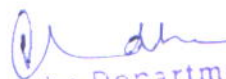
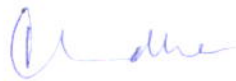


**DEPARTMENT OF MICROBIOLOGY**  
**B.Sc ACADEMIC ORGANIZER 2017-18**  
**B.Sc SEMESTER - I Paper - I**  
**INTRODUCTORY MICROBIOLOGY**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASS ES	TOTAL
		<b>I</b>	<b>History of microbiology</b>		
JUNE	1		Meaning, Definition and Scope of Microbiology	1	1
	2		History of Microbiology– An overview till 21 <sup>st</sup> century	2	3
	3		Contributions of Antony Von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Iwanowsky, Beijerinck, Winogradsky, Selman Walksman, Paul Ehrlich, and Alexander Fleming.	9	12
	4		Branches of Microbiology and Applications of Microbiology	3	15
JULY/JULY		<b>II</b>	<b>Microscopy and Prokaryotic Cell</b>		
	4,5		Principles of Microscopy. Bright field, Dark field, Phase-contrast, Fluorescent and Electron microscopy (SEM and TEM). Micrometry -Units of microscopic measurements.	7	22
	6		Types of stains and Principles of staining - Simple stain, Differential stain, Negative stain, Structural stains - Spore, Capsule, Flagella and Storage granules	4	26
	7		Ultra structure of a bacterial cell-invariant & variant components	3	19
	8		Motility in Bacteria. Hanging-drop method.	1	30
JULY/AUG		<b>III</b>	<b>Microbial Sterilization Techniques</b>		

  
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	8&9		Sterilization and Disinfection techniques. Principles and methods of Sterilization.	3	33
	10		Physical methods – Autoclave, Hot-air oven, Pressure cooker,	3	36
	11		Radiation methods – UV rays, gamma rays, Ultra sonic methods, Microwave.	3	39
	13		Chemical methods – Use of Alcohols, Aldehydes, Fumigants,	6	45
SEP		IV	<b>General characters of viruses</b>		
	14		General characteristics, Cultivation, Maintenance and ICTV Classification of Viruses- Plant, Animal and Bacteriophage.	9	53
	15		Structure of TMV	1	54
	16		Structure of HIV	1	55
	17		Structure of T2 bacteriophage	1	56
OCT	18		Structure and multiplication of lambda bacteriophage	3	60



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**2017-18**  
**SUBJECT -MICROBIOLOGY I SEMESTER PRACTICALS**  
**(INTRODUCTORY MICROBIOLOGY- Paper I)**

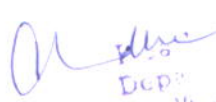
Month	Week	S.No	B.Sc I Year Practicals	Hrs	Total
June	2	1	Precautions to work in Microbiology laboratory	1	1
	3	2	Light compound microscope and its handling	1	2
	4	3	Calibration of microscopic measurements (Ocular, Stage micrometers)	1	3
June/July	4,5	4	Measuring dimensions of Protozoa	1	4
	6	5	Microscope observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Cyanobacteria (Nostoc, Oscillatoria, Anaebena, Spirulina), Algae (Scenedesmus Sps., Diatoms), and Fungi (Saccharomyces, Rhizopus, Aspergillus, Penicillin, Fusarium)	2	6
	7	6	Simple staining	2	8
	8	7	Differential staining (Gram staining)	2	10
Aug	9	8	Spore staining	2	12
	10	9	Capsule Staining and Negative staining	2	14
	11	10	Sterilization techniques : Autoclaving, Hot-Air oven and Filtration	2	16
	12	11	Hanging drop technique for observation of motility in Bacteria.	2	18
Aug/Sep	13	12	Diagramatic or Electron photomicrographic observation of TMV, HIV, T2 Phage and Adeno virus)	2	20




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DEPARTMENT OF MICROBIOLOGY  
**B.Sc ACADEMIC ORGANIZER 2017-18**  
**Paper II General Microbiology (SEM- II)**  
**B.SC I YEAR**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Bacterial Taxonomy and General Characters of Prokaryotes &amp; Eukaryotes</b>		
Nov	2	1	Outline classification of living organisms: Haeckel, Whittaker and Carl Woese System	2	2
	3	2	Outline classification for bacteria as per the second edition of Bergey's Manual Of Systematic Bacteriology (up to section level).	3	5
	3	3	Differentiation of Prokaryotes and Eukaryotes	1	6
	4	4	Prokaryotes - General characteristics of Bacteria, Archaeobacteria, Rickettsias, Mycoplasma, Cyanobacteria and Actinomycetes	6	12
Dec	4	5	Eukaryotes – General characteristics and classification (up to order level) of eukaryotic microorganisms – Protozoa, Microalgae, Molds and Yeast	3	15
		<b>II</b>	<b>Pure Culture Techniques &amp; Preservation</b>		
	5	1	Concept of Pure cultures	1	16
	6,7	2	Isolation of Pure culture techniques – Enrichment Culturing, Dilution-Plating, Streak Plate, Spread Plate, Pour Plate, Single cell isolation and Micromanipulator	5	21
	8	3	Culturing methods- Aerobic and Anaerobic methods	4	25
	8,9	4	Preservation of microbial cultures – Sub culturing, Overlaying cultures with mineral oils, Lyophilization, Sand cultures, Storage at low temperature	5	30
		<b>III</b>	<b>Biomolecules</b>		
Jan	10	1	Biomolecules of microorganisms and their significance	1	31
	10,11	2	Outline Classification and Properties of Carbohydrates (MonosaccharideDisaccharides and Polysaccharides).	4	35

  
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	12	3	Structure and properties of Amino acids and Proteins	4	39
	13	4	Structure and properties of Nitrogenous bases, Nucleotides, Nucleic acids	3	42
	13	5	Structure and Classification of lipids	3	45
		<b>IV</b>	<b>Biochemical Techniques</b>		
Jan, Feb	14,15	1	Buffers- types of buffers and their use in biological reactions	3	48
Feb	16	2	Hydrogen ion concentration in biological fluids, pH measurement	2	50
	17	3	Principle and application of Colorimetry	3	53
	18	4	Chromatography - Paper and Thin layer	4	57
	19	5	Electrophoresis – Paper electrophoresis	2	59
Feb, Mar	20	6	Agarose gel electrophoresis ( AGE)	1	60

  
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**2017-18**  
**SUBJECT -MICROBIOLOGY II SEMESTER PRACTICALS**  
**(GENERAL MICROBIOLOGY- Paper II)**

Month	Week	B.Sc I Year Practicals	Hrs	Total
Nov	2	Isolation of single colonies on solid media	1	1
	3	Enumeration of bacterial numbers by serial dilution and plating	1	2
Dec	4	Isolation of pure cultures by streak, spread and pour plate techniques	1	3
	5	Preparation of culture media: Solid / Liquid, Defined / Complex	2	5
	6	Preservation of microbial cultures – Slants, Stabs, Sand cultures, Mineral oil overlay- Glycerol stocks	2	7
	7	Aerobic culturing methods –Shake flask, Anaerobic method -McIntosh Jar, Pyrogallol method.	2	9
Dec/Jan	8	Qualitative tests for Carbohydrates	2	11
	9	Qualitative tests for amino acids	2	13
	10	Paper chromatography- amino acids/sugars	1	14
	11	Determination of pH, preparation of buffers	2	16
Jan/Feb	12	Verification of Beer Lambert's Law	1	17



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# DEPARTMENT OF MICROBIOLOGY

## B.Sc ACADEMIC ORGANIZER 2017-18

### B.Sc SEMESTER - III Paper - III

#### MICROBIAL PHYSIOLOGY

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Nutrition and Growth</b>		
JUNE	1		Microbial Nutrition - Nutritional requirements and uptake of nutrients by cells	4	4
	2		Nutritional groups of microorganisms - Autotrophs, Heterotrophs, Phototrophs, Chemotrophs, Organotrophs, Lithotrophs, Mixotrophs, Methylotrophs. With example of each	3	7
	3		Growth media - Synthetic, Nonsynthetic, Selective, Enrichment and Differential media.	2	9
	4		Microbial growth - Different phases of growth in batch cultures	2	11
JUNE/JULY	4,5		Synchronous, continuous, biphasic growth	1	12
	5		Factors influencing microbial growth	1	13
	6-Jan		Methods for measuring microbial growth – Direct microscopy, Viable Count estimates, Turbidometry, Biomass. (DNA, Protein, Nitrogen content- Kjeldal method)	2	15
		<b>II</b>	<b>Enzymes</b>		
	6,7		Enzymes - properties and classification, enzyme unit, enzyme assay methods	5	20
JULY/AUG	8		Biocatalysis - Induced fit, Lock and key model, Types of catalysis, Coenzymes, Cofactors, Factors affecting catalytic activity of enzymes	5	25
	9	3	Inhibition of enzyme activity –Reversible, Competitive, Non competitive, uncompetitive and Irreversible, Allosteric	5	30
		<b>III</b>	<b>Microbial Metabolism 1</b>		
	10,11		Aerobic respiration - Glycolysis, HMP pathway, ED pathway, TCA cycle	7	37
	12		Electron transport, Oxidative and Substrate-level Phosphorylation	5	42
SEP	13		$\beta$ -Oxidation of fatty acids	2	44
			Glyoxylate cycle	1	45
		<b>IV</b>	<b>Microbial Metabolism 2</b>		
	14		Anaerobic respiration (nitrate, sulphate respiration).	2	47

  
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	14,15	Fermentation - Common microbial fermentations with special reference to Ethyl alcohol, Butanol and lactic acid fermentations	6	53
	16	Photosynthetic apparatus in prokaryotes	2	55
SEP/OCT	17,18	Outlines of oxygenic and anoxygenic photosynthesis in bacteria	5	60

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**2017-18**  
**SUBJECT -MICROBIOLOGY III SEMESTER PRACTICALS**  
**Microbial physiology - Paper III)**

Month	Week	B.Sc I Year Practicals	Hrs	Total
JUNE	2	Preparation of media for culturing Autotrophic and Heterotrophic microorganisms - Algal medium, Mineral salts medium, Nutrient agar medium, McConkey agar, and Blood agar	2	2
	3,4	Enrichment culturing and isolation of Phototrophs and Chemoautotrophs	2	4
JUNE/JULY	4,5	Setting and observation of Winogradsky Column	1	5
	6	Determination of viable count of bacteria	2	7
	7	Turbidometric measurement of bacterial growth	2	9
	8	Bacterial growth curve	2	11
AUG	9,10,11	Factors affecting bacterial growth – pH, temperature, salts	6	17
	12	Sugar fermentation	1	18
SEP	13	Starch hydrolysis and amylase assay (Quantitative method).	2	20

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**DEPARTMENT OF MICROBIOLOGY****B.Sc ACADEMIC ORGANIZER 2017-18****B.Sc SEMESTER -II SEC- MB-301****FOOD ADULTERATION**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>			
june	1		Definition and introduction to food adulteration	2	2
	2		Types of food adulteration	2	4
july	3,4,5,6		common food adulterants	8	12
AUG	7,8,9		Causes of food adulteration, Analysis of food	6	18
SEP		<b>II</b>			
	10,11		Effects of food adulteration, Prevention of Food Adulteration	4	22



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	12,13		Detection of food adulteration.	4	26
Oct	14,15		Food adulteration Act- 1954	4	30

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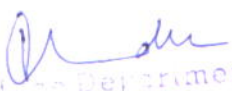
# DEPARTMENT OF MICROBIOLOGY

## B.Sc ACADEMIC ORGANIZER 2017-18

B.Sc SEMESTER - IV Paper - IV

### MOLECULAR BIOLOGY

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Fundamentals of Microbial Genetics</b>		
NOV	2	1	DNA and RNA as genetic materials	3	3
	3		Structure of DNA – Watson and Crick model (B ), A and Z forms of DNA	1	4
	3		Super coiling of DNA ( positive and negative coiling, Topoisomerases /Gyrase)	1	5
	3		Replication of DNA – Semi conservative mechanism	2	7
	3,4		Types of RNA and their functions	2	9
DEC	4		Outlines of RNA biosynthesis in prokaryotes	3	12
	4,5		Genetic code. Structure of ribosomes and a brief account of protein synthesis	3	15
		<b>II</b>	<b>Mutation and Genetic variation</b>		
	5		Mutations – spontaneous and induced, base pair changes, frame shifts, deletions,inversions, tandem duplications, insertions	3	18
	6		Various physical and chemical mutagens, Biological agents, Overview of Site directed Mutagenesis	4	22
	7		Outlines of DNA damage and repair mechanisms	3	25
	8,9		Genetic recombination in bacteria – transformation, transduction and conjugation	5	30
		<b>III</b>	<b>Microbial Gene Expression</b>		
JAN	9,10		Concept of gene and its product, gene structure - Muton, Recon and Cistron	2	32
	11		Operon concept. Regulation of gene expression in bacteria – lac operon	3	35
	12,13		Extra chromosomal Genetic elements:a.Plasmids : Types F, R, Col Ti, Degradative etc, Properties and Functions	5	40
JAN/FEB	14		b.Transposons : IS, Composite, DNA , RNA and Retro transposons -b.Transposons : IS, Composite, DNA , RNA and Retro transposons -Structure and Functions	5	45
		<b>IV</b>	<b>Recombinant DNA Technology</b>		
	14,15		Basic principles of genetic engineering	2	47

  
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	16	Enzymes in Genetic engineering ,restriction endonucleases, DNA polymerases,ligases S1 nuclease ,Reverse transcriptase,Alkaline phosphatase, Methylase,	4	51
	17	Outlines of gene cloning methods-random cloning,short gun ,PCR and cDNA	3	54
	18	Genomic and c DNA libraries.- construction and applications	3	57
FEB/MARCH	19,20	General account on application of genetic engineering in industry, agriculture ,Medicine, Environment	3	60

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**2017-18**  
**SUBJECT -MICROBIOLOGY IV SEMESTER PRACTICALS**  
**MOLECULAR BIOLOGY - Paper IV)**


Month	Week	B.Sc IV Year Practicals	Hrs	Total
NOV	2	Colorimetric estimation DNA by diphenylamine method.	2	1
	3	Colorimetric estimation RNA by orcinol method	2	3
DEC	4	Colorimetric estimation of proteins by Biuret method	2	5
	4,5&6	Paper chromatographic separation of sugars or amino acids	2	7
DEC/JAN	7,8	Extraction of Genomic DNA	4	11
	9,10	Agarose gel Electrophoresis	2	13
JAN/FEB	11,12	Problems related to DNA and RNA characteristics, Transcription and Translation	4	17



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**DEPARTMENT OF MICROBIOLOGY**  
**2017-18 ( Non CBCS - Autonomous)**  
**SEMESTER V - Immunology(THEORY)**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>History and types of Immunity</b>		
JUNE	1		History of Immunology	1	1
			Recent developments of immunology	1	2
	2,3		Types of immunity – innate and acquired; active and passive	6	8
	3		Humoral and Cell-mediated immunity	1	9
JUNE	4		Vaccines – natural and recombinant	2	11
		<b>II</b>	<b>Components of Immune system</b>		
	04-Jan		Process of Hematopoiesis	1	12
JULY	5,6		Cells of immune system - Identification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils ,eosinophils, Mast cells and Dendritic cells , Process of phagocytosis	4	16
	6		Primary organs of immune system- Thymus, Bursa fabricus, Bone marrow	2	18
	7	3	Secondary organs of immune system –, Spleen, Lymph nodes, Mucous Associated Lymphoid Tissue (MALT).	3	21
		<b>III</b>	<b>Basics of Immunology</b>		
	8		Antigens – types, chemical nature, antigenic determinants, haptens.	3	24
			Factors affecting antigenicity		
AUG	9		Antibodies – basic structure, types, properties and functions of immunoglobulins	3	27
	10		Complement, Components of complement and activation of complement	3	30
	11		Role of Cytokines in Immune system	2	32
		<b>IV</b>	<b>Immunological processes</b>		
SEP	11,12		Types of antigen-antibody reactions – agglutination, precipitation, neutralization, complement fixation	3	35
	12,13		Labeled antibody based techniques – ELISA, RIA and Immunofluorescence,	3	38
			Western Blotting.		

  
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	14	Polyclonal and monoclonal antibodies – production (Hybridoma Technology) and applications	1	39
	14	Types of hypersensitivity – immediate and delayed	2	41
<b>OCT</b>	15	MHC and its Role in graft rejection	1	42
	15	Autoimmunity and its significance	3	45

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SUBJECT -MICROBIOLOGY V SEMESTER PRACTICALS  
IMMUNOLOGY-PAPER-V

Month	Week	B.Sc Practicals	Hrs	Total
JUNE	1,2	Total Count(TC)-RBC count, WBC count	2	2
	3	Total Differential Count (DC)	1	3
	4	Separation of serum and plasma	1	4
JULY	5	Erythrocyte Sedimentation Rate	1	5
	6	Estimation of blood haemoglobin- Sahli's method	1	6
	7	Determination of blood groups and Rh typing	1	7
JULY/AUG	8,9	Widal test – Qualitative and Semi-quantitative	2	9
	10,11	VDRL test - Qualitative and Semi-quantitative	2	11
	12	Ouchterlony double diffusion test	1	12
SEP	13	Radial Immuno diffusion	1	13
	14,15	ELISA	2	15

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**DEPARTMENT OF MICROBIOLOGY**  
**2017-18 ( Non CBCS - Autonomous)**  
**SEMESTER V - Medical Microbiology(THEORY)**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Basics of Medical microbiology</b>		
JUNE	1		History of Medial microbiology	1	1
	1,2		Normal flora of human body-Definition, Effects of Antibiotics, Distribution of normal flora	3	4
	2		Definition and process of infection, non-specific defense mechanisms, mechanical barriers	2	6
	3		Host-pathogen interactions. Bacterial toxins, virulence and attenuation	3	9
	4		Anti-microbial substances of host – lysozyme, complement, properdin, antiviral substances, Phagocytosis ,beta lysine, leukin,	2	11
		<b>II</b>	<b>Diagnostic Microbiology &amp; Medical Bacteriology</b>		
	04-Jan		General principles of diagnostic microbiology	1	12
JULY	5		Collection, transport and processing of clinical	2	14
	5,6		General methods of laboratory diagnosis – cultural, biochemical, serological and molecular methods	2	16
	6		General account of the following diseases – causal organisms, pathogenesis, epidemiology, diagnosis, prevention and control of:	1	17
	6		Air-borne diseases - Tuberculosis	1	18
	7		Food and water-borne diseases - Cholera,	2	20
AUG	7,8		Contact diseases - Syphilis, Gonorrhoea	2	22
	8		General account of nosocomial infections- <i>Staphylococcus</i> and <i>Pseudomonas</i>	1	23
		<b>III</b>	<b>Virology and Parasitology</b>		
			General account of the following diseases – causal organisms, pathogenesis, epidemiology, diagnosis, prevention and control of:		
	8		Air-borne diseases - Influenza	1	24
	9		Food and water-borne diseases - Hepatitis- A, Poliomyelitis, Amoebiasis	3	27
	10		Zoonotic diseases – Rabies,Ebola	2	29
	10,11		Blood-borne diseases - Serum hepatitis, AIDS	2	31

  
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	11		Insect Borne: Malaria, Filariasis	2	34
SEP	12		General account on superficial and fungal infections	1	
		IV	<b>Chemotherapy</b>		
	12		Elements of chemotherapy – therapeutic drugs	2	36
	13,14		Mode of action of cell wall inhibitors( penicillin), antimetabolites (sulpha drugs), and	4	40
OCT	14,15		Drug resistance	3	43
	15		Tests for antimicrobial susceptibility	1	44
	15		General account of antiviral drugs	1	45

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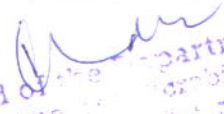
SUBJECT -MICROBIOLOGY V SEMESTER PRACTICALS  
MEDICAL MICROBIOLOGY-PAPER-VI

Month	Week	B.Sc Practicals	Hrs	Total
JUNE	1,2,3	Media for isolation of bacterial pathogens: McConkey, Mannitol Salt agar, Cetrimide, Simmon Citrate Media	3	3
	4	Acid fast staining of Mycobacteria(stained/permanant slide)	1	4
JULY/AUGU	5,6,7,8,9,10	Isolation and identification of medically important bacteria ( <i>E. coli</i> , <i>Klebsiella</i> , <i>Pseudomonas</i> , <i>Staphylococcus</i> ) by cultural, microscopic and biochemical tests.	6	10
	11	Antibiotic sensitivity testing – disc diffusion method	1	11
SEP	12	Parasites – Malarial parasite, <i>Entamoeba</i> (study of permanent slides).	1	12
	13	Observation of fungal pathogen ( <i>Candida</i> ).	1	13
	14,15	Tests for disinfectant (Phenol coefficient).	2	15

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**DEPARTMENT OF MICROBIOLOGY**  
**B.Sc ACADEMIC ORGANIZER 2017-18**  
**B.Sc SEMESTER - VI Paper - VII**  
**AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY**

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Agricultural Microbiology</b>		
NOV	1	1	Physical and chemical characteristics of soil	1 hr	1
	1		Microorganisms of Soil	1hr	2
	2		Rhizosphere and phyllosphere	2 hr	4
	2&3		Plant growth-promoting microorganisms -Mycorrhizae, <i>Rhizobia</i> , <i>Azospirillum</i> , <i>Azotobacter</i> , <i>Cyanobacteria</i> , <i>Frankia</i> and <i>Phosphate-solubilizing microorganisms</i>	5 hr	9
	4		Outlines of biological nitrogen fixation (symbiotic, non-symbiotic).	2hr	11
	4		Biofertilizers - Production and application of Biofertilizers - <i>Rhizobium</i> and <i>Cyanobacteria</i> .	1 hr	12
		<b>II</b>	<b>Plant Diseases and Biocontrol</b>		
DEC	5		Concept of disease in plants	1 hr	13
	5&6		Symptoms of plant diseases caused by fungi, bacteria, and viruses	3hr	16
	6&7		Plant diseases caused by fungi (Groundnut rust), bacteria (Angular Leaf Spot of Cotton) and viruses (Tomato Leaf Curl).	3 hr	19
	7		Principles of plant disease control	1 hr	20
	7&8		Biological control of plant diseases. Biopesticides – <i>Bacillus thuringiensis</i> , <i>Nuclear Polyhedrosis Virus (NPV)</i> , <i>Trichoderma</i>	3 hr	23
		<b>III</b>	<b>Environmental Microbiology</b>		
DEC/JAN	8,9,10		Role of microorganisms in nutrient cycling - carbon, nitrogen, sulphur, phosphorus .	6 hr	29
	10&11		Microbial interactions – mutualism, commensalism, antagonism, competition, parasitism, predation.	2 hr	31
	11&12		Microorganisms in Air	1 hr	32
	12		Air sampling methods	2 hr	34
		<b>IV</b>	<b>Environmental Pollution and Bioremediation</b>		
	12		Microorganisms in water	1 hr	35
JAN/FEB	12&13		Microbiology of potable and polluted waters. <i>E. coli</i> and <i>Streptococcus faecalis</i> as indicators of water pollution, Sanitation of potable water	3 hr	38
	13,14		Sewage treatment (primary, secondary and tertiary).	3 hr	41
	14		Outlines of biodegradation of environmental pollutants– pesticides	2 hr	43
	15		Solid waste disposal – sanitary landfills, composting	2 hr	45

  
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**2017-18**  
**SUBJECT -MICROBIOLOGY VI SEMESTER PRACTICALS**  
**AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY**

Month	Week	B.Sc Practicals	Hrs	Total
Nov	1,2,3,4	Isolation and enumeration of major groups of microorganisms from rhizosphere and non rhizosphere	4	4
DEC	5	Isolation and enumeration of major groups of microorganisms from phyllosphere.	1	5
	6	Study of root nodules and isolation of <i>Rhizobium</i> from legume root nodules	1	6
	7	Isolation of <i>Azospirillum</i> / <i>Azotobacter</i>	1	7
	8	Staining and observation of vesicular-arbuscular mycorrhizal (VAM) fungi	1	8
JAN	9	Observation of plant diseases of local importance – Rusts, smuts, powdery mildews, tikka disease of groundnut, citrus canker, bhendi yellow vein mosaic, tomato leaf curl, little leaf of brinjal	1	9
	10	Isolation of microorganisms of air by Petri plate exposure method	1	10
	11	Determination of biological oxygen demand (BOD) of polluted water	1	11
FEB	12,13,14	Microbial testing of water by coliform test (Multiple Tube Fermentation)	3	14

  
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## DEPARTMENT OF MICROBIOLOGY

**B.Sc ACADEMIC ORGANIZER 2017-18**

**B.Sc SEMESTER - VII Paper - VIII**

### FOOD AND INDUSTRIAL MICROBIOLOGY

MONTH	WEEK	UNIT	TOPIC	NO.OF CLASSES	TOTAL
		<b>I</b>	<b>Food Microbiology</b>		
NOV	1		Microorganisms of food spoilage and their sources	1	1
	1&2		Spoilage of different food materials - fruits, vegetables, meat, fish. Canned foods	5	6
	3&4		Food poisoning (botulism and staph poisoning), Food bornediseases (Salmonellosis, Shigellosis, Listeria) and their detection	4	10
	4		General methods of food preservation	2	12
		<b>II</b>	<b>Applied Food Microbiology</b>		
DEC	5		Microbiological production of fermented foods – bread, cheese, yogurt	3	15
	6		Biochemical activities of microbes in milk	2	17
	6&7		Microorganisms as food – SCP, edible mushrooms.	4	21
	8		Concept of probiotics and its production	2	23
		<b>III</b>	<b>Industrial Microbiology</b>		
	8&9		Microorganisms of industrial importance – yeasts, molds, bacteria, actinomycetes	3	26
DEC/JAN	9&10		Screening and isolation of industrially-important microorganisms	2	28
	10		Outlines of strain improvement	2	30
	11&12		Types of fermentation – aerobic, anaerobic, batch, fed batch continuous, surface ,submerged and solid state	4	34
		<b>IV</b>	<b>Microbial Biotechnology</b>		
	12		Design of a stirred tank reactor fermentor	1	35
	12&13		Fermentation media. Raw materials used in fermentation industry	2	37
FEB	13,14,15		Industrial production of alcohols (ethyl alcohol), beverages (beer), enzymes(amylases), antibiotics (penicillin), amino acids (glutamic acid), organic acids(citric acid), vitamins (B12), biofuels (biogas - methane). Insulin production.	8	45

  
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2017-18

**SUBJECT -MICROBIOLOGY VII SEMESTER PRACTICALS**  
**FOOD AND INDUSTRIAL MICROBIOLOGY**

Month	Week	B.Sc Practicals	Hrs	Total
NOV	1,2,3,4	Observation and Isolation of fungi and bacteria from spoiled fruits and vegetables	4	4
DEC	5	MBRT –Test for microbiological quality of milk	1	5
	6	Isolation of antagonistic microorganisms by crowded plate technique	1	6
	7,8	Isolation of amylase-producing organisms	2	8
JAN	9,10,11	Alcohol production and estimation; Calculation of fermentation efficiency	3	11
JAN/FEB	12,13	Citric acid production and estimation	2	13
FEB	14,15	Preparation of fermented food- Yoghurt	2	15

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