DISCIPLINE: Biotechnology.	SEMESTER: 5 <sup>th</sup>	NAME OF THE TEACHING FACULTY:
		Mr.Sunil Biswajit Maharana
SUBJECT: Tissue culture	NO. OF DAYS/ PER WEEK	SEMESTER
laboratory	CLASS ALLOTTED: 03	FROM DATE: 01-07-2024
		TO DATE: 08-11-2024
	0.000000	NO. OF WEEKS: 15
WEEK	CLASS DAY	PRACTICAL TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	Instrument
	2 <sup>nd</sup>	Discuss about Instrumentation
and	3 <sup>rd</sup>	Dry heat Sterilization
2 <sup>nd</sup>	1 <sup>st</sup>	Steam Sterilization
	2 <sup>nd</sup>	Flame Sterilization
_ »d	3 <sup>rd</sup>	Filter Sterilization
3 <sup>rd</sup>	1 <sup>st</sup>	Repeated
	2 <sup>nd</sup>	Repeated
AL.	3 <sup>rd</sup>	Discussion and writing record
4 <sup>th</sup>	1 <sup>st</sup>	Record checking
	2 <sup>nd</sup>	Discussion about media
	3 <sup>rd</sup>	Sterilization of glassware's
5 <sup>th</sup>	1 <sup>st</sup>	Collection of distil water
	2 <sup>nd</sup>	Preparation of chemicals
	3 <sup>rd</sup>	Preparation of chemicals
6 <sup>th</sup>	1 <sup>st</sup>	Preparation of chemicals
	2 <sup>nd</sup>	Preparation of media
	3 <sup>rd</sup>	Preparation of media and sterilization.
7 <sup>th</sup>	1 <sup>st</sup>	Discussion and writing record
	2 <sup>nd</sup>	Record checking
	3 <sup>rd</sup>	Instrument
8 <sup>th</sup>	1 <sup>st</sup>	Discuss about Instrumentation
	2 <sup>nd</sup>	Preparation of chemicals
	3 <sup>rd</sup>	Sterilization of instruments
89 <sup>h</sup>	1 <sup>st</sup>	Discussion about surface sterilization.
	2 <sup>nd</sup>	Inoculation process
101	3 <sup>rd</sup>	Repeat
10th	1 <sup>st</sup>	Repeat
	2 <sup>nd</sup>	Record writing
	3 <sup>rd</sup>	Record checking
11 <sup>th</sup>	1 <sup>st</sup>	Instrument
	2 <sup>nd</sup>	Discussion about callus
	3 <sup>rd</sup>	Discussion about suspension culture.
12 <sup>th</sup>	1 <sup>st</sup>	Sterilization of glassware's
	2 <sup>nd</sup>	Collection of distil water
AL	3 <sup>rd</sup>	Preparation of chemicals
13 <sup>th</sup>	1 <sup>st</sup>	Preparation of chemicals
	2 <sup>nd</sup>	Preparation of media
AL.	3 <sup>rd</sup>	Preparation of media
14 <sup>th</sup>	1 <sup>st</sup>	Sterilization of media
	2 <sup>nd</sup>	Inoculation of explant
	3 <sup>rd</sup>	Inoculation of explant
15 <sup>th</sup>	1 <sup>st</sup>	Observation of growth of explant
	2 <sup>nd</sup>	Record writing.
	3 <sup>rd</sup>	Record checking

DISCIPLINE: Biotechnology	SEMESTER: 5th Sem.	NAME OF THE TEACHING FACULTY:
		Dr. Sasmita Panigrahi
SUBJECT: Project phase-I	NO. OF DAYS/ PER WEEK	SEMESTER FROM DATE: 01-07-2024
	CLASS ALLOTTED:04	TO DATE: 08-11-2024
		NO. OF WEEKS:15

## PROJECT TITLE- IN VITRO REGENERATION OF PLANTLETS OF BANANA

WEEK	CLASS/ DAY	THEORY/ PRACTICAL TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	Discussion about the project.
	2 <sup>nd</sup>	Discussion about the project.
	3 <sup>rd</sup>	Discussion about the project.
	4 <sup>th</sup>	Discussion about the project.
2 <sup>nd</sup>	1 <sup>st</sup>	Collection of research article regarding
		project.
	2 <sup>nd</sup>	Collection of research article regarding
		project.
	3 <sup>rd</sup>	Planning of project work.
	4 <sup>th</sup>	Preparation of distil water.
3 <sup>rd</sup>	1 <sup>st</sup>	Preparation of distil water.
	2 <sup>nd</sup>	Sterilization of glass wares
	3 <sup>rd</sup>	Preparation of chemicals.
	4 <sup>th</sup>	Preparation of chemicals.
4 <sup>th</sup>	1 <sup>st</sup>	Preparation of chemicals.
	2 <sup>nd</sup>	Preparation of MS media with different
		hormone combination for growth of
		callus.
	3 <sup>rd</sup>	Preparation of MS media with different
		hormone combination for growth of
		callus.
	4 <sup>th</sup>	Preparation of MS media with different
		hormone combination for growth of
		callus.
5 <sup>th</sup>	1 <sup>st</sup>	Preparation of MS media with different
		hormone combination for growth of
		callus.
	2 <sup>nd</sup>	Preparation of MS media with different
		hormone combination for growth of
		callus.
	3 <sup>rd</sup>	Inoculation of explants
	4 <sup>th</sup>	Inoculation of explants
6 <sup>st</sup>	1 <sup>st</sup>	Inoculation of explants
	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
7 <sup>th</sup>	1 <sup>st</sup>	Observation of growth.
	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
8 <sup>th</sup>	1 <sup>st</sup>	Observation of growth.

	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
9 <sup>th</sup>	1 <sup>st</sup>	Review of the project work.
	2 <sup>nd</sup>	Review of the project work.
	3 <sup>rd</sup>	Review of the project work.
	4 <sup>th</sup>	Preparation of MS media with different
		hormone combination for shooting
10 <sup>th</sup>	1 <sup>st</sup>	Preparation of MS media with different
		hormone combination for shooting.
	2 <sup>nd</sup>	Preparation of MS media with different
		hormone combination for shooting.
	3 <sup>rd</sup>	Inoculation of Callus.
	4 <sup>th</sup>	Inoculation of Callus.
11 <sup>st</sup>	1 <sup>st</sup>	Inoculation of Callus.
	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
12 <sup>th</sup>	1 <sup>st</sup>	Observation of growth.
	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
13 <sup>th</sup>	1 <sup>st</sup>	Observation of growth.
	2 <sup>nd</sup>	Observation of growth.
	3 <sup>rd</sup>	Observation of growth.
	4 <sup>th</sup>	Observation of growth.
14 <sup>th</sup>	1 <sup>st</sup>	Review of the project work.
	2 <sup>nd</sup>	Review of the project work.
	3 <sup>rd</sup>	Review of the project work.
	4 <sup>th</sup>	Writing of project.
15 <sup>th</sup>	1 <sup>st</sup>	Writing of project.
	2 <sup>nd</sup>	Writing of project.
	3 <sup>rd</sup>	Discussion and presentation.
	4 <sup>th</sup>	Discussion and presentation.

DISCIPLINE:	SEMESTER:5 <sup>th</sup>	NAME OF THE TEACHING FACULTY: Sunil Biswajit Maharana
Biotechnology	Sem	·
SUBJECT: Th. 3 PLANT	NO. OF DAYS/	FROM DATE: 01-07-2024
BIOTECHNOLOGY	PER WEEK CLASS	TO DATE: 08-11-2024
	ALLOTTED:04	NO. OF WEEKS:15
WEEK	CLASS DAY	THEORY/ PRACTICAL TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	1.1 What is Biotechnology.
	2 <sup>nd</sup>	1.1 Concept of Plant Biotechnology.
	3 <sup>rd</sup>	1.1 Concept of Plant Biotechnology.
	4 <sup>th</sup>	1.2 What is plant Tissue culture.
2 <sup>nd</sup>	1 <sup>st</sup>	1.2 Tissue culture laboratory .
	2 <sup>nd</sup>	1.2 Tissue culture laboratory (Equipments).
	3 <sup>rd</sup>	1.2 Tissue culture laboratory (glass wares ).
	4 <sup>th</sup>	1.2 Tissue culture laboratory (chemicals).
3 <sup>rd</sup>	1 <sup>st</sup>	1.2 Tissue culture (Equipments, glass wares & chemicals)&
		sterilization.
	2 <sup>nd</sup>	1.3 What is Sterilization?
	3 <sup>rd</sup>	1.3 What is Aseptic condition?
	4 <sup>th</sup>	1.3 How to maintain Sterilization & Aseptic condition.
4 <sup>th</sup>	1 <sup>st</sup>	1.4 Applications of plant tissue culture.
	2 <sup>nd</sup>	1.4 Applications of plant tissue culture.
	3 <sup>rd</sup>	1.4 Applications of plant tissue culture.
	4 <sup>th</sup>	2.1 What is culture media?
5 <sup>th</sup>	1 <sup>st</sup>	2.1Types of culture media.
	2 <sup>nd</sup>	2.1preparation of culture media.
	3 <sup>rd</sup>	2.2 What is Callus?
	4 <sup>th</sup>	2.2 Techniques of callus culture.
6 <sup>st</sup>	1 <sup>st</sup>	2.2Different types and nature of Callus.
	2 <sup>nd</sup>	2.3 What is Protoplast?
	3 <sup>rd</sup>	2.3 Techniques for Isolation of protoplast.
	4 <sup>th</sup>	2.3 Techniques for fusion of protoplast.
7 <sup>th</sup>	1 <sup>st</sup>	2.3 Culture of protoplast.
	2 <sup>nd</sup>	2.4 What is Somatic Embryogenesis?
	3 <sup>rd</sup>	2.4 Protocols for inducing Somatic Embryogenesis.
	4 <sup>th</sup>	2.4 Importance Somatic Embryogenesis.
8 <sup>th</sup>	1 <sup>st</sup>	2.5 What is Single cell culture.
	2 <sup>nd</sup>	2.5 Methods of Single cell culture.
	3 <sup>rd</sup>	2.6What is Embryo culture?
	4 <sup>th</sup>	2.6 Methods of Embryo culture.
9 <sup>th</sup>	1 <sup>st</sup>	2.7 What is Somatic hybridization and Cybridization.
	2 <sup>nd</sup>	2.7 Methods of Somatic hybridization and Cybridization
	3 <sup>rd</sup>	2.7 Importance of Somatic hybridization and Cybridization.
	4 <sup>th</sup>	3.1What is Vector?
10 <sup>th</sup>	1 <sup>st</sup>	3.1 Vector mediated Gene transfer.
	2 <sup>nd</sup>	3.1Mthod of Vector mediated Gene transfer.
	3 <sup>rd</sup>	3.1 Method of Vector mediated Gene transfer.

	1	
	4 <sup>th</sup>	3.2 What is Agro bacterium
11 <sup>st</sup>	1 <sup>st</sup>	3.2Types of Agro bacterium mediated gene transfer methods.
	2 <sup>nd</sup>	3.2Types of Agro bacterium mediated gene transfer methods.
	3 <sup>rd</sup>	3.2 Importance of Agro bacterium mediated gene transfer.
	4 <sup>th</sup>	3.3 Ti-plasmid &Ri plasmid
12 <sup>th</sup>	1 <sup>st</sup>	3.3 Ti-plasmid &Ri plasmid
	2 <sup>nd</sup>	3.4 What is transgenic plant
	3 <sup>rd</sup>	3.4 Formation of transgenic plant
	4 <sup>th</sup>	3.4 Importance of transgenic plant.
13 <sup>th</sup>	1 <sup>st</sup>	3.5 Transposon & Transposable elements .
	2 <sup>nd</sup>	3.5 Transposon & Transposable elements
	3 <sup>rd</sup>	4.1 Flavor ,Savor (tomato)
	4 <sup>th</sup>	4.1 Flavor ,Savor (tomato)
14 <sup>th</sup>	1 <sup>st</sup>	4.1 Application of Flavor ,Savor (tomato).
	2 <sup>nd</sup>	4.2 What is BT cotton?
	3 <sup>rd</sup>	4.2Technique of BT cotton.
	4 <sup>th</sup>	4.2 Application of BT cotton.
15 <sup>th</sup>	1 <sup>st</sup>	4.3 What is BT Brinjal?
	2 <sup>nd</sup>	4.3 Importance of BT Brinjal
	3 <sup>rd</sup>	4.4What is Gloden Rice?
	4 <sup>th</sup>	4.4Importance of Gloden Rice
	4 <sup>th</sup>	4.4Importance of Gloden Rice

DISCIPLINE: Biotech	SEMESTER: 5 <sup>th</sup>	NAME OF THE TEACHING FACULTY:
		Dr. Sasmita Panigrahi
SUBJECT:	NO. OF DAYS/ PER	FROM DATE: 01-07-2024
Instrumentation &	WEEK CLASS	TO DATE: 08-11-2024
Chemical Analysis	ALLOTTED: 04	NO. OF WEEKS: 15
(Theory )		
WEEK	CLASS DAY	THEORY TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	Instrument
	2 <sup>nd</sup>	Instruments and its importance
	3 <sup>rd</sup>	Standards of measurement
	4 <sup>th</sup>	Functional elements of instruments
2 <sup>nd</sup>	1 <sup>st</sup>	Performance characteristics of an instrument
	2 <sup>nd</sup>	Measurements of characteristics
	3 <sup>rd</sup>	Measurement of viscosity by Red Wood Viscometer
	4 <sup>th</sup>	Measurement of viscosity by Falling Sphere Viscometer
3 <sup>rd</sup>	1 <sup>st</sup>	Measurement of viscosity by Continuous Viscometer
	2 <sup>nd</sup>	Principle and uses of spectrophotometer
	3 <sup>rd</sup>	Principle and uses of polarimeter
	4 <sup>th</sup>	Measurement of refractive index by Refractometer
4 <sup>th</sup>	1 <sup>st</sup>	pH & Conductivity Measurement
	2 <sup>nd</sup>	Measurement of pH
	3 <sup>rd</sup>	Measurement of electrical conductivity
	4 <sup>th</sup>	Temperature Measurement
5 <sup>th</sup>	1 <sup>st</sup>	Different temperature scales
	2 <sup>nd</sup>	Different methods of temperature measurement
	3 <sup>rd</sup>	Temperature measurement by liquid in glass
		thermometer
	4 <sup>th</sup>	Temperature measurement on electrical phenomena –
		like thermocouple, resistance thermometer, optical
a+b	- c+	pyrometer, radiation pyrometer.
6 <sup>th</sup>	1 <sup>st</sup>	Test 1
	2 <sup>nd</sup>	Basic reasons of pressure
	3 <sup>rd</sup>	Pressure Measurement
_+h	4 <sup>th</sup>	Different types of pressure
7 <sup>th</sup>	1 <sup>st</sup>	Different methods of measurement of pressure
	2 <sup>nd</sup>	Pressure measurement by Bourdon tube, Bellows
	3 <sup>rd</sup>	Maintenance and repair of pressure measuring
	4 <sup>th</sup>	instruments
<b>o</b> th	1 <sup>st</sup>	Automatic control
8 <sup>th</sup>	2 <sup>nd</sup>	Application of Automatic control system
	3 <sup>rd</sup>	Application of Automatic control system
	3	Elementary idea about transfer functions for a first
	4 <sup>th</sup>	order system  Elementary idea about transfer functions for a time
	<b>-</b>	constant.
9 <sup>th</sup>	1 <sup>st</sup>	Block diagram
<i>3</i>	2 <sup>nd</sup>	Components of Process Control system
	3 <sup>rd</sup>	Types of process control system
	4 <sup>th</sup>	Advantages and disadvantages of process control
	7	system
		Jystem

10 <sup>th</sup>	1 <sup>st</sup>	Test 2
	2 <sup>nd</sup>	Elementary idea about different types of automatic
		controllers
	3 <sup>rd</sup>	Principle of PLC
	4 <sup>th</sup>	Computer Aided measurement and control
11 <sup>th</sup>	1 <sup>st</sup>	Modern analytical instruments for measuring process
		parameters
	2 <sup>nd</sup>	Fatty acid titration
	3 <sup>rd</sup>	instruments used in the process industry
	4 <sup>th</sup>	Principles of measuring instruments.
12 <sup>th</sup>	1 <sup>st</sup>	Verification of Beer Lamberb's law
	2 <sup>nd</sup>	Structure of Industrial Instrumentation in Real Time
		Applications
	3 <sup>rd</sup>	Measurement of physical variables such as flow,
		temperature, level, or pressure
	4 <sup>th</sup>	Separation of Iron using solvent extraction technique
13 <sup>th</sup>	1 <sup>st</sup>	Determine pH and conductivity of a given solution by
		pH-meter
	2 <sup>nd</sup>	Concentration of sugar in sugar solution by Polarimeter
	3 <sup>rd</sup>	Refractive index of different liquids by Abbe's
		Refractometer
	4 <sup>th</sup>	Maximum wavelength of a solution of cobalt chloride
14 <sup>th</sup>	1 <sup>st</sup>	Beer's Law and apply it to find the concentration of the
		given unknown solution by Spectrophotometer
	2 <sup>nd</sup>	Beer's law of solution of KMnO4 and K2Cr2O7 using
		calorimeter
	3 <sup>rd</sup>	Demonstrate different types of pressure gauges and
		temperature measuring devices
	4 <sup>th</sup>	Determine the viscosity of an Oil by Red Wood
		Viscometer at different temperature
15 <sup>th</sup>	1 <sup>st</sup>	Plotting a graph between viscosity and temperature
	2 <sup>nd</sup>	Calibration of a thermocouple
	3 <sup>rd</sup>	Demonstrate function of digital multi-meter
	4 <sup>th</sup>	Test 3

DISCIPLINE: Biotech	SEMESTER: 5 <sup>th</sup>	NAME OF THE TEACHING FACULTY:
		Dr. Sasmita Panigrahi
SUBJECT:	NO. OF DAYS/	FROM DATE: 01-07-2024
Instrumentation &	PER WEEK	TO DATE: 08-11-2024
<b>Chemical Analysis</b>	CLASS	NO. OF WEEKS: 15
(Practical)	ALLOTTED: 03	
WEEK	CLASS DAY	PRACTICAL TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	Instrument
	2 <sup>nd</sup>	Discuss about Instrumentation
	3 <sup>rd</sup>	Difference between solvent and solute
2 <sup>nd</sup>	1 <sup>st</sup>	Separation of Iron using solvent extraction technique
	2 <sup>nd</sup>	Repeat
	3 <sup>rd</sup>	Repeat
3 <sup>rd</sup>	1 <sup>st</sup>	Disuss about pH
	2 <sup>nd</sup>	About pH meter and its electrode
	3 <sup>rd</sup>	Conductivity discussion
4 <sup>th</sup>	1 <sup>st</sup>	Determination of pH and conductivity of a given solution
		by pH meter
	2 <sup>nd</sup>	Result and discussion
	3 <sup>rd</sup>	Repeat
5 <sup>th</sup>	1 <sup>st</sup>	Writing of record
	2 <sup>nd</sup>	Record checking
	3 <sup>rd</sup>	Discuss about Polari meter
	1 <sup>st</sup>	Concentration sugar preparation
	2 <sup>nd</sup>	Determine of Concentration of sugar in sugar solution by
		Polari meter
	3 <sup>rd</sup>	Abbs refracto meter
6 <sup>th</sup>	1 <sup>st</sup>	Refractive index
	2 <sup>nd</sup>	Relation between refractive index values
	3 <sup>rd</sup>	Determine the refractive index by different liquids by
		Abbs refracto meter
7 <sup>th</sup>	1 <sup>st</sup>	Beers Law
	2 <sup>nd</sup>	Lamberts Law
	3 <sup>rd</sup>	Web length discussion
8 <sup>th</sup>	1 <sup>st</sup>	Study of Spectro photo meter
	2 <sup>nd</sup>	Cobalt chloride b preparation
	3 <sup>rd</sup>	Measurement of different solution of Cobalt chloride
9 <sup>th</sup>	1 <sup>st</sup>	Repeat
	2 <sup>nd</sup>	Repeat
	3 <sup>rd</sup>	Record writing
10 <sup>th</sup>	1 <sup>st</sup>	Record checking
	2 <sup>nd</sup>	Record checking
	3 <sup>rd</sup>	Verify Beers law by using KMNO4 solution
11 <sup>th</sup>	1 <sup>st</sup>	Verification Beers Law by using K2Cr2O7 using Calori
		meter
	2 <sup>nd</sup>	Demonstrate different types of pressure gauge and
		temperature measuring devices
	3 <sup>rd</sup>	Discuss about Viscosity
12 <sup>th</sup>	1 <sup>st</sup>	Viscometer its parts and use
	2 <sup>nd</sup>	Determine the viscosity of an oil by Redwood viscometer

		at different temperature
	3 <sup>rd</sup>	Graph preparation
13 <sup>th</sup>	1 <sup>st</sup>	Calibration of thermo couples
	2 <sup>nd</sup>	Function of digital multi meter
	3 <sup>rd</sup>	Writing of record
14 <sup>th</sup>	1 <sup>st</sup>	Repeat
	2 <sup>nd</sup>	Record checking
	3 <sup>rd</sup>	Record checking
15 <sup>th</sup>	1 <sup>st</sup>	Doubt Clear session
	2 <sup>nd</sup>	Repeat
	3 <sup>rd</sup>	Repeat

DISCIPLINE: BIOTECHNOLOGY	SEMESTER:5 <sup>th</sup>	NAMEOF THE TEACHING FACULTY: SWETANGINI NAIK
SUBJECT:	NO.OFDAYS/PER	FROM DATE: 01-07-2024
Genetic	WEEK	TO DATE: 08-11-2024
Engineering	CLASSALLOTED:4	NO OF WEEK: 15
WEEK:	CLASS DAY:	THEORY/PRACTICAL TOPICS:
1 <sup>st</sup>	1 <sup>st</sup>	1.1 Concept of Genetic Engineering.
	2 <sup>nd</sup>	Genes
	3 <sup>rd</sup>	Genome
	4 <sup>th</sup>	RDT, Basic steps of RDT.
2 <sup>nd</sup>	1 <sup>st</sup>	RDT, Basic steps of RDT.
	2 <sup>nd</sup>	Tools of RDT
	3 <sup>rd</sup>	Discussion about Restriction Endo nuclease enzyme.
	4 <sup>th</sup>	Discussion about Restriction Endo nuclease enzyme.
3 <sup>rd</sup>	1 <sup>st</sup>	Ligase enzyme and ligation
	2 <sup>nd</sup>	Plasmid
	3 <sup>rd</sup>	DNA modifying enzymes
	4 <sup>th</sup>	necessary role of RDT.
4 <sup>th</sup>	1 <sup>st</sup>	Application of RDT
	2 <sup>nd</sup>	Application of RDT
	3 <sup>rd</sup>	Vector system
	4 <sup>th</sup>	2.1 Gene cloning Vectors.
5 <sup>th</sup>	1 <sup>st</sup>	Gene cloning Vectors.
<u> </u>	2 <sup>nd</sup>	Gene cloning Vectors.
	3 <sup>rd</sup>	Plasmids and their properties.
	4 <sup>th</sup>	Plasmids and teir properties.
6 <sup>th</sup>	1 <sup>st</sup>	Bacteriophage
	2 <sup>nd</sup>	Bacteriophage vectors for E. coli.
	3rd	Bacteriophage vectors for E. coli.
	4 <sup>th</sup>	Life cycle of M13
7 <sup>th</sup>	1 <sup>st</sup>	Life cycle of M13
•	2 <sup>nd</sup>	lambda phage in E. coli.
	3rd	lambda phage in E. coli.
	4 <sup>th</sup>	Cosmids
8 <sup>th</sup>	1 <sup>st</sup>	Cosmids
0	2 <sup>nd</sup>	Shuttle Vectors
	3 <sup>rd</sup>	Shuttle Vectors
9th	4 <sup>th</sup>	YAC vectors. YAC vectors.
J.''	2 <sup>nd</sup>	3.1Integration of DNA insert in to vector.
	3 <sup>rd</sup>	Integration of DNA insert in to vector.
	4 <sup>th</sup>	Linkers
	441	Lilikeis
10 <sup>th</sup>	1 <sup>st</sup>	Linkers
	2 <sup>nd</sup>	adaptors
	3 <sup>rd</sup>	Homo polymer tailing.
	4 <sup>th</sup>	Homo polymer tailing.
	1 <sup>st</sup>	cDNA and Genomic Libraries.
11 <sup>th</sup>	1 <sup>st</sup>	cDNA and Genomic Libraries.
	2 <sup>nd</sup>	Introduction of foreign DNA into host cells.
	3 <sup>rd</sup>	Transformation- Griffith Effect, Infection, Transfection.
	4 <sup>th</sup>	Sequence based screening – colony hybridization
12 <sup>th</sup>	1 <sup>st</sup>	Sequence based screening – colony hybridization
	2 <sup>nd</sup>	Sequence based screening – colony hybridization
	1	

	3 <sup>rd</sup>	Chromosome walking	
	4 <sup>th</sup>	Chromosome walking	
13 <sup>th</sup>	1 <sup>st</sup>	Concept of chromosome Jumping	
	2 <sup>nd</sup>	Concept of chromosome Jumping	
	3 <sup>rd</sup>	Screening by PCR	
	4 <sup>th</sup>	Screening by PCR	
14 <sup>th</sup>	1 <sup>st</sup>	Gene Tagging	
	2 <sup>nd</sup>	Blotting Techniques (Southern & Western blotting)	
	3 <sup>rd</sup>	Blotting Techniques (Southern & Western blotting)	
	4 <sup>th</sup>	Genetic finger printing.	
15 <sup>th</sup>	1 <sup>st</sup>	Microarray Technology.	
	2 <sup>nd</sup>	Different molecular genetic marker RFLP,RAPD only	
	3 <sup>rd</sup>	Different molecular genetic marker RFLP,RAPD only	
	4 <sup>th</sup>	Revision and Class test	

DISCIPLINE: Biotech	SEMESTER: 5 <sup>th</sup>	NAME OF THE TEACHING FACULTY:	
		SWETANGININ NAIK	
SUBJECT:	NO. OF DAYS/ PER	FROM DATE: 01-07-2024	
Biochemistry	WEEK CLASS ALLOTTED:	TO DATE: 08-11-2024	
(Theory )	04	NO. OF WEEKS: 15	
WEEK	CLASS DAY	THEORY TOPICS	
1 <sup>st</sup>	1 <sup>st</sup>	About organic Chemistry	
	2 <sup>nd</sup>	Basics of Biochemistry	
	3 <sup>rd</sup>	Functions of Carbohydrates	
	4 <sup>th</sup>	Structure and function of monosaccharides	
2 <sup>nd</sup>	1 <sup>st</sup>	Structure and function of disaccharides	
	2 <sup>nd</sup>	Structure and function of polysaccharides	
	3 <sup>rd</sup>	Proteoglycans	
	4 <sup>th</sup>	Glycoprotein with glycolipids	
3 <sup>rd</sup>	1 <sup>st</sup>	Some commercially important carbohydrates	
	2 <sup>nd</sup>	Amino acids,	
		Peptides and proteins	
	3 <sup>rd</sup>	Structure and function of amino acids	
	4 <sup>th</sup>	Classification of amino acids	
4 <sup>th</sup>	1 <sup>st</sup>	Functional group of amino acids	
	2 <sup>nd</sup>	Biological activity of small peptides	
	3 <sup>rd</sup>	Biosynthesis of amino acids	
	4 <sup>th</sup>	Structure and function of protein	
5 <sup>th</sup>	1 <sup>st</sup>	Different types of protein with respect to their	
		structure and function	
	2 <sup>nd</sup>	Nucleotides and Nucleic Acid	
	3 <sup>rd</sup>	Structure and function of nucleotides	
	4 <sup>th</sup>	Properties of nucleotide bases that affect the	
		structure of nucleic acid	
6 <sup>th</sup>	1 <sup>st</sup>	Chemistry of nucleic acid	
	2 <sup>nd</sup>	Structure of nucleic acid	
	3 <sup>rd</sup>	Lipids and Fats	
	4 <sup>th</sup>	Storagelipids.	
7 <sup>th</sup>	1 <sup>st</sup>	Structurallipids	
	2 <sup>nd</sup>	Lipids with specific biological activities	
	3 <sup>rd</sup>	Lipid Bilayer	
	4 <sup>th</sup>	Amphipathicnature of membrane lipids that form	
Al-	1	the bilayer.	
8 <sup>th</sup>	1 <sup>st</sup>	Role of lipid in plasma membrane	
	2 <sup>nd</sup>	Function of protein	
	3 <sup>rd</sup>	Nucleotide and nucleoside formation	
0+h	4 <sup>th</sup>	About DNA structure	
9 <sup>th</sup>	1 <sup>st</sup>	DNA synthesis	
	2 <sup>nd</sup>	RNA structure	
	3 <sup>rd</sup>	RNA synthesis	
+ h	4 <sup>th</sup>	Protein synthesis	
10 <sup>th</sup>	1 <sup>st</sup>	Chemistry of nucleic acid	
	2 <sup>nd</sup>	Properties of nucleotide bases	
	3 <sup>rd</sup>	Structure of nucleic acid	
	4 <sup>th</sup>	Test 1	

11 <sup>th</sup>	1 <sup>st</sup>	Storage lipid & Distructural lipids
	2 <sup>nd</sup>	Biological function of lipid
	3 <sup>rd</sup>	Test 2
	4 <sup>th</sup>	Plasma membrane structure
12 <sup>th</sup>	1 <sup>st</sup>	Plasma membrane functions
	2 <sup>nd</sup>	Cell and biosynthesis
	3 <sup>rd</sup>	Amphipathic nature of membrane
	4 <sup>th</sup>	Adipose tissuer
13 <sup>th</sup>	1 <sup>st</sup>	Fat biosynthesis
	2 <sup>nd</sup>	Mono- glycerides & Di-glyceride structure
	3 <sup>rd</sup>	Lipid bilayer & Lipid biosynthesis
	4 <sup>th</sup>	Determination of pH color comparison pH meter
		determination of PKa value
14 <sup>th</sup>	1 <sup>st</sup>	Qualitative tests on carbohydrates and proteins
	2 <sup>nd</sup>	Estimation of total sugar by anthrone method
	3 <sup>rd</sup>	Estimation of reducing sugar by Benedict's test
	4 <sup>th</sup>	Fatty acid titration
15 <sup>th</sup>	1 <sup>st</sup>	Verification of Beer Lambert's law
	2 <sup>nd</sup>	Determine iodine value of different fat samples
	3 <sup>rd</sup>	Quantify amino acid using ninhydrin reaction
	4 <sup>th</sup>	Test 3

DISCIPLINE: Biotech	SEMESTER: 5 <sup>th</sup>	NAME OF THE TEACHING FACULTY: SWETANGINI NAIK
SUBJECT:	NO. OF DAYS/ PER	FROM DATE: 01-07-2024
Biochemistry	WEEK CLASS	TO DATE: 08-11-2024
(Practical)	ALLOTTED: 06	NO. OF WEEKS: 15
WEEK	CLASS DAY	PRACTICAL TOPICS
1 <sup>st</sup>	1 <sup>st</sup>	About pH meter
	2 <sup>nd</sup>	Determination of Pka value
	3 <sup>rd</sup>	Relation between pH and Pka
	4 <sup>th</sup>	Numericals
	5 <sup>th</sup>	Numericals
	6 <sup>th</sup>	Numericals
2 <sup>nd</sup>	1 <sup>st</sup>	Qualitative tests demonstration
	2 <sup>nd</sup>	Test for Carbohydrates
	3 <sup>rd</sup>	Test for protein
	4 <sup>th</sup>	Results and discussions
	5 <sup>th</sup>	Results and discussions
	6 <sup>th</sup>	Results and discussions
3 <sup>rd</sup>	1 <sup>st</sup>	Repeat Exp- 1
	2 <sup>nd</sup>	Repeat Exp- 1
	3 <sup>rd</sup>	Repeat Exp- 1
	4 <sup>th</sup>	Checking of records
	5 <sup>th</sup>	Checking of records
	6 <sup>th</sup>	Checking of records
4 <sup>th</sup>	1 <sup>st</sup>	Anthrone reagent preparation
	2 <sup>nd</sup>	Preparation of stock
	3 <sup>rd</sup>	Preparation of stock
	4 <sup>th</sup>	Results and discussions
	5 <sup>th</sup>	Results and discussions
_+h	6 <sup>th</sup>	Results and discussions
5 <sup>th</sup>	1 <sup>st</sup>	Repeat Exp- 2
	2 <sup>nd</sup>	Repeat Exp- 2
	3 <sup>rd</sup>	Repeat Exp- 2
	4 <sup>th</sup>	Checking of records
	5 <sup>th</sup>	Checking of records
	6 <sup>th</sup>	Checking of records
6 <sup>th</sup>	1 <sup>st</sup>	Discussion about reducing sugar
	2 <sup>nd</sup>	Benedicts reagent preparation
	3 <sup>rd</sup>	Discuss about colori meter
	4 <sup>th</sup>	Discuss about Spectro meter
	5 <sup>th</sup>	Discuss about visible length of light
	6 <sup>th</sup>	Discuss about visible length of light
7 <sup>th</sup>	1 <sup>st</sup>	Estimation of reducing sugar
	2 <sup>nd</sup>	Estimation of reducing sugar by Benedicts test
	3 <sup>rd</sup>	Estimation of reducing sugar by Benedicts test
	4 <sup>th</sup>	Repeat Exp- 3
	5 <sup>th</sup>	Repeat Exp- 3
	6 <sup>th</sup>	Repeat Exp- 3
8 <sup>th</sup>	1 <sup>st</sup>	Checking of records

	2 <sup>nd</sup>	Checking of records
	3 <sup>rd</sup>	Checking of records
	4 <sup>th</sup>	Discuss about fatty acid
	5 <sup>th</sup>	Fatty acid seponification
	6 <sup>th</sup>	Titration
9 <sup>th</sup>	1 <sup>st</sup>	
9		Fatty acid titration with use of oil
	2 <sup>nd</sup>	More About titration
	3 <sup>rd</sup>	Results
	4 <sup>th</sup>	Repeat Exp- 4
	5 <sup>th</sup>	Repeat Exp- 4
	6 <sup>th</sup>	Checking of records
10 <sup>th</sup>	1 <sup>st</sup>	Beer Lambarts Law
	2 <sup>nd</sup>	Colorimeter using for Beers Law
	3 <sup>rd</sup>	Verification of Beer Lambarts Law
	4 <sup>th</sup>	Repeat Exp- 5
	5 <sup>th</sup>	Repeat Exp- 5
	6 <sup>th</sup>	Repeat Exp- 5
11 <sup>th</sup>	1 <sup>st</sup>	Checking of records
	2 <sup>nd</sup>	Checking of records
	3 <sup>rd</sup>	Checking of records
	4 <sup>th</sup>	About Iodine value
	5 <sup>th</sup>	Discuss about fats
	6 <sup>th</sup>	Determine the lodine value of different fat samples
12 <sup>th</sup>	1 <sup>st</sup>	Repeat Exp- 6
12	2 <sup>nd</sup>	Repeat Exp- 6
	3 <sup>rd</sup>	Repeat Exp- 6
	4 <sup>th</sup>	Checking of records
	5 <sup>th</sup>	
	6 <sup>th</sup>	Checking of records
4.2th		Checking of records
13 <sup>th</sup>	1 <sup>st</sup>	Discuss about Amino acid
	2 <sup>nd</sup>	Structure of Amino acid
	3 <sup>rd</sup>	Classification of Amino acid
	4 <sup>th</sup>	Ninhydrin reagent preparation
	5 <sup>th</sup>	Quantify Amino acid using in ninhydrine reagent
	6 <sup>th</sup>	Quantify Amino acid using in ninhydrine reagent
14 <sup>th</sup>	1 <sup>st</sup>	Repeat Exp- 7
	2 <sup>nd</sup>	Repeat Exp- 7
	3 <sup>rd</sup>	Repeat Exp- 7
	4 <sup>th</sup>	Checking of records
	5 <sup>th</sup>	Checking of records
	6 <sup>th</sup>	Checking of records
15 <sup>th</sup>	1 <sup>st</sup>	Repeat Exp- 8
	2 <sup>nd</sup>	Repeat Exp- 8
	3 <sup>rd</sup>	Repeat Exp- 8
	4 <sup>th</sup>	Checking of records
	5 <sup>th</sup>	Checking of records
	6 <sup>th</sup>	Checking of records  Checking of records
	U	CHECKING OF FECOLOS