

Shiv Chhatrpati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

Department of Biotechnology Structured Work Plan for Teaching Academic Year 2019-20 (Term-I)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	M.Sc. II	S. S. Kshirasagar	Biotechnology	Course Title: Plant Biotechnology Course Code: P-PLB-337 Course Title:
		20	District St. Des	Lab course XII Course Code: P-LAC-341

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	Plant Tissue Culture-I Introduction to cell and tissue culture Tissue culture media: Composition and Preparation. Initiation and maintenance of callus and suspension culture Organogenesis: Principle, Concept and Applications of Somatic embryogenesis Rapid clonal propagation and production of virus free plants.	1 July 19 to 17 July 19	03 02 02 02 01 01	Group Discussion	Unit – I 24/07/19 Unit – II 18/08/19 Unit – III 23/08/19

	UNIT II		5		
	➤ Protoplast culture: Importance, Isolation of protoplasts, method of protoplast culture, culture media, Growth and division of protoplast, regeneration of plants		02		
	> Embryo culture and embryo		03		
- Albana on Line	rescue > Anther, Pollen and Ovary	18-07-19 To	03	A. 00,00	
	culture for production of haploid plants and homozygouslines	09-08-19	02		
	> Cryopreservation, slow growth and DNA banking for germ plasm		02	Summary of Lunes	\$
To a M and a short on any applications of the short of th	conservation > Commercial application of tissue culture technology, examples: banana and		03	toojd iš ili a	
Capta Capta	Sugarcane.		t next () set	U me 4	
E ACULT					
			in the second se		
	UNIT III Plant molecular biology ➤ Gene structure, expression, and regulation in plants	para di para di para di	02		
	> Agrobacterium tumefaciens and the genetic engineering of		02		
	plants	31-08-19	02		

 Mechanism of gene transfer from Agrobacterium to plants Strategies for gene transfer in plants Molecular markers and marker assisted selection 	To 30-09-19	04	
Transgenic Crops ➤ Crops with Tolerance / resistance to biotic stresses, viruses, fungal and bacterial diseases: ➤ Crops with Tolerance / resistance to abiotic stresses (Herbicides and drought conditions): ➤ GM crops, ➤ Medical applications of GM plants ➤ Terminator technology ➤ Ecological risk assessment of genetically modified crops	1-10-19 To 23-10-19	02 02 02 02 02 01	

Sr. No.	Subject	Practicals	Date	No. of Practicals
1		Plant tissue culture laboratory design		05
2		Plant tissue culture laboratory design		05
3		Aseptic techniques	08/07/19	05
4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Media preparation	To 24/10/19	05
5		Micro propagation		05

6		Anther culture	e i i	05
7		Plant DNA isolation	Batch B,C,D	05
8	÷.	Protoplast isolation	Lag IV	05
9		Embryo culture		05
10		RAPD	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	05

HoD Head

Department of Biotechonlogy Rajarshi Shahu Mahavidyalaye (Autonomous) Latur-413 53′ Rajarshi Shahu Mahavidyalaya,Later (Autonomous)



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1. Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Professor	Subject	Paper
1	B.Sc. II	S. S. Kshirasagar	Biotechnology	Course Title: Environment Biotechnology Course Code:U-ENB-400 Course Title: Lab Course XI Course Code: U-LAC-404

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignm ent with topic and date
1	Environment	Unit I	A VARTE	eda berm		Unit – I
	Biotechnology		art tylige			15/07/1
		Components of Environment and	bycett stil	04	Rejor II	9
		Global Environmental Problems	18-06-19	1 19	Classroom	Unit – II
		08	То	the part to sale	Section 1	23/08/1
		Hydrosphere, lithosphere,	10-07-19	7 10	Group Discussion	9
		atmosphere and biosphere -		04	Galler 1	Unit -III
	land to a	definitions with examples;			paid (25/08/1
		Interaction of man and environment;				9
		Environmental Studies as a multidisciplinary subject.		04		
		Green House Effect, Acid rain,				

	El Nino Effect,				T	
	Ozone depletion,					
	Biodiversity loss					
-	Unit-II:					
	Environmental pollution and Environmental Management 10 Pollution of air, water and land with reference to their causes, nature of pollutants & impact	10-07-19 To	04	7 161	- X- (E	
-	Environmental damage by agriculture,	08-08-19	02			
· · · · · · · · · · · · · · · · · · ·	Perspectives of pollution in urban, industrial and rural areas. Habitat Pollution	00 00 13	02		2.5	
	Environmental diseases – infectious (Water and air borne) and pollution related, Solid waste management.		03			
	Unit-III:					
	Waste water treatment and management		04			
	Domestic Waste Water			metra 17	V + 6/10	
	Treatments: Preliminary, Primary,	08-08-19	04		-	
You BY Store	Secondary and Tertiary.	То		der -	Jon-Fax	
in the second production of the second	Waste water treatment Reactors:	31-08-19				
	Introduction and types in brief Aerobic Biological Treatments:					
	Activated sludge process, Lagoons Anaerobic Biological Treatments:		03	intil more		
	upflow anaerobic sludge blanket (UASB) reactor,		and to			
20 21	Fluidized bed reactor.			318		
Prince in	Unit IV	late				
ner et	Biodegradation and Bioremediation	31-08-19	06			
	Biodegradation of Hydrocarbon	To 10-10-19				
	Xenobiotics biodegradation- pesticide biodegradation					
	Bioremediation: Introduction, Definition and Concept,		06			

Methods of Bioremediation (In Situ and Ex Situ Methods)		
Phytoremedation: Concept and Types	i.	

		No. of Practicals
Determination of Dissolved oxygen(D.O.)		02
Determination of carbon dioxide(co ₂)		02
Determination of Biochemical oxygen demand (BOD).		02
Presumptive test		02
Confirmed test		02
Completed test		02
Determination of Chemical Oxygen demand(COD)	01/07/190	02
Determination of Hardness of given water sample.	to	02
Determination of P ^H of given water sample	24/10/19	02
Determination of alkalinity and chlorinity of given water sample.	Batch A and	04
		Determination of proof given water sample Determination of alkalinity and chlorinity of given water sample.

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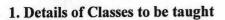
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Department of Biotechnology Structured Work Plan for Teaching Academic Year 2019-20 (Term-II)



Sr. No.	Class	Name of Asstt. Professor	Subject	Paper
1	M.Sc. I	S. S. Kshirasagar	Biotechnology	Course Title: Immunology & immunotechniques Course Code: P-IMI-233 Course Title: Lab course VI Course Code: P-LAC-237

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	Immunology &	UNIT I		15L		Unit – I
	Immunotechniques	Historical perspective and		01		09/01/20
		importance of Immunology	CONTRACTOR	SHED LEVE		
		Innate and Adaptive Immune		02		
		response.	10-12-19	03	State - chi	-
		Hematopoiesis, Cells of Immune	То	Baser, 11		
		system and their biological role.	08-01-20	01	Same and the same	
		Humoral and cell mediated	with a	Make 1	Group	F - J.
		Immunity.	atoma in a	01	Discussion	
		Primary and Secondary immune				
		responses.		03		
		The Primary and secondary		01		
		lymphoid organs and their				
		interaction,		01		
		MHC molecules,				
		Antigen processing and		01		
		presentation (antigen presenting	in it can	01		

	cells, endocytic, cytosolic pathway). BCR and TCR (structure and properties), Cytokines & signal transduction.	ra indonya sa ser sa s	66 to 1		
	UNIT II		12L		Unit – II
	Antigen: Characteristics of antigen & its types, Factors that Influence Immunogenicity, Epitopes, Haptens and the Study of Antigenicity,	09-01-20 To	01	Home Assignment	05/02/20
, , , , , , , , , , , , , , , , , , ,	adjuvant and its types.	04-02-20			
Three prices con	Antigen engineering for better immunogenicity, Antigenicity and	S (volumble)	01	Areas University	amar it
mingline i i innercongre pri richi i	Immunogenicity, Biology of superantigens.	- 5+	01		
Jrose	Antibody: Discovery of antibody structure by chemical and	Athagering in ordered to social materials Adorption	01	i gydenarae	
	enzymatic Methods. General Structure of antibody molecule, Function of antibody molecule. Affinity and Avidity,	Al main ju	01		
1783236	Valency of Antibody.	discount less	01		
	Antibodies-Types, variation in structure of antibody and their biological significance. Organization and Expression of Immunoglobulin Genes.				
	Antigen – Antibody Interaction: Strength of Antigen-Antibody Interactions, Cross-Reactivity.		01		

tometry and Fluorescence, munoprecipitation, munoelectronmicroscopy, emiluminescence assay. IIT III Implement system: Activation Complement systems ternative, classical & lectin thway) and its Functions. In persensitivity: Hypersensitivity exticutions and its types. Implement systems Iternative, classical & lectin Ithway) and its Functions. Implement systems Iternative, classical & lectin Ithway) and its Functions. In persensitivity: Hypersensitivity In persensitivity in the persensitivity Iternative, conditions: In persensitivity: Hypersensitivity Iternative, conditions: Iternative, classical of the persensitivity Ite	in regulerati	10L 02 01	Quiz	Unit – III 25/02/20
omplement system: Activation Complement systems ternative, classical & lectin thway) and its Functions. persensitivity: Hypersensitivity actions and its types. munodeficiency Conditions: mary immunodeficiency (SCID),	05-02-20 To	02	Quiz	
Complement systems ternative, classical & lectin thway) and its Functions. persensitivity: Hypersensitivity actions and its types. munodeficiency Conditions: mary immunodeficiency (SCID),	05-02-20 To	01	Quiz	25/02/20
ternative, classical & lectin thway) and its Functions. persensitivity: Hypersensitivity actions and its types. munodeficiency Conditions: mary immunodeficiency (SCID),	То		Quiz	
persensitivity: Hypersensitivity actions and its types. munodeficiency Conditions: mary immunodeficiency (SCID),	the break that I			
munodeficiency Conditions: mary immunodeficiency (SCID),	e formit film privore stall privore stall			
mary immunodeficiency (SCID),	galoratig	01		
condary immunodeficiency		The state of the s	Well I	
DS).	to mission of	A years		
toimmunity: Organ specific		02		
toimmune diseases and Systemic toimmune diseases.	W. (1, 2, 1)			
munity to infectious diseases:		02		
berculosis), parasitic (malaria) d viral (HIV) infections.		deministration	2 yealor sapphalation	
mor Immunology: Tumor		02		
to the man	oimmune diseases and Systemic oimmune diseases. nunity to infectious diseases: nune response during bacterial perculosis), parasitic (malaria) l viral (HIV) infections.	oimmune diseases and Systemic oimmune diseases. nunity to infectious diseases: nune response during bacterial perculosis), parasitic (malaria) I viral (HIV) infections.	coimmunity: Organ specific coimmune diseases and Systemic coimmune diseases. O2 nunity to infectious diseases: nune response during bacterial coerculosis), parasitic (malaria) I viral (HIV) infections. O2 nor Immunology: Tumor	coimmunity: Organ specific coimmune diseases and Systemic coimmune diseases. Coimmune diseases. Coimmune diseases. Coimmune response during bacterial coerculosis), parasitic (malaria) Coimmune response during bacterial coerculosis), parasitic (malaria) Coimmune response during bacterial coerculosis), parasitic (malaria) Coimmune diseases and Systemic Coimmune diseases and

	UNIT IV		08L	Group	Unit – IV
				discussion	23/03/20
		27-02-20			
	4.	То			
	Transplantation Technology: Types	21-03-20	02	1	
	of graft (auto, Iso, Allo, and xeno		(Table 19	I	
<u>.</u>	graft), Specificity and memory of	grandle (1955)		÷	
	rejection response, Mechanisms				
	involved in graft rejection ,Bone	en la la			
1	marrow chimera.		1.10		
	Vaccine Technology: Active and	A CONTRACTOR	02		
	Passive Immunization, Live	erroserroserges	02		
	attenuated vaccines, subunit		2 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1		
	vaccines, conjugate vaccines,				
	multivalent subunit vaccines, DNA		in congress		
	vaccines, Recombinant vector	ang a zalis	ns en outsea		
	vaccines, edible vaccines.		04		
	Smeld	dinney Com			
	Antibody engineering: Monoclonal	en eriskern b	mi yasmi A		
	antibody, Purification of antibodies,	:Fishoriumes	Lymbia (C.)		
	Chimeric antibodies, phage display,		secondo		
	large scale production of MAb				
	antibodies, Applications of MAb in	e namid and	contribution		
	diagnosis and therapy.	I was a line	hermoslav k		E Island

Sr. No.	Subject	Practicals	Date	No. of
1	Immunology &	Agglutination reaction	- 15:17cl 8 -	Practicals
			percentary	02
2	immunotechniques	Blood film preparation & Identification of cells		02
3		Determination of bleeding time		02
4		Determination of clotting time		
5		1 2 BAN YEAR	TOTAL TOTAL	02
		VDRL	16/12/19	02
6		Radial immunodiffusion,	То	
		mana minunoumusion,		02
7		Simple Double diffusion	31/03/20	-
				02

8	Ouchterlony Double diffusion	4 %	02
9	Widal		02
10	Rocket immunoelectrophoresis.	Batch A & B	02
11	Microscopic observation of lymphoid organs		02

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Department of Biotechnology Structured Work Plan for Teaching

Academic Year 2019-20 (Term-II)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	M.Sc. II	S. S. Kshirasagar	Biotechnology	Course Title: Environment Biotechnology Course Code:P-ENB-435 Course Title: Lab Course XIV Course Code: P-LAC-437

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized	No. of Test / Assignmen t with topic and date
1	Environment Biotechnolog Y	Unit-I: Ecology & Environment: Ecosystem structure and functions, abiotic and biotic component. Energy flow, food chain, food web. Ecological Pyramids-types.	10-12-19 To 02-01-20	02	Group Discussion	Unit - I 03/01/20
		Biogeochemical cycles. Ecological succession, Ecads and ecotypes. Ecology and its relevance to man, natural resources.		04		
		Threats to Environment - Global and				

-	regional threats to the environment.				
	Sustainable management and	inga dila	4-1-25	alva" (
	conservation of environment.	om H	ma mest	mod i	
	Agro ecology; cropping pattern as	gomustell j	02	100	
	indicators of environments.	Americania	obiteching)	graff	
	Unit-II:		11	Home	Unit – II
	Environmental Pollution:	g inst		Assignment	27/01/20
	Classification of pollutants. Air pollution and their properties,	(Upp	02	agailt !	
	and the second s	03-01-20		mik!	
	Water pollutants and their properties.	То	01	grant !	
		25-01-20	9	tini I	
os april empresado	Environmental pollution and associated hazards to crops, animals and humans.	gerfree d	02	glas B.A. pholiasit	
	Greenhouse effect and global warming	ers Cife. Pr Strockives	03	outs H	
	Climate change - International conventions and global initiatives.		03	Appy(T pidamyA	
	Unit-III:	on ed.(V) Mark 19450	12	tioned Sontain	Unit –III
				W-109-A	24/02/20
	Biotechnological processes:			Quiz	
	Waste water treatment plant.		02		167 SH
The split	Physical, Chemical and Biological	27-01-20			
	unit operations/processes-overview,	То	() to 10/9		44.02
- 1-44j.	Activated Sludge Process,	22-02-20	02		1
in that	Trickling Filters, Oxidation ponds,		in motor consi		1
	anaerobic biological treatment				
THE SECOND	process.		1700 TK 0		
	a pinale		n beingli		1 1
the first server	Biotechnology in Remediation:		i milion		
201 9	Introduction to bioremediation,	di blaccio il	02		
	Advantages, limitations and applications				
	Types of Bioremediation and Factors	lie engo tan g			L.L.

	affecting: Natural, Engineered,	flacia wili i	ats 11 %	1 1	
	Ex-situ and in-situ				
	Phytoremediation, Bioaugmentation,		02		
	Biostimulation. Bioconversion,			di b	-
	Bioaccumulation, Bioconcentration,	17	:	on A	
	Biomagnification, Biodegradation.	11 Jan 195 25	. 36		
1					
	Energy & Biofuels:			Harter 1	
	Energy from Biomass.	To appropriate	ingle-Greek	To all or	
	Biosensors and biochips,	egang sic Sulf	02		
	Bio filters,				
	Biofuel cells.		02		
	Unit IV		10		
	Advancement in environmental technology	24.02.20	P1-1	Group discussion	Unit –III
	Remote sensing and CIS D:	24-02-20		, 1	23/03/20
	Remote sensing and GIS- Principal, terminologies and objectives.	To	03	inscript Inventor if	
		21-03-20			
	Types of remote sensing. Applications of Remote sensing	moitarelali	04	Surati D	
		ELGINI FERON	non anuli	200 4 (2000)	
III- Kipti	Ecological / Niche modeling. Environmental Impact Assessment Case Study.	-	03	T-din U	

Sr. No.	Subject	Practical Levinologies and Tables Company	Date	No. of practical
1	Environment	Estimation of T.S. / T.D.S. from given water sample.	and -	02
2	Biotechnology Estimation of Hardness of given water sample.			02
3	Determination of Presumptive test	and the second	02	
4		To perform Confirmed test	No.	02
5		Analysis of Completed test		02
6		Gram staining of coliform group of bacteria		02
7		Determination of Biological Oxygen Demand of polluted water.	16/12/19	02
3		Determination of Dissolved Oxygen of polluted water.	to	02
9		Determination of Chemical Oxygen Demand of polluted water.	31/03/20	02
10		Isolation of pathogens from air		02
11		Isolation of pathogens from water		02

12	Estimation of alkalinity of given sample.	Batch A and	02
		В	

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