

ORGANIZER FOR THE ACADEMIC YEAR 2015-2016

MICROBIAL BIOTECHNOLOGY THEORY

SEMESTER IV

PAPER-II

Month	Week	Unit	Sub Unit	Detailed Topic	No.of Periods	TOTAL
Jan	1	1	A	Fermentative production of industrial alcohol - Uses Raw materials, Microorganisms, Inoculum preparation, Preparation of Wort, Fermentation & Recovery.	4	4
	2		B 1	Fermentative production of Beer-Medium components, Malt, Malt adjuncts, Hops ,Water.	3	7
	3		B2	Preparation of Wort , mashing, Wort boiling, Microorganisms, Inoculum preparation Fermentation, Cold Storage maturationn,Carbonation,Packing&	5	12
	4		C	Principles of Wine making -Fruit Selection, Picking, Crushing, Sulphite addition,Pressing,Fermentation Aging & Botling.	4	16
Feb	5	2	A	Fermentative production of Citric acid- Uses,Microbes, Inoculum Preparation, Medium Preparation, Fermentation, Recovery& Mechanism of C.A	6	22
	6		B	Fermentative Production of Vitamin B12- Uses,Structure of Vitamin B 12,Microbes, Inoculum Preparation ,Medium preparation, Fermentation &	4	26
	7		C	Fermentative production of Glutamic acid-Uses,Microbes, Inoculum preparation, Production Medium, Fermentation& Down Stream Processing.	4	30
	8	3	A	Antibiotics-Commercial Production of Benzyl Penicillin,Uses, Microbes, Inoculum Preparation, Production Medium, Fermentation, Recovery & Semi-Synthetic Penicillins.	3	33
March	9		B	Fermentative Production of Tetracyclines,Uses,Chloro tetracyline, Oxy -Tetracyline,Tetracyline&Semi Synthetic Tetracyclines,Structures, Microbes, Inoculum Preparation, Production Medium. Fermentation. Recovery Methods.	3	36
March 1	10	4	A	Production & applications of Microbial enzymes-Amylases, Lipases& Proteases,Uses, Microbes, Inoculum Preparation, Production Medium, Fermentation & Recovery.	10	46
	11		B	Steroid Bio- transformations .Substrates, Typical Structure, Microbes, Inoculum Preparation, 11-Hydroxylation, Process & Recovery.	4	50
	12		C	Principles of Vaccine Production & types of Vaccines.	4	54
	13		D	Microbial Bio-Pesticides.	3	57
April	14&15		E	Microbial Products from Genetically Modified (cloned) organisms Ex:Insulin.	3	60



Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

Semester-III Microbial Genetics Practicals

Month	Week	Expt .No	Experiment	No of periods	Total
July	1 ,2 & 3	1	Extraction of DNA (Plasmid DNA & Genomic DNA) Mini Preparation & large Preparation.	3	3
August	4	2	Estimation of DNA.	1	4
August	5	3	Estimation of RNA.	1	5
August	6	4	Estimation of Protein.	1	6
August	7	5	Determination of Molecular Weight of DNA, resolved on agarose gel electrophoresis.	1	7
September	8	6	Determination of Molecular Weight of Protein by PAGE.	1	8
September	9 & 10	7	Induction of Mutations by Physical/ Chemical Mutagens ,Screening & Isolation of Mutants.	2	10
September October	11 & 12	8	Replica Plate Technique .	2	12
October	13 & 14	9.	Transformation in Bacteria .	1	13
November	15	10	Conjugation in Bacteria.	1	14
November	16	11	Complementation Tests in Bacteria.	1	15
November	17	12	Protoplast Preparation & Regeneration.	1	16



Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 004

MICROBIAL BIOTECHNOLOGY THEORY

SEMESTER IV

2015-2016

Month	Week	Unit	Sub.Unit	Detailed Topic	No.Of Periods	Total
Jan	1	1	A	Gene Regulation & Expression:	4	4
			Ai	Lac operon		
			A ii	Arabinose &		
			A iii	Tryptophan operon.		
Jan	2		B	Repressors & Activators in Lamda.	4	8
			C	Sigma Switch in B. subtilis.		
Jan	3		D	Gene Regulation in Eukaryotic System :	4	12
			D I	Repitative DNA		
			D ii	Gene Rearrangement		
			D iii	Promoters		
			D iv	Enhancer elements		
			D v	Gene amplification.		
Jan	4		E	Signal Transduction:	4	16
			E I	Concept of Second messengers-		
			E ii	c-AMP, cGMP		
			E iii	Protein Kinases & G-Proteins.		
Feb	5		F	Steroid/ Peptide Hormone Regulation	4	20
			G	Tissue Specific Regulation		
Feb	6	2	A	Plasmids:	4	24
			A I	Defination & Types of Plasmids		
			A ii	Identification & Classification		
			A iii	Purification of Plasmids		
			A iv	Plasmid Transfer & its mechanism.		
			A v	Host restriction in Transfer.		
	7		B	Transposable Elements:	4	28
			B I	Defination ,Detection of Transposition in bacteria.		
			B ii	Types of bacterial Transposons		



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

			B iii	Mechanism of Transposition & excision.		
			B iv	Application of Transposons.		
Feb	8		C	PCR - Technology:	4	32
			C i	Principle,		
			C ii	Designing of Primers		
			C iii	PCR methodology.		
			C iv	RT-PCR, Multiplex PCR		
			C v	Identification of PCR product.		
			C vi	Application of PCR technology.		
March	9	3	A	Genetic Engineering:	4	36
			A i	Cloning Vectors		
			A ii	Enzymes involved in Genetic Engineering.		
			A iii	Restriction Mapping		
			A iv	Cloning Strategies		
			A v	Methods of Gene Transfer.		
March	10		B	Detection of Clones & its expression:	4	40
			B i	Expression of Cloned genes in Yeast & E.coli		
			B ii	Blot analysis-		
March	11			Southern, Northern & Western Blottes.	4	44
			C	DNA- Methylation.	1	45
			D	DNA- Hybridization.	1	46
	12		E	Genomic & c-DNA library construction & application.	2	48
			F	Hybridoma technology.		
March	13	4	A	Molecular markers:	4	52
			A i	RFLP, RAPD,		
			A ii	AFLP, 16s r-RNA typing.		
April	14		B.	Gene chip & Microarrays:	4	56
			B i	Assays		
			B ii	Applications in Disease profiles.		
			B iii	Drug target		
			B iv	Gene discovery		
			B v	Drug action & Toxicity.		
April	15		C	Molecular biology data bases & bioinformatics :	4	60

Maha

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad.

			C I	Over view & data mining of Sequence data bases.		
			C ii	DNA sequencing methodology & Software		
			C iii	Sequence Comparision & alignment.		
			D	Concept of Pharmacogenomics & its application.		
April	16		E	IPR- & Patenting- Concept & Overview.	2	62

Adha

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

MICROBIAL BIOTECHNOLOGY PRACTICALS

SEMESTER - IV Academic Year 2016

Month	Week	Serial No:	Experiments	No.of Periods
Jan	1&2	1	Production of Ethanol by flask fermentation, Recovery of ethanol by distillation and calculation of Fermentation efficiency.	2
	3	2	Preparation of Beer by Microbial Fermentation.	1
	4	3	Preparation of Wine from grapes/fruits by Fermentation.	1
Feb.	5&6	4	Production of Citric acid by fungal fermentation, Recovery and Estimation.	2
Feb.	7&8	5	Production of Amino acid (GA) by fermentation	2
Mar.	9&10	6	Production of Amylase by fermentation Recovery, Concentration & Estimation	2
		7	Estimation of Protien	1
Mar.	11&12	7	Production & Estimation of Penicillin by flask fermentation	2
Mar.	13	8	Immobilised bacteria/ yeast/enzymes in fermentation	1
April	14&15	9	Scale up of Fermentation	2

(Signature)

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad

MEDICAL VIROLOGY & PARASITOLOGY THEORY
SEMESTER IV 2015-2016

Month	Week	Unit	Sub.Uni	Detailed Topic	No.of Periods	Total
Jan	1	1	A	Diagnostic Virology	1	1
	2		A1	Cultivation of Pathogenic Viruses in lab ,Animals & Tissue culture,	1	2
	3		A2	Identification of pathogenic Viruses & establishment of Viral etiology	3	5
			B	Air Borne Viral Infections (detailed study)	1	6
	4		B I	Influenza virus	2	8
			B ii	Rhino virus	1	9
			B iii	Rubella virus	1	10
Feb	5		B iv	Adeno virus (type 2)	1	11
			B v	Mumps virus	2	13
			B vii	Measles virus.	2	15
Feb	6	2	A	Detailed study of Viruses transmitted by Water	2	17
			A I	Hepatitis (HAV)	2	19
	7		A ii	Polio myelitis	3	22
			B	Detailed study of Viruses transmitted by Zoonosis	2	24
	8		B I	Rabies	4	28
March	9		B ii	Japanese encephalitis.	2	30
	10	3	A	Detailed study of Contact & Sexually transmitted Viral Diseases:	2	32
			A I	Small pox	2	34
	11		A ii	Herpes (Herpes simplex Virus)	3	37
	12		Bii	Hepatitis Viruses & their Diseases.	4	41
	13		Bii	Acquired Immunodeficiency Syndrome (AIDS).	4	45
April	14	4	A	Detailed study of Parasitic Diseases	1	46
			Ai	Malaria	2	48
	15		A ii	Amoebiasis	1	49
			B	Helmentheic infections	1	50
			Bii	Round worm	1	51
			Bii	Hook worm	1	52
	16		C	Medical Mycology	3	55
April	17		Ci	Dermatomycosis	3	58
			Cii	Systemic mycosis	2	60



Head of the Department
Department of Microbiology
Bharatiya Vidya Shavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

Medical Virology & Parasitology.

SEMESTER - IV 2015-16

Month	Week	Experiment	No.of Periods	Total
Jan	1	Cultivation of viruses :- Egg inoculation, CAM,	1	1
Jan	2&3	Allantoic Amnoitic route inoculation.	2	3
Jan	4	Tissue culture techniques	1	4
Feb	5	Animal inoculation techniques.	1	5
Feb	6&7	Microscopic studies of virus infected material.	2	7
Feb	8	Examination of Pathogenic Fungi	2	9
March	10	Examination of stools for Helminths & Amoeba.	1	10
March	11	Examination of blood smear by Leishman stain for medical parasite.	1	11
March	12	Rota viral RNA (Ds RNA) analysis.	1	12
April	13,14,15	Immunodiagnosis, ELISA tests.	3	15

Head of the Department
Department of Microbiology
Bharatiya

FOOD AND ENVIRONMENTAL MICROBIOLOGY THEORY
SEMESTER IV-2015- 2016

Month	Week	Unit	Sub.Unit	Detailed Topic	No. of Periods	Total
Jan	1	1	A	Introduction to Fermented foods	1	1
			A i	Microbial Product of Milk	1	2
			A ii	Microbiology of Cheese	1	3
			A iii	Microbiology of Butter	1	4
	2		A iv	Microbiology of Yogurt	1	5
			A v	Microbiology of Bread.	1	6
			A vi	Microbiology Saurkraut	1	7
			A vii	Microbiology of Idly.	1	8
			B	Bacteriological examination		
			B i	Fresh Food		
	3		B ii	Canned Food	2	10
			C	Microbial Spoilage of Foods.	2	12
	4		D	Factors Influencing the Spoilage.	1	13
			E	Food Preservation Methods.	5	18
			F	Silage.	1	19
Feb	5&6		G	Food Poisoning.	2	21
			H	Mycotoxins.	1	22
			I	Diary Microbiology.	1	23
			I i	Types of Microbes In Milk		
			I ii	Significance of Microbes in Milk	1	24
	7		I iii	Microbiological examination of Milk.	1	25
			I iv	Control of Microbial Flora of Milk.		
		2	A	Microbes & Animal Interaction.	1	26
	8		A i	Rumen Microbiology.	3	29
			A ii	Termite Microbial Communities.	2	31
			A iii	Microbes in the production of Energy from Agricultural & Domestic Wastes.	1	32
March	8&9		A iv	Methanogenesis(Biogas) & Microbiology of Methanogenesis.	4	36
	10	3	A	Microbial Degradation of Pesticides & Persistence of Pesticides.	2	38
Mar			B i	Degradation of Herbicides.	1	39
			B ii	Degradation of Fungicides.	1	40
	11		B iii	Degradation of Insecticides.	1	41
			C	Microbes & Plant Interactions.	1	42
			C i	Rhizosphere & PGPRS	3	45
			C ii	Mycorrhiza	1	46
	12		C iii	Phyllosphere	2	48
April	13	4	A i	Microbes & water Pollution	1	49
			A ii	Water Borne Pathogenic Microbes & their Transmission	1	50
			A iii	Sanitary Quality of Water.	1	51

(Signature)

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad.

	14		A iv	Water Pollution Due to Degradation of Organic Matter.	2	53
			B	Aerobic Sewage Treatment.		
April	14&15		B I	Oxidation Ponds	2	55
			B ii	Trickling Filters.		
			B iii	Activated Sludge Treatment.	1	56
			B iv	Anaerobic Sewage Treatment - Septic Tank.	2	58
			C	Microbes in Air & their Importance.	2	60

M. Dhe

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri Secunderabad - 500024.

MICROBIOLOGY OF FOOD & ENVIRONMENT PRACTICALS

SEMESTER IV (2016)

Month	Week	Experiment	No.of periods.	Total
Jan.	1&2	Microbiological examination of fresh & Canned foods & Mushrooms.	2	2
	3&4	Microbiological examination of milk & milk products.	1	3
		Microbiological quality testing of milk (MBRT test).	1	4
Feb	5	Isolation & cultivation of anaerobes from rumen & termites.	1	5
Feb	6	Isolation & observation for Phyllosphere microflora.	1	6
	7	Isolation & observation for Rhizosphere microflora.	1	7
	8	Observation for Mycorrhiza.	1	8
Mar	9&10	Effect of pesticides on microbial activity.	2	10
	11	Estimation of B.O.D.	1	11
	12	Testing for microbial sanitary quality of water (Coliform test).	1	12
	13	Isolation & analysis of mycotoxins.	1	13
April	14	Isolation & observation of air microflora.	1	14



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

**MOLECULAR BIOLOGY & MICROBIAL GENETICS THEORY
SEMESTER III (2015) 16**

Month	Week	Unit	Sub.Unit	Detailed Topic	No.of Periods	Total
AUG	1	I	A	Structure of DNA & its biosynthesis :		
			A i	Detailed Structure of DNA	1	1
			A ii	Variation from Watson & Crick Model ;A, B & Z Forms.	1	2
			A iii	Denaturation & Melting Curves.	2	4
AUG	2		A iv	Genomic Organization in Prokaryotes & Eukaryotes.	2	6
			B	Enzymes invovled in Replication.:	2	8
			B i	Step by step process		
AUG	3		B ii	Heteroduplexes		
			B iii	Modes of DNA Replication:	2	10
				Semiconservative & conservative.		
			B iv	Mechanisms of DNA Replication in E.coli (Bi -directional).	2	12
AUG	4		C	Mitochondrial (D- loop).		
			D	Viral DNA (Rolling Circle).	2	14
			E	Single Stranded DNA Phages (M13, O X 174)	2	16
SEP	5		F	Eukaryotic telomeres & its Replication.	2	18
			G	Selfish DNA		
			H	Alu Sequences.	2	20
SEP	6	II	A	RNA Stucture & Biosynthesis :		
			A i	m-RNA	2	22
			Aii	r-RNA		
			A iii	t- RNA Structures.		
			B	Transcription apparatus & Proteins Involved in Transcription .	2	24
SEP	7		B i	Prokaryotic &Eukaryotic Transcription.	4	28
SEP	8		B ii	Processing of t-RNA,	4	32
			B iii	r-RNA,		
			B iv	m-RNA Splicing		
SEP	9		C	Concepts of Ribozyme.	2	34
			D	The Genetic Code & Wobble Hypothesis.	2	36
OCT	10		E	Protein Synthesis:		
			E i	Translation in Prokaryotes & Eukaryotes.	4	40
OCT	11		E ii	Post Translation Modification	1	41
		III	A	Mutagenesis:	3	44
			A i	Types of Mutagens		
			A ii	Molecular Basis of Mutations.		
OCT	12		A iii	Analysis of Mutations	2	46
			A iv	Site directed Mutagenesis &		
			A v	Reverse Genetics.	2	48
NOV	13		B	DNA damage & Repair Mechanisms	2	50
			C	Mutagenicity testing Using Microbial Systems.	1	51



**Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.**

			D	Concepts of Gene:		
			D I	Benzer's fine Structure analysis	1	52
			D ii	Introns & Exons.		
			E	Complementation & Functional Allelism.		
NOV	14	IV	A I	Bacterial Transformation :	2	54
			A ii	Discovery , Detection		
			A iii	Molecular mechanisms of Transformation.		
			A iv	Transformation methods.		
			B	Bacterial Conjugation:	2	56
			B I	Sex Factors in bacteria		
			B ii	F & Hfr transfer		
			B iii	Mechanism of Transfer		
			B iv	Linkage mapping.		
			B v	Mechanism of Recombination.		
NOV	15		C	Bacterial Transduction :	2	58
			C I	Transduction Phenomena		
			C ii	Methods of Transduction		
			C iii	Cotransduction		
			C iv	Generalized, Specialed& Abortive Transduction.		
			C v	Sex ductions & their applications.	1	59
			D	Genetics of Eukaryotic Viruses.	1	60

M. d. h.

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

PAPER II MB:352U INDUSTRIAL MICROBIOLOGY
ACADEMIC YEAR 2015-2016

Month	Week	Unit No	Sub Unit	Topic	No. of Periods	Total
				Introduction to Industrial Microbiology		
AUG	1	1	A	Definition ,Scope and History	3	3
				Properties of Industrial Microorganisms Industrial Products	1	4
AUG	2		B	Screening for microbes of Industrial importance		
				Primary Screening- Screening for Amylase ,Organic acid , Antibiotic, Amino acid& Vitamin producing Microorganisms..	1	5
				Secondary Screening	2	7
				Further evaluation of Primary isolates.	1	8
AUG	3		C	Detection and assay of Fermentation Products		
				Physico chemical methods & Biological assay	2	10
			D	Fermentation equipment & its use.		
				Design of Fermentor	1	11
				Types of Fermentor	1	12
AUG	4			Agitation	1	13
				Aeration	1	14
				Antifoam	1	15
				pH and temperature control.	1	16
SEP	5		A	Inoculum media AND Inoculum preparation		
		2		Inoculum media	2	18
				Inoculum preparation	2	20
SEP	6		B	Raw materials		
				Saccharine, Starchy& Cellulosic materials.	4	24
SEP	7		C	Fermentation media & Sterilization.	2	26
			D	Types of Fermentation Processes:		
				Solid State Fermentation.	2	28
SEP	8			Surface Fermentation	2	30
				Submerged Fermentation	2	32
SEP	9	3	A	Batch , Fed- batch Fermentation	1	33
				Continuous Fermentation	1	34
OCT	10		B	Direct, Dual or multiple Fermentation	2	36
			C	Scale up of fermentations	4	40
OCT	11		E	Product recovery methods	4	44
			D	Fermentation type reactions :		



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500094.

				Alcoholic Type	1	45
				Mixed Acid Type	1	46
				Propionic Acid Type	1	47
OCT	12			Butanediol Type&Acetone-Butanol Type	1	48
NOV	13	4	A	Strain development : - strategies Environmental factors for	4	52
NOV	14			Genetic factors for improvement	4	56
NOV	15		B	Immobilization methods :	4	60
				Advantages and disadvantages		
				Adsorption		
				Covalent linkage		
				Cross linkages		
				Entrapment		

A. S. S.

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

SOIL MICROBIOLOGY THEORY

SEMESTER III (2015)-16

Month	Week	Unit	Sub.Unit	Detailed Topic	No. of Periods	Total
AUG	1	1	A	The soil has habitat of Microbes:	2	2
			A I	General description of Soil		
			A ii	Soil Structure	1	3
			A iii	Differences among soils & factor of Ecological Significance.		
			B	Soil Microbes - Distribution, Estimation, Biomass measurement, Environmental factors, Activity & functions of Soil	1	4
AUG	2		B I	Bacteria	2	6
			B ii	Fungi	2	8
AUG	3		B iii	Algae	1	9
			B iv	Protozoa	1	10
			C	Blue green Algae(Cyanobacteria) & Soil fertility.	2	12
AUG	4		D	Microbial diversity in Soil & its Significance.	2	14
			A	Organic matter Decomposition both Native & added Organic matter & Factors Governing the Decomposition & biochemistry of Decomposition.	3	17
			B	Degradation of Carbonaceous Material in Soil & Factors Governing the Decomposition.	2	19
SEP	6		B I	Cellulose	2	21
			B ii	Hemi-Cellulose	2	23
SEP	7		B iii	Lignin	2	25
			C	Mineralization of Nitrogenous Organic Matter, Microbes Involved & Factors Influencing the Processes.	3	28
SEP	8		D	Soil Humus Formation.	2	30
		3	A	Nitrification;	1	31
			A I	Factors influencing nitrification	1	32
			A ii	Nitrifying Bacteria		
SEP	9		A iii	Biochemical mechanism	1	33
			B	Denitrification	1	34



Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

			B I	Microbes Involved		
			B ii	Factors Influencing	1	35
			B iii	Mechanism of Denitrification	1	36
OCT	10		B iv	Nitrate Pollution	1	37
			C	Nitrogen Fixation :	1	38
			C I	Asymbiotic	1	39
			C ii	Microbes Involved		
OCT	11		C iii	Biochemistry & Genetics of Nitrogen Fixation.	2	41
			C iv	Measurement of Nitrogen Fixation.	1	42
			C v	Ecological & Economic Importance.	1	43
			D I	Symbiotic	1	44
			D ii	Microbes Involved		
OCT	12		D iii	Biochemistry & Genetics of Nitrogen Fixation.	2	46
			D iv	Measurement of Nitrogen Fixation.		
			D v	Ecological & Economic Importance.	1	47
NOV	12&13	4	A	Microbial Transformation of Phosphorus in Soil.	3	50
			B	Microbial Transformation of Sulphur in Soil.	2	52
			C	Microbial Transformation of Iron in Soil.	2	54
NOV	14		D	Biofertilizers	1	55
			D I	Bacterial Biofertilizers		
			D ii	Production of Rhizobial Inoculants.	1	56
NOV	15		D iii	Quality Control Test	1	57
			D iv	Algal Fertilizers- Blue Green Algae.	1	58
			D v	Production of B.G .A Inoculants.	1	59
			D v	Quality Control Test.	1	60

Adher

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

MEDICAL BACTERIOLOGY THEORY

SEMESTER III (2015)-16

Month	Week	Unit	Sub.Unit	Detailed Topic	Periods	Total
AUG	1	1	A	Principles of Medical Microbiology : Classification of Medically important Microbes.	4	4
AUG	2	1	B I	Normal flora of Human Body-Origin of Normal Flora, Role of the Resident Flora , Effect of Antimicrobial agents on Normal Flora, Characteristics of Normal Flora.	4	8
AUG	3		B ii	Distribution & Occurrence of Normal Flora-Skin, Conjunctiva, Nose, Nasopharynx, Sinuses, Mouth, Upper Respiratory Tract, Urogenital Tract.	4	12
AUG	4		B iii	Bacteria in Blood & Tissues, Factors Influencing Normal Flora.	4	16
SEP	5	2	A	Properties of Pathogenic Microbes .	2	18
			B	Factors That Influence Pathogenicity		
			C I	Types of Infections	2	20
			C ii	Source of Infection		
			C iii	Different modes / Means of Infection.		
SEP	6		D	Diagnostic Microbiology- Types of specimen, specimen collection , Transportation of specimen, Processing, Laboratory investigation, Specific Laboratory test, Non-specific Laboratory test, Diagnosis & Report.	4	24
SEP	7		E	Use of animals in Diagnostic Microbiology.	2	26
		3	A	Systemic bacteriology: Detailed study of Morphology , Cultural Characteristics, Antigenic structure, Pathogenesis, Diagnostic lab tests, Epidemiology, Prevention & Treatment of the following Bacterial Pathogens.	1	28
SEP	8		B	Bacterial Air Borne Infection:	1	29
			B I	b- Hemolytic Streptococci	2	31
			B ii	Pneumococci	1	32
SEP	9		B iii	Corynebacterium diphtheriae	1	33
			B iv	Mycobacterium tuberculosis	2	34
OCT	10		B v	Mycobacterium leprae	1	35
			B vi	Neisseria meningitidis.	2	37
OCT	11		B vii	Hemophilus influenzae.	2	39
			C	Sexually transmitted diseases caused by bacteria;	2	41



Head of the Department
Department of Microbiology
 Bharatya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad-500 004.

OCT	12		C I	Treponema pallidum	2	43
			C ii	Neisseria gonorrhoea	2	45
		4	A	Systemic bacteriology: Detailed study of Morphology , Cultural Characteristics, Antigenic structure, Pathogenesis, Diagnostic lab tests, Epidemiology, Prevention & Treatment of the following Bacterial Pathogens.		
NOV	13		B	Water Borne Infections:	1	46
			B I	E.coli	1	47
			B ii	Salmonella typhi	2	49
NOV	14		B iii	Shigella dysenteriae	1	50
			B iv	Vibrio cholera	2	52
			C	Wound Infections	1	53
NOV	15		C I	Staphylococcus aureus	2	55
			C ii	Clostridium tetani	2	57
			C iii	Clostridium welchii	2	59
			C iv	Pseudomonas	1	60

Adhe

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 091,

Semester-III Microbial Genetics Practical's -2015 -16

Month	Week	Expt .No	Experiment	No of periods	Total
August	1 & 2	1	Extraction of DNA (Plasmid DNA & Genomic DNA) Mini Preparation & large Preparation.	2	2
	3	2	Estimation of DNA.	1	3
	4	3	Estimation of RNA.	1	4
September	5	4	Estimation of Protein.	1	5
September	6	5	Determination of Molecular Weight of DNA, resolved on agarose gel electrophoresis.	1	6
	7	6	Determination of Molecular Weight of Protein by SDS-PAGE.	1	7
September	8 & 9	7	Induction of mutations by Physical/ Chemical Mutagens , Screening & Isolation of Mutants.	2	9
October	10	8	Replica Plate Technique .	1	10
October	11	9.	Transformation in Bacteria.	1	11
October	12	10	Conjugation in Bacteria.	1	12
November	13	11	Complementation Tests in Bacteria.	1	13
November & December	14 & 15	4	Protoplast Preparation & Regeneration.	2	15



Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 002

SOIL MICROBIOLOGY PRACTICALS
SEMESTER III (2016 - 17)

Month	Week	EXPERIMENT	No. of Periods	Total
AUG	1	Setting of Winogradsky's Column .	1	1
AUG	1	Estimation of Soil Composition by Sedimentation method .	1	2
AUG	2	Enumeration of Soil Microbes (Bacteria, Actinomycetes & Fungi) by Standard Plate Count .	1	3
AUG	4	Estimation of Soil Microbial Activity by CO ₂ Evolution	1	4
SEP	5	Isolation of cellulose decomposing microbes & estimation of cellulase activity.	1	5
SEP	6&7	Estimation of Ammonifiers, Nitrifiers & denitrifiers in soil by MPN method.	2	7
SEP	8	Isolation and culturing of Rhizobium sp. From root nodules & Azospirillum from grasses (Cyanoden).	1	8
SEP	9	Biological enrichment, isolation of Rhizobium from soil by Leonard jar experiment.	1	9
OCT	10	Nodulation testing by tube/jar method.	1	10
OCT	11	Solubilization of rock phosphate by microbes & estimation.	1	11
OCT	12	Assessment for sulphate reducing bacteria.	1	12
NOV	13	Observation & assessment of soil Algae/Algal bio fertilizers.	1	13
NOV	14	Bacterial biofertilizers & their use.	1	14
NOV	15	Estimation of N ₂ fixation (Micro Kjeldhol/GC method)	1	15

M. Dha

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 04.

Medical Microbiology - Practicals
SEMESTER III (2015)-16

Month	Week	S.No.	Experiments	No. of classes	Total periods
AUG	1	1	Preparation of different types of culture media/observation	4	4
			Types of culture media.		
			*Mannitol salt agar.		
			*Bired parker media.		
AUG	2		*MacConkey agar.	4	8
			*Lowenjein.		
			*Jensen media.		
			*Wilson & Blair bismuth sulphite media		
AUG	3		*Biochemical media.	4	12
AUG	4	2	Staining technique		
SEP	5		*Gram staining	4	16
SEP	6		*A F B staining	8	24
SEP	7		*Albert staining	4	28
SEP	8		*Capsular staining	4	32
SEP/OCT	9&10	3	Isolation & Identification of various pathogenic bacteria by biochemical, enzymatic & serological tests.	8	40
OCT	11,12	4	Bacteriological examination of different specimens from patients for diagnosis.	8	48
NOV	13		*Urine	4	52
NOV	14		*Pus	4	56
NOV	15		*Throat swab.	4	60


Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

INDUSTRIAL MICROBIOLOGY PRACTICALS

Academic year 2015-2016				
Month	Week	Experiments	No. of Periods	Total
August	1&2	Screening for Amylase producing organisms	2	2
August	3&4	Isolation of Antibiotic producing organisms by crowded plate technique	2	4
September.	5&6	Screening for Organic acid producing organisms	1	5
September.	7	Isolation & Culturing of Yeasts	1	6
September.	8	Seperation of amino acids by chromatography	1	7
September.	9	Estimation of glucose by DNS method	1	8
October	10,11&12	Estimation of Ethanol by Dichromate method	3	11
November	13	Estimation of maltose	1	12
November	14&15	Immobilisation of microbial cells by Entrapment method.	3	15



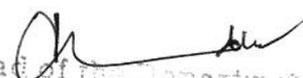
Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad- 500 094.

MICROBIAL PHYSIOLOGY THEORY						
SEMESTER II (2015-2016)						
Month	Week	Unit	Sub.unit	Detailed Topic	No.of Periods	Total
Jan	1	1	A	Microbial Nutrition.	1	1
			A I	Elemental nutrient requirements of microbes.	2	3
			A ii	Nutritional groups of bacteria.	1	4
Jan	2&3		B	The autotrophy- Phototrophy & bacterial photosynthesis.	3	7
Feb			B I	Chemoautotrophy & Autotrophic metabolism.	2	9
	3		C	Concept of Heterotrophy- Photoheterotrophy & Chemoheterotrophy.	2	11
Feb			D	Heterotrophic metabolism in bacteria.	2	13
Feb	4		E	Respiration (Aerobic & Anaerobic) Fermentation	3	16
		2	A	Microbiological media & culturing & Cultivation of microorganisms	1	17
Feb	5		A I	Autotrophic media, defined synthetic mineral media, Heterotrophic media.	2	19
Mar	5&6		A ii	The concept of prototrophs & Auxotrophs	2	21
			A iii	Prototrophic (minimal) medium, defined media, complex media (undefined media).	2	23
Mar	7		A iv	Basal medium, Enriched media, Enrichment media, Selective media, Biochemical media, Differential media, Maintenance media & Tansport media.	2	25
			B	Media for cultivation of Fungi	1	26
			B i	Media for cultivation of Algae.	1	27
Mar	7&8		C	Cultivation methods of bacteria, slant culturing, stab culturing, agar plate culturing, roll tube/bottle culturing, tube cultures, flask culturing.	2	29
			D	Aerobic culturing methods	1	30
			E	Anaerobic culturing methods	2	32
	9		F	Environmental requirements of growth.	1	33
		3	A	Microbial growth - The concept of growth & definition	1	34
			A I	Formation of protoplasm, building of macromolecules from elemental nutrients, supramolecules.	2	36
Mar	10		A ii	Organelles of cell & cellular components	1	37
			A iii	Cell cycle in microbes & generation times.	2	39
April	11		B	Growth phses of bacteria - lag phase, exponential phase, stationary phase (idio phase), decline & survival of microbial cells; Importance of each growth phase.	2	41
			C	Synchronous cultures - Methods of synchronous culturing	1	42
April			C I	Continuous culturing methods,	1	43
			C ii	Factors affecting growth	1	44
	12		C iii	Methods of growth measurement.	1	45
		4	A	Nature & properties of spores		


 Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhawan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

PAPER-II FOOD AND TOXICOLOGY
SEMESTER II -2015- 2016

Month	Week	Unit	Detailed Topic	No. of Periods	Total
Jan	1	1	Introduction to Fermented foods	1	1
			Microbial Product of Milk		
			Microbiology of Cheese	2	3
			Microbiology of Butter	1	4
	2		Microbiology of Yogurt	1	5
			Microbiology of Bread.	1	6
			Microbiology Saurkraut	1	7
			Microbiology of Idly.	1	8
			Bacteriological examination		
	3		Fresh Food	1	9
			Canned Food	1	10
			Spoilage of Foods.	2	12
Feb	4		Factors Influencing the Spoilage.	2	14
			Current and future implications concerning food safety, hazards and risks	2	16
	5	2	Diary Microbiology- Types of Microbes In Milk	2	18
			Significance of Microbes in Milk	2	20
	6		Microbiological examination of Milk.	2	22
			Control of Microbial Flora of Milk.	1	23
			Microbes & Animal Interaction	1	24
	7		Rumen Microbiology.	2	26
			Termite Microbial Communities.	2	28
Mar	8		Silage.	2	30
		3	Probiotics, Prebiotics and their significance in human beings and animals	2	32
	9		Food poisoning	2	34
			Bacterial toxins-exotoxins,	2	36
	10		Endotoxins,	1	37
			Toxoids	1	38
			Enterotoxins	1	39
			Different types of fungal and bacterial toxins	1	40
	11		Physiology of toxin production	1	41
			Detoxification methods of Mycotoxins in different food bases (Physical and Chemical)	2	43


 Head of the Department
 Department of Microbiology
 Bharatiya Vidya Shastra's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

April	11&12		Genetically Modified Probiotics, Prebiotics	2	45
			Infant Microbiota	1	46
		4	Application of toxins and toxic enzymes	2	48
	13		Laboratory testing methods for bacterial virulence properties	2	50
			Mechanism of toxicity including protein adduction	2	52
	14		Lipid peroxidation and oxidative stress	2	54
			Role of toxicity in environmental regulation and drug development	2	56
	15		Microbial threats & Bioterrorism	2	58
			Test procedures to detect disturbances of microbial communities	2	60

[Handwritten signature]

Dr. ...
 Bharathiya Vidyapeeth, ... College
 Sainikpuri, Secunderabad - 500 084.

IMMUNOLOGY

2015-16

Month	Week	Unit	Topic	No of periods	Total
Jan	1	I	Brief history of immunology	2	2
			Antigens – isoantigens, alloantigens, haptens	2	4
	2		Antibodies – structures, genes; Structural variants, classes, and subclasses of antibodies	5	9
	3		Immune system – cells, vessels, organs	2	11
			Immune response – antigen recognition	2	13
			T-cell interactions; B-cell interactions.	2	15
	4	II	Immune response	1	16
			Types of immunity – innate, specific, acquired	2	18
			Vaccines – whole cell, subunit, recombinant protein-based, DNA-based	2	20
Feb	5		Production of vaccines; QA and QC of vaccines	2	22
			Accepted pharmacopeial techniques; Future of vaccines – bacterial and viral vaccines in market; Advantages and disadvantages of vaccines; Approaches of vaccine design;	2	24
	6		Acquired and natural tolerance; Mechanism of tolerance	3	27
			Properties of interferon; Production and assay of interferons	3	30
	7	III	MHC Complex; Immunoglobulin superfamily; Self and non-self recognition	3	33
			Genetics of tissue transplantation; Genetic control of immune response; Macrophage restriction	2	35
	8		Structure of MHC; MHC products and cell surface; MHC and tissue transplantation	3	38
			Human MHC and disease association; Autoimmunity and HLA; Examples of autoimmunity and treatment;	3	41
Mar	9		Inflammation and anaphylactic reactions;	2	43
			Immune reaction of infection, reactions to infectious agents.	2	45
		IV	Antigen-antibody reactions; Polyfunctional antibodies; Cross reactivity	1	46
	10		Primary antigen-antibody reactions <i>in vivo</i> ; Secondary antigen-antibody reactions <i>in vivo</i> ; Sensitivity of antigen-antibody reactions;	2	48


 Head of Department
 Department of Microbiology
 Bharatiya Vidya Shivan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

IMMUNOLOGY
2015-16

		Immunological methods – agglutination, precipitation, complement fixation, radioactive and enzyme-mediated amplification for detection of antigen-antibody reactions;	4	52
	11	Immunization – adjuvants, lymphokines; Alternate pathway for complement fixation;	1	53
		Protective immunity to infection; Role of immune mechanism in protection against infection; Immune effector mechanisms in specific infections; Evasion of immune defenses;	3	56
	12	Tumor immunity – host-tumor relationship, tumor immunity in humans; Tumor antigens; Mechanism of tumor destruction by the immune system; Tumor surveillance; Immuno-diagnosis of cancers; Immuno-prophylaxis of cancer; Immuno-therapy of cancer.	4	60

Order

Pharmaceutical Microbiology Paper IV MB 204					
SEMESTER II				2015-2016	
Month	Week	Unit	Detailed Topic	No. of Periods	Total
Jan	1	1	The ecology of microorganisms affecting pharmaceutical industry :		
			atmosphere, water, skin & respiratory flora of personnel, raw-materials, packing, equipments, building, utensils etc.	4	4
	2		Types of microorganisms occurring in pharmaceutical products.		
			Microbiological spoilage preservation of pharmaceutical products –	4	8
			Microbial spoilage,		
			preservation of pharmaceutical products		
			antimicrobial agents used as preservatives	4	12
	3		Evaluation of the microbial stability of formulation		
	4		Good manufacturing practices and hygiene in industry and hospital	3	15
		2	Non-Medicinal antimicrobial agents –		
Feb			Bacteriostatic and bactericidal agents,	4	19
			factors affecting antimicrobial activity.		
			Non medicinal antimicrobial chemicals -		
			sanitizers, disinfectants, antiseptics, antimicrobial action of phenols and phenolic compounds, alcohols, halogens, heavy metals, dyes, aldehydes, detergents.	4	23
			Medicinal antimicrobial agents:		
			History of chemotherapy – plants and arsenicals as therapeutics,	4	27
			Paul Ehrlich and his contributions,		
			selective toxicity and target sites of drug action in microbes.		
			Development of synthetic drugs –		
			Sulphanamides, antitubercular compounds, nitrofurans, nalidixic acid, metronidazole group of drugs	3	30
			Antibiotics - The origin, development and definition of antibiotics as drugs		
			types of antibiotics and their classification.		
			Non-medical uses of antibiotics		
		3	Principles of chemotherapy –		


 Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

		Clinical and lab diagnosis, sensitivity testing, choice of drug, dosage, route of administration, combined/mixed multi drug therapy, control of antibiotic/drug usage	4	34
		Mode of action of important drugs –		
		Cell wall inhibitors (Betalactam – eg. Penicillin)	7	41
		membrane inhibitors (polymyxins)		
		macromolecular synthesis inhibitors (streptomycin),		
		folic acid inhibitor (sulfa drug)		
		antifungal antibiotics (nystatin)		
		Antiviral agents –		
		Biological antiviral agents- interferon and its action	2	43
		chemical antiviral agents.	2	45
	4	The drug resistance –		
		The phenomenon, clinical basis of drug resistance, biochemistry of drug resistance, genetics of drug resistance in bacteria.	4	49
		Microbiological assays:		
		Assay for non-medicinal antimicrobials (Phenol coefficient/RWC).	3	52
		Drug sensitivity testing methods and their importance	2	54
		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).	3	57
		Introduction to pharmacokinetics.	3	60

Pharmaceutical Microbiology PRACTICALS

SEMESTER II

2015-2016

Month	Week	Expt. No	Experiment	No. of Periods	Total
Jan	1	1	Sterility testing methods for pharmaceutical products	1	1
	2	2	Testing for sterilization equipment	1	2
Jan.	3 & 4	3	Tests for disinfectants (Phenol coefficient/RWC)	2	4
Feb.	5	4	Determination of antibacterial spectrum of drugs/antibiotics	1	5
Feb.	6	5	Chemical assays for antimicrobial drugs	1	6
	7	6	Testing for antibiotic/drug sensitivity/resistance	1	7
	8	7	Determination of MIC valued for antimicrobial chemicals	1	8
March	9	8	Microbiological assays for vitamins/amino acids	1	9
March	10 & 11	5	Microbiological assays for antibiotics (Liquid tube assay, agar tube assay, agar plate assays)	2	11
			Toxicity tests in lab animals		
March	12 & 13	6	Pyrogenicity tests in lab animals	2	13

Handwritten signature

Food Microbiology and Toxicology(Practicals)

SEMESTER-II Paper-2

2015-16

MONTH	WEEK	EXPT. NO.	EXPERIMENT	NO. OF WEEKS	TOTAL
DEC/JAN	1&2	1	Microbiological examination of fresh and canned foods and mushrooms	1 &2	2
JAN	3&4	2	Microbiological examination of spoiled foods and fruits	2	4
JAN	5	3	Microbiological examination of milk and milk products	1	5
JAN	6	4	Microbiological quality testing of milk (MBRT test)	1	6
FEB	7&8	5	Isolation and cultivation of anaerobic microbes from rumen and termites	2	8
FEB	9	6	Isolation of toxin producing organisms and estimation of their toxins in different foods	2	10
FEB	10	7	Extraction of Mycotoxins from contaminated food.	1	11
MAR	11&12	8	Detoxification of mycotoxins.	1	12
MAR	13	9	Isolation of bacterial and fungal probiotics	1	13
MAR	14	10	Development of probiotics <i>in vitro</i>	1	14
MAR	15	11	Test procedures to detect disturbances of microbial communities	1	15


 Head of Department
 Department of Food Microbiology
 Bharatiya Vidya Bhawan's Vivekananda Institute
 Sainikpuri, Secunderabad-500084

Microbial Ecology and Plant microbe interactions (Practicals)

SEMESTER-IV Paper-4 (2016-2017)

MONTH	WEEK	EXPT. NO.	EXPERIMENT	NO. OF WEEKS	TOTAL
DEC/JAN	1&2	1	Protein isolation from E coli, Bacillus and Yeast	1 &2	2
JAN	3&4	2	Effect of parameters on Trypsin activity.	2	4
JAN	5	3	Sequence analysis of proteins (by BLAST, ClustalW and Phylip). Protein structure prediction by Homology modeling	1	5
JAN	6	4	Isolation of plant beneficial bacteria from soil and vermicompost	1	6
FEB	7&8	5	N fixers, P-solubilizers	2	8
FEB	9	6	Siderophore producers	1	9
FEB	10	7	Isolation of Plant growth hormone producing bacteria	1	10
MAR	11&12	8	IAA, GA and their quantification	2	12
MAR	13	9	Isolation of plant pathogenic bacteria, fungi:	1	13
MAR	14	10	Isolation of antagonistic microbes	1	14
MAR	15	11	Detection of QS compounds in Bacteria.	1	15

		A I	Bacterial endospore structure	1	46
	10	A ii	Phenomenon of sporulation	1	47
		A iii	Biochemistry & genetics of sporulation	1	48
		A iv	Induction of sporulation phenomenon.		
	13	A v	Germination of spores.	1	49
		B	Concept of disease - Infectious disease	1	50
April		B i	Pathogenic microbes; Properties of pathogenic microbes - infection, pathogenesis, virulence.	2	52
	14	C	Capsular materials	1	53
		D	Bacterial toxins - exotoxins, toxoids, endotoxins, enterotoxins.	2	55
		D I	Physiology of toxin production	1	56
	15	D ii	Extracellular enzymes of pathogenic bacteria.	4	60
		D iii	Application of toxins & toxic enzymes.		
		E	Laboratory testing methods for bacterial virulence properties.	4	64



Department of Microbiology
 Bharathi Mohan College of Arts, Science & Commerce
 Sarakyni, Secunderabad - 500 084.

MICROBIAL PHYSIOLOGY PRACTICALS

SEMESTER II 2015-16				
Month	Expt No.	Experiments	No. of Periods	Total
Jan	1	Preparation of Microbiological media	1	1
Jan	2	Isolation and Cultivation of Autotrophic microbes	1	2
Feb	3	Culturing methods of microbes Slant/Stab/Flask/Shake	1	3
	4	Anaerobic Culturing Methods	1	4
Feb	5	Microbial Growth Experiments Viable Count	1	5
March	6	Determination of Generation Time	1	6
March	7	Turbidometric Estimation of Bacterial Growth	2	8
March	8	Factors effecting Bacterial Growth	2	10
	9	Tests for Microbial Toxins	2	12
April	10	Determination of LD50	1	13
April	11	Testing for Extracellular Microbial Enzymes	2	15

(Handwritten Signature)

GENERAL MICROBIOLOGY THEORY						
SEMESTER I (2015-2016)						
Month	Week	Unit	Sub. Unit	Detailed Topic	Periods	Total
			A	History of Microbiology, Microscopy and structure of Microbial cell	1	1
Aug	1	1	A I	Spontaneous generation		
			A ii	Germ theory of disease	1	2
			A iii	Contribution of Antony Van Leuwenhoek		
			A iv	Louis Pasteur	1	3
			A v	Robert Koch		
			A vi	Edward Jenner	1	4
			A vii	Winogradsky		
Aug	2		A viii	Beijerinck	1	5
			A ix	Alexander Flemming		
			A x	Waksman	1	6
			A xi	Development in modern biology .		
Sept	3		B	Principles & working of Microscopy		
			B I	Bright field microscope	1	7
			B ii	Flourescent microscope		
			B iii	Phase contrast microscope	1	8
			B iv	Electron microscope and Units of microscopic me	1	9
			B v	Application & importance of above microscopes		
			B vi	Measurement of microscopic objects.	1	10
			B vi	Prokaryotic cell.	1	11
				Cell wall of bacteria	1	12
			B viii	Cell membranes, Flagella, Pili, & Capsular structures		
Sept	4		C I	Chemical structure of peptidoglycan.	1	13
			C ii	Protoplasts, Spheroplasts.	1	14
			C iii	Ribosomes & ribosomal RNAs	1	15
			C iv	Nuclear material/Nucleus.	1	16
Sept	5		C v	Eukaryotic Cell	1	17
			C vi	Organization and function of cellular organelles	1	18
		2	A	Methods of Sterilization :		
				Physical methods : Dry heat, Moist heat, Radiation & Filtration methods, Dessication, Osmotic pressure,		
			A I	Chemical methods of sterilization & their application.	2	20
Sept	6		A ii	Concept of containment facility.	1	21
			A iii	Sterilization at industrial level.	1	22
			A iv	Microbial cultures ; Concept of pure cultures.	1	23
			B	Methods of pure culture isolation.	1	24
Sept	7		B I	bacteria and accessing non culturable bacteria.	2	26
			B ii	Single cell isolation & Pure culture development.	1	27
			B iii		1	28

(Signature)

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

			C	Preservation and maintenance		
Oct	8		C I	Repeated sub culturing, Preservation at low temperature, Sterile soil preservation, Mineral oil preservation	2	30
			C ii	Deep freezing & liquid Nitrogen preservation.	1	31
			C iii	Freeze-drying (Lyophilization)		
			C iv	Advantages and disadvantages of each method.	1	32
		3	A	Identification methods & Classification of bacteria		
Oct	9		A I	Microscopic identification characteristics	1	33
			A ii	Staining methods :- Simple staining, Differential staining, Structural staining & Special staining methods.	1	34
			A iii	Ecological identification methods	1	35
			A iv	Nutritional (cultural) identification methods	1	36
			A v	Chemical identification methods.		
Oct	10		A vi	Biochemical identification methods	1	37
			A vii	Immunological character identification		
			A viii	Pathogenic properties identification.		
			A ix	Genetic characters identification	2	39
			B	Principles of Bacterial Taxonomy & classification	1	40
Nov	11		B I	Numerical taxonomy	1	41
			B ii	importance. Phylogenetic analysis	2	43
			B iii	General properties of bacterial group.	1	44
Nov	12		C	Rickettsia- General characters & their importance.	2	47
			C I	Mycoplasma- General characters.	1	48
Nov	13		C ii	Chlamydia- TRIC agents & LGV, Archaeobacteria.	1	49
		4	A	Algae- General characters	1	50
			A I	Distribution of Algae	1	51
			A ii	Thallus organization	1	52
Nov	14		A iii	Products of Algae & their importance.	1	53
			A iv	Reproduction	1	54
			A v	Biochemical classification of Algae.	1	55
			B	Fungi- Vegetative body of Fungi.	1	56
Dec	15		B I	Reproduction	1	57
			B ii	Fruiting bodies & dispersal of Fungal propagules	1	58
			B iii	Nutritional groups & habitat relationships of Fungi	1	59
			B iv	Economic importance of Fungi Classification of Fungi. Anaerobic Fungi	1	60

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

GENERAL MICROBIOLOGY PRACTICALS

ACADEMIC YEAR 2015-2016 / SEM 1

SEMESTER I

Month	Week	Expt No.	Experiments	Classes	Total
Aug.	1	1	General instructions, Microbiology laboratory and its discipline,	1	1
Aug.	2	2	Caliberation and Measurement of Objects	1	2
Sep.	3	3	Preparation Media and Reagents	1	3
Sep.	4	4	Staining techniques: Simple/Differential	1	4
Sep.	5	5	Special Staining technique-spore	1	5
Sep.	6	6	Sterilization procedures	1	6
Sep.	7	7	Isolation and Cultivation of Pure Cultures	1	7
Oct.	8 TO 10	9	Isolation and Culturing of Fungi	2	10
Nov	11 TO 14	10	Isolation and Culturing of Algae	1	11
Dec	15	11	Observation of permanent slides	1	12



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

M.Sc. MICROBIOLOGY SEMESTER I(2015-2016)
VIROLOGY

Month	Week	Unit	Sub Unit	Detailed topic	No.of Periods	Total
August	1	1		History of virology	1	1
				Developments in modern virology	1	2
				Viral taxonomy (ICTV classification)	2	4
August	2			Virus structure and morphology	1	5
				Subviral particles-Prions, virusoids, satellite viruses.	1	6
				General idea about cyanophages, actinophages and mycophages	2	8
September	3			Cultivation of plant and animal viruses	2	10
				Purification and maintenance of viruses	3	13
September	4			Quantitation of viruses (viral assays)	2	15
		2		Structure, Genome organization and Mode of replication of Bacteriophages	1	16
September	5			One step growth curve	1	17
				Lytic ds linear DNA viruses (T4, T7);	3	20
September	6			Lysogenic ds linear DNA virus (Lambda);	3	23
				ss Circular DNA virus (Φ X 174);	1	24
September	7			Male specific filamentous phage (M13)	1	25
				Structure and Mode of replication of Plant Viruses	1	26
				TMV	2	28
October	8			CaMV	2	30
		3		Recombination in phages	3	33
October	9			multiplicity reactivation	1	34
				phenotypic mixing	1	35
October	10			General account of Tumor virus (RNA and DNA).	2	37
				Viral Interference and Interferons	1	38
				Nature and source of interferons,	1	39
				Classification of interferons	1	40
November	11			Induction of interferon	1	41
				Assays of interferons.	1	42

Adhe

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

November	12			Antiviral agents (chemical and biological) their mode of actions	3	45
		4		Structure and Mode of replication of animal viruses		
				Adeno	2	48
				Influenza	2	50
November	13			Retro viruses (HIV)	2	52
				Hepatitis B.	2	54
				Viruses as cloning vectors	1	55
November	14			Viral Vectors used for cloning and sequencing: λ phage, M 13, retro viruses	2	57
December	15			CaMV 35S promoter and its application in genetically modified crops	1	58
				Baculovirus System for insect cell lines.	2	60

Al dha

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

VIROLOGY PRACTICALS 2015-2016
SEMESTER I

Month	Week	Expt No.	Experiments	Classes	Total
August	1	1	Isolation of phage from soil	1	1
	2	2	Isolation of phage from Sewage	1	2
September	3	3	Cultivation and Preservation of phages	1	3
	4	4	Quantitation of phages	2	5
	5	5			
	6	6	Growth phases of phage and Burst size	1	6
	7	7	Isolation of plaque type and host range mutants	2	8
October	8	8			
	9	9	Phage induction	1	9
	10	10	Lysogeny-Transduction	1	10
November	11	11	Cultivation of animal viruses in egg- allantoic	1	11
	12	12	Cultivation of animal viruses in egg- amniotic	1	12
	13	13	Cultivation of animal viruses in egg- CAM	1	13
	14	14	Demonstration of cytopathological changes.	1	14
December	15	15	Symptomatic observations of plant viral infections.	1	15

[Handwritten Signature]

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

		BIOCHEMISTRY THEORY		2015 - 16	
		SEMESTER-I			
Paper IV MB104 Biochemistry (Theory) CBCS					
Month	week	Unit	Detailed Topic	No of Periods	Total
Aug	1	1	pH & its biological relevance.	2	2
			Determination of pH		
			preparation of buffers	2	4
			Types of Buffers		
Aug	2		Concept of entropy, free-energy, free energy changes	2	6
			High energy compounds	1	7
			Equilibrium constraints	1	8
Sep	3		Redox potentials	1	9
			Biological redox systems.	1	10
			Biological oxidation		
			Biological redox carriers.	1	11
			Biological membranes	1	12
Sep	4		Electron transport	2	14
			Oxidative phosphorylation & mechanism.	1	15
Sep	5	2	Lipid classification	2	17
			Bacterial lipids	1	18
			Prostaglandins: Structure & function.	1	19
			Major steroids of biological importance.	1	20
Sep	6		Carbohydrates: Classification	1	21
			basic chemical structure of monosaccharides	1	22
			aldoses & ketoses ,cyclic structure of monosaccharides.	1	23
			stereoisomerism, anomers and epimers	1	24
Sep	7		Sugar derivatives, deoxy sugars, amino sugars, and sugar acids	1	25
			Nucleic acids:		
			*structure & properties of purines & pyrimidines.	1	26
			*nucleosides& nucleotides.		
			Conformation of nucleic acids (DNA & RNA) secondary structures and supercoiling	2	28
			Metabolism of purines		
Oct	8		*biosynthesis & degradation of Pyrimidines	2	30
			biosynthesis & degradation of Purines.		

M. A. K.

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

		3	Proteins & Amino acids		
			*introduction	2	32
			*properties of amino acids		
Oct	9		Structure, conformation & properties of proteins	3	35
			Metabolism of amino acids		
Oct	9&10		Biosynthesis & degradation of amino acids an overview	4	39
			Enzymes nomenclature, classification		
Oct /Nov	10 &11		Methods for determination of enzyme activity	2	41
			Isolation and purification of enzymes		
Nov	11&12		substrate concentration , temperature and inhibitors.	4	45
			Mechanism of enzyme action – Action of Hydrolases, Pencillin acylases, Oxidases and reductases	4	49
Nov	12 &13	4	Coenzyme catalysis(pyridoxal phosphate and TPP).	2	51
			Isoenzymes.	2	53
			Competitive and non-competitive inhibition		
			Methods for increased microbial enzymes production and activity.	2	55
			Control of enzymes - Regulation of enzyme activity: allosteric enzymes and feed back mechanisms	3	58
Nov/Dec	14& 15		Metabolic compartmentalization in relation to enzyme,		
Dec	15		Enzymes and secondary metabolites	2	60

[Handwritten Signature]

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

BIOCHEMISTRY PRACTICALS

SEMESTER I

2015 - 16

I Semester Paper II MB 152 Biochemistry (Practicals) (CBCS)

Month	Week	Expt. No	Experiment	No. of Periods	Total
Aug	1	1	Safety and good lab practices	1	1
Aug/Sep	2&3	2	Preparation of buffers and adjustment of pH	2	3
Sep	4&5	3	Qualitative and quantitative tests for carbohydrates and analysis of unknowns	2	5
Sep	6&7	4	Qualitative and quantitative tests for amino acids and analysis of unknowns	2	7
Oct	8&9	5	Quantitative estimation of inorganic and organic phosphate	2	9
Oct/Nov	10&11	6	Tests for lipids (qualitative and quantitative)	2	11
Nov	12&13	7 & 8	Quantitative estimation of glucose and fructose	2	13
Nov/Dec	14&15	9&10	Determination of saponification value and iodine number of fats	2	15



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

		Research Methodology		2015-16	
		SEMESTER-I			
Paper III MB 103 Research Methodology & Techniques (Theory) (CBCS)					
Month	week	Unit	Detailed Topic	No of Periods	Total
			Optical methods:		
Aug	1	1	colorimetry and spectrophotometry	2	2
			fluorimetry	1	3
			optical rotation	1	4
	2		Circular dichroism,	1	5
			NMR, ESR spectroscopy	3	8
Sep	3		X-ray diffraction	1	9
			types of mass spectrometry.	2	11
Sep	3&4		Electrophoretic techniques and application	3	14
			counter current distribution	1	15
		2	Separation methods:		
Sep	4&5		Chromatographic techniques - HPLC, FPLC	2	17
			paper, thin layer	1	18
			ion exchange, gel filtration and affinity chromatography	2	20
Sep	6		Diffusion, dialysis	1	21
			cell disruption methods	1	22
			centrifugation techniques	2	24
Sep	7		cell free extracts and their use in metabolic studies.	1	25
			Radio isotopes		
			detection and measurement of radioactivity – scintillation counters, autoradiography	2	27
			Safety precautions		
			stable isotopes and their use	1	28
Oct	8		General method of study of intermediary metabolism in microbes	1	29
			Uses of mutants in study of metabolism:	1	30
		3	Biometry		
			Population, samples and sampling procedures	1	31
			variables, variations and frequency distributions	1	32
Oct	9		measures of central tendency and dispersion	2	34
			element of probability		
			gaussian or normal distribution, binomial distribution, poisson distribution, 't' distribution, 'F' distribution and Chi-square distribution	2	36
Oct	10		correlation and linear regression.	2	38
			Normal curve test, 't' test, 'F' test	2	40
Nov	11		ANOVA, analysis of covariance	2	42
			Chi-square test, and confidence intervals.	2	44
Nov	12		Experimental designs using statistical tools	1	45
		4	Computers		

Head of the Department
Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 094.

			Introduction to Windows	2	47
			Word Processing	1	48
Nov	13		Electronic Spread Sheet	1	49
			Data collection, Data representation, Data analysis	3	52
Nov	14		Manuscript preparation	2	54
			Research ethics	1	55
Nov/Dec	14&15		QA, QC	2	57
			GLP, GMP	2	59
			Patents & IPR	1	60

M. S. S.

Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.

I Semester Paper II MB152 Research Methodology and techniques (Practicals) CBCS
SEMESTER I

2015 - 16

Month	Week	Expt. No	Experiment	No. of Periods	Total
Aug	1	1	Absorption maxima of proteins, NA, Aromatic aa and riboflavin	1	1
Aug	2	2	Differential centrifugation	1	2
Sep	3	3	Paper chromatography: sugars	1	3
	4	4	Dialysis	1	4
	5	5	Demonstration of Gel filtration technique	1	5
	6	6	Demonstration of electrophoresis	1	6
	7	7	Partial purification of enzymes (β -amylase, urease and catalase, alkaline	1	7
October	8	8	Effect of substrate concentration, pH, time and temperature on enzyme activity	1	8
	9	9	enzyme	1	9
	10	10	Study for inhibition of enzyme activity	1	10
November	11	11	enzyme	1	11
	12	12	Study for inhibition of enzyme activity	1	12
	13	13	Creating documents using word processor	1	13
	14	14	Calculations and statistics (Biometry)	1	14
Dec	15	15	Biological data analysis using software	1	15



Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 094.