

# Rajarshi Shahu Mahavidyalaya, Latur

**( Autonomous )**

## Structured Work Plan for Teaching

**(June – 2018 to Dec . 2018)**

### Details of Classes to be taught

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	B. Sc. I	V. V. Patil	Biotechnology	Course Title: Lab Course I Course Code : U-LAC-187
				Course Title: Lab course III Course Code: U-LAC-193
2	B.Sc. II			Course Title: Good Laboratory Practices Course Code:U-ADC-334

#### 1. Summary of Lesson Plan

Name of Teacher: V. V. Patil

Class : B.Sc. BT. I (First Semester)

Sr. No.	Subject	Practicals	Date	No. of Practicals
1	Lab Course I	Cell Diversity	1/08/18 To 10/10/18  Batch A, B, C	03
2		Separation of cells using sedimentation and velocity Centrifugation		03
3		Study of sub cellular organelles		03
4		Study of Karyotyping		03
5		Study of Mitosis		03
6		Harvesting and cell lysis		03
7		Demonstration of Antigen- Antibody reaction through clinical approach		03
8		Immunoprecipitation		03
9		Study of Meiosis		03
10		Preparation of blood smear and morphological study of different cells		03
11		Determination of cell density by turbidometer.		03
12		Study of osmosis		03

Name of Teacher: V. V. Patil

Class : B.Sc. BT. I (First Semester)

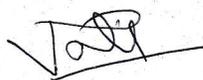
Sr. No.	Subject	Practicals	Date	No. of Practicals
1	Lab Course III	General Rules and Safety in Microbiology Laboratory	2/07/18 To 10/10/18  Batch D, E, F	03
2		Study of basic requirements in Microbiology Laboratory- Autoclave, Hot air oven & Incubator		03
3		Staining techniques (Monochrome staining, Grams staining ,Negative staining)		03
4		Preparation of solid and liquid media		03
5		Isolation of bacteria by spread plate, streak plate and pours plate method		03
6		Isolation of microorganisms from soil, water and air		03
7		Isolation of microorganisms by using selective media		03
8		Study of motility of Microorganisms by hanging drop method		03
9		Study of bacterial growth curve		03
10		Effect of environment on growth of microorganisms		03

Name of Teacher: V. V. Patil

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

Sr. No.	Subject	Unit and Chapter to be covered	Date	No. of Lectures	Academic activities to be organized
1	Good Laboratory Practices	Unit I: -Introduction to GLP, History, Scope  - Fundamental points of GLP (Resources Characterization, Rules, Results, Quality assurance)  Practical: 1. Standard Operating Procedures  Unit II: - General Rules/Protocols for Lab Safety measures  -Precaution and Safety in handling of chemicals, Laboratory tools, Glasswares and instruments.	01/08/18 to 10/10/18	02  04  03  02  03	1. Guest Lecture  2. Classroom Seminar

		-Internal and External Audit		02	
		Practicals:			
		1. Preparation of Standard Solution and Buffers		02	
		2. Demo and Maintenance of Internal and External Audit		02	
		Unit III:			
		- Levels of Laboratories, Log Book			
		Maintenance		02	
		-Basic SOPs for instrument handling and Maintenance		02	
		-Practicals:			
		1. Calibration of Instruments: PH meter, colorimeter, spectrophotometer, water bath, Distillation assembly, Burette, Pipette etc.		04	
		Unit IV:			
		-Keeping data records, its analysis by using statistical and mathematical tools.		02	
		-Result analysis and its interpretation.		01	
		-Practicals			
		1. Use of Microsoft word, Excel. ( for Data entry, calculation and graphical representation)		02	
		2. Use of internet and emails		02	



Teacher



Head

Department of Biotechnology  
Rajarshi Shahu Mahavidyalaya  
(Autonomous) Latur-413 531



Principal

**PRINCIPAL**  
Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)

**Rajarshi Shahu Mahavidyalaya, Latur**

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**Structured Work Plan for Teaching**

**(Dec-2018 to March-2019)**

**1. Details of Classes to be taught**

Sr. No.	Class	Name of Asstt. Prof.	Subject	Paper
1	B. Sc. BT FY Div A & B	Dr. V V Patil	Biotechnology	Fundamentals of Biological Chemistry
2	M. Sc. BT FY			Bioprocess Engineering

**2. Summary of Lesson Plan**  
Name of Teacher: Dr. V. V. Patil

Class: B. Sc. BT FY Div A & B (Second 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	Fundamentals of Biological Chemistry	<b>Unit -1: Carbohydrates</b> -Structure of atom, Molecules weak interaction stabilizing biomolecules -Henderson-Hasselbach equation pH, pK, Buffers and thermodynamics principles. - <b>Carbohydrates:</b> Introduction, biological importance. Definition -Classification of Carbohydrates	01 Dec 18 to 18 Dec 18	02  02  01	Guest Lecture  Quiz Contest  Classroom Seminar	Unit Test – I 20.01.2019 Unit Test – II 22.03.2019



	<p><b>-Protein structure: Classification</b></p> <ul style="list-style-type: none"> <li>-Conformation of proteins (primary, secondary, super secondary, quaternary domains)</li> <li>-Peptide bond</li> <li>-Biological function of protein</li> <li>-Revision</li> </ul> <p><b>Unit -4: Enzymes</b></p> <ul style="list-style-type: none"> <li>-Basic concept, active site, energy of activation</li> <li>- Lock and key hypothesis</li> <li>- Induced fit hypothesis</li> <li>- <b>Co-enzymes:</b> Niacin Folic acid, Cyno-cobalamine</li> <li>-Revision</li> </ul>		<p>02</p> <p>03</p> <p>01</p> <p>02</p> <p>02</p> <p>02</p> <p>18 Feb 19 to 07 Mar 19</p> <p>03</p> <p>02</p> <p>02</p> <p>03</p> <p>02</p>		
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Subject	Practical to be covered	Date	No. of Practicals
Fundamentals of Biological Chemistry	1. Preparation of solutions, buffer sensitivity, specificity accuracy, Molarities, molality, Normality.	13 & 15.12.18	02
	2. Qualitative test for carbohydrates	20 & 22.12.18	02
	3. Estimation of reducing sugars by Benedict's Method	27 & 29.12.18	02
	4. Spot tests for Amino Acids	03 & 05.01.19	02
	5. Estimation of Amino acids	10 & 12.01.19	02

	<p>6. Protein estimation</p> <p>07. Saponification of Fats</p> <p>08. Estimation of Cholesterol</p> <p>09. Sugar estimation by DNSA</p> <p>10. Sugar estimation by Anthrone Method</p> <p>11. DNA estimation by DPA Method.</p>	<p>17 &amp; 19.01.19</p> <p>07 &amp; 09.02.19</p> <p>14 &amp; 16.02.19</p> <p>21 &amp; 23.02.19</p> <p>28 &amp; 02.03.19</p> <p>07 &amp; 09.03.19</p>	<p>02</p> <p>02</p> <p>02</p> <p>02</p> <p>02</p> <p>02</p>
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Name of Teacher: Dr. V. V. Patil

Class: M. Sc. BT FY (Second 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	Bioprocess Engineering	<p><b>Unit -1: Basic Chemical Engineering calculations:</b></p> <ul style="list-style-type: none"> <li>-Material balance. Material balance with reactions.</li> <li>-Material balance with recycle and purge. Energy balance. Enthalpy, specific heat, means specific heat.</li> <li>Heat Balance.</li> <li>-Heat of reaction and heat of solution. Material and Energy balance together.</li> </ul> <p><b>-Fluid statics:</b> Classification of fluids</p> <ul style="list-style-type: none"> <li>-Concept of Reynold's number, Rheological properties of fermentation process (Viscosity, cell concentration, product concentration etc)</li> <li>-Fluid mechanics. Potential flow. Newtonian and non Newtonian fluid (Bingham plastic, pseudo plastic, dilatants etc.) Heat and mass Transfer</li> </ul> <p><b>Unit -2:</b></p> <p><b>Fermenters:</b> Ideal Properties of Bioreactor Components of the fermenters &amp; their specifications: Body Construction, Agitator, Impeller, Baffles etc.</p>	01 Dec 18 to 18 Dec 18	02  02  01  01  02  02  03	<p>Guest Lecture</p> <p>Quiz Contest</p> <p>Classroom Seminar</p>	<p>Unit Test – I 20.01.2019</p> <p>Unit Test – II 22.03.2019</p>



		<p>Cell recycle &amp; continuous fermentation processes. Monod model &amp; constitutive equations used for expressing growth</p> <p>Substrate consumption &amp; product formation, Solid State fermentation</p> <p><b>Unit -4:</b></p> <p><b>Measurement &amp; Control of Bioprocesses</b></p> <p><b>Parameters:</b> Cell growth. pH, temperature, Substrate consumption, product formation, Measurement of O<sub>2</sub>/CO<sub>2</sub> uptake, evolution. Specific rates of consumption substrate &amp; formation of product.</p> <p>Strategies for fermentation control.</p> <p>Computer controlled fermentations, Foam &amp; its control. Scale up in Bioprocesses fermentations, Factors used in scale up</p> <p><b>-Downstream processing:</b> Strategy for recovery, Harvesting of Biomass and Product</p> <p>Removal of microbial cells &amp; solid matter, foam separation, filtration, centrifugation, cell</p> <p>Disruption Liquid-liquid extraction, chromatography and membrane processes, Drying and crystallization</p> <p><b>-Bioprocess Economics:</b> Choice of process, process analysis, fixes &amp; variable cost</p> <p>Depreciation, Amortized costs, Selection of Pricing, Profitability, Scales of operations etc.</p>			
			04		
			05		
			05		

Subject	Practical to be covered	Date	No. of Practicals
Bioprocess Engineering	1. Media formulation and optimization	13 & 14.12.18	02
	2. Study of Growth Kinetics of Bacteria and Yeast by turbidometry & SCP	20 & 21.12.18	02
	3. Screening and maintenance of Industrially important microorganism - Acids, Antibiotics, Enzymes.	27 & 28.12.18	02
	4. Study of scale up of fermentation	03 & 04.01.19	02
	5. Study of design of bioreactor	10 & 11.01.19	02
	6. Determination of TDP	17 & 18.01.19	02
	7. Determination of TDT and design of sterilizer	07 & 08.02.19	02
	8. Study of types of fermentation process	14 & 15.02.19	02
	9. Downstream process of industrial products (Intra & Extra cellular)	21 & 22.02.19	02
	10. Problems based on: - Growth kinetics, fluid flow, Reynold's number	28 & 01.03.19	02
	11. Visit to fermentation Industry	09.03.19	01

Teacher



Head



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