


GENERAL MICROBIOLOGY (PREVIOUS) SEMESTER(CBCS) THEORY					
Paper I MB GENERAL MICROBIOLOGY (CORE)(CBCS) SEMESTER I (2016-2017)					
Month	Week	Unit	Detailed Topic	Periods	Total
AUGUST	1	1	Pioneers of microbiology		
			Contribution of Antony Van Leuwenhoek		
			Louis Pasteur	1	1
			Robert Koch	1	2
			Edward Jenner		
			Winogradsky	1	3
	2		Beijerinck		
			Alexander Flemming		
			Waksman	1	4
AUGUST			Principles & working of Microscopy		
			Bright field microscope	1	5
			Flourescent microscope		
			Phase contrast microscope	1	6
	3		Electron microscope	1	7
			Application & importance of above microscopes		
			Measurement of microscopic objects.	1	8
AUGUST			Microbial cell structures		
			Prokaryotic cell.	1	9
			Eukaryotic cell.	1	10
AUGUST			Organisation & function of cellular organells		
	4		Cell wall of bacteria	1	11
			Cell membranes, Flagella, Pili, & Capsular structures	1	12
			Chemical structure of peptidoglycan.	1	13
	5		Protoplasts, Spheroplasts.		
			Ribosomes & ribosomal RNAs	1	14
			Nuclear material/Nucleus.		
AUGUST			Bacterial endospore structure ,biochemistry		
			and genetics of sporulation	3	17
AUGUST		2	Methods of Sterilization : Introduction		
			Physical methods : Dry heat, Moist heat,Radiation & Filtration methods.	2	19
			Chemical methods of sterilization & their application.	1	20
SEPT	6		Microbiological media-Autotriophic media ,defined	1	21
			synthetic mineral media ,heterotrophic media,		
SEPT			The concept of prototroph s and auxotrophs ,		
			prototrophic (minimal media),complex media		
			(un defined media)	1	22
SEPT			Microbial cultures ; Concept of pure cultures.	1	23
			Methods of pure culture isolation.	1	24
	7		Enrichment techniques.	1	25


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

			Single cell isolation & Pure culture development.	1	26
SEPT			Preservation and maintenance	1	27
			Repeated sub culturing, Preservation at low temperature, Sterile soil preservation, Mineral oil preservation		
			Deep freezing & liquid Nitrogen preservation.	1	28
	8		Freeze-drying (Lyophilization)	1	29
			Advantages & Disadvantages of each method.	1	30
SEPT		3	Identification methods & Classification of Bacteria	1	31
			Microscopic identification characters		
			Structural staining & Special staining methods.	1	32
SEPT			Ecological identification methods		
			Nutritional (cultural) identification methods		
			Chemical identification methods.	1	33
			Biochemical identification methods		
			Immunological character identification	1	34
SEPT	9		Pathogenic properties identification.	1	35
OCT			Genetic characters identification(16s RNA	1	36
OCT	10		Principles of Bacterial Taxonomy & Identification.Numerical taxonomy.Bergeys manual and its importance ,general properties	4	40
OCT			of bacterial groups .	1	41
	11		Microbial nutrition and metabolism -autotrophy-	1	42
OCT			photoautotrophy and bacterial photosynthesis	1	43
			chemoautotrophy and heterotrophic metabolism	2	45
	12	4	Microbial growth - The concept of growth & definition	1	46
OCT			elemental nutrients, supramolecules.	1	47
NOV	13		Organelles of cell & cellular components	2	49
	14		Cell cycle in microbes & generation times.	2	51
			stationary phase (idio phase), decline & survival of microbial	2	53
NOV			Synchronous cultures - Methods of synchronous culturing	1	54
	15		Continuous culturing methods,	1	55
NOV			Factors affecting growth	2	57
NOV	16		Methods of growth measurement.	3	60

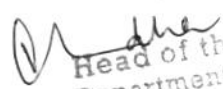
Handwritten signature

Department of Microbiology
 Sri Atya - Sri Venkateswara's Vivekananda College
 Sainikpuri, Secunderabad - 500 084.


M.Sc. MICROBIOLOGY SEMESTER I(2016)

VIROLOGY


Month	Week	Unit	Detailed topic	Periods	Total
August	1	1	History of virology (latest Scientific investigations),	2	2
			Viral classification and nomenclature (ICTV system of classification).	2	4
	2		Virus structure and morphology		
			Detection of viruses: physical, biological, immunological, serological and molecular methods.	3	7
	2&3		Isolation, purification, propagation, characterization, identification and quantification of bacteriophages, plant viruses and animal viruses	2	9
			Sub-viral particles: Discovery, structure, replication and diseases caused by satellites virus, viroids and prions.	2	11
	4		General idea about cyanophages, actinophages and mycophages.	2	13
			Metagenomics for virus characterization.	2	15
Aug	4&5	2	Virus replication Strategies: Principal events involved in replication: Adsorption, penetration, uncoating nucleic acid and protein synthesis, intracellular trafficking, assembly, maturation and release.	2	17
			Viral-host interaction, Host response to viral infection.	2	19
Sep	6		An Overview of Cellular interactions—clathrin coated pits, lipid rafts, endocytosis and virus uncoating mechanisms.	2	21
			Lambda	2	23
	6&7		T4 Bacteriophage,	2	25
			Morphology, Ultrastructure, Genome organization and Replication strategies of Adenovirus	1	26
			Banana bunchy top virus	1	27
			Reovirus	1	28
	8		TMV	2	30
			Influenza virus	1	31
			HIV	1	32
Sep	9		HBV	1	33
		3	Recombination in phages	3	36
			multiplicity reactivation	1	37
			phenotypic mixing	1	38


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

Oct	10&11		General account of Tumor virus (RNA and DNA).	2	40
			Viral Interference and Interferons	2	42
			Nature and source of interferons	1	43
			Classification of interferons	1	44
	12		Induction of interferons.	1	45
			Antiviral agents (chemical and biological) and their mode of actions	3	48
Nov	13	4	Introduction to viral vaccines	1	49
			preparation of vaccines	1	50
			Viruses as cloning vectors	2	52
	14		Vectors used for cloning and sequencing: λ phage, M13; retro viruses.	2	54
			CaMV 35S promoter and its application	1	55
			Baculovirus System for insect cell lines and its importance	1	56
	15		Silver lining: viruses as therapeutic agents	1	57
			viruses for gene delivery	1	58
			viruses to destroy other viruses	1	59
			Importance of studying modern virology	1	60


 Bharadwaj
 Sainikpuri, Secunderabad - 500 094.

Research Methodology & Techniques					
SEMESTER-I (2016-17)					
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
Aug	2		Circular dichroism,	1	5
			NMR, ESR spectroscopy	3	8
Aug	3		X-ray diffraction	1	9
			types of mass spectrometry.	2	11
Aug	3&4		Electrophoretic techniques and application	3	14
			counter current distribution	1	15
		2	Separation methods:		
Aug	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
Sep	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
Sep	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
Oct	11		ANOVA, analysis of covariance	2	42


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

			Chi-square test, and confidence intervals.	2	44
Oct	12		Experimental designs using statistical tools	1	45
		4	Computers		
			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	14&15		QA, QC	2	57
			GLP, GMP	2	59
			Patents & IPR	1	60

BIOCHEMISTRY PRACTICALS

SEMESTER I

2015 - 17

I Semester Paper III Biochemistry (Practicals) (CBCS)

Month	Week	Expt. No	Experiment	No. of Periods	Total
June	1		Safety and good lab practices	4	4
july	2		Preparation of buffers and adjustment of pH	4	8
	3		Qualitative and quantitative tests for carbohydrates and analysis of unknowns	4	12
	4		Qualitative and quantitative tests for amino acids and analysis of unknowns	4	16
Aug	5		Quantitative estimation of inorganic and organic phosphate	4	20
	6		Tests for lipids (qualitative and quantitative)	4	24
	7		Quantitative estimation of glucose and fructose	4	28
	8		Determination of saponification value of fats	4	32
	9		Partial purification of enzymes - β -amylase	4	36
Sep	10		Partial purification of enzymes - urease	4	40
	11		Partial purification of enzymes - catalase	4	44
	12		Effect of substrate concentration, pH, tie and temperature on enzyme activity	4	48
Oct	13		Calculation of Km for partially purified enzyme	4	52
	14		Study for inhibition of enzyme activity	4	56
	15		Record	4	60

M. A. K.

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

SEMESTER I


2016 - 17

Month	Week	Expt. No	Experiment	No. of Periods	Total
Aug	1		Absorption maxima of proteins, NA, Aromatic aa and riboflavin	4	4
Aug	2		Differential centrifugation	4	8
	3		Paper chromatography: sugars	4	12
	4		Dialysis	4	16
	5		Demonstration of Gel filtration technique	4	20
Sep	6		Demonstration of electrophoresis	4	24
	7		Partial purification of enzymes (β -amylase, urease and catalase, alkaline phosphatase)	4	28
	8		Effect of substrate concentration, pH, time and temperature on enzyme activity	4	32
	9		Calculation of K_m for partially purified enzyme	4	36
Oct	10		Study for inhibition of enzyme activity	4	40
	11		Calculation of K_m for partially purified enzyme	4	44
	12		Study for inhibition of enzyme activity	4	48
Nov	13		Creating documents using word processor	4	52
	14		Calculations and statistics (Biometry)	4	56
	15		Biological data analysis using software	4	60

[Signature]

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 017

Microbial Biochemistry THEORY					
SEMESTER-I					
Paper IV Biochemistry (Theory) CBCS restructured PMB 2016 -17					
Month	week	Unit	Detailed Topic	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
Aug	3		Redox potentials	1	9
			Biological redox systems.	1	10
			Biological oxidation		
			Biological redox carriers.	1	11
			Biological membranes	1	12
Aug	4		Electron transport	2	14
			Oxidative phosphorylation & mechanism.	2	16
Aug	5		Lipid classification	2	18
			Bacterial lipids		
			Prostaglandins: Structure & function.	1	19
			Major steroids of biological importance.	1	20
Sep	6	2	Carbohydrates: Classification	2	22
			basic chemical structure of monosaccharides		
			aldoses & ketoses ,cyclic structure of monosaccharides.		
			stereoisomerism, anomers and epimers	2	24
			Sugar derivatives, deoxy sugars, amino sugars, and sugar acids		
Sep	7		Respiration (Aerobic and anaerobic) and fermentation. Glycolysis (EMP, HMP and ED) pathways. TCA Cycle and its integration	2	26
			Nucleic acids:		
			*structure & properties of purines & pyrimidines.	2	28
			*nucleosides & nucleotides.		
			Metabolism of purines		
Sep	8		*biosynthesis & degradation of Pyrimidines	2	30
			biosynthesis & degradation of Purines.		



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		
Sep	9		Structure, conformation & properties of proteins	2	34
			Metabolism of amino acids		
Oct	10		Biosynthesis & degradation of amino acids -an overview	4	38
			Enzymes nomenclature, classification	2	40
Oct	11		Methods for determination of enzyme activity	2	42
			Isolation and purification of enzymes		
Oct	12		Enzyme kinetics: Effect of pH, substrate concentration, temperature and inhibitors.	4	44
Nov	13	4	Mechanism of enzyme action – Action of Hydrolases, Oxidases and reductases	4	48
			Coenzyme catalysis(pyridoxal phosphate and TPP).	2	52
Nov	14		Isoenzymes.	2	54
			Competitive and non-competitive inhibition		
	15		Methods for increased microbial enzymes production and activity.	2	56
Nov	15		Control of enzymes - Regulation of enzyme activity: allosteric enzymes and feed back mechanisms	4	60
			Metabolic compartmentalization in relation to enzyme,		
Nov	16		Enzymes and secondary metabolites	2	62


He...
 D...
 Bh...
 S...

MOLECULAR BIOLOGY & MICROBIAL GENETICS THEORY
SEMESTER II 2016

Month	Week	Unit	Sub.Unit	Detailed Topic	No.of Periods	Total
Dec	1		A I	Detailed Structure of DNA,Z-DNA,A & B DNA	2	2
			A ii	Denaturation & Melting Curves.	2	4
Jan	2		A iii	Genomic Organization in Prokaryotes & Eukaryotes.	2	6
			Aiv	Enzymes invovled in Replication.:	2	8
Jan	3.00		Av	Modes of DNA Replication: Detailed mechanism of Semiconservative replication	2	10
				Plasmids : Classification,Properties and replication.	2	12
			F	Eukaryotic telomeres & its Replication.		
Jan	4	II		Prokaryotic &Eukaryotic Transcription.	4	16
Jan	5		A	RNA Stucture and processing	4	20
			A i	m-RNA		
			Aii	r-RNA		
			A iii	t- RNA .		
			B	Ribozyme	2	22
			B I	The Genetic Code & Wobble Hypothesis.		
Feb	6		B ii	Post Translation Modification	2	24
			B iii	Translation in Prokaryotes & Eukaryotes.	2	26
			B iv	Gene regulation & expression		
Feb	7		C	Lac operon,arabinose and tryptophan Operon	2	28
			D	Gene regulation in eukaryotic systems	2	30
			E	repetitive DNA		
Feb	8		E I	Gene rearrangements	2	32
				Promoters		
			E ii	Enhancer elements		
Feb	9	III	A	Mutagenesis:	4	36
			A i	Types of Mutagens		


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

			A ii	Molecular Basis of Mutations.		
			A iii	Analysis of Mutations		
March	10		A iv	Site directed Mutagenesis & Reverse Genetics.	4	40
				Detailed mutagenesis and repair mechanism of UV ,Ethidium bromide and Nitrous oxide	2	42
March	11		A v	DNA damage & Repair Mechanisms	2	44
			B	Isolation and application of Mutants	2	46
March	12		C	Transposable elements- defination	2	48
			D ii	Types of bacterial transposons		
			E	Applications of Transposons	2	50
March	13	IV	A I	Bacterial Recombinations- Discovery ,gene transfer ,molecular mechanism ,detection ,efficacy calculation and application	2	52
			A iii	Bacterial Transformation- Competency and ressistance		
March	14		B	Bacterial Conjugation:	4	56
			B I	Sex Factors in bacteria		
			B ii	F & Hfr transfer		
			B iv	Linkage mapping.		
March	15		C	Bacterial Transduction :	4	60
			C I	Transduction Phenomena		
			C ii	Methods of Transduction		
			C iii	Cotransduction		
April	16		C iv	Generalized, Specialed & Abortive Transduction.	2	62
			C v	Sex ductions .		


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

Semester-II Molecular Biology and Microbial Genetics-2016

Month	Week	Expt. No	Experiment	No of periods	Total
December & January	1&2	1	Extraction of DNA of Genomic DNA from Bacteria and Yeast	8	8
January	3	2	Estimation of DNA.	4	12
January	4	3	Estimation of RNA.	4	16
January	5	5	Determination of Molecular Weight of DNA, resolved on agarose gel electrophoresis.	4	20
February	6	6	Determination of Molecular Weight of Protein by PAGE.	4	24
February	7&8	7	Induction of Mutations by Physical/ Chemical Mutagens ,Screening & Isolation of Mutants.	8	32
February	9&10	8	Replica Plate Technique .	8	40
March	11&12	9	Transformation in Bacteria .	8	48
March	13	10	Conjugation in Bacteria.	4	52
March	14	11	Protoplast Preparation & Regeneration.	4	56
March	15	12	Calculations and record correction	4	60

(Handwritten Signature)

ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY THEORY

II - SEMESTER ■ - 2017

Month	Week	Unit	Detailed Topic	No. of Periods	Total
Dec	1	1	Microorganisms in air and their importance	2	2
			Sampling of Air	2	4
Dec	2		Microbes and sources of water Pollution	1	5
			Water-borne pathogenic microorganisms and their transmission	2	7
Dec	3		Sanitary quality of water.	1	8
			Water pollution due to degradation of organic matter	2	10
			Sewage treatment - Overview	1	11
			Aerobic sewage treatment	1	12
Jan	4		Oxidation ponds, trickling filters	1	13
			Activated sludge treatment	1	14
			Anaerobic sewage treatment – Septic tank	1	15
Jan	4&5	2	Xenobiotics	2	17
Jan	6		Bioremediation technologies: <i>in situ</i> and solid phase; <i>ex situ</i> and bioreactors	5	22
			Microbial remediation of metals,	2	24
Jan	7		Molecular techniques in bioremedia	2	26
			activity of microbes in environment	2	28
Feb	8		Microbial biodegradation of organic pollutants.	2	30
		3	Degradation of carbonaceous materials in soil -Introduction	1	31
Feb	9		Cellulose	2	33
			Hemicellulose	1	34
			Lignin	2	36
Feb	10		Pectin	1	37
			Factors governing the decomposition and biochemistry of	1	38
			Soil humus formation	2	40
Feb	11		Ammonification,	2	42

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhawan's Vivekananda College
 Sainikpuri Secunderabad, 500 014


			Denitrification – microbes involved, factors influencing and the mechanism of denitrification	2	44
March	12		Nitrate pollution	1	45
		4	Nitrogen fixation – Overview	1	46
			Asymbiotic nitrogen fixation	1	47
March	12&13		Symbiotic nitrogen fixation	2	49
			Microbes involved in Nitrogen fixation	1	50
			Biochemistry of nitrogen fixation	1	51
			Genetics of Nitrogen fixation	1	52
March	14		Ecological and economic importance of nitrogen fixation.		
			Biofertilizers – bacterial fertilizers	1	53
		4	Production of rhizobial inoculants	1	54
			Production of blue-green algae	1	55
			Quality control tests	1	56
			Microbes and plant interactions		
March	15		Rhizosphere	1	57
			PGPRs	1	58
			Phyllosphere	1	59
			Mycorrhizae.	1	60

Handwritten signature

Pharmaceutical Microbiology Paper IV MB 204					
SEMESTER II		2016-2017			
Month	Week	Unit	Detailed Topic	No. of Periods	Total
DEC	1	1	Microorganisms affecting pharmaceutical industry :		
			The atmosphere, water, skin & respiratory flora of personnel, raw-materials, packing, equipments, building, utensils etc.	4	4
Dec	2		Types of microorganisms occurring in pharmaceutical products.		
			Microbiological spoilage preservation of pharmaceutical products –	4	8
			Microbial spoilage,		
			preservation of pharmaceutical products		
Dec	3		antimicrobial agents used as preservatives	4	12
			Evaluation of the microbial stability of formulation		
Jan	4		Good manufacturing practices and hygiene in industry and hospital	3	15
		2	Non-Medicinal antimicrobial agents –		
Jan	5		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:		
Jan	7		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 –		
Feb	8		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.

Feb	9	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 –		
FEB	10,11	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 –		
March	12	Biological antiviral agents- interferon and its action	2	43
		chemical antiviral agents.	2	45
	4	The drug resistance –		
March	13	The phenomenon, clinical basis of drug resistance, biochemistry of drug resistance, genetics of drug resistance in bacteria.	4	49
		Microbiological assays:		
March	14	Assay for non-medicinal antimicrobials (Phenol coefficient/RWC).	3	52
		Drug sensitivity testing methods and their importance	2	54
		Assay for antibiotics –		
March	15	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 and Pharmacogenomics	3	60


Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 084.

Pharmaceutical Microbiology PRACTICALS

SEMESTER II

2016-2017


Month	Week	Expt. No	Experiment	No. of Periods	Total
Dec	1	1	Sterility testing methods for pharmaceutical products	6	6
Dec/Jan.	3 & 4	2	Tests for disinfectants (Phenol coefficient/RWC)	6	12
Jan.	5	3	Determination of antibacterial spectrum of drugs/antibiotics	6	18
Jan.	6	4	Chemical assays for antimicrobial drugs	6	24
Jan.	7	5	Testing for antibiotic/drug sensitivity/resistance	6	30
Feb	8	6	Determination of MIC valued for antimicrobial chemicals	6	36
Feb	9	7	Microbiological assays for vitamins/amino acids	6	42
Feb/March	10 & 11		Microbiological assays for antibiotics (Liquid tube assay, agar tube assay, agar plate assays)		
Mar	12 & 13	8	Efficacy testing of preservatives like parabens.	3	45

Moh

II SEMESTER PRACTICALS PAPER IV PMB 053

IMMUNOLOGY AND PHARMACEUTICAL MICROBIOLOGY (CBCS) ACADEMIC YEAR ~~2017-2018~~ (2016-17)

EXP NO	Month	Week	Experiments	No. of Periods	Total
1	DEC	1	Agglutination reactions		
			– Widal	5	5
		2	VDRL,	5	10
	JAN		HA, Blood typing		
			tube method Precipitation test: Ring interphase,		
			single radial diffusion.	5	15
2		3	Ouchterlony double diffusion.	5	20
3	JAN		Immuno-electrophoresis	5	25
4		4	Neutralization test – Plaque neutralization, Haeme adsorption test.	5	30
5		5	WBC and RBC count and differential blood picture.	2	32
6	JAN	6	Separation of serum proteins.	3	35
7		7	Blot transfer and detection of protein on blot by staining	2	37
8		8	ELISA		
9		9	Purification of IgG from serum		
10		10	Lymphocyte culture, viable staining and haemocytometer count	3	40
11	JAN	11	Indirect agglutination (Pregnancy hCG Ag)	5	45
12		12	Sterility testing methods for pharmaceutical and cosmetic	5	50
13	FEB	13	Tests for disinfectants (Phenol coefficient/RWC)	5	55
14		14	Determination of antibacterial spectrum of drugs/antibiotics		
15	FEB	15	Chemical assays for antimicrobial drugs	5	60
16		16	Testing for antibiotic	5	65
			drug sensitivity/resistance	5	70
17		17	Determination of MIC valued for antimicrobial chemicals		
18		18	Microbiological assays for antibiotics		
	FEB		Liquid tube assay	5	80
		14	agar tube assay	2	55
	FEB		agar plate assays)	5	85
19	MARCH	19	Efficacy testing of preservatives like parabens	5	90


 Head of the Department
 Department of Microbiology
 Bharatiya Vidya Sahasra's Vishwananda
 Jainikpuri, Secunderabad 500004

IMMUNOLOGY

2016-17

Month	Week	Unit	Topic	No of periods	Total
Dec	1	I	History of immunology. Hematopoiesis, Cell lineage	2	2
Jan	1&2		components of immune system, cells and organs of immune system.	5	7
	2&3		Antigens –Nature, properties and types. Haptens	2	9
	3		Antibody -Structure , functions and classification. Isotypes, allotypes and idiotypes	2	11
	3&4		Immunoglobulin genes. Generation of antibody diversity. Clonal nature of the immune response - clonal selection theory. T cell and B cell receptors.	4	15
	4&5	II	Overview of Innate and adaptive immunity	2	17
Jan&Feb	5&6		T cell B cell interactions. Complement, classic and alternative pathways and function Immunological tolerance-central and peripheral	4	21
	6		Major Histocompatibility Complex (MHC). Human leucocyte antigen (HLA) restriction Processing and presentation of antigen by MHC. Transplantation immunity,	3	24
	7		Autoimmune diseases .Complemental action. Inflammation,	3	27
	7&8		Hypersensitivity - immediate and delayed type hypersensitivity reactions.	3	30
	8&9	III	Antigen and antibody reactions– Agglutination, Precipitation, neutralization ,Complement fixation, classic and alternative pathways and function	4	34
Feb	9&10		Labeled antigen-antibody reactions- ELISA, RIA, immune blot, immunofluorescence, cell sorting-flow cytometry	5	39
	10,11&12		Development of immuno diagnostic kits. Specific examples –Blood typing, WIDAL, VDRL, HIV TESTS hCG for pregnancy. Types of vaccines and principles of Immunization.	6	45
	12	IV	Hybridoma techniques and monoclonal antibody production - Myeloma cell lines,	3	48

[Handwritten Signature]

IMMUNOLOGY 2016-17

			fusion of myeloma cells with antibody producing B-cells, fusion methods		
March	13		Selection and screening methods for positive hybrids, cloning methods. Production, purification and characterization of monoclonal antibodies	3	51
	14		Applications of monoclonals in biomedical research, clinical diagnosis and treatment	4	55
	15		Tumor immunology. Immuno diagnosis and immune therapy of cancer. Immunological tolerance & immunosuppression, congenital immunodeficiencies, Immunodeficiency diseases.	5	60

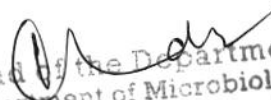
ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY THEORY
SEMESTER III - 2016 -17

Month	Week	Unit	Detailed Topic	No. of Periods	Total			
June	1	1	Microorganisms in air and their importance	2	2			
			Sampling of Air	2	4			
July			Microbes and sources of water Pollution	1	5			
			Water-borne pathogenic microorganisms and their transmission	2	7			
			Sanitary quality of water.	1	8			
			Water pollution due to degradation of organic matter	2	10			
			Sewage treatment - Overview	1	11			
			Aerobic sewage treatment	1	12			
			Oxidation ponds, trickling filters	1	13			
			Activated sludge treatment	1	14			
			Anaerobic sewage treatment - Septic tank	1	15			
			August		2	Xenobiotics	2	17
Bioremediation technologies: <i>in situ</i> and solid phase; <i>ex situ</i> and bioreactors	5	22						
			Microbial remediation of metals, Molecular techniques in bioremediation	2	24			
			activity of microbes in environment	2	26			
			Microbial biodegradation of organic pollutants.	2	28			
			Degradation of carbonaceous materials in soil -Introduction	2	30			
			Sep		3	Cellulose	1	31
						Hemicellulose	2	33
						Lignin	1	34
				7		Pectin	2	36
Factors governing the decomposition and biochemistry of	1	37						
Soil humus formation	1	38						
Ammonification,	2	40						
	2	42						

Adha

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

			Denitrification – microbes involved, factors influencing and the mechanism of denitrification	2	44
	8&9		Nitrate pollution	1	45
Oct	10	4	Nitrogen fixation – Overview	1	46
			Asymbiotic nitrogen fixation	1	47
			Symbiotic nitrogen fixation	2	49
	11		Microbes involved in Nitrogen fixation	1	50
			Biochemistry of nitrogen fixation	1	51
			Genetics of Nitrogen fixation	1	52
			Ecological and economic importance of nitrogen fixation.	1	53
	12		Biofertilizers – bacterial fertilizers	1	54
	13	4	Production of rhizobial inoculants	1	55
			Production of blue-green algae	1	56
			Quality control tests	1	57
	14		Microbes and plant interactions	1	58
			Rhizosphere	1	59
	14&15		PGPRs	1	60
Nov			Phyllosphere	1	61
			Mycorrhizae.	1	62


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



SOIL MICROBIOLOGY PRACTICALS
SEMESTER III (2016)- 17

Month	Week	EXPERIMENT	No. of Periods	Total
June	1	Isolation and observation of air microflora .	4	4
July	2	Enumeration of Soil Microbes (Bacteria, Actinomycetes & Fungi) by Standard Plate Count .	4	8
	3	Estimation of Soil Microbial Activity by CO ₂ Evolution	4	12
August	4	Isolation of cellulose decomposing microbes & estimation of cellulase activity.	4	16
	5	Estimation of Ammonifiers, Nitrifiers & denitrifiers in soil by MPN method.	4	20
	6&7	Isolation and culturing of Rhizobium sp. From root nodules & Azospirillum from grasses (Cyanodon).	8	28
September	8	Biological enrichment, isolation of Rhizobium from soil by Leonard jar experiment.	4	32
	9	Nodulation testing by tube/jar method	4	36
		algae/algal biofertilizers		
	10	Estimation of N ₂ fixation (Micro Kjeldahl method/GC method)	4	40
	11	Estimation of BOD	4	44
	12	Testing for microbial sanitary quality of water (coliform test)	4	48
October	13	Bioremediation- <i>insitu</i> , solid phase and bioreactors	4	52
	14	Isolation and observation for phyllosphere microflora	4	56
	14	Isolation and observation for rhizosphere microflora		
	15	Observation for mycorrhizae	4	60
	16	Effect of pesticides on microbial activity	4	64

Adhik

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

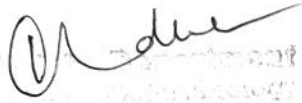
MEDICAL BACTERIOLOGY THEORY
SEMESTER III (2016)-17

Month	Week	Unit	Sub.Unit	Detailed Topic	Periods	Total
June	1	1	A	Principles of Medical Microbiology : Classification of Medically important Microbes.	4	4
July	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
July	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
Aug	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.		
Aug	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
	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
Aug	8		B	Bacterial Air Borne Infection:	1	29
			B I	β - Hemolytic Streptococci	2	31
			B ii	Pneumococci	1	32
Sep	9		B iii	Corynebacterium diphtheriae	1	33
			B iv	Mycobacterium tuberculosis	2	34
Sep	10		B v	Mycobacterium leprae	1	35
			B vi	Neisseria meningitidis.	2	37
Sep	11		B vii	Hemophilus influenzae.	2	39
			C	Sexually transmitted diseases caused by bacteria;	2	41

[Handwritten Signature]

[Handwritten Signature]
Head of the Department
Department of Microbiology
Bharatiya Vidya Bhavan's Vivekananda College
Sainikpuri, Secunderabad - 500 064.

Sep	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.		
Oct	13		B	Water Borne Infections:	1	46
			B I	E.coli	1	47
			B ii	Salmonella typhi	2	49
Oct	14		B iii	Shigella dysenteriae	1	50
			B iv	Vibrio cholera	2	52
			C	Wound Infections	1	53
Oct	15		C I	Staphylococcus aureus	2	55
			C ii	Clostridium tetani	2	57
			C iii	Clostridium welchii	2	59
			C iv	Pseudomonas	1	60


 Head of Department
 Department of Microbiology
 Government College Hospital
 Bangalore



Medical Microbiology - Practicals
SEMESTER III (2016) -17

Month	Week	S.No.	Experiments	No. of classes	Total periods
June	1	1	Preparation of different types of culture media/observation	4	4
			Types of culture media.		
			*Blood Agar, Chocolate agar		
			*Mannitol salt agar.		
			*Baired parker media.		
July	2		*MacConkey agar.	4	8
			*Lowenjein.		
			*Jensen media.		
			*Wilson & Blair bismuth sulphite media		
July	3		*Biochemical media.	4	12
Aug	4	2	Staining technique		
Aug	5		*Gram staining	4	16
Aug	6		*A F B staining	8	24
Aug	7		*Albert staining	4	28
Sep	8		*Capsular staining	4	32
Sep	9&10	3	pathogenic bacteria by microscopic, macroscopic, biochemical, enzymatic & serological tests (coagulase, catalase,	8	40
Sep	11,12	4	Bacteriological examination of different specimens from patients for diagnosis.	8	48
Sep	13		*Urine	4	52
Oct	14		*Pus	4	56
Oct	15		*Throat swab.	4	60

Handwritten signature

Handwritten signature

Department of Microbiology
 Rajawade Medical College
 Rajawade, Bangalore

**MOLECULAR BIOLOGY & MICROBIAL GENETICS THEORY
SEMESTER III**

2016 -Autonomous batch						
Month	Week	Unit	Sub.Unit	Detailed Topic	No.of Periods	Total
June	1		A I	Detailed Structure of DNA,Z-DNA,A & B DNA	2	2
			A ii	Denaturation & Melting Curves.	1	3
July	1/2		A iii	Genomic Organization in Prokaryotes & Eukaryotes.	2	5
			Aiv	Enzymes invovled in Replication.:	2	7
July	03-Feb		Av	Modes of DNA Replication: Detailed mechanism of Semiconservative replication	2	9
				Plasmids : Classification,Properties and replication.	2	11
	3		F	Eukaryotic telomeres & its Replication.	1	12
Aug	4	II		Prokaryotic &Eukaryotic Transcription.	4	16
Aug	5		A	RNA Structure and processing	4	20
			A i	m-RNA		
			Aii	r-RNA		
			A iii	t- RNA .		
			B	Ribozyme	2	22
Aug	6		B I	The Genetic Code & Wobble Hypothesis.	1	23
			B ii	Post Translation Modification	1	24
Aug	7		B iii	Translation in Prokaryotes & Eukaryotes.	2	26
			B iv	Gene regulation & expression		
Sep	7/8		C	Lac operon,arabinose and tryptophan Operon	3	29
			D	Gene regulation in eukaryotic systems	2	31
			E	repetitive DNA		
	8/9		E I	Gene rearrangements	2	33
				Promoters		
			E ii	Enhancer elements		
Sep	9/10	III	A	Mutagenesis:	4	37
			A i	Types of Mutagens		
	11/12		A v	DNA damage & Repair Mechanisms	2	45
			B	Isolation and application of Mutants	1	46
			C	Transposable elements- defination	1	47
OCT	12/13		D I	Detection of transposition in bacteria	2	49
			D ii	Types of bacterial transposons		
			E	Applications of Transposons		
	13	IV	A I	Bacterial Recombinations- Discovery ,gene transfer ,molecular mechanism ,detection ,efficacy calculation and application	4	53
			A iii	Bacterial Transformation- Competency and rersistance		
Oct	14		B	Bacterial Conjugation:	4	57
			B I	Sex Factors in bacteria		
			B ii	F & Hfr transfer		
			B iv	Linkage mapping.		
Oct	14/15		C	Bacterial Transduction :	3	60

Adhwa

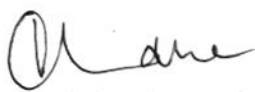
Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500024

		C I	Transduction Phenomena		
		C ii	Methods of Transduction		
		C iii	Cotransduction		
	15	C iv	Generalized, Specialized & Abortive Transduction.	4	
		C v	Sexductions .		64


 Head of the Department
 Department of Microbiology
 Bharathi College
 24.



Semester -III Molecular biology and Microbial Genetics Practicals -2016 - 17					
Month	Week	Expt.No	Experiment	No.of Periods	Total
June/july	1,2	1	Isolation of genomic DNA from E.coli & yeast	8	8
July	3	2	Estimation of DNA	4	12
August	4	3	Estimation of RNA	4	16
August	5	4	Estimation of Protein	4	20
August	6	5	Determination of Molecular weight of DNA ,resolved on Agarose gel electrophoresis	4	24
August	7	6	Induction of enzymes-Lac operon	4	28
September	8	7	Determination of molecular wt. of protein by SDS-PAGE	4	32
September	9&10	8&9	Induction of mutations by physical/chemical mutagens, isolation and screening of mutations	8	40
September	11&12	10	Replica plating	4	44
October	13&14	11& 12	Transformation in Bacteria	8	52
October	15	13	Conjugation in Bacteria	4	56
October	16	14	Protoplast Preparation & regeneration	4	60


 Head of the Department
 Department of Microbiology
 Bharatiya Mahatma Jayan's Vivekananda College
 Sainikpally, Secunderabad - 500 094.



Semester -III Molecular biology and Microbial Genetics Practicals -2016

Month	Week	Expt.No	Experiment	No.of Periods	Total
June/july	1,2	1	Isolation of genomic DNA from E.coli & yeast	2	2
July	3	2	Estimation of DNA	1	3
August	4	3	Estimation of RNA	1	4
August	5	4	Estimation of Protein	1	5
August	6	5	Determination of Molecular weight of DNA ,resolved on Agarose gel electrophoresis	1	6
August	7	6	Induction of enzymes-Lac operon	1	7
September	8	7	Determination of molecular wt. of protein by SDS-PAGE	1	8
September	9&10	8&9	Induction of mutations by physical/chemical mutagens, isolation and screening of mutations	2	10
September	11&12	10	Replica plating	1	11
October	13&14	11& 12	Transformation in Bacteria	2	13
October	15	13	Conjugation in Bacteria	1	14
October	16	14	Protoplast Preparation & regeneration	1	15

Handwritten signature

M.Sc.(FINAL) III SEMESTER-MICROBIOLOGY

PAPER II PMB:302U INDUSTRIAL MICROBIOLOGY(THEORY) ACADEMIC YEAR 2016-2017

Month	Week	Unit No	Sub Unit	Topic	No. of Periods	Total
				Introduction to Industrial Microbiology		
JUN	1	1	A	Definition ,Scope and History	3	3
				Properties of Industrial Microorganisms Industrial Products	1	4
JUL	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
JUL	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
JUL	4			Agitation	1	13
				Aeration	1	14
				Antifoam	1	15
				pH and temperature control.	1	16
JUL	5		A	Inoculum media AND Inoculum preparation		
		2		Inoculum media	2	18
				Inoculum preparation	2	20
AUG	6		B	Raw materials		
				Saccharine, Starchy& Cellulosic materials.	4	24
AUG	7		C	Fermentation media & Sterilization.	2	26
			D	Types of Fermentation Processes:		
				Solid State Fermentation.	2	28
AUG	8			Surface Fermentation	2	30
				Submerged Fermentation	2	32
AUG	9	3	A	Batch , Fed- batch Fermentation	1	33
				Continuous Fermentation	1	34
SEP	10		B	Direct, Dual or multiple Fermentation	2	36
			C	Scale up of fermentations	4	40

(Handwritten signature)

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

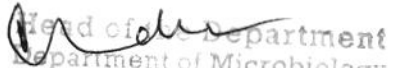
SEP	11		E	Product recovery methods	4	44
			D	Fermentation type reactions :		
				Alcoholic Type	1	45
				Mixed Acid Type	1	46
				Propionic Acid Type	1	47
OCT	12			Butanediol Type&Acetone-Butanol Type	1	48
OCT	13	4	A	Strain development : - strategies Environmental factors for	4	52
OCT	14			Genetic factors for improvement	4	56
OCT/NOV	15		B	Immobilization methods :	4	60
				Advantages and disadvantages		
				Adsorption		
				Covalent linkage		
				Cross linkages		
				Entrapment		

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

Adha

**M.Sc.(FINAL) III SEMESTER-MICROBIOLOGY
PAPER II PMB:302U IND MB (PRACTICALS)**

Month	Week	Experiments	No. of Periods	Total
JUNE/ JULY	1&2	Screening for Amylase producing organisms	8	8
JULY	3&4	Isolation of Antibiotic producing organisms by crowded plate technique	8	16
JULY/ AUGUST	5&6	Screening for Organic acid producing organisms	4	20
AUGUST	7	Isolation & Culturing of Yeasts .	4	24
AUGUST	8	Seperation of amino acids by chromatography	4	28
SEPTEMBER.	9	Estimation of glucose by DNS method	4	32
SEPTEMBER.	10,11&12	Estimation of Ethanol by Dichromate method	12	44
OCTOBER	13	Estimation of maltose	4	48
NOVEMBER	14&15	Immobilisation of microbial cells by Entrapment method.	12	60


 Head of Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500 084.




CELL AND MOLECULAR BIOTECHNOLOGY THEORY

SEMESTER IV

2016-2017

Month	Week	Unit	Sub.Unit	Detailed Topic	No.Of Periods	Total
Dec	1	1	a	Cell cycle: Cell division regulation and cancer	4	4
			b	Role of protein Kinases in cell cycle		
Dec	2		d	Programmed cell death	4	8
			e	Geno toxicity assays.		
Dec	3		f	Signal transduction : G- Protein linked receptors	4	12
			g	Concept of second messenger, cAMP & cGMP.		
Jan	4		h	Steroid/peptide hormone regulation	4	16
			i	tissue specific regulation		
			j	Protein folding and the roles of Molecular chaperones.		
Jan	5	2	a	Vectors in Molecular Biology	4	20
			b	Artificial chromosomes		
			c	Enzymes		
			d	Polymerase chain reaction	2	22
Jan	6		e	DNA/Protein sequencing	2	24
			f	rRNA/ Genomic/ c DNA Library construction and screening.	2	26
Jan	7		g	Cloning Techniques: cloning in <i>E-coli</i>	2	28
			h	Cloning in <i>Bacillus subtilis</i>	2	30
Feb	8		i	Cloning in Yeast	2	32
			j	promoters, Vectors, cloning strategy, Transformation, Selection, Expression and detection of cloned genes.	4	36
	9					
		3	a	Production of recombinant antibodies,	2	38
			b	Protein-protein and protein-DNA interactions		
			c	Biochips (DNA chips and Protein chips)	2	40
Feb	10		d	Pharmacogenomics		
			e	Molecular diagnostics		
			f	DNA markers: rRNA		
Feb	11		g	Molecular hybridization	4	44


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

			h	RAPD, AP-PCR, DAF AFLP and analysis		
			i	Simple sequence repeat markers		
			j	DNA fingerprinting		
Feb	12		k	Gene knock out – RNAi and Gene silencing,	4	48
			l	Gene therapy		
			m	Metagenomics.		
March	13	4	a	Bioinformatics -Databases,	4	52
			b	Primer Design		
March	14		c	finding and multiple sequence alignment	4	56
			d	Protein structure analysis-Modeling.		
			e	Protein engineering and drugs design		
March	15		f	Rational of protein engineering, steps involved in protein engineering and drug design.	4	60

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhawan's Vivekananda College
 Sainikpuri, Secunderabad - 500 082

Semester-IV Cell and Molecular Biotechnology -2016.

Month	Week	Expt.No.	Experiment	No of weeks	Total
December	1,2 & 3	1,2,3	Isolation of DNA ,RNA and protein from bacteria	12	12
December	4	4	Restriction Mapping.	4	16
January	5	5	PCR Technique - Demonstration.	4	20
January	6	5	Gene cloning in bacteria - Demonstration	12	32
January	7	6	Southern Transfer.- Demonstration.	4	36
January	8	7	Demonstration of RFLP	4	40
February	9	8	Recombinant confirmation (gel shift assays,blue white seletion)	4	44
February	10	9	Separation of Proteins by Column Chromatography	4	48
February	11	9	Data base searching	4	52
February	12	10	BLAST and MSA	4	56
February	13	11	Primer design and protein modeling	4	60


 Head of Department
 Department of Microbiology
 St. Ann's College of Arts, Science and Commerce
 Bangalore

MEDICAL VIROLOGY & PARASITOLOGY THEORY

SEMESTER IV 2016-2017 PAPER - III

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

[Handwritten Signature]

Medical Virology & Parasitology.

SEMESTER - IV 2016-17

Month	Week	Experiment	No. of Periods	Total
DEC	1,2	Tissue culture techniques (demonstration)	8	8
DEC/JAN	3,4	Microscopic studies of viruses infected materials (demonstration)	8	16
JAN	5,6	Examination of pathogenic fungi	8	24
JAN/FEB	7,8	Examination of stool for Hookworm, Round worm	8	32
FEB	9,10	Examination of stool for <i>Entamoeba histolytica</i>	8	40
FEB	11,12	Examination of blood smear by Leishman stain for Malarial parasites	8	48
MARCH	13,14,15	Immunodiagnosis - Tridot test for HIV, Hepstic test for HBV, ELISA.	12	60



ORGANIZER FOR THE ACADEMIC YEAR 2016-2017

**MICROBIAL BIOTECHNOLOGY THEORY
SEMESTER IV PAPER-II**


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

Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhawan's Vivekananda College
 Sainikpally, Secyderabad - 500 044.

MICROBIAL BIOTECHNOLOGY PRACTICALS

SEMESTER - IV Academic Year 2016-2017

Month	Week	Serial No:	Experiments	No.of Periods
Dec	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
Jan	4	3	Preparation of Wine from grapes/fruits by Fermentation.	1
	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
Feb/Mar.	11&12	7	Production & Estimation of Penicillin by flask fermentation	2
Mar.	13	8	Immobilised bacteria/ yeast/enzymes in fermentation	1
Marcl	14&15	9	Scale up of Fermentation	2


 Head of the Department
 Department of Microbiology
 Bharatiya Vidya Bhavan's Vivekananda College
 Sainikpuri, Secunderabad - 500061

Microbial Ecology and Plant microbe interactions (Theory)

SEMESTER-IV

PAPER-4 (2016-17)

MONTH	WEEK	UNIT	TOPIC	NO. OF PERIODS	TOTAL
DEC	1	I	PGPM-Plant growth promoting microorganisms	2	2
			Beneficial, symbiotic- establishment of symbiotic relations	2	4
JAN	2		Mycorrhiza, rhizobium	2	6
			Asymbiotic, epiphytic, endophytic microbes	2	8
JAN	3		Plant-microbe beneficial interactions	2	10
			Microbial inoculants and their detection methods in soil.	2	12
JAN	4	II	Classification of plant pathogenic fungi	2	14
JAN	5		Diseases caused by fungi: <i>Sclerotium rolfsii</i>	2	16
			<i>Macrophomina phaseolina</i> (collar rot disease, charcoal rot)	2	18
			Bacteria: <i>Xanthomonas</i> (black rot),	2	20
FEB	6		Actinomycetes- <i>Streptomyces</i> (soft rot)	2	22
			Infections caused by pest: Helicoverpa Spodoptera	2	24
FEB	7		Mechanisms of disease control	2	26
FEB	8		Production of antibiotics and lytic enzymes	2	28
			Mechanism of pathogenesis and resistance	2	30
FEB	9	III	Cell signalling	2	32
			Quorum sensing	2	34
			Planktonic growth	2	36
MAR	10		Biofilm formation	2	38
			Resistance mechanisms	2	40
MAR	11		Role of biotic factors in microbial interactions	2	42
			Abiotic factors	1	43
MAR	12		Molecular detection of pathogens	2	45
MAR	13	IV	Microbial Biofertilizers Rhizobium, Azospirillum,	4	49


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

MAR	14		Pseudomonas, Bacillus, Trichoderma,	2	51
			VAM- Production, quality control and drawbacks	2	53
APRIL	15		Bio pesticides:-Bacteria: Pseudomonas, Bacillus	3	56
			Fungi: Trichoderma	1	57
			Virus: NPV	1	58
	16		Vermicomposting.	2	60


Handwritten signature

Faint handwritten text

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


Head of the Department
Department of Microbiology
Bharatiya Vidya Bhawan's Vivekananda College
Sainikpuri, Secunderabad - 500 084.