filtration
3. Calibration of microscope by ocular , stage micrometer and measurement of bacterial and fungal spores.
4. Simple and differential staining (Gram staining), Spore staining, capsule staining and flagellar staining.
5. Microscopic observation of bacteria (Gram positive bacilli and cocci, Gram negative bacilli), cyanobacteria (Nostoc, Spirulina), fungi (Saccharomyces, Rhizopus, Aspergillus, Penicillium)
6. Bacterial motility: hanging drop method
7. Preparation of culture media: Solid/Liquid.
8. Isolation of bacteria by serial dilution and pure cultures methods (streak, spread and pour plate techniques)
9. Preservation of microbial cultures- Slant, Stab, mineral oil overlay and glycerol stocks
10. Bacterial biochemical identification-IMViC test, carbohydrate fermentation test

References:
B.Sc I year: II Semester Paper-II Theory
Code: BS 204, DSC

Title: Microbial Physiology and Biochemistry          4HPW-credits-4

1st Credit: Microbial nutrition and growth
Microbial Nutrition, Uptake of nutrients by cell. Nutritional groups of microorganisms –
Autotrophs, Heterotrophs, Mixotrophs, Methylotrophs. Photosynthetic apparatus in
prokaryotes.
Bacterial growth – Different phases of growth, factors influencing bacterial growth.
Synchronous, Continuous, Biphasic Growth. Methods for measuring microbial growth –
Direct Microscopic, Viable count, Turbidometry.

2nd Credit: Microbial metabolism
Bacterial photosynthesis: Outline of oxygenic and anoxygenic photosynthesis in bacteria.
Microbial respiration – Aerobic: Glycolysis, HMP Pathway, ED Pathway , TCA Cycle and
Anaplerotic reactions, Electron transport, Oxidative and Substrate level phosphorylation.
Glyoxylate cycle, Anaerobic respiration (Nitrate and Sulphate).

3rd Credit: Biomolecules
Classification and characteristics of carbohydrates (Monosaccharides, disaccharides and
polysaccharides). General characteristics of amino acids and proteins, fatty acids (saturated
and unsaturated) and lipids (phospholipids, sterols and phospholipids). Structure of
nucleotides and nucleic acids.
Properties and Classification of enzymes. Biocatalysis – Induced fit and Lock & Key Model,
Coenzymes, Co-factors. Factors effecting enzyme activity.

4th Credit: Biochemical techniques
Hydrogen ion concentration in biological fluids. pH measurement. Types of buffers and their
uses in biological reactions. Principles and application of colorimetry and chromatography
(paper and thin layer). Principles and applications of Electrophoretic techniques- Agarose gel
electrophoresis and SDS PAGE

References:

Publisher.
New York.

II-Semester Practical Paper – II

Microbial Physiology and Biochemistry 2 HPW- CREDITS-1

5th Credit: Practicals

1. Setting up of Winogradsky’s column
2. Cultivation of photosynthetic bacteria
3. Determination of viable count of bacteria
4. Turbidometric measurement of bacterial growth curve
5. Factors affecting bacterial growth – pH, temperature, salts
6. Qualitative tests for carbohydrates and amino acids
7. Determination of pH
8. Preparation of Buffers
9. Colorimetry - Principles, laws, determination of absorption maxima
10. Paper chromatography-separation of sugars/amino acids

References:

### Proposed Scheme for Choice Based Credit System in B.Sc. Microbiology (2016-17)

#### First Year - Semester 1

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BSc CBCS syllabus 2016-17

Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 104, DSC- 1A

Title: General Microbiology-I 4HPW -credits-4

B.Sc I year: 1st semester

UNIT-1: HISTORY OF MICROBIOLOGY

UNIT-2: MICROSCOPY

UNIT-3: BIOLOGY OF MICROORGANISMS
Classification of living organisms; Heckel, Whittaker and carlwoese systems. Place of microorganisms in the living world. Differentiation of prokaryotes and eukaryotes. Prokaryotes—General characteristics of bacteria, Archea bacteria. Rickettiasis, Mycoplasma, cyanobacteria and Actinomycets. Classification of bacteria as per the second edition of bergyes manual of systematic bacteriology

UNIT-4 STRUCTURE OF MICROORGANISMS

References:
Dept. Microbiology: Osmania University

CHOICE BASED CREDIT SYSTEM-2016-17(CBCS)

B.Sc I year –I-semester Practical Syllabus

General Microbiology-I

2HPW-Credits-1

- Light compound microscope and its handling.
- Calibration of microscopic measurements( ocular, stage micrometer)
- Measuring dimensions of microorganisms ( Bacteria and fungal spores)
- Simple and differential staining (Gram stating), Spore stating, capsule staining and negative statining.
- Microscopic observation of bacteria (Gram positive bacilli and cocci:Gram negative bacilli),cyanobacteria (nostoc,spirulina).
- Microscopic observation of algae
- Microscopic observation of fungi (sacharomyces, Rhizopus, Aspergillus, Pencillium, Fusarium)
- Electron Microscopic pictures of TMV and HIV

References:
BSc CBCS syllabus 2016-17

Dept. Microbiology: Osmania University
Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology
B.Sc I year: 2nd semester
Title: General Microbiology-II

Code: BS 204, DSC-1B

4HPW-creditd-4

UNIT-1-MICROBIOLOGICAL TECHNIQUES

UNIT-2-PURE CULTURE TECHNIQUES
Isolation of Pure cultural techniques- Enrichment culturing, Dilution plating, streak plate, spread plate, Micromanipulator. Preservation of Microbial cultures – Sub culturing, overlaying cultures with minerals oils, lyophilization, sand cultures, storage at low temperature

UNIT-3 BIOMOLECULES
Outline classification and general characteristics of carbohydrate (Monosaccharides, disaccharides and polysaccharides). General characteristics of Amino acids and proteins, Fatty acids(saturated and unsaturated) and lipids (sphingo lipids,sterols and phospholipids). Structure of nitrogenous bases, nucleotides and nucleic acids.

UNIT-4 BIOCHEMICAL TECHNIQUES
Hydrgen ion concentration in biological fluids. PH measurement. Types of buffers and their uses in biological reactions. Principles and application of colorimetry and chromatography (paper and thin layer). Principles and applications of Electrophoretic techniques.

References:


CHOICE BASED CREDIT SYSTEM (CBCS)-2016-17

B.Sc I year –II-semester Practical Syllabus

GENERAL MICROBIOLOGY-II

2 HPW- CREDITS-1

- Preparation of culture media: Solid/Liquid.
- Sterilization techniques: Autoclave, Hot air oven and filtration.
- Enumeration of bacterial numbers by serial dilution and plating.
- Isolation of pure cultures by streak, spread and pour plate techniques
- Preservation of microbial cultures- Slant, Stab, Sand cultures, mineral oil overlay and glycerol stocks
- Qualitative tests for carbohydrates and amino acids
- Paper chromatography-separation of sugars/amino acids
- Determination of pH
- Preparation of Buffers
- Colorimetry- Principles, laws, determination of absorption maximum.

References:

SKILL ENHANCEMENT COURSE-I (SEC-I)
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 301, SEC-1

B.Sc II year: 3rd semester

Title: HAEMATOLOGY 2 HPW-credits-2

Unit-I:

Unit-II

References:
3. Ramnik Sood . Medical Laboratory technology Methods and Interpretation Jaypee Publications.
BSc CBCS syllabus 2016-17

Dept. Microbiology, Osmania University
Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology

Code: BS 304, DSC-1C

B.Sc II year: 3rd Semester

Title: Microbial Physiology and Enzymology 4 HPW-credits-4

UNIT-1: MICROBIAL NUTRITION AND PHOTOSYNTHESIS -

UNIT-2: MICROBIAL GROWTH -
Synchronous, Continuous, Biphasic Growth. Methods for measuring microbial growth – Direct Microscopic, Viable count, Turbidometry, Biomass

UNIT-3- MICROBIAL METabolISM-
β-Oxidation of Fatty acids. Glyoxylate cycle, Anaerobic respiration (Nitrate, Sulphate respiration)
Fermentation – Common Microbial fermentation with special reference alcohol and lactic acid fermentation.

UNIT-4-ENZYMES-
Inhibition of Enzymes activity – Competitive non Competitive, Un competitive and Allosteric
References:

Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

II Year B.Sc III SEMESTER MICROBIOLOGY -2016-17

Title: MICROBIAL PHYSIOLOGY & ENZYMEOLOGY

Practical syllabus

2HPW- credits-1

- Preparation of media for culturing autotrophic and heterotrophic microorganisms – algal medium, mineral salts medium, nutrient agar medium, McConkey agar and Blood agar.
- Setting and observation of Winogradsky column
- Methods of pure culture isolation
- Enrichment culturing and isolation of phototrophs and chemoautotrophs.
- Determination of viable count of bacteria.
- Turbidometric measurement of bacterial growth.
- Starch hydrolysis, Catalase test and sugar fermentation test

References:
Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology

Code: BS 404, DSC-ID

B.Sc II year: 4th semester

Title: Microbial Genetics and Molecular Biology

4 HPW-credits-4

UNIT-1 : MICROBIAL GENETICS

Fundamentals of Genetics – Medellin laws, Alleles, Crossing over and Linkage
DNA and RNA as Genetic material
Structure of DNA – Watson and Crick model
Extra Chromosomal genetic elements – Plasmids and Transposons
Replication of DNA- Semi Conservative mechanism

UNIT-2: MUTATIONS

Mutations – Spontaneous and induced, Base pair changes, Frameshift, Deletion, Inversion, Tandem duplication, Insertion
Various physical and chemical mutagens
Outline of DNA Damage and repair mechanism
Brief account on gene transfer among bacteria – Transformation, Transduction and Conjugation

UNIT-3-GENE EXPRESSION

Concept of gene – Muton, Recon and Cistron.
One gene – One enzyme, One gene – One Poly peptide, One gene – One product hypothesis
Types of RNA and their function
Outline of RNA Biosynthesis in Prokaryotes
Genetic Code, Structure of Ribosomes and Brief account on Protein synthesis
Type of Genes – Structural, Constitutive, Regulatory
Operon Concept. Regulation of Genes expression in bacteria – Lac Operon

UNIT-4-RECOMBIANT DNA TECHNOLOGY

Basic principles of genetic engineering – Restriction endonucleases, DNA polymerases and Ligases, vectors
Outline of gene cloning methods.
Genomic and cDNA libraries
General account on application of genetic engineering in industry, agriculture and medicine.
References:

II Year B.Sc IV SEMESTER; MICROBIOLOGY -2016-17
CHOICE BASED CREDIT SYSTEM (CBCS)
Microbial Genetics and Molecular biology

Practical syllabus

2 HPW-Credits-1

- Colorimetric estimation of proteins by Biuret / Lowery method.
- Colorimetric estimation of DNA by Diphenyl amine method.
- Colorimetric estimation of RNA by Orcinol method
- Extraction of genomic DNA
- Agarose gel Electrophoresis
- Problems related to DNA and RNA characteristics, Transcription and Translation

References:

SKILL ENHANCEMENT COURSE-II (SEC-2)

Dept. of Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 401, SEC-2

B.Sc II year: 4th semester

Title: FOOD ADULTERATION 2 HPW-credits-2

Unit-I

Definition and Introduction to food adulteration.
Types of Food Adulteration
Common Food adulterants
Causes of Food adulteration
Analysis of food

Unit-II

Effects of Food Adulteration
Prevention of Food adulteration
Detection of Common food adulterants.
Food Adulteration act-1954

Reference:

1. Jesse Park Battershall. Food adulteration and its detection. Published by Book on Demand, Miami, 2015
2. R. B. Sethi’s Prevention of food adulteration act
3. Dr. Sheela.S. Prevention of Food Adulteration
Title: APPLIED MICROBIOLOGY  

3 HPW- Credits-3

UNIT-1 - Microbes in Agriculture  
Physical and chemical characteristics of soil  
Rhizosphere and phyllosphere  
Plant growth promoting microorganisms (mycorrhizae, rhizobium, azospirillum, azatobacter, cynobacteria, frankia and phosphate solubilising microorganisms)  
Biofertilizers- Rhizobium & Cyanobacteria

UNIT-2 Plant Diseases & Biocontrol  
Concept of disease in plant  
Symptoms of plant diseases caused by fungi (ground nut rust), bacteria (angular Leaf spot cotton) and viruses (tomato leaf curl) Principles of plant disease control  
Biological control of plant diseases, Biopesticides-Bacillus thuringenisis, Nuclear polyhedrosis virus (NPV), Trichoderma

UNIT-3 Microbial ecology  
Outline classification of nitrogen fixation (symbiotic,non symbiotic)  
Microorganisms of environment soil,water ,air  
Role of microorganisms in nutrient cycles (carbon,nitrogen,sulphur)  
Microbial interaction-mutalism, commensalism, antagonism, competition, parasitism, predation

UNIT-4 Role of microbes in environmental Pollution  
Microbiology of potable and polluted water. E.coli and Streptococcus faecalis as indicators of water pollution. Sanitation of potable water. Sewage treatment (primary, secondary and tertiary)  
Solid waste disposal-sanitary landfills composting  
Outline of biodegradation of environmental pollutants –pesticides

References:  
BSc CBCS syllabus 2016-17

B.Sc III year –V-semester Practical Syllabus-2016-17

APPLIED MICROBIOLOGY

Practical syllabus

2 HPW-CREDITS-1

- Isolation & enumeration of Rhizosphere microorganisms.
- Isolation & identification of Phyllosphere microorganisms.
- Study of root nodules of leguminous plants.
- Isolation of Rhizobium from leguminous root nodules.
- Isolation of Azospirillum and Azotobacter.
- Staining & observation of VAM fungi.
- Isolation of microorganisms in air by solid/liquid impingement method.
- Plant diseases-Rust, Smuts, Powdery mildews, Tikka disease of ground nut, citrus canker, bhendi yellow vein mosaic, tomato leaf curl, little leaf of brinjal.
- Microbial quality testing of water by coliform test
- Determination of Biological oxygen demand (BOD) of water

References:

SKILL ENHANCEMENT COURSE-III (SEC-3)
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 501, SEC-3

B.Sc III year: 5th semester

Title: Mushroom cultivation 2 HPW-credits-2

Unit-1
- Introduction to mushroom cultivation
- Importance and history of mushroom cultivation in India
- Global status of mushroom production
- Food value of mushroom

Unit-2
- Steps in mushroom cultivation
  a. Selection of site and types of mushroom
  b. Mushroom farm structure, design layout
  c. Principle and techniques of compost and composting
  d. Principle of spawn production
  e. Casing and crop production
  f. Harvesting and marketing
- Pest and pathogens of mushrooms
- Post harvest handling and preservation of mushrooms

Reference:

1. Mushroom cultivation in India by B.C. Suman and V.P. Sharma Published by Daya publishing house New Delhi.
GENERIC ELECTIVE-I (GE-1)
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology          Code: BS 502, GE-1

B.Sc III year: 5th semester

Title: Microbiology and Human health          2 HPW-credits-2

Unit-I:
Historic developments of Microbiology, contributions of Van Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch.
Types of microorganisms, Morphological characteristics of bacteria, Staining, cultivation methods of bacteria, Culture Media.

Unit-II:

References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IE) - A
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology               Code: BS 506, DSE-IE-A
B.Sc III year: 5th semester

Title: IMMUNOLOGY                             3 HPW-credits-3

UNIT-1 HISTORY OF IMMUNOLOGY AND IMMUNITY
Development of immunology.
Antigen –types,chemical nature,Antigenic determinants,Haptens
Factors affecting antigenicity.
Antibodies-Basic structure,Types,properties and functions of immunoglobulins.
Complement, components of complement and activation of complement.
Types of immunity-Innate, Acquired; Active and passive, humoral and cell mediated immunity.

UNIT-2 CELLS AND ORGANS OF IMMUNE SYSTEM
Primary and secondary organs of immune system- Thymus, bursa of fabrica, bone marrow,
spleen and lymphnodes, mucus associated lymphoid tissue (MALT).
Cells of immune system, Identification and functions of B &T Lymphocytes, Null cells,
Monocytes. Macrophages, Neutrophills, Basophills & Eosinophills.

UNIT-3 ANTIGENS AND ANTIBODY REACTION
Components of complement and activation of complement.
Types of antigens-Antibody reactions- Agglutination, blood groups, precipitation, neutralization,
complement fixation.
Labeled antibody based techniques-ELISA, RIA and Immunofluoresence

UNIT-4 IMMUNOLOGICAL PROCESSES AND APPLICATIONS
Types of hypersensitivity immediate and delayed.
Autoimmunity and its significance.
Polyclonal and monoclonal antibodies production and application
Vaccines-Natural and recombinants
References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IE) - A
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology Practicals
B.Sc III year: 5th semester

Title: IMMUNOLOGY 2HPW-credits-1

- Determination of blood grouping and RH typing.
- Total count of RBC and WBC.
- Differential count of blood leucocytes.
- Estimation of blood Haemoglobin.
- WIDAL test for typhoid (slide test) by Ag-Ab reactions
- VDRL test for syphilis (slide test) by Ag-Ab reactions.
- Ouchterlony double diffusion test
- Separation of serum and plasma

References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-1E) - B
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology

B.Sc III year: 5th semester

Code: BS 506, DSE-1E-B

Title: PHARMACEUTICAL MICROBIOLOGY 3 HPW-credits-3

UNIT-I:
Principles of chemotherapy – Clinical and lab diagnosis, sensitivity testing, choice of drug, dosage, route of administration, combined/mixed multi drug therapy, control of antibiotic/drug usage.

Unit-II:
History of chemotherapy – plants and arsenicals as therapeutics, Paul Ehrlich and his contributions, selective toxicity and target sites of drug action in microbes.
Over view of development of synthetic drugs.
Antibiotics - The origin, development and definition of antibiotics as drugs, types of antibiotics and their classification.

UNIT-III
Mode of action of important drugs – Cell wall inhibitors (Betalactam – eg. Penicillin), membrane inhibitors (polymyxins), macromolecular synthesis inhibitors (streptomycin), antifungal antibiotics (nystatin)

UNIT-IV:
Assay for antibiotics – Determination of MIC, the liquid tube assay, solid agar tube assay, agar plate assay (disc diffusion, agar well and cylinders cup method).

References:


DISCIPLINE SPECIFIC ELECTIVE-(DSE-2E) - B
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology
B.Sc III year: 5th semester

PRACTICALS

Title: PHARMACEUTICAL MICROBIOLOGY  2HPW-credits-1

- Tests for disinfectants (Phenol coefficient)
- Determination of antibacterial spectrum of drugs/antibiotics Chemical assays for antimicrobial drugs
- Testing for antibiotic/drug sensitivity/resistance.
- Determination of MIC value for antimicrobial chemicals
- Microbiological assays for antibiotics (Liquid tube assay, agar tube assay, agar well assays)

References:

**DISCIPLINE SPECIFIC ELECTIVE-(DSC-1F)**

Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 603, DSC-1F

B.Sc III year: 6th semester

Title: MEDICAL MICROBIOLOGY 3HPW-credits-3

**UNIT-I: INTRODUCTION TO MEDICAL MICROBIOLOGY**

History of medical Microbiology.
Normal flora of human body. Definition of infection.
Non specific defence mechanism- Mechanical barriers.
Antibacterial substance- Lysozyme, Complement, Properdin, Antiviral substances, Phagocytosis.
Host pathogen interactions. Bacterial toxins, Virulence and Attenuation.

**UNIT-II- DIAGNOSTICAND THERAPEUTICAL MICROBIOLOGY**

General principles of diagnostic microbiology
Collections, transport & processing of clinical samples.
General methods of lab diagnosis-cultural, biochemical, serological & molecular methods
Test for antimicrobial susceptibility.
Elements of chemotherapy-Therapeutic drugs, Mode of action of Pencillin & sulpha drugs & their clinical use. Drug resistance.
Antiviral agents- Interferon, Base analogues.
Preventive control of diseases- active & passive immunization.

**UNIT-III MEDICAL BACTERIOLOGY**

General account of following diseases, casual organisms, pathogenesis, epidemiology, diagnosis, prevention & control
Air born diseases-Tuberculosis.
Food & waterborn diseases- Cholera, Typhoid.
Contact diseases- Syphilis, Gonorrhoea. General account of Nosocomial infections.
Zoonotic diseases - Anthrax.

**UNIT-IV MEDICAL VIROLOGY AND PARASITOLOGY**

General account of following diseases, casual organisms, pathogenesis, epidemiology, diagnosis, prevention & control
Air born diseases- Influenza.
Insect born diseases - Malaria, Filariasis, Dengue fever.
Zoonotic diseases - Rabies. Blood born diseases - Serum hepatitis, AIDS.

References:
DISCIPLINE SPECIFIC ELECTIVE-(DSC-IF)
Dept.of Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology

B.Sc III year: 6th semester

PRACTICALS

Title: MEDICAL MICROBIOLOGY 2 HPW-credits-1

- Biochemical tests for identification members of enterobacteriacea.
- IMVIC test-indole test,methyl red test,voages proskeures test,citrate utilization test.
- Oxidase test.
- Catalase test.
- Study of medically important microorganisms-Ecoli, Klebsiella, Staphylococcus, Psedomonus.
- Test for disinfectant (Phenol coefficient)
- Antibiotic sensitivity testing – Disc diffusion method

Slides

Mycobacterium
Candida albicans
Entamoeba histolytica
plasmodium

References:

SKILL ENHANCEMENT COURSE-IV (SEC-4)
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology
Code: BS 601, SEC-4

B.Sc III year: 6th semester

Title: HOSPITAL WASTE MANAGEMENT 2 HPW-credits-2

Unit-I
- Types of Hospital waste and its Management.
- General, Hazardous, Health care waste, Infectious waste, Genotoxic Waste.
- Specification of Materials and colour coding for Identification.
- Biomedical waste management and handling rules.
- Guidelines of Central Pollution Control Board (CPCB).
- Safe disposal of the Radioactive waste rules.

Unit-II
- Basic steps in health care waste management- Segregation, Decontamination/Disinfection, Storage and Transportation.
- Mechanical and Chemical Treatment of the Waste.
- Liquid waste treatment-Autoclaving, Incrimination.
- Waste minimization- Recyclinf and reusing.
- Health and safety practices.
- Estimation of various items of waste management.

References:
GENERIC ELECTIVE-II (GE-2)
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17

Syllabus for B.Sc Microbiology Code: BS 602, GE-2

B.Sc III year: 6th semester

Title: CONTAGIOUS DISEASES AND IMMUNISATION 2 HPW-credits-2

Unit-1: Contagious diseases
Types of Infections,
Sources of infections,
Mode of infections.
Bacterial diseases: Diphtheria, woophing cough, Gonorrhoea,
Viral Diseases: HSV, HIV, HBV.

Unit-2: Immunization
Immunity,
Types of Immunity.
Immunization,
Types of immunization,
Vaccines- Live and killed vaccines,
Vaccination schedule.

References:
DISCIPLINE SPECIFIC ELECTIVE-(DSE-IF) - A  
Dept. Microbiology: Osmania University  

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)  
With effect from 2016-17  

Syllabus for B.Sc Microbiology  
Code: BS 606, DSE-1F-A  

B.Sc III year: 6th semester  

Title: FOOD MICROBIOLOGY  
3 HPW-credits-3  

UNIT-I  
Microorganisms of food materials and their sources.  
Spoilage of different food materials (Fruits, vegetables, Meat, Fish and Canned foods).  
Food born diseases (Salmonellosis & Shigellosis) and their detection.  

UNIT-II  
Microbiological production of fermented foods- Bread, Cheese, Yoghurt.  

Unit-3  
Methods of Food preservation, food poisoning (Staphylococci, C. botulinum)  
Food intoxication.  

UNIT-4  
Microbiology of potable and polluted water  
E.coli and streptococcus of water pollution Sanitation of potable water  
Sewage treatment (primary,secondary And tertiary)  
Solid waste disposal-sanitary landfills composting  
Outline of biodegradation of environmental pollution –pesticides
References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IF) - A
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology

Practicals

B.Sc III year: 6th semester

PRACTICALS

Title: FOOD MICROBIOLOGY

2HPW-credits-1

- Isolation of microorganisms by crowded plate technique.
- Isolation of Amylase producing organisms.
- Isolation of microorganisms in air by petriplate exposure method.
- Determination of microbiological quality of milk by MBRT method.
- Isolation of fungi & bacteria from spoiled fruits & vegetables.
- Microbiological examination of water by coliform test.
- Determination of biological oxygen demand.
- Spoiled foods-bacterial soft rot, bread & bakery products, milk & milk products, eggs, meat and meat products, canned foods, cheese, yoghurt.
- Bacterial slides- Escherichia coli, Bacillus, Lactobacillus, Azosporillum, Azotobacter, Rhizobium, Yeast, Rhizopus, Penicillium

References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IF) - B
Dept. Microbiology: Osmania University
Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)
With effect from 2016-17
Syllabus for B.Sc Microbiology Code: BS 606,DSE-1F-B

B.Sc III year: 6th semester
Title: INDUSTRIAL MICROBIOLOGY 3 HPW-credits-3

UNIT-I
Microorganisms of industrial importance-Yeast, Molds, Bacteria, Actinomycetes. Screening and isolation of industrially useful microbes. Methods of Screening and strain improvement.

UNIT-II
Types of fermentation- Aerobic, anaerobic, batch, continuous, submerged, surface, solid state Dual and multiple.
Design of stirred tank reactor fermentor,

UNIT-III
Inoculation media and fermentation media
Raw material used in fermentation industry and their processing
Downstream processing

UNIT-IV
Microbial products
Industrial production of alcohol (ethyl alcohol), Beverages (beer), Amylases, Antibiotics(pencillin) Aminoacids(glutamic acid), Organic acid(citric acid.) VitaminB12, Biofuels (biogas-methane)
References:

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IF) - B
Dept. Microbiology: Osmania University

Proposed scheme for B.Sc Microbiology program under choice based credit system (CBCS)

With effect from 2016-17

Syllabus for B.Sc Microbiology

B.Sc III year: 6th semester

Practicals

Title: INDUSTRIAL MICROBIOLOGY 2HPW-credits-1

- Screening for amylase producing microorganisms
- Screening for organic acid producing microorganisms
- Production and Estimation of Ethanol by potassium dichromate method.
- Production and Estimation of Citric acid by titrimetry method.
- Estimation of streptomycin.
- Bacterial slides- Bacillus, Lactobacillus, Yeast, Aspergillus, Pencillium

References:

Botany B.Sc. I Year Syllabus 2019-20.pdf - Free download as PDF File (.pdf), Text File (.txt) or read online for free.

Course CODE: PAPER TITLE: Type HPW Credits.

First year semester - I. BS 104 PAPER-I: Microbial Diversity and Lower Plants DSC-1A 4T+2P=6 4+1=5.

Second year semester - II. PAPER-II: Gymnosperms, Taxonomy of Angiosperms and BS 204 Ecology DSC-1B 4T+2P=6 4+1=5.


Second year semester - IV. BS 401 SEC-3: Greenhouse Technology SEC-3 2 2. BS 4021. SEC-4: Mushroom Culture Technology SEC-4 2 2.

B.Sc. 1st Year Tribhuvan University (T.U.) General Microbiology Syllabus (Nepal). Course No: MB 101 (Major). Microbiology Syllabus of Nepal. Full Marks: 100. Pass Marks: 35. Year: I. Total Lecture Hours: 150. Course Objectives. After completion of the course, the students will be able to:

a) understand the concept of microorganisms, history of microbiology, classification schemes and the nomenclature of microorganisms, scope, and applications of microbiology. 
b) know handling methods, growth, physiology, metabolism, genetics of microorganisms. 
c) understand the basics of bacteriology, virology, mycology, and parasitology.


Course Structure. The four years bachelor in Science consists of 2000 total full marks of each year full marks 500. In the first, second and third year, one/one microbiology subject of 100 full marks and their respective practical of 50 full marks have been included. The fourth year course in microbiology includes two theory subjects each of 100 full marks and their respective practical subjects each of 50 full marks. 

S.Y.B.Sc. Students can opt any one combination of the following provided those subjects were opted at first year. English is Compulsory. CPS: Chemistry, Physics, Statistics. CBZ: Chemistry, Botany, Zoology. MiCB: Microbiology, Chemistry, Botany. CPZ: Chemistry, Physics, Zoology.