

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026

Name of Teacher – Dr. M.P. Mane

Term – I

Department – P. G. Biotechnology

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
M.Sc. I	Research Methodology in Biotechnology	Unit I Fundamentals of Research Methodology Motivation and Types of Criteria of Good Research Hypothesis: Meaning, functions and types of hypotheses Literature Survey, Source of information, Review Ethical issues and intellectual property rights Publication Process, Selection of Journal, Citation index, Impact factor, Unit II Interpretation and Report Writing Meaning of Interpretation Technique of interpretation, Precaution in Interpretation Different Steps in Writing Report Meaning and Importance of workshop, Seminar, Conference Plagiarism-Concept and Significance of Plagiarism. • Writing tools Reference and Citation tools Unit III Research Methodology in Biotechnology Ultraviolet-visible absorption spectroscopy: Principle, Instrumentation and application. Fluorescence spectrophotometry Other types (IR, NMR, ESR and MASS) of spectrophotometry Unit IV Research Methodology in Biotechnology Chromatographic techniques Electrophoretic techniques Electrophoretic techniques General principles, support media, electrophoresis of	Unit I Fundamentals of Research Methodology Motivation and Types of Criteria of Good Research Hypothesis: Meaning, functions and types of hypotheses Literature Survey, Source of information, Review Ethical issues and intellectual property rights Publication Process, Selection of Journal, Citation index, Impact factor, Unit II Interpretation and Report Writing Meaning of Interpretation Technique of interpretation, Precaution in Interpretation Different Steps in Writing Report Meaning and Importance of workshop, Seminar, Conference Plagiarism-Concept and Significance of Plagiarism. • Writing tools Reference and Citation tools Unit III Research Methodology in Biotechnology Ultraviolet-visible absorption spectroscopy: Principle, Instrumentation and application. Fluorescence spectrophotometry Other types (IR, NMR, ESR and MASS) of spectrophotometry Unit IV Research Methodology in Biotechnology Chromatographic techniques Electrophoretic techniques Electrophoretic techniques	---	Completed
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		proteins electrophoresis of nucleic acids (Agarose, pulse-field and sequencing gels). Radioisotope techniques: Nature of radioactivity, isotopes in biochemistry, measurement of radioactivity	General principles, support media, electrophoresis of proteins electrophoresis of nucleic acids (Agarose, pulse-field and sequencing gels). Radioisotope techniques: Nature of radioactivity, isotopes in biochemistry, measurement of radioactivity		Completed
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 Signature of Head of Department
M. SC. CO-ORDINATOR
DEPARTMENT OF BIOTECHNOLOGY
WENKAND COLLEGE, KODHUR
(EMPLOYED AUTONOMOUS)


 Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026

Term – III

Name of Teacher – Dr. M. P. Mane.

Department – P. G. Biotechnology

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
M.Sc. II	Plant Biotechnology	Unit I Plant Protection Diseases of field Principles of plant disease control Integrated pest management-concepts and components Pesticides, their formulation, classification and safe use Behavioral methods Unit II Secondary Metabolites Concept of secondary metabolites In vitro production of secondary metabolites Influence of culture conditions on accumulation of secondary metabolites Biotic and abiotic elicitation. Different techniques involved in isolation Purification and characterization of useful Secondary metabolites Unit III Transgenic techniques in plant biotechnology Introduction of foreign gene into plants Mechanism of DNA transfer, role of virulence gene Vector less or direct DNA transfer Applications of plant transformation for enhancing resistance to pests, productivity & performance	Unit I Plant Protection Diseases of field Principles of plant disease control Integrated pest management-concepts and components Pesticides, their formulation, classification and safe use Behavioral methods Unit II Secondary Metabolites Concept of secondary metabolites In vitro production of secondary metabolites Influence of culture conditions on accumulation of secondary metabolites Biotic and abiotic elicitation. Different techniques involved in isolation Purification and characterization of useful Secondary metabolites Unit III Transgenic techniques in plant biotechnology Introduction of foreign gene into plants Mechanism of DNA transfer, role of virulence gene Vector less or direct DNA transfer Applications of plant transformation for enhancing resistance to pests, productivity &	---	Completed

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026

Term – II

Department – P. G. Biotechnology

Name of Teacher –Dr. M.P. Mane

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
M.Sc. I	Practical: Techniques in Molecular Biology	1 Eukaryotic DNA Isolation from Plant Material. 2 Eukaryotic DNA isolation from Animal Material. 3 Purification of DNA by silica membrane (solution based). 4 Plasmid isolation from Bacteria. 5 Isolation of RNA from plant. 6 SDS-PAGE for separation of protein using CCB. 7 Genomic DNA isolation from bacteria. 8 Restriction digestion of DNA. 9 Silica Gel Extraction by spin column method. 10 Plasmid isolation by spin column method.	1 Eukaryotic DNA Isolation from Plant Material. 2 Eukaryotic DNA isolation from Animal Material. 3 Purification of DNA by silica membrane (solution based). 4 Plasmid isolation from Bacteria. 5 Isolation of RNA from plant. 6 SDS-PAGE for separation of protein using CCB. 7 Genomic DNA isolation from bacteria. 8 Restriction digestion of DNA. 9 Silica Gel Extraction by spin column method. 10 Plasmid isolation by spin column method.	---	Completed

Signature of Head of Department

M. SC. CO-ORDINATOR
DEPARTMENT OF BIOTECHNOLOGY
VIVEKANAD COLLEGE, KOLHAPUR

Signature of Teacher

VIVEKANAD COLLEGE KOLHAPUR (AN EMPOWERED AUTONOMOUS INSTITUTE)

STATEMENT OF SYLLABUS COVERED

Year 2025-2026

Term – IV

Name of Teacher –Dr. M.P. Mane.

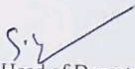
Department – P. G. Biotechnology

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to covered	Remark
M.Sc. II	Animal Biotechnology	Unit I Introduction to animal tissue culture Origin of concept of tissue culture Differentiation of stem cells Culture medium: Natural and Chemically defined, Major equipment's required: Unit II Establishment of primary cell culture Mouse splenocyte culture Handling mammalian cell lines Cell counting using hemacytometer Cell viability and proliferation assays Magnetic approaches to cell separation ex-vivo expansion of hematopoietic stem cells Unit III Applications of animal tissue culture Generation of chimeric, and knockout mice Gene editing Modern categories of vaccines Commercial preparation of vaccines regulatory aspects of vaccination for humans and veterinary use. Livestock improvement Unit IV Applications of cell culture Applications of cell culture in veterinary Applications of cell culture in medicine Applications of Stem cell therapies: Clinical applications of stem cell therapy Applications of stem cells in tissue repair and	Unit I Introduction to animal tissue culture Origin of concept of tissue culture Differentiation of stem cells Culture medium: Natural and Chemically defined, Major equipment's required: Unit II Establishment of primary cell culture Mouse splenocyte culture Handling mammalian cell lines Cell counting using hemacytometer Cell viability and proliferation assays Magnetic approaches to cell separation ex-vivo expansion of hematopoietic stem cells Unit III Applications of animal tissue culture Generation of chimeric, and knockout mice Gene editing Modern categories of vaccines Commercial preparation of vaccines regulatory aspects of vaccination for humans and veterinary use. Livestock improvement Unit IV Applications of cell culture Applications of cell culture in veterinary Applications of cell culture in medicine Applications of Stem cell therapies: Clinical applications of stem cell therapy Applications of stem cells in tissue repair and	---	Completed

Signature of Head of Department

Signature of Teacher

		Unit IV Concept of Plant Tissue culture Laboratory design of plant tissue culture laboratory Principle and working of equipment & instruments required in PTC Different types media used in PTC Organ culture technique: Introduction, Protocol, factors affecting Micro propagation Callus culture technique	performance Unit IV Concept of Plant Tissue culture Laboratory design of plant tissue culture laboratory Principle and working of equipment & instruments required in PTC Different types media used in PTC Organ culture technique: Introduction, Protocol, factors affecting Micro propagation Callus culture technique		
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Signature of Head of Department
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