

Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Structured Work Plan for Teaching

(December – 2021 to April 2022 (Summer)

Details of Classes to be taught

Sr. No.	Class	Name of Astd. Prof.	Subject	Paper
1	B.Sc. II	Dr. Ravindra Ade	Biotechnology	Course Title: Plant Biotechnology Course Code : U-PLB-497 Course Title: Lab Course Course Code: U-LAC-501
2	B.Sc. III			Course Title: Biodiversity and Systematics Course Code: U-BIS-707 Course Title: Lab Course Course Code: U-LAC-

1. Summary of Lesson Plan

Name of Teacher: Dr. Ravindra Ade

Class : B.Sc. BT. II (fourth Semester)

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1	Plant Biotechnology	Unit I Traditional agriculture: Development of civilization. Breeding methods: Advantages and disadvantages, Introduction to plant Breeding: Historical and traditional development for multiplication of agricultural produce. Green revolution: its implication and applications. Need of emergence of new techniques. New Breeding Technology – Biotechnological Approaches	16-12-21 To 29-12-21	01 01 02 01 01 01 01 02	Classroom Group Discussion	Unit – I 30/12/21 Unit – II 15/01/22 Unit – III 27/02/22

				02		
				01		
				01		
				01		
		<p>Unit II. Introduction to Plant Tissue Culture: Introductory History – Concepts of Cell theory & Cellular Totipotency</p> <p>Milestones in plant tissue culture, with respective scientist and their concepts</p> <p>Infrastructure & Organization of plant tissue culture:</p> <p>Design of laboratory – General & aseptic laboratory, different work areas, equipment & instruments required other</p>	<p>30-12-21</p> <p>To</p> <p>15-01-2022</p>	02		
				02		
				03		
				01		
				02		
		<p>Unit III</p> <p>Aseptic techniques – Washing & preparation of glassware, packing. Sterilization: media sterilization, surface sterilization, aseptic work station, precautions to maintain aseptic conditions.</p> <p>Nutritional requirements of the explants,</p> <p>PGR's & their <i>in vitro</i> roles.</p> <p>Media preparation. Preparations of stock solutions and their</p>	<p>16-01-2022</p> <p>To</p> <p>28-02-2022</p>	02		
				01		
				01		
				02		
				03		

	sterilization ' Explants ' for plant tissue culture – histological and/or cellular characteristics		01		
	Dedifferentiation and dedifferentiation, Organogenesis, Embryogenesis		01		
	Unit IV				
	Callus culture technique – Introduction, principle,	01-03-2022			
	Suspension culture technique – Introduction, principle, Growth & growth measurement, synchronization	To 15-04-2022	03		
	Organ culture technique – Introduction, principle,		02		
	Different routes of multiplication in vitro – a) auxiliary bud proliferation, Micropropagationb) somatic embryogenesis,				
	Embryo rescue,				
	anther and pollen culture,				
	Protoplast isolation, regeneration and fusion.		03		
	Plant secondary metabolites and its applications.				
	Germplasm conservation and cryopreservation.				
	Application of plant tissue culture technology and their commercialization		04		

Sr. No.	Subject	Practicals	Date	No. of Practical
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1	Plant Biotechnology	General laboratory design for establishing plant tissue culture	20/12/2021 To 15/04/2021 Batch A, B,C	03
2		Collection of explants, washing of explants and sterilization of explants		03
3		Surface sterilization and aseptic manipulations		03
4		Media preparation, sterilization and subculture		03
5		Callus culture		03
6		Cell suspension culture		03
7		Anther and pollen culture		03
8		Embryo culture		03
9		Artificial seed production		03
10		Field visit-National research laboratories		03
11		Visit to commercial Plant tissue culture laboratory		03
12		Visit to Nursery		03
13				Visit to Forest department

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignment with topic and date
1	Biodiversity and systematics	<p>Unit-I:</p> <p>Biodiversity: Basic concept of Biodiversity- What is biodiversity?why should it conserve?Element of Biodiversity - Ecosystem,Genetics,species abundance,Types of Biodiversity,(Alpha,Beta)Cataloging and discovering species,Geographical patterns of species richness What is Biogeography Importance of Distribution patterns(local,sparsly,Migratory species)</p>	<p>17-12-2021 To 30-12-2021</p>	<p>02 02 02 01 01 01 02 02</p>	<p>Classroom Group Discussion</p>	<p>Unit – I 31/12/2021 Unit – II 16/01/2022 Unit –III 26/02/2022</p>
		<p>Unit-II:</p> <p>Biodiversity and Conservation : Major drivers for loss of biodiversity overexploitation,</p>	31-12-	02		

		,habitat distruction, Latitudinal gradient, Invasive species IUCN, RED DATA BOOK, Current status of International illegal trade, problems in controlling International Trade (Enforcement ,Reservations, Illegal trade)	2021 To 15-01- 2022	01 02 02 02		
		Unit-III : Endangered Species Conservation Endangered categories The US endangered species Act State acts, Failures of endangered species conservation, problems with act Habitat conservation plans, Restoration strategies by National and International Communities and Conventions. Ethics of Conservations-Value of Biodiversity, Biopyracy, Hybridized Plants, GM crops (benefits and criticism)Economic value of Biodiversity Legal Ethical issues related to use of Biodiversity and Global conservation issues.	16-01- 2021 To 30-02- 2021	02 02 02 02 02 02		
		Unit IV Basic Concepts of Taxonomy: Nomenclature and species concept, Classification and systematics	31-02- 2022	01 02		

		<p>Construction of Phylogenetic trees, Cladistic, Cladogram, Phenetics, Molecular Taxonomy in relation to DNA characteristics and protein sequences</p> <p>Genetic markers for taxonomic purpose, comparing total genome by DNA-DNA Hybridization</p> <p>Importance of Bioinformatic based tools and databases for Biological classification through DNA Barcoding.</p>	To	15-04-2022	03		
					02		

Sr. No.	Subject	Practicals	Date	No. of Practicals
1	Biodiversity and systematics	Morphological studies of major groups A) Bryophytes B) Pteridophytes C) Gymnosperms D) Angiosperms	20/12/2021 to 15/04/2021 Batch A,B,C,D	04
2		Study of Leaf Morphology and Flower morphology		04
3		Study of fruits morphology		04
4		Surveys, collection and Herbarium preparation of different plant groups		04
5		Study of plant Identification using reference material		04
6		Visits to herbarium and culture collections centers		04
7		Photography and illustration in the field.		04
8		Documentation and dissemination of information.		04
9		Morphological studies of Insects		04
10		Morphological studies of Fishes. Visit to local market for identification.		04
11		Visit to Botanical, Zoological Gardens, Biosphere Reserves, Project Tiger and National sanctuaries		04

