VIVEKANAD COLLEGE KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)
STATEMENT OF SYLLABUS COVERED
Year 2025-2026 Term - I

Name of Teacher – Mr. S. G. Kulkarni. **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I, Sem I	Biochemistry-I	**Unit-I** Origin of life: - Basic concept, A.I. Oparin concept, Urey Miller's experiment, Introduction to Biomolecules - Carbohydrate, Protein, Lipid, Nucleic Acid Properties of water: Interactions in aqueous systems. Ionization of water, weak acid weak bases. Ionic Product of Water PH, pka value definition, H-H Equation, Titration Curve of Amino Acid Biological Buffer Systems- e.g. Phosphate, Bicarbonate, Haemoglobin buffer system, Protein buffer system Nucleic acids: Nucleosides, nucleotides, polynucleotide, DNA and its different forms with properties. (A, B, D, & Z), RNA and its types- m-RNA, t-RNA, r-RNA Forces Stabilizing nucleic acid structure **Unit - II** -Carbohydrates: Classification, glyceraldehydes, simple aldoses & ketoses ,open and Ring Structure of Aldoses and Ketoses, Confirmation of D-glucose, biological importance of carbohydrates, reactions of monosaccharide (Oxidation, reduction, Osazone), glycosidic bond, disaccharides (Sucrose, maltose, lactose), polysaccharides - homo polysaccharides, e.g. Starch, glycogen, Cellulose. Mutarotation of Glucose Lipids: Classification, Simple lipid - Triacyl glycerol & waxes. Compound lipid - Phospholipid, e.g. - Phosphotidylcholine, ethanolamine, Sphingolipids, e.g. Sphingomycelin, cerebrosides, gangliosides. Physical properties,- state, colour, odour, melting point, solubility, specific gravity, geometric	**Unit-I** Origin of life: - Basic concept, A.I. Oparin concept, Urey Miller's experiment, Introduction to Biomolecules - Carbohydrate, Protein, Lipid, Nucleic Acid Properties of water: Interactions in aqueous systems. Ionization of water, weak acid weak bases. Ionic Product of Water PH, pka value definition, H-H Equation, Titration Curve of Amino Acid Biological Buffer Systems- e.g. Phosphate, Bicarbonate, Haemoglobin buffer system, Protein buffer system Nucleic acids: Nucleosides, nucleotides, polynucleotide, DNA and its different forms with properties. (A, B, D, & Z), RNA and its types- m-RNA, t-RNA, r-RNA Forces Stabilizing nucleic acid structure **Unit - II** -Carbohydrates: Classification, glyceraldehydes, simple aldoses & ketoses ,open and Ring Structure of Aldoses and Ketoses, Confirmation of D-glucose, biological importance of carbohydrates, reactions of monosaccharide (Oxidation, reduction, Osazone), glycosidic bond, disaccharides (Sucrose, maltose, lactose), polysaccharides - homo polysaccharides, e.g. Starch, glycogen, Cellulose. Mutarotation of Glucose Lipids: Classification, Simple lipid - Triacyl glycerol & waxes. Compound lipid - Phospholipid, e.g. - Phosphotidylcholine, ethanolamine, Sphingolipids, e.g. Sphingomycelin, cerebrosides, gangliosides. Physical properties,- state, colour, odour, melting point, solubility, specific gravity, geometric	---	Completed

		isomerism, insulation, emulsification , surface tension. Chemical properties- sap value, acid value, iodine no., rancidity; Derived lipid- Cholesterol, lipoprotein - LDL, VLDL, HDL, Chylomicrons. Liposome.	isomerism, insulation, emulsification , surface tension. Chemical properties- sap value, acid value, iodine no., rancidity; Derived lipid- Cholesterol, lipoprotein - LDL, VLDL, HDL, Chylomicrons. Liposome.	---	Completed
B.Sc. II, Sem III	Metabolic Pathwys-I	**UNIT-I** Metabolism:- Introduction to metabolism, anabolism & catabolism, catabolism & its three stages, types of metabolic reactions, Methods employed to study metabolism (by cell free extract, using auxotrophic mutants, radioisotopes), High energy compounds enlist some examples 5 to 6. Carbohydrates Metabolism:-Reactions and energetics of Glycolysis, Gluconeogenesis, TCA cycle, Glyoxylate cycle, HMP and its significance. Shuttle system- Malate Aspartate shuttle system, Glycerol 3 Phosphate shuttle system. Cori Cycle **UNIT-II** Lipid Metabolism: Biosynthesis of fatty acid with respect to Palmitic acid & degradation of fatty acid (β-oxidation) with respect to Palmitic acid. Respiration:- Aerobic:-Flow of electrons in ETC, Redox potential components of ETC, Mechanism of ATP generation- Chemiosmotic hypothesis, ATP synthase complex. Inhibitors of ETC Anaerobic Respiration:- Alcoholic and Lactic acid fermentation.	**UNIT-I** Metabolism:- Introduction to metabolism, anabolism & catabolism, catabolism & its three stages, types of metabolic reactions, Methods empioyed to study metabolism (by cell free extract, using auxotrophic mutants, radioisotopes), High energy compounds enlist some examples 5 to 6. Carbohydrates Metabolism:-Reactions and energetics of Glycolysis, Gluconeogenesis, TCA cycle, Glyoxylate cycle, HMP and its significance. Shuttle system- Malate Aspartate shuttle system, Glycerol 3 Phosphate shuttle system. Cori Cycle **UNIT-II** Lipid Metabolism: Biosynthesis of fatty acid with respect to Palmitic acid & degradation of fatty acid (β-oxidation) with respect to Palmitic acid. Respiration:- Aerobic:-Flow of electrons in ETC, Redox potential components of ETC, Mechanism of ATP generation- Chemiosmotic hypothesis, ATP synthase complex. Inhibitors of ETC Anaerobic Respiration:- Alcoholic and Lactic acid fermentation.	-----	Completed

Signature of Head of Department

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

VIVEKANAND COLLEGE ESTD. JUNE 1964 KOLHAPUR-416 003

Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026 **Term - I**

Name of Teacher – Miss. V.N.More **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I	**MIN07BTE12 Microbiology-II (Techniques in Microbiology)**	Module/Unit: I Concept of Sterilization, Checking efficiency of Disinfection- Module/Unit: II Microscopy and Staining Techniques Stains and staining procedures	Module/Unit: I Concept of Sterilization, Checking efficiency of Disinfection- Module/Unit: II Microscopy and Staining Techniques Stains and staining procedures	---	Completed
B.Sc. II	**DSC – 1345C- Microbial Genetics**	Module/Unit: I Mendel's law of Inheritance, Deviations of Mendel laws, Interaction of gene Linkage ,Crossing over,Structural and numerical changes in chromosomes. Module/Unit: II Mutation, Genetic recombination in bacteria, Genetics Disease	Module/Unit: I Mendel's law of Inheritance, Deviations of Mendel laws, Interaction of gene Linkage ,Crossing over,Structural and numerical changes in chromosomes. Module/Unit: II Mutation, Genetic recombination in bacteria, Genetics Disease	---	Completed

Signature of Head of Department
DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

VIVEKANAND COLLEGE * ESTD. JUNE 1964 * KOLHAPUR-416 003 *

V.N.More
Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026 **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	Biotechnology I- Biotechnology for Human Welfare I	**Unit I- Introduction to Biotechnology:** Origin and definition, History of Biotechnology, Scope and importance, Branches of Biotechnology in India, **Production of Biofertilizer, Biopesticide** **Unit II- Health Biotechnology:** Gene therapy, Stem cells, Vaccines, **Forensic science:** Global history and development of forensic science, Sir Alec Jeffrey's Important Contribution, Divisions, Techniques and tools in Forensic labs	**Unit I- Introduction to Biotechnology:** Origin and definition, History of Biotechnology, Scope and importance, Branches of Biotechnology in India, **Production of Biofertilizer, Biopesticide** **Unit II- Health Biotechnology:** Gene therapy, Stem cells, Vaccines, **Forensic science:** Global history and development of forensic science, Sir Alec Jeffrey's Important Contribution, Divisions, Techniques and tools in Forensic labs	---	Completed
B.Sc. II, Sem III	Environmental Microbiology	**Unit I- Water Pollution** Hardness, Water softening methods, COD and BOD, Purification of water, **Air Pollution:** London and LA Smog, **Soil Pollution** **Unit II- Environmental Toxicology** Pesticide Toxicity –Mode of action of toxicants **Environmental Impact Assessment, Bioremediation:** Concept and types, Agricultural bioremediation, **Biofuel production**	**Unit I- Water Pollution** Hardness, Water softening methods, COD and BOD, Purification of water, **Air Pollution:** London and LA Smog, **Soil Pollution** **Unit II- Environmental Toxicology** Pesticide Toxicity –Mode of action of toxicants **Environmental Impact Assessment, Bioremediation:** Concept and types, Agricultural bioremediation, **Biofuel production**	---	Completed

Signature of Head of Department

DEPARTMENT OF BIO[illegible]NOLOGY (ENTIRE)
VIVEKANAND COL[illegible]E, KOLHAPUR
(EMPOWERED AU[illegible]NOMOUS)

VIVEKANAND COLLEGE ESTD. JUNE 1964 KOLHAPUR

Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026 **Term – I**

Name of Teacher –Ms. A. S. Kale. **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. III	Research Methodology in Biotechnology	**Unit I** Introduction to Research Sampling, data collection Web search Report writing- Writing tools Plagirism **Unit II** Spectroscopic method Tracer technique Methods of measurement of radioactivity Applications	**Unit I** Introduction to Research Sampling, data collection Web search Report writing- Writing tools Plagirism **Unit II** Spectroscopic method Tracer technique Methods of measurement of radioactivity Application	---	Completed
B.Sc. I	Bioinstrumentation	**Unit I** Method of cell disruption Centrifugation Basic laboratory instruments **Unit II** Microscopy Colorimeter UV-Visible Spectroscopy	**Unit I** Method of cell disruption Centrifugation Basic laboratory instruments **Unit II** Microscopy Colorimeter UV-Visible Spectroscopy	---	Completed

Signature of Head of Department

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

VIVEKANAND COLLEGE ESTD. JUNE 1964 KOLHAPUR-416 003

Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)
STATEMENT OF SYLLABUS COVERED
Year 2025-2026 Term - I

Name of Teacher – Miss. T. S. Vagavekar. **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. I, Sem I	Microbiology-I	**Unit I: Development of microbiology as a discipline-** 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 B. Scientific contribution leading to diversification of Microbiology Unit II: Diversity of Microbial World A. Systematic of Classification-** Binomial nomenclature, three kingdom, five kingdom classification and utility. **Bacterial taxonomy-** General principles of bacterial nomenclature **Differences in Cellular and Acellular microorganisms, Different groups microorganisms**	**Unit I: Development of microbiology as a discipline-** 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 B. Scientific contribution leading to diversification of Microbiology Unit II: Diversity of Microbial World A. Systematic of Classification-** Binomial nomenclature, three kingdom, five kingdom classification and utility. **Bacterial taxonomy-** General principles of bacterial nomenclature **Differences in Cellular and Acellular microorganisms, Different groups microorganisms**	---	Completed
B.Sc. III, Sem V	Industrial Biotechnology	**Unit I: Introduction to Industrial Biotechnology, Fermentation Media** Concept of pure and mixed culture, Composition of typical fermentation media, Types of fermentation media, General role of media components. Optimization of media **Unit II: Microbial Screening, Scale up and strain improvement Downstream Process and Product Recovery , Industrial Production and Recovery process**	**Unit I: Introduction to Industrial Biotechnology, Fermentation Media** Concept of pure and mixed culture, Composition of typical fermentation media, Types of fermentation media, General role of media components. Optimization of media **Unit II: Microbial Screening, Scale up and strain improvement Downstream Process and Product Recovery , Industrial Production and Recovery process**	---	Completed

Signature of Head of Department

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

VIVEKANAND COLLEGE KOLHAPUR ESTD. JUNE 1964

Tagavekar
Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026 **Term – I**

Name of Teacher –Ms. P. C.Wakarekar **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. III	Animal Tissue Culture	**Unit I** History of ATC Laboratory design and layout Requirements of ATC Culture Media Characters of cultured cells Growth measurement parameters Cell Synchronization **Unit II** Techniques in mammalian cell culture Scale up in ATC Contamination in ATC Applications in ATC Stem cell Technology	**Unit I** History of ATC Laboratory design and layout Requirements of ATC Culture Media Characters of cultured cells Growth measurement parameters Cell Synchronization **Unit II** Techniques in mammalian cell culture Scale up in ATC Contamination in ATC Applications in ATC Stem cell Technology	---	Completed

Signature of Head of Department

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

VIVEKANAND COLLEGE * ESTD. JUNE 1964 * KOLHAPUR-416 003

Signature of Teacher

(Ms. P. C. Wakarekar)

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026 **Term – I**

Name of Teacher –Ms. S.S.kakade **Department** – Biotechnology (Entire)

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
B.Sc. III	Enzymology	**Unit I** Introduction to enzymes Unit of enzyme activity Enzyme kinetics Allosteric enzymes **Unit II** Features of enzyme activity Mechanism of enzyme catalysis Isoenzymes Immobilization of enzymes Biosensor	**Unit I** Introduction to enzymes Unit of enzyme activity Enzyme kinetics Allosteric enzymes **Unit II** Features of enzyme activity Mechanism of enzyme catalysis Isoenzymes Immobilization of enzymes Biosensor	---	Completed

Signature of Head of Department

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

VIVEKANAND COLLEGE * KOLHAPUR (M.S.) * ESTD. JUNE 1964

Signature of Teacher