MG University, Nalgonda

Dept. of Microbiology

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

w. e. f. 2017-18

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

B.Sc I year:1 st semester

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

UNIT-1: HISTROY OF MICROBIOLOGY **15hrs**

Meaning, definition	1hr
History of microbiology	1hr
Spontaneous Generation Theory	1hr
Germ theory of disease	1hr
Pure culture	1hr
Development of Microbiology in 20 th Century	1hr
Contribution of Anton Von Leuwenhoek	1hr
Edward Jenner	1hr
Louis Pasteur	1hr
Robert Koch	1hr
lwanoswky	1hr
Beijernick	1hr
Winogradsky	1hr
Alexander Fleming	1hr
Importance and application of Microbiology	1hr

UNIT-2: MICROSCOPY	**15hrs**
Principles of Microscopy	1hr
Bright field	1hr
Dark field,	1hr
Phase-contrast,	1hr
Fluorescent	1hr
Electron microscopy (SEM and TEM)	1hr
Ocular and stage micrometry.	1hr
Size determination of microorganisms.	1hr
Principles and types of stains-simple stain,	1hr
Differential stain,	1hr
Negative stain.	1hr
Structural stains-spore,	1hr
Capsule,	1hr
Flagella.	1hr
Hanging drop method	1hr
UNIT-3-MICROBIOLOGICAL TECHNIQUES	**15hrs**
Sterilization and disinfection techniques.	1hr
Principles and methods of sterilization.	1hr
Physical methods-Autoclave,	1hr
Hot air oven	1hr
Pressure cooker	1hr
Laminar air flow	1hr
Filter sterilization	1hr
Radiation methods-U.V rays	1hr
Gamma rays	1hr
Ultrasonic methods	1hr
Chemical methods-use of Alcohols, Aldehydes	1hr

Fumigants	1hr
Phenol	1hr
Halogens and Hypochlorides	1hr
Phenol coefficient	1hr
UNIT-4-PURE CULTURE TECHNIQUES	**15hrs**
Isolation of Pure cultural techniques	1hr
Enrichment culture	1hr
Dilution plating	1hr
Streak plate	1hr
Pour plate method	1hr
Spread plate	1hr
Serial dilution Method	1hr
Advantages and disadvantages of different plating techniques	1hr
Micromanipulator technique	1hr
Preservation of Microbial cultures	1hr
Sub culturing	1hr
Overlaying cultures with mineral oil	1hr
lyophilization	1hr
Sand cultures	1hr
Storage at low temperature	1hr

Dept. of Microbiology: MG University,

Nalgonda

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

w.e.f. 2017-18

Syllabus for B.Sc Microbiology **Code: BS 204,DSC-1B**

B. Sc I year: 2nd semester

Title: General Microbiology-II **4HPW-credits4**

Unit-1 BIOLOGY OF MICROORGANISMS **15hrs**

Classification of living organisms 1hr

Haeckel 1hr

Whittaker's five kingdom concept 1hr

Difference between five groups of organisms 1hr

Carlwoese Systems 1hr

Place of microorganisms in the living world 1hr

Differences between prokaryotes and eukaryotes. 1hr

Prokaryotes-General characteristics of bacteria, 1hr

Archeae 1hr

Rickettsia 1hr

Mycoplasma, 1hr

Cyanobacteria 1hr

Actinomycetes 1hr

Classification of bacteria 1hr

As per the second edition of Bergey's manual of Systematic Bacteriology 1hr

UNIT-2 STRUCTURE OF MICROORGANISMS **15hrs**

Ultra structure of bacterial cell 1hr

Invariant components-cell wall 1hr

Cell membrane 1hr

Ribosomes, 1hr

Nucleoid. 1hr

Variant components-Capsule flagella, 1hr

Fimbriae 1hr

Endospores, 1hr

Storage granules. 1hr

General characteristics and classification of virus. 1hr

Morphology and structure of TMV and HIV. 1hr

Structure and multiplication of lambda bacteriophage. 1hr

Eukaryotes- General characteristics and classification. 1hr

Eukaryotic microorganisms-protozoa 1hr

Microalgae, molds and yeast. 1hr

UNIT-3 GENERAL CHARECTERISTICS OF BIOMOLECULES 15hrs

Outline classification of carbohydrates 1hr

Monosaccharides, 1hr

Disaccharides 1hr

Polysaccharides 1hr

General characteristics of carbohydrates 1hr

General characteristics of amino acids 1hr

Classification of Aminoacids 1hr

Properties of amino acids 1hr

General characteristics of proteins 1hr

Structure of Proteins 1hr

Classification of Proteins 1hr

Biological importance of Proteins 1hr

Fatty acids (saturated and unsaturated) 1hr

Lipids (sphingolipids, sterols and phospholipids) 1hr

Physical and chemical properties of Lipids 1hr

UNIT-4 BIOMOLECULES AND TECHNIQUES **15hrs**

Structure of nitrogenous bases	1hr
Nucleotides	1hr
Nucleic acids	1hr
DNA	1hr
RNA	1hr
Hydrogen ion concentration in biological fluids.	1hr
pH measurement.	1hr
Types of buffers	1hr
And their uses in biological reactions.	1hr
Principles of colorimetry	1hr
Application of colorimetry	1hr
Chromatography	1hr
Principles of chromatography	1hr
Application of chromatography	1hr
Techniques (paper and thin layer)	1hr

B.Sc Microbiology program under Choice Based Credit System (CBCS)

With effect from 2017-18

Syllabus for B.Sc Microbiology **Code: BS 304, DSC-1C**

B.Sc II year: 3rdSemester

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

UNIT-1: MICROBIAL NUTRITION AND PHOTOSYNTHESIS - 15hrs

MicrobialNutrition 1hr

Nutritional Requirement, 1hr

Classification of nutrients 1hr

Growth factors 1hr

Uptake of nuitrients by cell. 1hr

Group translocation and its mechanism 1hr

Nutritional group of microorganism – Autotrophs 1hr

Heterotrophs 1hr

Mixotrophs , 1hr

Methylotrophs. 1hr

Culture media 1hr

Categories of media 1hr

Photosynthetic Apparatus in Prokaryotes. 1hr

Outlineof oxygenic photosynthsis in bacteria 1hr

Anoxygenic photosynthesis in bacteria. 1hr

UNIT-2: MICROBIAL GROWTH - 15hrs

Growth media – Synthetic , 1hr

Non Synthetic , 1hr

Selective , 1hr

Enrichment and Differential media. 1hr

Microbial growth – 1hr

Different Phases of Growth in Batch culture. 1hr

Factors Influencing microbial growth. 1hr

Synchronous, 1hr

Continuous , 1hr

Biphasic Growth. 1hr

Methods for measuring microbial growth – 1hr

Direct Microscopic , 1hr

Viable count , 1hr

Turbidometry , 1hr

Biomass 1hr

UNIT-3- MICROBIAL METBOLISM **15 hrs**

AerobicRespiration – 1hr

Glycolysis , 1hr

HMP Pathway , 1hr

ED Pathway , 1hr

TCA Cycle 1hr

Anapleroticreaction 1hr

Electron Transport , 1hr

Oxidative phosphorylation 1hr

substrate level phosphorylation. 1hr

ß-Oxidation of Fatty acids. 1hr

Glyoxylate cycle , 1hr

Anaerobic respiration -Nitrate 1hr

Sulphate respiration 1hr

Fermentation – Common Microbial fermentation with special reference alcohol 1hr

Lactic acid rfermentation 1hr

UNIT-4-ENZYMES **15 hrs**

Enzymes introduction 1hr

Properties of enzymes 1hr

Enzyme specificity and regulation 1hr

Classifications of Enzymes	1hr
Enzymes unit.	1hr
Biocatalysis	1hr
Induced fit and Lock & Key Model	1hr
Coenzymes	1hr
Co-Factors	1hr
Factors effecting catalytic reaction activity of enzymes.	1hr
Inhibition of Enzymes activity	1hr
Competitive	1hr
Non Competitive	1hr
Un competitive	1hr
Allosteric	1hr

Mahatma Gandhi University

Dept. Microbiology:

B.Sc Microbiology under Choice Based Credit System (CBCS)

With effect from 2017-18

Syllabus for B.Sc Microbiology **Code: BS 404, DSC-ID**

B.Sc II year: 4thsemester

Title: Microbial Genetics and Molecular Biology **4 HPW-credits-4**

UNIT-1 : MICROBIAL GENETICS	**15 hrs**
Fundamentals of Genetics	1hr
Medelian laws	1hr
Mendel's laws of inheritance	1hr
Alleles ,	1hr
Crossing over	1hr
Genetic Linkage	1hr
DNA and RNA as Genetic material	1hr
Structure of DNA	1hr
Chargaff's rule	1hr
Watson and Crick model	1hr
Extra Chromosomal genetic elements –	1hr
Plasmids	1hr
Transposons	1hr
Replication of DNA-	1hr
Semi Conservative mechanism	1hr
UNIT-2: MUTATIONS	**15 hrs**
Mutations	1hr
Spontaneous and induced	1hr
Base pair changes	1hr
Frameshift	1hr

Deletion	1hr
Inversion	1hr
Tandem duplication	1hr
Insertion	1hr
Various physical mutagens	1hr
Chemical mutagens	1hr
Outline of DNA Damage	1hr
Repair mechanism	1hr
Brief account on gene transfer	1hr
Among bacteria – Transformation	1hr
Transduction and Conjugation	1hr
UNIT-3-GENE EXPRESSION	**15 hrs**
Concept of gene – Muton	1hr
Recon and Cistron	1hr
One gene – One enzyme	1hr
One gene – One Poly peptide	1hr
One gene – One product hypothesis	1hr
Types of RNA and their function	1hr
Outline of RNA Biosynthesis in Prokaryotes	1hr
Genetic Code	1hr
Structure of Ribosomes and Brief account on Protein synthesis	1hr
Type of Genes	1hr
Structural	1hr
Constitutive	1hr
Regulatory	1hr
Operon Concept	1hr
Regulation of Genes expression in bacteria – Lac Operon	1hr

UNIT-4-RECOMBIANT DNA TECHNOLOGY	**15 hrs**
Basic principles of genetic engineering	1hr
Restriction enzymes	1hr
Types of restriction endonucleases	1hr
DNA polymerases	1hr
Bacterial DNA polymerases	1hr
Eukaryotic DNA polymerases	1hr
Ligases	1hr
Vectors	1hr
Outline of gene cloning methods.	1hr
Application of gene cloning	1hr
Genomic libraries	1hr
C DNA libraries	1hr
General account on application of genetic engineering in industry	1hr
Agriculture	1hr
Medicine.	1hr

B.Sc Microbiology under Choice Based Credit System (CBCS)

Syllabus for B.Sc Microbiology **Code: BS 503, DSC-1E**

CHOICE BASED CREDIT SYSTEM---2017-18

B.Sc III year, SEMESTER V

Title: APPLIED MICROBIOLOGY **3 HPW- Credits-3**

UNIT-1 - Microbes in Agriculture **15 hrs**

Agriculture microbiology 1hr

Physical characteristics of soil 1hr

Chemical characteristics of soil 1hr

Rhizosphere 1hr

Phyllosphere 1hr

Plant growth promoting microorganisms 1hr

Mycorrhizae 1hr

Rhizobium 1hr

Azospirillum, 1hr

Azatobacter 1hr

Cynobacteria 1hr

Frankia 1hr

Phosphate solubilising microorganism 1hr

Biofertilizers- Rhizobium 1hr
Cyanobacteria 1hr

UNIT-2 Plant Diseases & Biocontrol **15 hrs**

Concept of disease in plant 1hr

Symptoms of plant diseases Caused by fungi 1hr

Plant disease caused by Bacteria 1hr

Plant disease caused by virus 1hr

Ground rust 1hr

Angular leaf spot of cotton 1hr

Tomato leaf curl	1hr
Principles of plant disease control	1hr
Chemical control method	1hr
Biological control of plant diseases	1hr
Biopesticides	1hr
Bacillus thuringenisis	1hr
Nuclear polyhedrosis	1hr
Virus (NPV)	1hr
Trichoderma	1hr
UNIT-3 Microbial ecology	**15 hrs**
Outline classification of symbiotic nitrogen fixation	1hr
Non symbiotic nitrogen fixation	1hr
Microorganisms of environment soil	1hr
Water	1hr
Air	1hr
Role of microorganisms in nutrient cycles carbon	1hr
Nitrogen	1hr
Sulphur	1hr
Microbial interaction-	1hr
Mutalism	1hr
Commensalism	1hr
Antagonism	1hr
Competition	1hr
Parasitism	1hr
Predation	1hr

UNIT-4 Role of microbes in environmental Pollution **15 hrs**

Microbiology of water	1hr
Water sampling and examination	1hr
Microbiology of potable water and polluted water	1hr
E.coli	1hr
Streptococcus faecalis as indicators ofwater pollution.	1hr
Sanitation of potable water.	1hr
Sewage water treatment	1hr
Primary treatment	1hr
Secondary treatment	1hr
Tertiary treatment	1hr
Solid waste disposal	1hr
Sanitary landfills	1hr
composting	1hr
Outline of biodegradation of environmental pollutants	1hr
Microbial degradation of pesticides	1hr

GENERIC ELECTIVE-I (GE-1)

Dept. Microbiology: Mahatma Gandhi University

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

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-1: **15hrs**

Historic developments of Microbiology, 1hr

Contributions of Van Leeuwenhoek, 1hr

Edward Jenner 1hr

Louis Pasteur 1hr

Robert Koch 1hr

Types of microorganisms 1hr

Morphological characteristics of bacteria 1hr

Staining 1hr

Staining techniques Simple stain 1hr

Negative stain 1hr

Differential stain 1hr

Endospore stain 1hr

Capsule stain 1hr

Cultivation Methods of bacteria, 1hr

Culture Media. 1hr

Unit-II:	**15 hrs**
Microorganisms related to human health.	1hr
Normal microbial flora	1hr
Normal flora of the skin ,Conjuctiva ,Nose,Nasopharyns and accessory sinuses	1hr
Normal flora of the mouth and upper respiratory tract	1hr
Normal flora of the intestinal tract ,genitourinary tract	1hr
Pathogenic microbes and their diseases	1hr
Typhoid	1hr
Hepatities –A	1hr
Cholera	1hr
T.B,	1hr
Syphilis	1hr
Gonorrhoea	1hr
AIDS	1hr
Serum hepatitis	1hr
Influenza	1hr

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

Syllabus for B.Sc Microbiology **Code: BS 506, DSE-1E-A**

B.Sc III year: 5thsemester

Title: IMMUNOLOGY **3 HPW-credits-3**

UNIT-1 HISTORY OF IMMUNOLOGY AND IMMUNITY **15hrs**

Development of immunology	1hr
Antigen –types	1hr
Chemical nature	1hr
Antigenic determinants Haptens	1hr
Factors affecting antigenicity	1hr
Antibodies-Basic structure	1hr
Types,properties	1hr
Functions of immunoglobulins	1hr
Complement	1hr
Components of complement	1hr
Activation of complement	1hr
Types of immunity-Innate	1hr
Acquired; Active and passive	1hr
Humoral	1hr
Cell mediated immunity	1hr

UNIT-2 CELLS AND ORGANS OF IMMUNE SYSTEM **15hrs**

Primary and secondary organs of immune system	1hr
Thymus	1hr
Bursa of fabrica	1hr
Bone marrow	1hr
Spleen	1hr
Lymphnodes	1hr

Mucus associated lymphoid tissue (MALT)	1hr
Cells of immune system	1hr
Identification and functions of B Lymphocytes	1hr
Identification and functions of T Lymphocytes	1hr
Null cells	1hr
Monocytes	1hr
Macrophages Neutrophills,	1hr
Basophills	1hr
Eosinophills	1hr
UNIT-3 ANTIGENS AND ANTIBODY REACTION	**15hrs**
Nature of antigen antibody reaction	1hr
Factors affecting measurement of Ag/Ab reaction	1hr
Components of complement	1hr
Activation of complement	1hr
Types of antigens	1hr
Antibody reactions	1hr
Agglutination	1hr
Blood groups	1hr
Precipitation	1hr
Neutralization	1hr
Complement fixation.	1hr
Qualitative changes in antibody during 1^0 and 2^0 responses	1hr
Labeled antibody based techniques-ELISA,	1hr
RIA	1hr
Immunoflurosence	1hr

UNIT-4 IMMUNOLOGICAL PROCESSES AND APPLICATIONS **15 hrs**

Hypersensitivity	1hr
Type I hypersensitivity	1hr
Type II hypersensitivity	1hr
Type III hypersensitivity	1hr
Type IV hypersensitivity	1hr
Comparison of different types of hypersensitivity	1hr
Auto immunity and its significance	1hr
Organs specific autoimmune diseases	1hr
Systemic auto immune diseases	1hr
Polyclonal antibodies production	1hr
Polyclonal antibodies application	1hr
Monoclonal antibodies production	1hr
Monoclonal antibodies application	1hr
Vaccines-	1hr
Natural and recombinants vaccines	1hr

DISCIPLINE SPECIFIC ELECTIVE-(DSE-1E) – B

Dept. Microbiology: Mahatma Gandhi University

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

Syllabus for B.Sc Microbiology **Code: BS 506, DSE-1E-B**

B.Sc III year: 5th semester

Title: PHARMACEUTICAL MICROBIOLOGY **3 HPW-credits-3**

UNIT-I: **15 hrs**

Chemotheraphy	1hr
Principles of chemotherapy	1hr
Properties of anti microbial drugs	1hr
Clinical and lab diagnosis	1hr
Types of administration	1hr
Sensitivity testing	1hr
Choice of drug	1hr
Antimicrobial drugs	1hr
Anti –bacterial synthetic drugs	1hr
Antibiotics	1hr
Classification of antibodies	1hr
Dosage	1hr
Route of administration	1hr
Combined/mixed multi drug therapy	1hr
Control of antibiotic/drug usage	1hr

Unit-II: **15hrs**

History of chemotherapy	1hr
Plantsandarsenicals as therapeutics	1hr
Paul Ehrlich and hiscontributions,	1hr
Selective toxicity	1hr
target sites of drug action in microbes	1hr
metabolic inhibitors	1hr
protein synthesis inhibitor	1hr
Over view of development of synthetic drugs.	1hr
Antibiotics	1hr
The origin Development and definition of antibiotics as drugs,	1hr
Characteristic feature of antibiotics	1hr
Broad spctrun antibiotics	1hr
Narrow spectrum antibiotics	1hr
Types of antibiotics	1hr
Classification of antibiotics	1hr

UNIT-III **15hrs**

Mode of action of important drugs	1hr
Bacterial static drug	1hr
Bactericidal drug	1hr
Cell wall inhibitors (Betalactam – eg. Penicillin),	1hr
Semi synthetic betalactum	1hr
Tetra cycline	1hr
Membrane inhibitors (polymyxins),	1hr
Drugresistence	1hr
Mode of administration of drugs	1hr
Sulpha drugs	1hr
Application of anti fungal antibiotics	1hr
Macromolecular synthesis inhibitors	1hr
streptomycin	1hr
Antifungal antibiotics	1hr
Nystatin	1hr

UNIT-IV: **15 hrs**

Anti Microbial Assays:	1hr
Assay for growth inhibiting substances	1hr
Assay for non-medicinal	1hr
Antimicrobials (Phenol coefficient/RWC).	1hr
Drug sensitivity testing methods and their importance.	1hr
Assay for antibiotics – Determination of MIC	1hr
Determination of MLC	1hr
Theliquid tube assay,	1hr
Solid agar tube assay,	1hr
Agarplateassay	1hr
Disc diffusion	1hr
Agar well	1hr
cylinders cup method	1hr
dilution tube method	1hr

bioautography

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

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 **15 hrs**

Histroy of medical Microbiology 1hr

Normal flora of human body 1hr

Normalflora of the skin,conjunctiva 1hr

Normal flora of the nose,nasopharynx and accessory sinuses ,mouth and upper respiratory tract 1hr

Normal flora of thr intestinal tract,genitourinary tract 1hr

Definition of infection Non specific defence mechanism 1hr

Mechanical barriers 1hr

Antibacteria l substance- Lysozyme 1hr

Complement 1hr

Properdin 1hr

Antiviral substances 1hr

Phagocytosis 1hr

Host pathogen interactions 1hr

Bacterial toxins 1hr

Virulence and Attenuation 1hr

UNIT-II- DIAGNOSTIC AND THERAPEUTICAL MICROBIOLOGY **15 hrs**

General principles of diagnostic microbiology Collections 1hr

Transport &processing of clinical samples 1hr

General methods of lab diagnosis 1hr

Cultural 1hr

Biochemical 1hr

Serological & molecular methods 1hr

Test for antimicrobial susceptibility 1hr

Molecular biolgy 1hr

Elements of chemotherapy-Therapeutic drugs 1hr

Mode of action of Pencillin & sulpha drugs 1hr

Their clinical use of Pencillin & sulpha drugs 1hr

Antiviral agents- Interferon 1hr

Base analogues 1hr

Preventive control of diseases- active 1hr

Passive immunization. 1hr

UNIT-III MEDICAL BACTERIOLOGY 15 hrs

General account of following diseases 1hr

Casual organisms 1hr

Pathogenesis 1hr

Epidomology 1hr

Diagnosis 1hr

Prevention 1hr

Control 1hr

Air born diseases-Tuberculosis 1hr

Food & waterborn diseases 1hr

Cholera 1hr

Typhoid 1hr

Contact diseases- Syphilis 1hr

Gonorrhoea 1hr

General account of Nosocomial infections 1hr

Zoonotic diseases - Anthrax 1hr

UNIT-IV MEDICAL VIROLOGY AND PARASITOLOGY 15 hrs

General account of following diseases, Casualorganisms 1hr

Pathogenesis 1hr

Epidomology 1hr

Diagnosis	1hr
Prevention& control	1hr
Air born diseases- Influenza	1hr
Food&waterborn diseases- Hepatitis-A	1hr
Poliomyelitis	1hr
Amoebiosis	1hr
Insect born diseases-Malaria	1hr
Filariasis	1hr
Dengue fever	1hr
Zoonotic diseases -Rabies	1hr
Blood born diseases- Serum hepatitis	1hr
AIDS	1hr

DISCIPLINE SPECIFIC ELECTIVE-(DSE-1F)-A

DEPT.MICROBIOLOGY; MAHATMA GANDHI UNIVERSITY

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

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

B.Sc III year: 6thsemester

Title: FOOD MICROBIOLOGY 3 HPW-credits-3

UNIT-I	**15hrs**
Microorganisms of food spoilage	1hr
Bacteria	1hr
Yeasts	1hr
Molds	1hr
Sources of microorganisms	1hr
Spoilage of different food materials	1hr
Microbial spoilage of vegetables & fruits	1hr
Microbial spoilage of Fruits& vegetables,	1hr
Microbial spoilage of Meat	1hr
Microbial spoilage of Fish	1hr
Canned foods	1hr
Food born diseases and their detection.	1hr
Botulism	1hr
Salmonellosis	1hr
Shigellosis	1hr

UNIT-II **15hrs**

Microbiological production of fermented foods- 1hr

Fermentation 1hr

Production of Bread 1hr

Cheese 1hr

Yoghurt 1hr

Microbiology of milk 1hr

Microorganisms and contamination of milk 1hr

Milk pasteurization 1hr

Spoilage of Milk . 1hr

Quality testing of milk 1hr

Microorganisms as food – SCP 1hr

Edible mushrooms 1hr

White button oyster, 1hr

Paddy straw 1hr

Concepts of Probiotics 1hr

Unit-III **15hrs**

Food preservation 1hr

Low temperature 1hr

High temperature 1hr

Sterilization 1hr

Drying 1hr

Radiation 1hr

Processing of foods for irradiation 1hr

Effect of irradiation on food 1hr

Chemical preservatives 1hr

Sulfur dioxide and sulphites,Nitrites and nitrates	1hr
Propionates and Nacl and Sugars	1hr
Antibiotics	1hr
Food poisoning in Staphylococci,	1hr
C. botulinum	1hr
Food intoxication	1hr
UNIT-IV	**15hrs**
Microbiology of water	1hr
Water sampling and examination	1hr
Microbiology of potable water and polluted water	1hr
E.coli	1hr
Streptococcus faecalis as indicators ofwater pollution.	1hr
Sanitation of potable water.	1hr
Sewage water treatment	1hr
Primary treatment	1hr
Secondary treatment	1hr
Tertiary treatment	1hr
Solid waste disposal	1hr
Sanitary landfills	1hr
composting	1hr
Outline of biodegradation of environmental pollutants	1hr
Microbial degradation of pesticides	1hr

DISCIPLINE SPECIFIC ELECTIVE –(DSE-1F)-B

Dept .microbiology :mahatmagandhi university

B.Sc Microbiology under Choice Based Credit System (CBCS) With effect from 2017-18

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 **15 hrs**

Industrial microbiology	1hr
Microorganisms of industrial importance	1hr
Yeast	1hr
Molds	1hr
Bacteria	1hr
Actinomycetes	1hr
Fungi	1hr
Screening and isolation of industrially useful microbes	1hr
Primary screening	1hr
Secondary screening	1hr
Outlines of strain improvement	1hr
Further Methods of mutagenesis	1hr
Direct Mutagenesis	1hr
Non recombination method	1hr
Recombination method.	1hr

UNIT-II **15 hrs**

Types of fermentation	1hr
Aerobic	1hr
Anaerobic	1hr

Batch	1hr
Fed batch	1hr
Continuous	1hr
Submerged	1hr
Surface	1hr
Solid state	1hr
Dual and multiple	1hr
Design of stirred tank reactor fermentor	1hr
Design of fermentor	1hr
Impeller	1hr
Antifoam agents	1hr
Aeration System	1hr
UNIT-III	**15 hrs**
Inoculation media	1hr
Fermentation media	1hr
Carbonaaceous materials	1hr
Nitrogenous materials	1hr
Raw materials and media	1hr
Raw material used in fermentation industry	1hr
fermentation industry and their processing	1hr
Fermentation conditions	1hr
Production process	1hr
Downstreamprocessing	1hr
Beef extract	1hr
yeast extract	1hr
peptones	1hr
Optimization of a fermentation Medium	1hr
Sterilization of fermentation Media	1hr

UNIT-IV	**15 hrs**
Microbial products	1hr
Industrial production of alcohol (ethyl alcohol)	1hr
Beverages	1hr
Beer	1hr
Amylases	1hr
Antibiotics	1hr
Pencillin	1hr
Aminoacids	1hr
Glutamic acid	1hr
Organic acid(citric acid.)	1hr
Citric acid production by fungi, bacteria,yeast	1hr
Vitamin B_{12}	1hr
Uses of vitamin B_{12}	1hr
Biofuels (biogas-methane)	1hr
Factors afecting biogas production	1hr

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