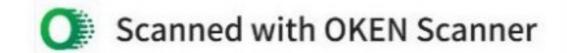
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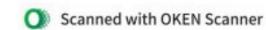
Year 2024-2025

(Sem-I, II)

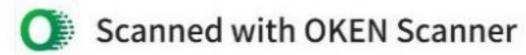
Name of Teacher - Mr.S.G.Kulkarni

Class	Subject	Syllabus assigned	- Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	- DSC07BTE 12	Unit I	Unit I		Completed
	Biotechnology-II	Origin of life	Origin of life		
Sem-I	(Biochemistry-I)	Basic concept, A.J.Oparin, Haldane, Urey Miller expt Concept of Biomolecules- Carbohydrates, Protein, Lipid, Nucleic acid. Properties of Water- Interactions in aqueous systems, Ionization of water, weak acid, weak base, Ionic properties of water Ph.,pka Value definition, H-H equation, Titration curve of Amino acid. Biological buffer systems. Biological Buffer Systems- Phosphate, Bicarbonate, Hemoglobin buffer system, Protein buffer system Nucliec acid- Nucleosides, Nucleotides, polynmucleotides, DNA and its different forms RNA and its different forms	Basic concept, A.I.Oparin, Haldane, Urey Miller expt Concept of Biomolecules- Carbohydrates, Protein, Lipid, Nucleic acid. Properties of Water- Interactions in aqueous systems, Ionization of water, weak acid, weak base, Ionic properties of water Ph, pka Value definition, H-H equation, Titration curve of Amino acid. Biological buffer systems. Biological Buffer Systems- Phosphate, Bicarbonate, Hemoglobin buffer system, Protein buffer system Nucliec acid- Nucleosides, Nucleotides, polynmucleotides, DNA and its different forms RNA and its different form		



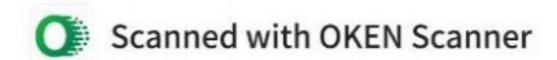


Unit II Unit II Carbohydrates- classification, Carbohydrates- classification, glyceraldehydes, simple aldoses, ketoses, glyceraldehydes, simple aldoses, ketoses, open and ring structure of aldoses, ketoses, open and ring structure of aldoses, ketoses, confirmation of D-Glucose, biological confirmation of D-Glucose, biological importance of carbohydrates, Reactions of importance of carbohydrates, Reactions of monosaccharides(Oxidation, reduction, monosaccharides(Oxidation, reduction, osazone), glycosidic bond, disaccharides, (osazone), glycosidic bond, disaccharides, (Sucrose, maltose, lactose), polysaccharides-Sucrose, maltose, lactose), polysaccharideshomopolysaccharides- starch, glycogen, homopolysaccharides- starch, glycogen, cellulose, mutarotation of glucose. cellulose, mutarotation of glucose. Lipids:- Classification, Simple lipid, -Lipids:- Classification, Simple lipid, -Triacylglycerol, and waxes, Compound lipids-Triacylglycerol, and waxes, Compound Phospholipid, e.g- Phosphotidylcholine, lipids- Phospholipid, e.gethanolamine, sphingolipids, sphingomyelin, Phosphotidylcholine, ethanolamine, cerebrocides, gangliosides sphingolipids, sphingomyelin, cerebrocides, gangliosides Physical properties:- state, a our, odour, melting points, solubility, specific grayity Physical properties:- state, colour, odour, melting points, solubility, specific gravity geometric isomerism, insulation emulsification, surface tension. geometric isomerism, insulation emulsification, surface tension. Chemical properties: - SAPvalue, Iodine Chemical properties: - SAPvalue, Iodine ,Acid. Rancidity, Derived lipids:- Cholesterol, LDL, VLDL, ,Acid. Rancidity, Derived lipids:- Cholesterol, LDL, VLDL, HDL, Chylomicrons, Liposome HDL, Chylomicrons, Liposome



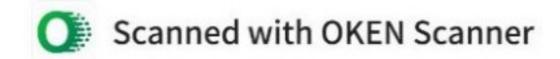


B.Sc. I	- DSC07BTE 22	Unit I	Unit I	 Completed
	Biotechnology-IV	Proteins-	Proteins-	
Sem-II	(Biochemistry-II)	Amino acid classification, Peptide bond	Amino acid classification, Peptide bond	
		concept	concept	
		Classification of protein based on	Classification of protein based on	
		Composition, Protein sequencing methods	Composition, Protein sequencing methods	
		Classification depending upon R group,	Classification depending upon R group,	
		single letter code of amino acids. Properties	single letter code of amino acids. Properties	
	1	of amino acids	of amino acids	
		Simple, conjugate, derived	Simple, conjugate, derived	
		Snger's Edmans, Dansyl chloride	Snger's Edmans, Dansyl chloride	
		Structural level classification of proteins	Structural level classification of proteins	
		Priamary, secondary, tertiary structure of	Priamary, secondary, tertiary structure of	
		proteins, α-helix, β-sheets Ramchandran plot	proteins, α-helix, β-sheets Ramchandran plot	
		, Quatarnary structure of proteins-Hb,	, Quatarnary structure of proteins-Hb,	
		Biological finctions of proteins.	Biological finctions of proteins.	
	•	Chromatography-	Chromatography-	
		Introduction, theory, Principle, applications	Introduction, theory, Principle, applications of	
		of Paper, TLC, column chromatography-	Paper, TLC, column chromatography- Size	
		Size exclusion, Ion exchange, Affinity	exclusion. Ion exchange, Affinity	
		chromatography.	chromatography.	
		Unit II	Unit II	
	-	Enzymes	Enzymes	
		Intro, IUB classification, active site, energy	Intro, IUB classification, active site, energy	
		of activation, transition state, graph	of activation, transition state, graph	
		presentation, Lock and key, induced fit	presentation, Lock and key, induced fit	
		hypothesis, Types of enzyme inhibition	hypothesis, Types of enzyme inhibition	
		competitive, uncompetitive, non competitive,	competitive, uncompetitive, non competitive,	
		Km equation, LB plot	Km equation, LB plot	
-		Vitamines as a coenzymes	Vitamines as a coenzymes	
		Classification of Water soluble vitamin	Classification of Water soluble vitamin	
		B1,B3,B5,B6 and their coenzyme role in	B1,B3,B5,B6 and their coenzyme role in	
		different biochemical reaction, Fat soluble	different biochemical reaction, Fat soluble	





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PARTMENT OF BIOTEOHNOLOGY (ENTIRE)
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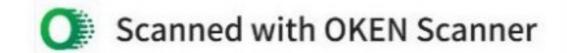
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Year 2024-2025

Term - II (Sem-III, IV)

Name of Teacher - Mr. S. G. Kwkarni

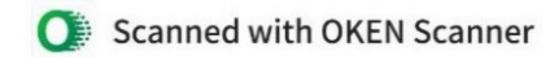
Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. II	DSC-VI	Unit I	Unit I		Completed
	DSC07BTE32	Metabolism and Carbohydrate Metabolism	Metabolism and Carbohydrate Metabolism		
Sem-III	Metabolic	Introduction to metabolism and catabolism and its 3	Introduction to metabolism and catabolism		
	Pathways-I	stages, methods employed to study the metabolism,	and its 3 stages, methods employed to study		
		High energy compounds with examples	the metabolism, High energy compounds		
		Introduction, reaction and energetics of Glycolysis,	with examples ntroduction, reaction and		
		Gluconeogesis, TCA cycle, Glyoxylate cycle,	energetics of Glycolysis, Gluconeogesis,		
		HMP and its significance	-TCA cycle. Glyoxylate cycle, HMP and its		
-		Shuttle system- Malate Aspartate shuttle, Glycerol	significance Shuttle system- Malate Aspartate	-	
		phosphate shuttle system, Cori cycle.	shuttle, Glycerol phospilate shuttle system,		
		Unit II	Cori cycle.		
	-	Biosynthesis of fatty acid with respect to palmitic	Unit II		-
		acid & degradation of fatty acid β- oxidation w.r.to	Biosynthesis of fatty acid with respect to		
		palmitic acid	palmitic acid & degradation of fatty acid β-		
		Aerobic- Flow of electorns in ETC, Redox potential	oxidation w.r.to palmitic acid		
		componenets of ETC, Mechanism of ATP generation	Aerobic- Flow of electorns in ETC, Redox		
		- Chemiosmotic hypothesis, ATP synthase complex,	potential componenets of ETC, Mechanism		
		Inhibitors of ETC , Anaerobic respiration , Alcoholic	of ATP generation – Chemiosmotic		
		and Lactic acid fermentation .	hypothesis, ATP synthase complex, Inhibitors		
			of ETC , Anaerobic respiration , Alcoholic and		
			Lactic acid fermentation .		





	UNIT-I	UNIT-II	
B.Sc. II DSC-VII DSC07BTE42 Metabolic Pathways-II	Plant Water relation and Photosynthesis Introduction, Absorption of Water- Mechanism, Theories (Active, Passive), Translocation of Water- Mechanism, Theories (Root pressure, Capillary), Transpiration. Ultra structure of chloroplast, Photosynthetic pigments, red-drop and Emerson's enhanacement effect, mechanism of photosyntheisis, light reaction, dark reaction, C-3 pathway, C-4 pathway, CAM, photorespiration UNIT-II Role of nitrogen in plants, source of nitrogen, nitrogen fixation – symbiotic and non symbiotic, mechanism of nitrogen fixation, nif gene-concept and significance, transamination reaction Introduction to plant hormones Biosynthesis of Plant hormones- Auxin, Cytokinin, Gibeerlins Secondary Metabolism Introduction examples and biological concept Photoperiodism and vernalisation Types of plants SDP,LDP, DNP, mechanism of Photoperiodism, Theories, Vernalization, theories and mechanism, importance and applications	Plant Water relation and Photosynthesis Introduction, Absorption of Water- Mechanism, Theories (Active, Passive), Translocation of Water- Mechanism, Theories (Root pressure, Capillary), Transpiration. Ultra structure of chloroplast, Photosynthetic pigments, red-drop and Emerson's enhanacement effect, mechanism of photosyntheisis, light reaction, dark reaction , C-3 pathway, C-4 pathway, CAM, photorespiration UNIT-II Role of nitrogen in plants, source of nitrogen , nitrogen fixation – symbiotic and non symbiotic, mechanism of nitrogen fixation , nif gene- concept and significance, transamination reaction Introduction to plant hormones Biosynthesis of Plant hormones Biosynthesis of Plant hormones- Auxin, Cytokinin , Gibeerlins Secondary Metabolism Introduction examples and biological concept Photoperiodism and vernalisation Types of plants SDP,LDP, DNP, mechanism of Photoperiodism, Theories, Vernalization , theories and mechanism , importance and applications	

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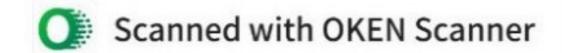
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Year 2024-2025

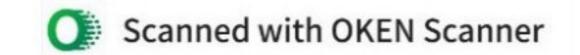
Term - I

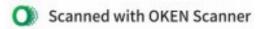
Name of Teacher -Ms. R. M. Shetty

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. II	Microbial genetics	Unit I	Unit I		Completed
		Mendel's law of inheritance	Mendel's law of inheritance	-	
		Interaction of genes	Interaction of genes		
		Linkage	Linkage		
		Rossing over -	Rossing over		
		Structural changes in chromosomes	Structural changes in chromosomes		
		Numerical changes in chromosomes	Numerical changes in chromosomes		
		Extrachromosomal or cytoplasmic or	Extrachromosomal or cytoplasmic or		-
	THE RESIDENCE OF THE PARTY OF T	organellar inheritance	organellar inheritance		
	DEPOSITOR OF THE	Unit II	Unit II		
		Mutation	Mutation		
		Plasmid	Plasmid		
		Genetic recombination in bacteria	Genetic recombination in bacteria		
		Genetic diseases	Genetic diseases		
B.Sc.	Application of	Unit I	Unit I		Completed
III	Biotechnology in	Methods of crop improvement	Methods of crop improvement		
	Agriculture	Plant breeding markers	Plant breeding markers		
		Somatic Hybridization	Somatic Hybridization		
		Germplasm conservation	Germplasm conservation		
		Unit II	Unit II		
		Transgenic Plants	Transgenic Plants		
		Molecular farming	Molecular farming		



	Forms of Protection-IPR & IPP	Forms of Protection-IPR & IPP	
	Biopesticides	Biopesticides	
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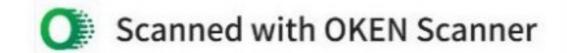
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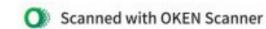
Year 2024-2025

Term - II

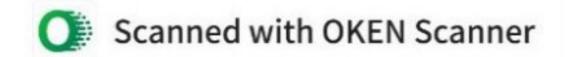
Name of Teacher -Ms. R. M. Shetty

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	DDC07BTE21-	Unit I	Unit I		Completed
D.SC. 1	Biotechnology-III-	Agriculture Biotechnology	Agriculture Biotechnology		
	Biotechnology for	Genetically Modified Crop	Genetically Modified Crop		
	Human welfare-II	Animal cell culture	Animal cell culture		
	Tullian wenaic-ii	Plant cell culture	Plant cell culture		make a
		Flant cen culture	Titalit con carrens		
		Timbe II	Unit II		
		Unit II	Applied biotechnology		
		Applied biotechnology	Conservation Biotechnology		
	FIRST WA	Conservation Biotechnology	Single cell protein (SCP)		
	La Carlo	Single cell protein (SCP)	Concept of probietics		
		Concept of probiotics	Concept of prooferres		
			TI-14 T		Completed
B.Sc.	Bioinformatics	Unit I	Unit I Introduction to Bioinformatics		Complete
III		Introduction to Bioinformatics			
		History of bioinformatics	History of bioinformatics		
	150000000000000000000000000000000000000	Introduction to Genomics	Introduction to Genomics		
	19 TO 19 THE 19	Sequence retrieval system	Sequence retrieval system		
		Human Genome Project (HGP)	Human Genome Project (HGP)		
		Literature Database	Literature Database		
		Introduction to Proteomics	Introduction to Proteomics		
	HANTLE THE REAL PROPERTY.	Unit II	Unit II		
		Sequence Alignment and Phylogenetic analysis	Sequence Alignment and Phylogenetic		
		construction of phylogenetic tree	analysis		
		Phylogenetic analysis tools	construction of phylogenetic tree		





Drug designing Phylogenetic analysis tools Molecular Docking Drug designing Structure and ligand-based drug designing Molecular Docking ADME property Structure and ligand-based drug designing ADME property Signature of Head of Department Signature of Teacher DEPARTMENT OF BIOTECHNOLOGY (ENTIRE) VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)





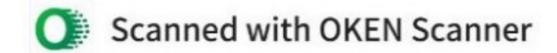
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Year 2024-2025

Term - I

Name of Teacher - Miss. V.N. More

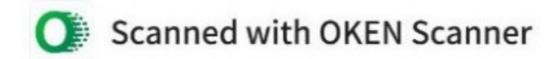
Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	MIN07BTE12 Microbiology- II (Techniques in Microbiology)	Unit I Concept of Sterilization:- Definitions of: Sterilization, Disinfection, Antiseptic, Germicide, Microbiostasis, Asepsis, Sanitization. Methods of sterilization by- a) Physical agents: i) temperature dry heat, moist heat ii) Radiation- U.V, Gamma radiation iii) Bacteria proof filter- membrane filter. b) Chemical agents: - Phenol & Phenolic compounds, Alcohol, Heavy metals (e.g. mercury, c) Gaseous agents- Ethylene oxide, formaldehyde Checking efficiency of sterilization- biological and chemical indicator Checking efficiency of Disinfection- Phenol coefficient- Rideal Walker coefficient, Chick Martin Test. Unit II Microscopy and Staining Techniques Microscopy: Microscopy a) General principles of microscopy- Image formation, magnification, numerical aperture (Uses of oil immersion objective), resolving power of microscope and working distance. b) Ray diagram, special features, applications and comparative study of compound microscope and Electron Microscope (Scanning and Transmission Electron Microscope). Stains and staining procedures - Definition of dye and	Unit I Concept of Sterilization:- Definitions of: Sterilization, Disinfection, Antiseptic, Germicide, Microbiostasis, Asepsis, Sanitization. Methods of sterilization by-a) Physical agents: i) temperature dry heat, moist heat ii) Radiation- U.V, Gamma radiation iii) Bacteria proof filter- membrane filter. b) Chemical agents: - Phenol & Phenolic compounds, Alcohol, Heavy meta! (e.g. merci.y). c) Gaseous agents- Ethylene oxide, formaldehyde Checking efficiency of sterilization- biological and chemical indicator Checking efficiency of Disinfection- Phenol coefficient- Rideal Walker coefficient, Chick Martin Test. Unit II Microscopy and Staining Techniques Microscopy: Microscopy and Staining Techniques Microscopy: Microscopy and Staining Techniques Microscopy Image formation, magnification, numerical aperture (Uses of oil immersion objective), resolving power of microscope and working distance. b) Ray diagram, special features, applications and comparative study of compound microscope and Electron Microscope (Scanning and Transmission		Completed



stain, Classification of stains – Acidic, Basic and Neutral, Principles, Procedure, Mechanism and application of staining, Procedures - i) Simple staining, ii) Negative staining, iii) Differential staining: Gram staining and Acid fast staining, iv) Special staining: Capsule staining, cell wall staining, endospore staining

Electron Microscope). Stains and staining procedures - Definition of dye and stain, Classification of stains - Acidic, Basic and Neutral, Principles, Procedure, Mechanism and application of staining, Procedures - i) Simple staining, ii) Negative staining, iii) Differential staining: Gram staining and Acid fast staining, iv) Special staining: Capsule staining, cell wall staining, endospore staining

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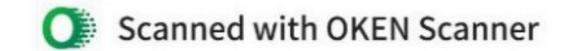
STATEMENT OF SYLLABUS COVERED

Year 2024-2025

Term - II

Name of Teacher - Miss. V.N. More

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I		Centrifugation and precipitation iii. Enumeration of viruses- Direct and Indirect method B. Replication of viruses: i. Bacteriophages – T4 phage (Lytic), Lambada phage(Lytic and lysogeny) ii. Plant viruses – TMV iii. Animal	Unit I General Virology: A. History, Origin and Evolution of viruses B. General characteristics of Viruses C. Structure of viruses i Enveloped and Non enveloped viruses ii. Capsid symmetries – Icosohedraland Helical iii. Structural components of virus – Protein - Envelope proteins, Matrix proteins and Lipoproteins, Genome – dsDNA, ssDNA, dsRNA, ssRNA (positive sense, negative sense and ambisense), linear, circular, segmented D. Classification & nomenclature of viruses i. ICTV nomenclature ii. Baltimore classification Unit II A. Isolation, Cultivation, Parification and Enumeration of Viruses i. Isolation and cultivation of viruses- Bacteriophages, Animal viruses, Plant viruses ii. Purification of viruses- Centrifugation and precipitation iii. Enumeration of viruses- Direct and Indirect method B. Replication of viruses: i. Bacteriophages – T4 phage (Lytic), Lambada phage(Lytic and lysogeny) ii. Plant viruses – TMV iii. Animal viruses – HIV, nCoV, HPV		Completed





B.Sc. II	Unit I Introduction-	Unit I		Completed
	Types of immunity-i)Innate (specific and non-	Introduction-		
	specific) ii) Acquired	Types of immunity-i)Innate (specific and non-		
	(Active and Passive),	specific) ii) Acquired		
	Types of Defense- a) first line of defense	(Active and Passive),		1
	(barriers at the portal of entry,	Types of Defense- a) first line of defense (barriers		Part I all
	physical and chemical barriers) b) second line of	at the portal of entry,		
	defense (Phagocytosis-	physical and chemical barriers) b) second line of		
	oxygen dependent and independent) c) third line	defense (Phagocytosis-		
	of defense-specific	oxygen dependent and independent) c) third line		
	defense mechanism.	of defense-specific		
	Introduction to cells and organs of immune	defense mechanism.		
	Organs of immune system-primary and	Introduction to cells and organs of immune		
	secondary lymphoid organsstructure	System-		
	and their role.	Organs of immune system-primary and secondary	Take is all	
	Cells of immune system-a)broad categories of	lymphoid organsstructure and their role.		
	leucocytes, their role and	Cells of immune system-a)broad categories of		
	properties b) B-lymphocytes c) T-cells-subsets d)	leucocytes, their role and		
	other cells (APC, Null,	properties b) B-lymphocytes c) T-cells-subsets d)		
	NK)	other cells (APC, Null,		
	Unit II	NK)		
	Antigen and Antibody	Unit II -		
	Antigen- definition, nature, types of antigen,	Antigen and Antibody		
	factors affecting antigenicity.	Antigen- definition, nature, types of antigen,		
	Antibody- definition, nature, basic structure of	factors affecting antigenicity.		
	immunoglobulin molecule,	Antibody- definition, nature, basic structure		
	major human immunoglobulin classes, properties and functions. Theories of	immunoglobulin molecule,		
	antibody production.	major human immunoglobulin classes, properties		
	Immune response-primary and secondary	and functions. Theories of		
	immune response,	antibody production.		
	Antigen Antibody reactions Principle and	Immune response-primary and secondary		
	applications of a)agglutination	immune response,		
	b) Precipitation a) complement C.	Antigen Antibody reactions-Principle and		
	ELISA.	applications of a)agglutination		
		b) Precipitation c) complement fixation d) ELISA. Hypersensitivity Consent and the second se		
	example. (Type-LILIII)	Hypersensitivity- Concept and types with		
		example. (Type-I,II,III)		Fire Property
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Year 2024-2025

Term - I

Name of Teacher - Miss. V. N. Arekar

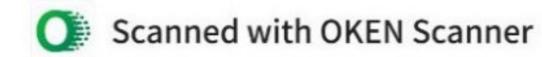
Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	Sem I DSC07BTE11 Biotechnology I- Biotechnology for Human Welfare I	and definition, History of Biotechnology, Scope and importance, Branches of Biotechnology in	Unit I - Introduction to Biotechnology:Origin and definition, History of Biotechnology, Scope and importance, Branches of Biotechnology in India, CSIR Institutes in India, Commercial potential & Achievements of Biotechnology Production of Biofertilizer and biopesticide Unit II - Health Biotechnology: Gene Therapy, Vaccines- concept, types of vaccines, Stem Cells, Forensic science- Global history and development of forensic science, Sir Alec Jeffrey's Important Contribution, Divisions of FSL		Completed
B.Sc. II	Sem III MIN07BTE32 Environmenta! Microbiology	water, Air Pollution -London and LA Smog, Greenhouse Effect, Ozone Depletion, Soil	Unit I: Water Pollution - Hardness, Water softening methods, COD and BOD, Purification of water, Air Pollution - London and LA Smog, Greenhouse Effect, Ozone Depletion, Soil Pollution - Role of pesticide Environmental Toxicology - Pesticide Toxicity - Mode of action of toxicants (Metals, organophosphates, carbamates and mutagens) Unit II: Environmental Impact Assessment, Bioremediation - Concept and types, Agricultural bioremediation, Biofuel production.		Completed

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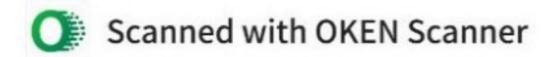
Term - II

Name of Teacher - Miss. V. N. Arekar

Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	Sem II OEC07BTE21: OE III- Ecology	productivity, Food chain, Ecological pyramids, Energy flow in ecosystem, Biogeochemical cycle: Carbon, Nitrogen, Sulphur, Phosphorus cycle, Biodiversity - conservation & importance of biodiversity, Hot Spots. Unit II- Population Ecology- population characteristics & growth curve Evolution:	pyramids, Energy flow in ecosystem, Biogeochemical cycle: Carbon, Nitrogen, Sulphur, Phosphorus cycle, Biodiversity - conservation & importance of biodiversity, Hot Spots. Unit II- Population Ecology- population characteristics & growth curve Evolution: Lamarckism, Darwinism, Modern synthetic &		Completed
B.Sc.	Sem VI Application of Biotechnology in Health	Unit I :Stem cells and Transgenic Technology :Concept of stem cell progenitors, stem cell technology and its application, Transgenic :echnology, Vaccines- types of vaccine, Subunit vaccines, Recombinant vaccines, Bioreporters Unit II: Monoclonal Antibodies- Hybridoma Technology, Biosensors, Gene Therapy, Public health: DNA sample preparation, Methods of disease Diagnosis	Unit I :Stem cells and Transgenic Technology :Concept of stem cell progenitors, stem cell technology and its		Completed

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STATEMENT OF SYLLABUS COVERED

Year 2024-2025

Term - I

Name of Teacher - Miss. A.S. Kale

Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	Bioinstrumentation	Unit I Methods of cell disruption Centrifugation and Types of centrifuge Basic laboratory instrumentation Unit II Microscopy Principle, working & application of Types of Microscopy Colorimeter UV-Visible Spectroscopy	Unit I Methods of cell disruption Centrifugation and Types of centrifuge Basic laboratory instrumentation Unit II Microscopy Principle, working & application of Types of Microscopy Colorimeter UV-Visible Spectroscopy		Completed
B.Sc. II	Molecular Biology L	Unit I Experimental evidences for DNA as a genetic material Properties and Function of DNA Organization of genome Unit II Nucleic Acid Biosynthesis DNA Replication DNA repair	Unit I Experimental evidences for DNA as a genetic material Properties and Function of DNA Organization of genome Unit II Nucleic Acid Biosynthesis DNA Replication DNA repair		Completed

Signature of Head of Department

DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Signature of Teacher



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STATEMENT OF SYLLABUS COVERED

Year 2024-2025

Term - II

Name of Teacher - Miss. A.S. Kale

Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	Basic in cell biology	Unit I Cell structure Organization of cell Ultrastructure and function of cell organelles Types of membrane transport Unit II Nucleus Chromosome structure Cytoskeleton assembly Microfilaments	Unit I Cell st.ucture Organization of cell Ultrastructure and function of cell organeiles Types of membrane transport Unit II Nucleus Chromosome structure Cytoskeleton assembly Microfilaments		Completed
	Advance in cell biology	Unit I Secretary pathway and protein trafficking Transport of prot in	Unit I Secretary pathway and protein trafficking		Completed
		Cell signaling Cell surface recentor protein	Transport of pro in Cell signaling Cell surface receptor protein Unit II		
		Cell cycle checkpoint Cell division Synaptonemal complex	Cell division cycle Cell cycle checkpoint Cell division Synaptonemal complex		

Signature of Head of Department

HEAD DEPARTMENT OF BIOTECHNOLOGY (ENTIRE) VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

Signature of Teacher



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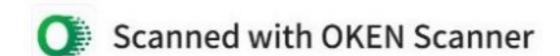
VIVEKANAD COLLEGE KOLHAPUR (EMPOWERED AUTONOMOUS INSTITUTE) STATEMENT OF SYLLABUS COVERED

Year 2024-2025

Term - I

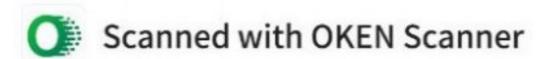
Name of Teacher - Miss. T.S. Vagavekar

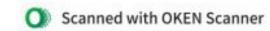
Class	Subject	Syllabus assigned	Syllabus Covered ·	Syllabus not to covered	Remark
B.Sc. I	MIN07BTE11	Unit I	Unit I		Completed
B.Sc. I	MIN07BTE11 Microbiology-I (Introduction to Microbial world)	Unit I Development of microbiology as a discipline Biogenesis Vs Abiogenesis. Ubiquitous nature of microbial life. Development from simple to complex life form. Significance of Scientific contributions in development in Microbiology as a discipline: A. Early contributions Robert Hook, Anton Van Leeuwenhoek, Louis Pasteur, Robert Koch, John Tyndall. B. Scientific contribution leading to diversification of Microbiology i. Medical Microbiology and Immunology- Edward Jenner, Paul Ehrlich, Ellie Metchnikoff, Lister. ii. Food Microbiology and Fermentation Alexander Fleming, Louis Pasteur, Selman Waksman iii. Soil Microbiology- Winogradsky, Martinus Beijerinck iv. Microbial Genetics – Watson and Crick, Hargobind Khurana, Griffith, Avery, McCarty, and Macloed. Beneficial and harmful activities of microorganisms in – Medical, Environmental, Food, Agriculture, Industrial microbiology Applied branches of Microbiology and major	Unit I Development of microbiology as a discipline – Biogenesis Vs Abiogenesis. Ubiquitous nature of microbial life. Development from simple to complex life form. Significance of Scientific contributions in development in Microbiology as a discipline: A. Early contributions Robert Hook, Anton Van Leeuwenhoek, Louis Pasteur, Robert Koch, John Tyndall. B. Scientific contribution leading to diversification of Microbiology i. Medical Microbiology and Immunology- Edward Jenner, Paul Ehrlich, Ellie Metchnikoff, Lister. ii. Food Microbiology and Fermentatio - Alexander Fleming, Louis Pasteur, Selman Waksman iii. Soil Microbiology- Winogradsky, Martinus Beijerinck iv. Microbial Genetics – Watson and Crick, Hargobind Khurana, Griffith, Avery, McCarty, and Macloed. Beneficial and harmful activities of microorganisms in – Medical, Environmental, Food, Agriculture, Industrial microbiology Applied branches of Microbiology and major		Completed
		microbiological institutes in India.	microbiological institutes in India.		
		Unit II	Unit II		
		Diversity of Microbial World:	Diversity of Microbial World:		





		A. Systematic of Classification- Binomial nomenclature, three kingdom, five kingdom classification and utility. Bacterial taxonomy: General principles of bacterial nomenclature - a) Taxonomic ranks, b) Common or Vernacular name, c) Scientific or International name, Criteria for bacterial classification-Morphological, cultural, biochemical & serological characters, Concept of bacterial species & strain. Introduction to Bergey's manual of systematic bacteriology. B. Differences in Cellular and Acellular microorganisms Differences in prokaryotic and eukaryotic (Occurrence, morphology, mode of reproduction and economic importance) C. Different groups microorganisms-Bacteria, Yeast, Fungi, Actinomycetes, Algae, Viruses, Protozoa, Viroids and Prions	A. Systematic of Classification- Binomial nomenclature, three kingdom, five kingdom classification and utility. Bacterial taxonomy: General principles of bacterial nomenclature - a) Taxonomic ranks, b) Common or Vernacular name, c) Scientific or International name, Criteria for bacterial classification-Morphological, cultural, biochemical & serological characters, Concept of bacterial species & strain. Introduction to Bergey's manual of systematic bacteriology. B. Differences in Cellular and Acellular microorganisms Differences in prokaryotic and eukaryotic (Occurrence, morphology, mode of reproduction and economic importance) C. Different groups microorganisms-Bacteria, Yeast, Fungi, Actinomycetes, Algae, Viruses, Protozoa, Viroids and Prions	
B.Sc.	DSE-1352-E- Industrial Biotechnolc by	Unit I Introduction to Industrial Biotechnology Concept and range of fermentation technology, Types of fermentations (Batch, continuous, dual, multiple), Concept of solid state & submerged fermentation. Microbial metabolic products- Primary & Secondary products. Basic design of Fermentor Components of Fermentor and their functions, Types of Fermentor- Stirred tank Fermentor, Airlift Fermentor, Tower Fermentor. Microbial Screening, Scale up and strain improvement Primary and secondary screening, Primary screening of antibiotics, organic acids and amines, enzymes, vitamins and amino acid producers, volatile component degraders, organisms using specific carbon and nitrogen sources. Secondary screening of antibiotic	Unit I Introduction to Industrial Biotechnology Concept and range of fermentation technology, Types of fermentations (Batch, commuous, dual, multiple), Concept of solid state & submerged fermentation. Microbial metabolic products- Primary & Secondary products. Basic design of Fermentor Components of Fermentor and their functions, Types of Fermentor- Stirred tank Fermentor, Airlift Fermentor, Tower Fermentor. Microbial Screening, Scale up and strain improvement Primary and secondary screening, Primary screening of antibiotics, organic acids and amines, enzymes, vitamins and amino acid producers, volatile component degraders, organisms using specific carbon and nitrogen sources. Secondary screening of antibiotic	Completed





producers, Scale up of fermentations, Strain improvement- concept and methods -mutation, genetic recombination. Maintenance and preservation of industrially important cultures. Microbiological assay

Unit II

Concept of pure and mixed culture,
Composition of typical fermentation media,
Criteria for typical fermentation medium,
Types of fermentation media, General role of
media components- water, carbon source,
nitrogen source, minerals, precursors, growth
factors, buffers, antifoams, inducers, inhibitors.
Optimization of media- Plackett and Burmann
design, Factors affecting fermentation process.
Microbial growth kinetics basic concept
(Batch, Continuous and Fed Batch).

Downstream Process and Product Recovery
Downstream Processes in fermentation and
bioprocess technology Solid and liquid
separation, Flocculation and Flotation,
filtration and centrifugation, Cell disruption by
colid and liquid sher, ultrasonication, enzyme
action and mechanical disruption.
Product recovery and purification-principle,
Precipitation, Crystallization, Liquid-Liquid
extraction, Distillation (Fractional and Steam),
evaporation, Chromatographic separation
(Principles), Adsorption and concentration,
Membrane filtration, drying and packing.

producers, Scale up of fermentations, Strain improvement- concept and methods -mutation, genetic recombination. Maintenance and preservation of industrially important cultures. Microbiological assay

Unit II

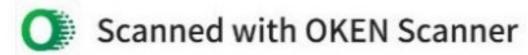
Concept of pure and mixed culture,
Composition of typical fermentation media,
Criteria for typical fermentation medium, Types
of fermentation media, General role of media
components- water, carbon source, nitrogen
source, minerals, precursors, growth factors,
buffers, antifoams, inducers, inhibitors.
Optimization of media- Plackett and Burmann
design, Factors affecting fermentation process.
Microbial growth kinetics basic concept (Batch,
Continuous and Fed Batch).

Downstream Process and Product Recovery
Downstream Processes in fermentation and
bioprocess technology Solid and liquid
separation, Flocculation and Flotation, filtration
and centrifugation, Cell disruption by solid and
liquid shear, ultras nication, enzyme action and
mechanical disruption.

Product recovery and purification- principle,
Precipitation, Crystallization, Liquid-Liquid

extraction, Distillation (Fractional and Steam), evaporation, Chromatographic separation (Principles), Adsorption and concentration, Membrane filtration, drying and packing.

Signature of Head of Department
DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
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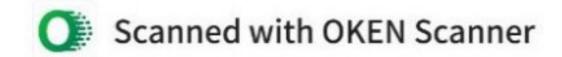
VIVEKANAD COLLEGE KOLHAPUR (EMPOWERED AUTONOMOUS INSTITUTE) STATEMENT OF SYLLABUS COVERED

Year 2024-2025

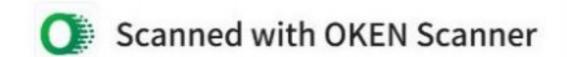
Term - II

Name of Teacher - Miss. T.S. Vagvekar

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	MIN07BTE21 Microbiology-III (Bacterial Cytology and Cultivation)	Unit I Morphology and cytology of Bacteria Morphology of Bacteria – i) Size, ii) Shape, iii) Arrangements Cytology of Bacteria – 1. Cell wall: Composition and detailed structure of Gram positive and Gram negative cell walls, archaebacterial cell wall, Lipopolysaccharide, Sphaeroplasts, protoplasts and L: forms. Effect of antibiotics and enzymes on the cell wall 2. Cell membrane: Structure, function and chemical composition of bacterial and archael cell membranes 3. Endospore: Structure, formation and stages of sporulation 4. Capsule: Structure, composition and function 5. Flagella: Structure, composition and function 6. Fimbriae and pili: structure, composition and function 7. Cytoplasm: Ribosomes, mesosomes, nucleoid, chromosome and plasmids, Cell inclusion - gas vesicles, carboxysomes, PHB granules, metachromatic granules and glycogen bodies	Unit I Morphology and cytology of Bacteria Morphology of Bacteria — i) Size, ii) Shape, iii) Arrangements Cytology of Bacteria — 1. Cell wall: Composition and detailed structure of Gram positive and Gram negative cell walls, archaebacterial cell wall, Lipopolysaccharide, Sphaeroplasts, protoplasts and L: forms. Effect of antibiotics and enzymes on the cell wall 2. Cell membrane: Structure, function and chemical composition of bacterial and archael cell membranes 3. Endospore: Structure, formation and stages of sporulation 4. Capsule: Structure, composition and function 5. Flagella: Structure, composition and function 7. Cytoplasm: Ribosomes, mesosomes, nucleoid, chromosome and plasmids, Cell inclusion - gas vesicles, carboxysomes, PHB granules, metachromatic granules and glycogen bodies Unit II		Completed
		Unit II Microbial nutrition Nutritional requirements of inicroorganisms: Water;	Microbial nutrition Nutritional requirements of microorganisms: Water;		



		Micronutrients; Macronutrients; Carbon, Energy source; Oxygen and Hydrogen; Nitrogen, Sulphur and Phosphorous and growth factors- auxotroph, prototroph and fastidious organisms. Nutritional types of microorganism based on carbon and energy sources - a. Autotrophs b. Heterotrophs c. Phototrophs d. Chemotrophs, e. Photoautotrophs f. Chemoautotrophsg. Photoheterotrophs, h. Chemoheterotrophs. Culture media and pure culture techniques: Common components of media and their functions Peptone, Yeast extract, NaCl, Agar and Sugar. Culture media - a) Living Media (Lab. Animals, plants, bacteria, embryonated eggs, tissue cultures), b) Non living media - i) Natural, ii) Synthetic, iii) Semisynthetic, iv) Differential, v) Enriched, vi) Enrichment, vii) Selective. Methods for isolation of pure culture - i) Streak plate ii) Pour plate iii) Spread plate Microbial growth: Definition of growth, phases & growth curve - a] Continuous culture, b] Synchronous growth, e] Diauxic growth Effect of environmental factors on growth-temperature, p.f., osmotic pressure, hydrostatic pressure, surface tension, heavy metals, ultraviolet light.	Micronutrients; Macronutrients; Carbon, Energy source; Oxygen and Hydrogen; Nitrogen, Sulphur and Phosphorous and growth factors-auxotroph, prototroph and fastidious organisms. Nutritional types of microorganism based on carbon and energy sources - a. Autotrophs b. Heterotrophs c. Phototrophs d. Chemotrophs, e. Photoautotrophs f. Chemoautotrophsg. Photoheterotrophs, h. Chemoheterotrophs. Culture media and pure culture techniques: Common components of media and their functions Peptone, Yeast extract, NaCl, Agar and Sugar. Culture media - a) Living Media (Lab. Animals, plants, bacteria, embryonated eggs, tissue cultures), b) Non living media - i) Natural, ii) Synthetic, iii) Semisynthetic, iv) Differential, v) Enriched, vi) Enrichment, vii) Selective. Methods for isolation of pure culture - i) Streak plate ii) Pour plate iii) Spread plate Microbial growth: Definition of growth, phases & growth curve - a] Continuous culture, b] Synchronous growth, c] Diauxic growth Effect of environmental factors on growth-temperature, pH., osmotic pressure, hydrostatic pressure, surface tension, heavy metals, ultraviolet light.	
B.Sc.	DSE-1352-F-	Unit I	Unit I	 Completed
III	Food and Microbial Biotechnology	Microbial Production of Industrial product Microbial Production of - Edible mushroom, Single Cell Protein- Spirulina, Yeast Pharma product- Antibiotics - Penicillin, Organic products - Citric acid, Vitamins (B 12), Amino acids- Lysine, Industrial Enzyme - amylase -koji fermentation Fermented Foods and Beverages Nutraceutical Dairy Products - Cheese, Probiotic - Homo and Heterolactic fermentation, Bakery Products - Bread,	Microbial Production of Industrial product Microbial Production of - Edible mushroom, Single Cell Protein- Spirulina, Yeast Pharma product- Antibiotics - Penicillin, Organic products - Citric acid, Vitamins (B 12), Amino acids- Lysine, Industrial Enzyme - amylase -koji fermentation Fermented Foods and Beverages Nutraceutical Dairy Products - Cheese, Probiotic - Homo and Heterolactic fermentation, Bakery Products - Bread,	



Fermented Pickles – Sauerkraut, Beverages – Beer, Wine (Red table and white table), Champagne

Unit II

testing,

Food Spoilage, preservation & toxicity
Types of spoilage- Physical, Chemical and
Biological (auto and microbial), Preservation
methods- High and Low temperatures,
Controlled atmosphere and Anerobiosis,
Radiations and Asepsis, Chemical
preservatives (Salt, sugar, organic acids, SO2,
NO2). Food Toxicity – Mycotoxin (Aflatoxin),
Exotoxin (Staphylococcal), Neurotoxin
(Botulinum), Food borne illness- Shigellosis,
Amoebiosis, Aspergiliosis.

Fermentation economics

Contribution of various expense heads to a process (Recurring and non-recurring expenditure) citing any suitable example

Quality Assurance of fermentation product:
Detection and quantification of the product by
physicochemical,
biological and enzymatic methods, Sterility

Fermented Pickles – Sauerkraut, Beverages – Beer, Wine (Red table and white table), Champagne

Unit II

Food Spoilage, preservation & toxicity
Types of spoilage- Physical, Chemical and
Biological (auto and microbial), Preservation
methods- High and Low temperatures,
Controlled atmosphere and Anerobiosis,
Radiations and Asepsis, Chemica! preservatives
(Salt, sugar, organic acids, SO2, NO2). Food
Toxicity – Mycotoxin (Aflatoxin), Exotoxin
(Staphylococcal), Neurotoxin (Botulinum),
Food borne illness- Shigellosis, Amoebiosis,
Aspergillosis.

Fermentation economics

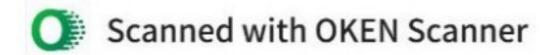
Contribution of various expense heads to a process (Recurring and non-recurring expenditure) citing any suitable example

Quality Assurance of fermentation product:

Detection and quantification of the product by physicochemical, biological and enzymatic methods, Sterility

testing,

DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
VIVEKANAND COLLEGE, KOLHAPUR
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STATEMENT OF SYLLABUS COVERED

Year 2024-2025

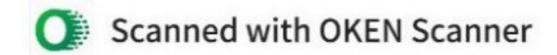
Term - I

Name of Teacher - Miss. S.S. Rote

Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. II	Molecular Biology II	Unit I Transcription in prokaryote and Eukaryote, Enzyme involved, Inhibitors of transcription, Post transcriptional modification, Genetic code, Wobble Hypothesis Unit II Translation in prokaryote and Eukaryote Initiation, Elongation, termination, Inhibitors	Unit I Transcription in prokaryote and Eukaryote, Enzyme involved, Inhibitors of transcription, Post transcriptional modification, Genetic code, Wobble Hypothesis Unit II Translation in prokaryote and Eukaryote Initiation, Elongation, termination, Inhibitors		Completed
		of translation, Post- translation modifications Regulation of gene expression	of translation, Post- translation modifications Regulation of gene expression		
E Sc.	Advance in Genetic Engineering	Isolation of Gene, cDNA and genomic library, Screening of libraries, PCR and its application, Types of PCR and Applications molecular identification 16 s r RNA18 s r	Unit I Isolation of Gene, cDNA and genomic library, Screening of libraries, PCR and its application, Types of PCR and Applications molecular identification16 s r RNA18 s r		Completed
		RNA, and Bar code Unit II Cloning methodologies, Construction of plasmid, Chemical methods, Physical methods, Screening of recombinants Application of r-DNA technology	RNA, and Bar code Unit II Cloning methodologies, Construction of plasmid, Chemical methods, Physical methods, Screening of recombinants Application of r-DNA technology		

DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)



STATEMENT OF SYLLABUS COVERED

Year 2024-2025

Term - I

Name of Teacher - Miss. S. S. Rote

Department - Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc.	Basics in Genetic Engineering	Unit I Introduction and Scope, Enzymes and its applications, Restriction enzymes- types, Cloning Vectors, Bacteriophage vectors, Animal vectors, Retroviral, Plant vector Unit II Nucleic Acid Hybridization, Probe Preparation, Methods of labeling probes, Radio labeling and Non Radiolabelling, DNA Sequencing and blotting technique	Unit I Introduction and Scope, Enzymes and its applications, Restriction enzymes- types. Cloning Vectors, Bacteriophage vectors, Animal vectors, Retroviral, Plant vector Unit II Nucleic Acid Hybridization, Probe Preparation, Methods of labeling probes, Radio labeling and Non Radiolabelling, DNA Sequencing and blotting technique		Completed
B.Sc.	Bio safety, Bioethics and Intellectual Property Rights	Unit I Bioethics, National Regulations of Bioethics and International considerations, Regulatory bodies, Biosafety, Levels of Biosafety, Levels of Biosafety, Levels of Biosafety, Practices Unit II Intellectual Property Rights, World Trade Organization and its related intellectual Property provisions, Budapest Treaty; Protection of GMOs	Unit I Bioethics, National Regulations of Bioethics and International considerations, Regulatory bodies, Biosafety, Levels of Biosafety, Levels of Biosafety, Levels of Biosafety, Good Laboratory Practices Unit II Intellectual Property Rights, World Trade Organization and its related intellectual Property provisions, Budapest Treaty; , Protection of GMOs		Completed

DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
VIVEKANAND COMPGE KOMMADUR

