Shiv Chhatrpati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

Department of Biotechnology Structured Work Plan for Teaching

Academic Year 2019-20 (Term-I)

Details of Classes to be taught

Sr. No.	Class	Name of Asst. Prof.	Subject	Paper
1	B.Sc. II	Manisha A. Dhotre	Biotechnology	Course Title: Metabolism Course Code: U-MET-401 Course Title: Lab Course XII Course Code: U-LAC-412

1. Summary of Lesson Plan

Name of Teacher: Manisha A. Dhotre

: B.Sc. BT. II (Third 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	Metabolism	Unit 1	iday 1			Unit – I
		1.Respiration		01		27/07/19
		2.aerobic respiration – glycolysis	18-06-19	02		Unit – II
		and its regulation	То		Classroom	14/08/19
		3.Krebs cycles and its regulation	15-07-19	02		Unit – III
		4.Substrate Level Phosphorylation		01	Group Discussion	29/08/19
		5.oxidative phosphorylation: ETC and its inhibitors	elestro	03		
		6.Electrochemical proton gradient chemiosmotic theory, ATP synthase,	and the second	03		
		7.P/O ratio,pasteur effect, warburg		01	State of the state	
		effect, respiratory quotient 8. Alchohol and Lactic acid Fermentation, cori cycle.		02		
		Unit II				
		 Photosynthesis photosynthetic pigments, concept 		01		

	of photosynthetic unit, Hill reaction,	15-07-19	03	T	
	oxygenic & anoxygenic	То			
	photosynthesis	07-08-19			
	3. Light reaction: Cyclic and Non		03		
	Cyclic				
	4.Photophosphorylation		01		
	5. Dark reaction: C ₃ , C ₄ , CAM,				
- *	Photorespiration		04		
	Unit III		-		Comment May 2011
	1. Glyoxylate PW.		01		
	2. Pentose Phosphate Pathway		02		
	3. Entner-Doudoroff PW		01		
	4. Carbohydrate metabolism –	07-08-19	04		
100 5 2 3 2 2 2 2 2 2 2 2	Gluconeogenesis,	То	or y largest	La april As also	
	Glycogenesis,	05-09-19			
1 1	Glycogenolysis.				
Some non-like skiller	5. Lipid Meatbolism –		04		
and bear	Biosynthesis of FA				
1 2 2 1 1	6. Fatty acid oxidation,		03	Latin or jury warfs	
ALC PROPERTY.	alternative PW of fatty acid		Ant	grain parallel	
1-57-1	oxidation		indian p. A	Softman ()	
12 12 12 12 12 12 12 12 12 12 12 12 12 1	7. Ketone bodies		01	pel de Vant ;	
Tind Set Late	Unit IV				
	1. Amino acid Metabolism:		03	to the state of	
	Amino acid synthesis	05-09-19			
	2. Amino acid catabolism	То	02	to an area	
	3. urea cycle.	10-10-19	01		
	4. Nucleotide Metabolism			Carlotte A	
	Nucleotide synthesis: De-Novo		02		
	5. Salvage PW		02	Sec. 12	
	6. Nucleotide degradation.		02		

, si	of photosynthetic unit, Hill reaction,	15-07-19	03	9	778.16
- : ::::::	oxygenic & anoxygenic	То		(a	
	photosynthesis	07-08-19	1		
	3. Light reaction: Cyclic and Non		03		
	Cyclic		and constraint		
	4.Photophosphorylation		01		
	5. Dark reaction: C ₃ , C ₄ , CAM,		and the observed law of		
	Photorespiration		04		
	Unit III	A LATE OF SECTION	a two periods	31	1 1
	1. Glyoxylate PW.		01	3	
	2. Pentose Phosphate Pathway		02		
	3. Entner-Doudoroff PW		01		
	4. Carbohydrate metabolism -	07-08-19	04		
	Gluconeogenesis,	То	The standing		
	Glycogenesis,	05-09-19			
	Glycogenolysis.		Constitution of	ar est	
	5. Lipid Meatbolism –		04		
	Biosynthesis of FA				
	6. Fatty acid oxidation,		03		
	alternative PW of fatty acid			Ringer	at Talestand
	oxidation			- sel	mesty.
	7. Ketone bodies	4-	01	restore	y Links
	Unit IV	A Ir Time	E .		
ming a point	1. Amino acid Metabolism:		03		
	Amino acid synthesis	05-09-19	1		
	2. Amino acid catabolism	То	02		
	3. urea cycle.	10-10-19	01		4.
	4. Nucleotide Metabolism				
	Nucleotide synthesis: De-Novo		02		
	5. Salvage PW		02		
	6. Nucleotide degradation.		02		

Sr. No.	Subject	Practicals	Date	No. of Practicals
1	Metabolism	Hydrolysis of Sucrose and Starch		03
2		Qualitative Test for Amino Acids	1	03
3		Qualitative Test for Proteins	-	03
4		To Perform Fatty acid Titration		03
5		Estimation of Ketone Bodies	02/07/19	03
6		Determination of Urinary Titrable acidity	То	03
7		Estimation of Urinary Creatinine	24/10/19	03
8		Estimation of Enzyme activity of Acid Phosphatase	2 \$1 \$2po k = 1 1	03
9		Estimation of Enzyme activity of β-amylase	* * / I	03
10		Estimation of Total Serum Cholesterol by Zak and	Batch B,C,D	
		Henley's method	f .	03
11		Determination of Serum Bilirubin by Van de Bergh		
		reaction		03
12		Solution of Problems in Biochemistry and		03
		Metabolism		03

Date: 17 June,2019

Course Teacher

HoD Head

Department of Biotechonlogy Rajarshi Shahu Mahavidyalava, (Autonomous) Latur-413 5 PRINCIPAL PRINCIPAL aiarshi Shahu Mahavidyalay

Rajarshi Shahu Mahavidyalaya,Latur (Autonomous)

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

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	M.Sc. II	Manisha A. Dhotre	Biotechnology	Course Title: Microbial Biotechnology Course Code: P-MIB-335 Course Title: Lab Course X Course Code: P-LAC-339

Name of Teacher: Manisha A. Dhotre

Class

: M.Sc. BT. II (Third Semester)

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	Microbial Biotechnology	Unit 1 Microbial Production of Organic Acids: Production, recovery and applications of:		04	20 (20) (20) (20)	Unit – I 30/07/1 9
		Citric acid Lactic acid	18-06-19 To	100	Classroom	Unit – II 16/08/1
		Microbial Production of Organic Solvents: Production, recovery and applications of: 1. Alcohol 2. Glycerol 3. Acetone	10-07-19	04	Group Discussion	9 Unit –III 29/08/1 9
		Microbial Production of Vitamins: Production, recovery and applications of vitamins: 1. Vitamin-B12 2. Riboflavin		04	File 7 Free A	
		Unit II Microbial Production of Amino Acids: Production, recovery and applications of amino acids:		04		

	1.L-Glutamic acid	10-07-19				
	2.L-Lysine	То				
	3.L- Tryptophan Production of insulin and	08-08-19	:8			
	erythropoietin		02			
3	- smokanitaa mill ne sama					
- ,	Biogas production from biomass: Methane		02			
	Bioleaching: Mechanism of Bioleaching with example. Biosorption Microbial recovery of petroleum	14	03		d = 1	
	Unit III					
i n as	Production of Chemotherapeutic		04			
1 1	Agents : Production, recovery and					
	applications of antibiotics:					
Last special Configuration	1. Penicillin	08-08-19	0.7 (2002)	a educati		i Cami
	2. Tetracycline	То				
	3. Erythromycin	31-08-19				ni ni
and st	Production of microbial					
2 2002	polysaccharides:Production,		04	1		-1
	recovery and applications of			:t-		
	polysaccharides:			3141.3		
17.84.00.5	1.Xanthan		din da 2	mount i		200
1.12			As awage	al fords		× 1
II - Into	2.Dextran		ho suit i	-9		
byed at	3.Alginate		o mini			
	Production of		Enti Ma	no.		
	Polyhydroxyalkanoates:	Color (120)	03	apt.		
	1. Polyhydroxybutyrate (PHB)					
	2. Biopol-a biodegradable plastic					
	Unit IV		2001-200			
	 Enzyme Technology: 1. Immobilization of enzymes and cells. 2. Production and applications of: Proteases, Pectinases, Cellulase, amylase. 	31-08-19 To 10-10-19	06	to jan-		
	Biotransformation: 1. Types of bioconversion reactions: Oxidation, Reduction, Hydrolytic reactions, Condensations		06	Cont.		

reactions, Condensations 2. Transformation of steroids			
and sterols 3. Transformation of		200	
nonsteroid compounds: L- Ascorbic acid, Prostaglandins, Antibiotics.	r		

Sr. No.	o. Subject Practicals		Date	No. of Practicals
1	Microbial	Fermentative production of amylase by Bacillus subtilis.		02
2	Biotechnology	Fermentative production of alpha amylase from fungi Aspergillus niger		02
3		Production of Sauerkraut by microorganism		02
4		Ethanol fuel production from Tissue Paper Waste or Molasses.		02
5		Estimation of Alcohol by specific gravity method	01/07/19	02
6		Estimation of Alcohol by Idometry test	to	02
7	4	I] Isolation and identification of lipase producer. II] Production and estimation of lipase producing organism.	24/10/19	02
8		Production of alkaline protease from Bacillus species.	Batch A and	02
9		I] Isolation and screening of Lactic acid producing bacteria II] Production and estimation of Lactic acid.	В	02
10		Isolation and Characterization of microorganisms used as Biofertilizer		04
11		Production of Extracellular Polysaccharide from <i>Rhizobium</i> Species isolated from leguminous Plant (<i>Glycine max</i>)	91	04
12		Production of fermented milk by Lactobacillus.		04

Date: 17 June,2019

Course Teacher

HoD

PRINCIPAL
Rajarshi Shahu Mahavidyalaya, Latur
(Autonomous)

वित्व छत्रपति वित्व छत्रपति वित्वण संस्था वित्रप्र (1) आपील सम्बंग ज्योतिशी स्थापना – १९७०

Shiv Chhatrpati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

Department of Biotechnology

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

Details of Classes to be taught

Sr. No.	Class	Name of Asst. Prof.	Subject	Paper
1	B.Sc. II	Manisha A. Dhotre	Biotechnology	Course Title: Enzymology Course Code: U-ENZ-498 Course Title: Lab Course XV Course Code: U-LAC-502

1. Summary of Lesson Plan

Name of Teacher: Manisha A. Dhotre

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	Metabolism	Unit I ENZYMES & ENZYME CATALYSIS:	egitş pîloturi (8 tiranî a sajê	ileve till	opforfil.	Unit – I 09/01/20
		1.General Features of enzymes	yesishka di	01	i hatha	Unit – II
		2.Characteristics of enzymes	e Marshautrania	01	Min and 1	15/02/20
		3.Classification - IUB system,	10-12-19		Edward Co.	Unit – III
		rationale, overview and specific examples,	To 03-01-20	02		26/03/20
		4.Enzyme substrate complex, Concept of active centre, binding		01	Classroom	
		sites			Group Discussion	
		5. Types of Specificity		01	ALL PARTY	
		6. Effect of different factors on reaction rate		01		
		7.Factors affecting catalytic efficiency - proximity and		02	elhyside P Bergana	
		orientation effects, distortion or strain, acid - base and nucleophilic catalysis				

	8.Methods for studying fast	31, 1	02	10		
	reactions		= 4	¥		
а	9. Chemical modification of		01	-9		
	enzymes					
	10.Isoenzymes and multiple forms		01			
	of enzymes.					
- 1	11.Examples of Enzymatic Reactions: Lysozyme and		03	a man per f		
	Chymotrypsin, Zymogen,					
	Ribozyme.			75.		
				-		
	Unit II.		7			
	APPLICATION AND CHARACTERISATION OF					
	ENZYMES OF			alli amana iti		
question in the	1.Commercial application of	04-01-20	02	1.15.490		
	enzymes in food pharmaceutical and other industries	То		See See		
1	s a destingual assertant	22-01-20				
interior parties	2. Commercial application of Enzymes for analytical and		02	-		
statistics	diagnostic applications					
Lealing	3.Production and Purification of			Little Control	u.do.dd	
02/10/400	Crude Enzyme extracts from plant,		03	CATAL		
9-8011	animal and microbial sources-some case studies		I entraves	Interior I		
02/20/01	4.Methods of characterization of	puns lo	01	2.Charge		
v m Siti	enzyme	er 1731	rightes	Direction (
DE BYE	5development of enzymatic assays.	for library	02	elpasius.		
	Unit III ENZYME KINETICS:			DECE		
	1.Michaelis - Menten Equation -	nes en	02	a constant		
	form and derivation, steady state		with to	mari 3		
	enzyme kinetics	10.00				
	2. Significance of Vmax and Km,	23-01-20	01	Control of		
	3. Bisubstrate reactions	То	01	Total real states		
		10-02-20		a men	4. 1	
			02	More than		
	enzymology - advantages and					
	disadvantages of alternate plotting	reign milt				
	5. Enzyme inhibition - types of					
	inhibitors - competitive, non-		03		9.8	
	competitive and uncompetitive, their		03			

-1		mode of action and experimental	14 1 1-		19	
glis 4.5		determination. 6.Enzyme activity,				
	1	international units, specific activity,		01	A.	
+		turnover number	are alleman	opii yean	GR 1	
		7. end point kinetic assay	generalu2 ha	01	61	
		Unit IV	Lare Had be	DESTRUCTION OF THE PARTY OF THE		
	0	ENZYME REGULATION &	and the same of the	Acres Acres		
	1012	IMMOBILIZED ENZYMES	11-02-20 To	type. Websend	int.	
		1 Duadwat inhibition foodbaal	25-03-20	01	and a	
		1.Product inhibition, feedback control	23-03-20		Out I	
		2.enzyme induction and repression			Name of	
	P A	and covalent modification,		03	Maria I	
		Allosteric regulation		and the	30 m	1 01
		3. Relative practical and economic		नार्त सम्बं अवस्थ	and I	
		advantage for industrial use, effect		02	ation 1	
		of partition on kinetics and		a model the		12
		performance with particular		ca ne+luriii2	18 (H +)	
		emphasis on charge and			SHIP CONTRACTOR	
	7	hydrophobicity (pH, temperature				
		and Km)		03		
		4. Various methods of		05		ggg mgg.
		immobilization - ionic bonding,				1 1
	1	adsorption, covalent bonding (based			a.A.	my fret
1		on R groups of amino acids),				le franchistere
	20,144,79	microencapsulation and gel				
		entrapment. Immobilized		75.		- va
1		multienzyme systems				
		5.Biosensors - glucose oxidase,		04		
		cholesterol oxidase, urease and				
		antibodies as biosensors.				

Sr. No.	Subject	Practicals	Date	No. of
1	Enzymology	To study effect of α amylase activity on starch		Practicals 03
2	1	Determination of α amylase activity	uni de la companya de	03
3		To study effect of pH on α amylase activity		03
4		To study effect of Substrate on α amylase activity	1 - , ,	03
5		To study effect of Salt on α amylase activity	16/12/19	03
6		To study effect of Temperature α amylase activity	То	03
7		To study effect of Time on α amylase activity	31/03/20	03
8		A] Immobilization of Yeast cells by Calcium- Alginate Entrapment method	i netalejsi i	03
		B] Determination of viability of immobilized Cells by invertase activity	Batch C,D,E	
9		Hydrolysis of sucrose by yeast β- Fructofuranosidase		03
10		Determination of Hydrolyzed Sucrose solution by Benedict Method		03
11		Indirect Estimation of Lactate Dehydrogenase		03
12		A] Purification of HRP by Affinity Chromatography B] Estimation of HRP activity		03
13	1	Problems Based on MM equation and Lineweaver-Burk plot		03

Date: 09 Dec,2019

Course Teacher

HoD

Head
Department of Biotechonlogv
Rajarshi Shahu Mahavidyala:
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Department of Biotechnology Structured Work Plan for Teaching

Academic Year 2019-20 (Term-II)

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	M.Sc. II	Manisha A. Dhotre	Biotechnology	Course Title: Food and Nano Biotechnology Course Code:P-FNB-434 Course Title: Lab Course XIV Course Code: P-LAC-437

Name of Teacher: Manisha A. Dhotre

: M.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 / Assignmen t with topic and date
1 Food and Nano Biotechnolo	Nano	Unit-I: Biotechnology for Food Ingredients	genner stat Ditan an Fil	5-1-14 15-114		Unit – I 04/01/20 Unit – II
	•		10-12-19 To 02-01-20	02	Classroom Group Discussion	18/02/20 Unit –III 27/03/20
		 polysaccharides in food Microbial biotechnology for food flavor production 	n to a	02		
		Aspects of Food Production. • Food safety: HACCP System to food protection, Responsibility for food	and his had	02		
		 safety. Food Additives: Definition, Types and Functional characteristics. 		01		

	Natural Colors: Types, Applications		01
	• Sweeteners: Types and		01
	Applications.Causes of food spoilage		02
,	Food Preservation Methods		02
	Unit-II:	Lail a	
Hartan Constitution of	Fermented Food Products • Fermentation technology for		1 100 m
	traditional food of the Indian subcontinent	03-01-20 To	02
	Solid state fermentations for	25-01-20	01
territorio con en el fi	food applications • Genetic engineering of		02
streeting in a local state of the state of t	bakers yeast Biotechnology of wine yeast		02
I - Hotel	Biotechnology of beta carotene from Dunaliella		02 tin/3 time 5 (04)
0.000	SCP: Spirulina and Chlorella		Various Biote hardagy
	Unit-III: • Molecular evolution and	wangm s	02
Marie Company	diversity of food borne pathogens		aborate a
	Application of microbial molecular techniques for	27-01-20 To	02
	food systems	22-02-20	nd land
	Application of ELISA assays for detection and quantitation of toxins in		02
	quantitation of toxins in foods and <i>E.coli</i> in food		
	Biosensors for food quality assessment		02
	Biotechnological approaches		02

	mode of action and experimental determination. 6.Enzyme activity,	a a	01				
	international units, specific activity, turnover number		-idi	best hteld		- 10 02 . - 00 04	
	7. end point kinetic assay		01	nje r	Allegani	eogu i s	
50	Unit IV	plate play to	ngillaring	Den			
	ENZYME REGULATION &		heiteaira	Dep			
- Day	IMMOBILIZED ENZYMES	11-02-20 To	in in want	perta			
674	1.Product inhibition, feedback	25-03-20	01	15.00			
10 . 1151	control 2.enzyme induction and repression		de la nesta	Fabru			
10	and covalent modification,		03	akijosi akijim			
	Allosteric regulation		d lo no	100			
K02	3. Relative practical and economic advantage for industrial use, effect		02	rata de			
	of partition on kinetics and performance with particular		amer to	DENIE DENIE			
	emphasis on charge and	e kirdia jii	in Hay be	1 5/13			
	hydrophobicity (pH, temperature	District Co	of the lo	1 5711			
	and Km)	E 6	2.003	10 80 70			
	4. Various methods of		03	cn 19			
	immobilization - ionic bonding,		1.00				
10	adsorption, covalent bonding (based	1					
	on R groups of amino acids),						
	microencapsulation and gel	1					
	entrapment. Immobilized					ner sold	
	multienzyme systems						
	5.Biosensors - glucose oxidase,		04			edeling	
	cholesterol oxidase, urease and					p.drag	i Semi
ing Longities	antibodies as biosensors.						

Sr. No.	Subject	Practicals	Date	No. of
1	Food and Nano Biotechnology	Determination of quality of milk sample by methylene blue reduction test		02
2		Determination of physiological properties of milk	6	02
3		Determination of calcium and phosphorous in milk		02
4		Efficiency of pasteurization of milk by phosphates test	Sagr	02
5		Quantitative analysis of milk by standard plate count (SPC) method	16/12/19	02
6		Estimation of Ascorbic Acid	to 31/03/20	02
7	1	Isolation and characterization of food fermenting micro- organisms from idli batter	Batch A and	02
8		Isolation of probiotics micro-organisms from various sources	В	02
9		Effect of temperature on growth of probiotics micro- organisms		02
.0		Effect of pH on growth of probiotics micro-organisms		02
1	1	Effect of salt concentration on growth of probiotics micro- organisms	gi .	02
2		Estimation of lactic acid	30	02
3		Production of nanoparticles	011	02

Date: 09 Dec,2019

Course Teacher

Department of Biotechonlogy Rajarshi Shahu Mahavidyalaya, (Autonomous) Latur-413 5,3

Rajarshi Shahu Mahavidyalaya,Latur (Autonomous)