3rd SEMESTER (DSC & SEC)

Session: July 2020 to December 2020

(COURSE CODE: BOTGCOR03T, BOTSSEC01M)

SEM III: DSC-CORE COURSE III:PAPER III

PLANT ANATOMY AND EMBRYOLOGY

CODE: BOTGCOR03T (4 Credits)

COURSE OUTCOME: Plant anatomy is the study of the internal structure of plants, mostly at the cellular/microscopic level. In this study plant morphology mainly reflects reproductive structures of angiosperm like flower, inflorescence, fruits and seeds. On the other hand anatomy reveals apical meristem, vascular cambium, wood, and also focuses on adaptive and protective system. **Embryology** is helpful for studying the reproductive biology.
This course will be helpful for the students to acquire a clear knowledge on the internal structure of angiosperms along with their different adaptive and protective systems as well as their reproductive mechanism.

On completion of the course, students will be able to:
1. Understand the habit of the angiosperm plant body.
2. Know the vegetative characteristics of the plant.
3. Understand the scope & importance of Anatomy.
4. Know various tissue systems.
5. Understand the normal and anomalous secondary growth in plants and their causes.
6. A parallel practical course will also help to gather a brief knowledge on various techniques used in anatomical study.

THEORY

(BOTGCOR03T)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT	BOTANY									
HOD	DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	FROM JULY 2020 TO DECEMBER 2020						**HONS**	**GENERAL** √		

SEM	3	Core Course DSC	3	CREDIT POINT	4	Course Code	BOTGCOR03T

Name of the Course	Plant Anatomy and Embryology
Course Coordinator	DR. AYANA CHAKRAROBTY

TOTAL MARKS	50	TH	√	TUT		PRAC	
TOTAL HOURS	60	TH	√	TUT		PRAC	

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1			
NAME OF THE UNIT/MODULE	Meristematic and permanent tissues			

TOTAL HOURS	8	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AC	JULY
2	Simple tissues	1	AC	JULY
3	Complex tissues	1	AC	AUG
4	Basic Concept of Root apical meristems	1	AC	AUG
5	Theories of Root Apical Meristem: Histogen	1	AC	AUG
6	Theories of Root Apical Meristem: korper kappe	1	AC	AUG
7	Basic Concept of Shoot apical meristems	1	AC	AUG
8	Theories of Shoot Apical Meristem: Histogen, Tunica Corpus	1	AC	AUG
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	2			
NAME OF THE UNIT/MODULE	Organs			

TOTAL HOURS	4	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Structure of dicot root stem	1	AC	AUG
2	Structure of dicot leaf	1	AC	AUG
3	Structure of monocot root stem	1	AC	SEPT
4	Structure of monocot leaf	1	AC	SEPT
	TOTAL HOURS	4		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Secondary Growth**				
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AC	SEPT
2	Vascular cambium – structure	1	AC	SEPT
3	Vascular cambium – function	1	AC	SEPT
4	Vascular cambium seasonal activity	1	AC	SEPT
5	Secondary growth in root	1	AC	SEPT
6	Secondary growth in stem	1	AC	SEPT
7	Wood (heartwood and sapwood)	1	AC	SEPT
8	Class Test	1	AC	OCT
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	4			
NAME OF THE UNIT/MODULE	**Adaptive and protective systems**			

TOTAL HOURS	8	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AC	OCT
2	Epidermis	1	AC	OCT
3	cuticle	1	AC	OCT
4	stomata	1	AC	DEC
5	General account of adaptations in xerophytes	1	AC	DEC
6	General account of adaptations in hydrophytes	1	AC	DEC
7	Doubt Clearing Class	1	AC	DEC
8	Class Test	1	AC	DEC
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	5			
NAME OF THE UNIT/MODULE	**Structural organization of flower**			

TOTAL HOURS	8	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	SS	JULY
2	Structure of pollen	1	SS	JULY
3	Structure of pollen	1	SS	AUG
4	Structure of ovules	1	SS	AUG
5	types of ovules	1	SS	AUG
6	Types of embryo sacs	1	SS	AUG
7	organization of mature embryo sac	1	SS	AUG
8	ultrastructure of mature embryo sac	1	SS	AUG
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			Pollination and fertilization				
TOTAL HOURS	10	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	AUG
2	Pollination mechanisms	1	SS	AUG
3	Pollination adaptations	1	SS	SEPT
4	Double fertilization	1	SS	SEPT
5	Seed- structure appendages	1	SS	SEPT
6	Seed- dispersal mechanisms	1	SS	SEPT
7	Doubt clearing class	1	SS	SEPT
8	Class Test	1	SS	SEPT
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7				
NAME OF THE UNIT/MODULE			Embryo and endosperm				
TOTAL HOURS	8	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	SEPT
2	Endosperm types	1	SS	SEPT
3	Endosperm structure	1	SS	OCT
4	Endosperm functions	1	SS	OCT
5	Dicot embryo	1	SS	OCT
6	Monocot embryo	1	SS	OCT
7	Embryo endosperm relationship	1	SS	OCT
8	Class test	1	SS	NOV
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			**Apomixis and polyembryony**				
TOTAL HOURS	12	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	SS	NOV
2	Apomixis - Definition, Types	1	SS	NOV
3	Apomixis - Types	1	SS	NOV
4	Apomixis - practical applications	1	SS	DEC
5	Polyembryony – Definition, Types	1	SS	DEC
6	Polyembryony – Practical Application	1	SS	DEC
7	Doubt clearing class	1	SS	DEC
8	Class test	1	SS	DEC
	TOTAL HOURS	8		

SEM III: SKILL ENHANCEMENT COURSE
Plant Diversity and Human Welfare

CODE: BOTSSEC01M (Credits 2)

COURSE OUTCOME: The course deals with plant diversity and human welfare. Now a day's loss of biodiversity is a major problem which is threatening the earth. Through this course student will come to know the causes of diversity loss and also about the organization who have been continuously working for biodiversity management and sustainable development. We are hopeful enough that the course will be helpful in growing student's awareness about conservation of nature and natural recourses.

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THEORY

(BOTSSEC01M)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)										
NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	FROM JULY 2020TO DECEMBER 2020						**HONS** √	**GENERAL** √		
SEM	3	**SEC**	1	**CREDIT POINT**	2	**Course Code**	**BOTSSEC01M**			
Name of the Course	**Plant Diversity and Human Welfare**									
Course Co-ordinator	DR. AYANA CHAKRAROBTY									
TOTAL MARKS	25	TH	√	TUT		PRAC				
TOTAL HOURS	30	TH	√	TUT		PRAC				

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1						
NAME OF THE UNIT/MODULE	Plant diversity and its scope						
TOTAL HOURS	8(Reduced to 4)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Genetic diversity, Species diversity and Plant diversity at the ecosystem level	1	ABJ	JUL
2	Agrobiodiversity; Cultivated plant taxa, wild taxa	1	ABJ	AUG
3	Values and uses of Biodiversity: Ethical and aesthetic values	1	ABJ	AUG
4	Precautionary principle, Methodologies for valuation, Uses of plants and Uses of microbes	1	ABJ	AUG
5**				
6**				
7**				
8**				
	TOTAL HOURS	4 hrs		

***** Alloted total 8 hours adjusted to 4 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			**Loss of Biodiversity**				
TOTAL HOURS	8(Reduced to 5)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Loss of genetic diversity, Loss of species diversity AND Loss of ecosystem diversity	1	ABJ	SEPT
2	Loss of agrobiodiversity, Projected scenario of Bio-diversity loss	1	ABJ	SEPT
3	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO	1	ABJ	SEPT
4	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution- WWF, NBPGR	1	ABJ	SEPT
5	Biodiversity legislation and conservations, Biodiversity information management and communication	1	ABJ	SEPT
6**				
7**				
8**				
	TOTAL HOURS	5 hrs		

***** Alloted total 8 hours adjusted to 5 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Conservation of Biodiversity:**				
TOTAL HOURS	8(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Conservation of genetic diversity, species diversity and ecosystem diversity	1	ABJ	OCT
2	*In situ* conservation and *ex situ* conservation	1	ABJ	OCT
3	Social approaches to conservation, Biodiversity awareness programmes and Sustainable development.	1	ABJ	OCT
4**				
5**				
6**				
7**				
8**				
	TOTAL HOURS	3 hrs		

***** Alloted total 8 hours adjusted to 3 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Role of plants in relation to Human Welfare**				
TOTAL HOURS	6(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Importance of forestry, Utilization and commercial aspects: Avenue trees and Ornamental plants of India	1	ABJ	DEC
2	Alcoholic beverages through ages, Fruits and nuts: Important fruit crops their commercial importance	1	ABJ	DEC
3**	Wood and its uses	1	ABJ	DEC
4**				
5**				

6**				
	TOTAL HOURS	3 hrs		

***** Alloted total 6 hours adjusted to 3 hours.**

******Due to pandemic situation, Total allotted 30 hours for this course has been adjusted to 15 hours keeping the total content unchanged.**

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3rd SEMESTER (GE & SEC)

Session: July 2020 to December 2020

(COURSE CODE: BOTHGEC03T, BOTSSEC01M)

SEM III: PAPER III: GENERIC ELECTIVE

PLANT ANATOMY AND EMBRYOLOGY

CODE: BOTHGEC03T (4 Credits)

COURSE OUTCOME: Plant anatomy is the study of the internal structure of plants, mostly at the cellular/microscopic level. In this study plant morphology mainly reflects reproductive structures of angiosperm like flower, inflorescence, fruits and seeds. On the other hand anatomy reveals apical meristem, vascular cambium, wood, and also focuses on adaptive and protective system. **Embryology** is helpful for studying the reproductive biology.
This course will be helpful for the students to acquire a clear knowledge on the internal structure of angiosperms along with their different adaptive and protective systems as well as their reproductive mechanism.

On completion of the course, students will be able to:
1. Understand the habit of the angiosperm plant body.
2. Know the vegetative characteristics of the plant.
3. Understand the scope & importance of Anatomy.
4. Know various tissue systems.
5. Understand the normal and anomalous secondary growth in plants and their causes.
6. A parallel practical course will also help to gather a brief knowledge on various techniques used in anatomical study.

THEORY

(BOTHGEC03T)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT				BOTANY						
HOD				DR. AYANA CHAKRAROBTY						
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER		FROM JULY 2020 TO DECEMBER 2020				**HONS**		**GENERAL** √		
SEM	3	**Core Course** / **GE**	3	**CREDIT POINT**	4	**Course Code**	**BOTHGEC03T**			
Name of the Course		Plant Anatomy and Embryology								
Course Coordinator		DR. AYANA CHAKRAROBTY								
TOTAL MARKS	50	TH	√	TUT		PRAC				
TOTAL HOURS	60	TH	√	TUT		PRAC				

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1			
NAME OF THE UNIT/MODULE	**Meristematic and permanent tissues**			
TOTAL HOURS 8	**THEORY** √	**TUTORIAL**		**PRAC**

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AC	JULY
2	Simple tissues	1	AC	JULY
3	Complex tissues	1	AC	AUG
4	Basic Concept of Root apical meristems	1	AC	AUG
5	Theories of Root Apical Meristem: Histogen	1	AC	AUG
6	Theories of Root Apical Meristem: korper kappe	1	AC	AUG
7	Basic Concept of Shoot apical meristems	1	AC	AUG
8	Theories of Shoot Apical Meristem: Histogen, Tunica Corpus	1	AC	AUG
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			**Organs**				
TOTAL HOURS	4	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Structure of dicot root stem	1	AC	AUG
2	Structure of dicot leaf	1	AC	AUG
3	Structure of monocot root stem	1	AC	SEPT
4	Structure of monocot leaf	1	AC	SEPT
	TOTAL HOURS	4		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Secondary Growth**				
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AC	SEPT
2	Vascular cambium – structure	1	AC	SEPT
3	Vascular cambium – function	1	AC	SEPT
4	Vascular cambium seasonal activity	1	AC	SEPT
5	Secondary growth in root	1	AC	SEPT
6	Secondary growth in stem	1	AC	SEPT
7	Wood (heartwood and sapwood)	1	AC	SEPT
8	Class Test	1	AC	OCT
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Adaptive and protective systems**				
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AC	OCT
2	Epidermis	1	AC	OCT
3	cuticle	1	AC	OCT
4	stomata	1	AC	DEC
5	General account of adaptations in xerophytes	1	AC	DEC
6	General account of adaptations in hydrophytes	1	AC	DEC
7	Doubt Clearing Class	1	AC	DEC
8	Class Test	1	AC	DEC
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			**Structural organization of flower**				
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	SS	JULY
2	Structure of pollen	1	SS	JULY
3	Structure of pollen	1	SS	AUG
4	Structure of ovules	1	SS	AUG
5	types of ovules	1	SS	AUG

6	Types of embryo sacs	1	SS	AUG
7	organization of mature embryo sac	1	SS	AUG
8	ultrastructure of mature embryo sac	1	SS	AUG
TOTAL HOURS		8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			**Pollination and fertilization**				
TOTAL HOURS	10	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	AUG
2	Pollination mechanisms	1	SS	AUG
3	Pollination adaptations	1	SS	SEPT
4	Double fertilization	1	SS	SEPT
5	Seed- structure appendages	1	SS	SEPT
6	Seed- dispersal mechanisms	1	SS	SEPT
7	Doubt clearing class	1	SS	SEPT
8	Class Test	1	SS	SEPT
TOTAL HOURS		8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7				
NAME OF THE UNIT/MODULE			**Embryo and endosperm**				
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	SEPT
2	Endosperm types	1	SS	SEPT
3	Endosperm structure	1	SS	OCT
4	Endosperm functions	1	SS	OCT
5	Dicot embryo	1	SS	OCT
6	Monocot embryo	1	SS	OCT
7	Embryo endosperm relationship	1	SS	OCT

8	Class test	1	SS	NOV
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			**Apomixis and polyembryony**				
TOTAL HOURS	12	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	NOV
2	Apomixis - Definition, Types	1	SS	NOV
3	Apomixis - Types	1	SS	NOV
4	Apomixis - practical applications	1	SS	DEC
5	Polyembryony – Definition, Types	1	SS	DEC
6	Polyembryony – Practical Application	1	SS	DEC
7	Doubt clearing class	1	SS	DEC
8	Class test	1	SS	DEC
	TOTAL HOURS	8		

SEM III: SKILL ENHANCEMENT COURSE
Plant Diversity and Human Welfare

CODE: BOTSSEC01M (Credits 2)

COURSE OUTCOME: The course deals with plant diversity and human welfare. Now a day's loss of biodiversity is a major problem which is threatening the earth. Through this course student will come to know the causes of diversity loss and also about the organization who have been continuously working for biodiversity management and sustainable development. We are hopeful enough that the course will be helpful in growing student's awareness about conservation of nature and natural recourses.

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THEORY

(BOTSSEC01M)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)										
NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									

PERIOD OF SEMESTER	FROM JULY 2020TO DECEMBER 2020			**HONS** √	**GENERAL** √		
SEM	3	**SEC**	1	**CREDIT POINT**	2	**Course Code**	**BOTSSEC01M**

Name of the Course	**Plant Diversity and Human Welfare**						
Course Co-ordinator	DR. AYANA CHAKRAROBTY						
TOTAL MARKS	25	TH	√	TUT		PRAC	
TOTAL HOURS	30	TH	√	TUT		PRAC	

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1						
NAME OF THE UNIT/MODULE	Plant diversity and its scope						
TOTAL HOURS	8(Reduced to 4)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Genetic diversity, Species diversity and Plant diversity at the ecosystem level	1	ABJ	JUL
2	Agrobiodiversity; Cultivated plant taxa, wild taxa	1	ABJ	AUG
3	Values and uses of Biodiversity: Ethical and aesthetic values	1	ABJ	AUG
4	Precautionary principle, Methodologies for valuation, Uses of plants and Uses of microbes	1	ABJ	AUG
5**				

6**				
7**				
8**				
	TOTAL HOURS	4 hrs		

***** Alloted total 8 hours adjusted to 4 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2					
NAME OF THE UNIT/MODULE			**Loss of Biodiversity**					
TOTAL HOURS	8(Reduced to 5)	**THEORY**	√	**TUTORIAL**		**PRAC**		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	**TOPIC**				**HR**	**TEACHER**	**MONTH**	
1	Loss of genetic diversity, Loss of species diversity AND Loss of ecosystem diversity				1	ABJ	SEPT	
2	Loss of agrobiodiversity, Projected scenario of Bio-diversity loss				1	ABJ	SEPT	
3	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO				1	ABJ	SEPT	
4	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution- WWF, NBPGR				1	ABJ	SEPT	
5	Biodiversity legislation and conservations, Biodiversity information management and communication				1	ABJ	SEPT	
6**								
7**								
8**								
	TOTAL HOURS				5 hrs			

***** Alloted total 8 hours adjusted to 5 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3					
NAME OF THE UNIT/MODULE			**Conservation of Biodiversity:**					
TOTAL HOURS	8(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Conservation of genetic diversity, species diversity and ecosystem diversity	1	ABJ	OCT
2	*In situ* conservation and *ex situ* conservation	1	ABJ	OCT
3	Social approaches to conservation, Biodiversity awareness programmes and Sustainable development.	1	ABJ	OCT
4**				
5**				
6**				
7**				
8**				
	TOTAL HOURS	3 hrs		

***** Alloted total 8 hours adjusted to 3 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4					
NAME OF THE UNIT/MODULE			**Role of plants in relation to Human Welfare**					
TOTAL HOURS	6(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**

1	Importance of forestry, Utilization and commercial aspects: Avenue trees and Ornamental plants of India	1	ABJ	DEC
2	Alcoholic beverages through ages, Fruits and nuts: Important fruit crops their commercial importance	1	ABJ	DEC
3**	Wood and its uses	1	ABJ	DEC
4**				
5**				
6**				
	TOTAL HOURS	3 hrs		

***** Alloted total 6 hours adjusted to 3 hours.**

******Due to pandemic situation, Total allotted 30 hours for this course has been adjusted to 15 hours keeping the total content unchanged.**

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5th SEMESTER (DSE & SEC)

SESSION: July 2020 to December 2020

(CORSE CODE: BOTGDSE01T, BOTSSEC01M)

SEM V: DISCIPLINE CENTRIC ELECTIVE BOTANY

Cell and Molecular Biology

COURSE CODE: BOTGDSE01T (4Credits)

COURSE OUTCOME: At the end of this course students will be able to:

- Demonstrate the various microscopic techniques;
- Explain the processes of cell division;
- Identify, describe and differentiate plant cells and cell organelles and their functions;
- Describe DNA replication and protein synthesis.

THEORY

(BOTGDSE01T)

NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES	DAY	AC	A B	ABJ	SDG	SS				
	MORN									
PERIOD OF SEMESTER	FROM JULY 2020TO DECEMBER 2020					**HONS**		**GENERAL** √		
SEM	5	**DSE**	1A	**CREDIT POINT**	4	**Course Code**	**BOTGDSE01T**			
Name of the Course	**Cell and Molecular Biology**									
Course Co-ordinator	DR. ARUNEEMA BARDHAN									
TOTAL MARKS	50	TH	√	TUT		PRAC				
TOTAL HOURS	60	TH	√	TUT		PRAC				

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	**1**						
NAME OF THE UNIT/MODULE	**Techniques in Biology**						
TOTAL HOURS	8	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Study of Principles of microscopy	1	AB	JUL
2	Study of Light Microscopy	1	AB	JUL
3	Study of Phase contrast microscopy	1	AB	AUG
4	Study of Fluorescence microscopy	1	AB	AUG
5	Study of Confocal microscopy	1	AB	AUG
6	Study of Sample Preparation for light microscopy	1	AB	AUG
7	Study of Electron microscopy (EM)- Scanning EM and Scanning Transmission EM (STEM)	1	AB	AUG
8	Study of Sample Preparation for electron microscopy and X-ray diffraction analysis	1	AB	AUG
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**2**					
NAME OF THE UNIT/MODULE			**Cell as a unit of Life**					
TOTAL HOURS	2	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	The Cell Theory (Prokaryotic and eukaryotic cells)	1	AB	AUG
2	Cell size and shape and Eukaryotic Cell components	1	AB	SEPT
	TOTAL HOURS	2		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**3**					
NAME OF THE UNIT/MODULE			**Cell Organelles**					
TOTAL HOURS	20	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Study of Mitochondrial structure,	1	AB	SEPT
2	Study of Mitochondrial marker enzymes and compositions	1	AB	SEPT
3	Mitochondria: Semiautonomous nature and Symbiotic hypothesis	1	AB	SEPT
4	Proteins synthesized within mitochondria and mitochondrial DNA	1	AB	SEPT
5	Study of Chloroplast Structure,	1	AB	SEPT
6	Study of Chloroplast marker enzymes and composition	1	AB	SEPT
7	Chloroplast: semiautonomous nature and chloroplast DNA	1	AB	SEPT
8	ER, Golgi body & Lysosomes: Structure and roles	1	AB	SEPT
9	Peroxisomes: Structures, composition, functions in animals and plants and biogenesis	1	AB	SEPT
10	Glyoxisomes: Structures, composition, functions in animals and plants and biogenesis.	1	AB	OCT
11	Study of Nucleus and its components	1	AB	OCT
12	Study of Nuclear Envelope structure of nuclear pore complex	1	AB	OCT
13	Study of Chromatin structure	1	AB	OCT
14	Study of molecular organization of DNA packaging in eukaryotes	1	AB	OCT
15	Study of euchromatin and heterochromatin	1	AB	NOV
16	Study of nucleolus and ribosome structure	1	AB	NOV
17	Doubt clearing class	1	AB	DEC
18	Doubt clearing class	1	AB	DEC
19	Class test	1	AB	DEC
20	Class test	1	AB	DEC
	TOTAL HOURS	20		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**4**				
NAME OF THE UNIT/MODULE			**Cell Membrane and Cell Wall**				
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	The study of functions of membranes	1	SDG	JUL
2	Different models of membrane structure	1	SDG	AUG
3	The fluidity of membranes and membrane proteins and their functions; Carbohydrates in the membrane	1	SDG	AUG
4	Faces of the membranes and Selective permeability of the membranes	1	SDG	AUG
5	The study of Cell wall structure and composition	1	SDG	AUG
6	Doubt clearing class	1	SDG	AUG
TOTAL HOURS		6		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**5**				
NAME OF THE UNIT/MODULE			**Cell Cycle**				
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Study on overview of cell cycle	1	SDG	AUG
2	Study on mitosis	1	SDG	SEPT
3	Study on meiosis	1	SDG	SEPT
4	Study of cell cycle control units	1	SDG	SEPT
5	Study of cell cycle checkpoints	1	SDG	SEPT
6	Class test	1	SDG	SEPT
TOTAL HOURS		6		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**6**					
NAME OF THE UNIT/MODULE			**Genetic material**					
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Miescher to Watson and Crick- historic perspective	1	SDG	SEPT
2	Different experiment on DNA as genetic material(Griffith's and Avery's transformation experiments, Hershey-Chase bacteriophage experiment)	1	SDG	SEPT
3	structure of DNA(Watson and Crick model), types of DNA, and types of genetic material.	1	SDG	OCT
4	Different types of DNA replication mechanism(bidirectional replication, semi–conservative, semi discontinuous RNA priming, Ø (theta) mode of replication, replication of linear)	1	SDG	OCT
5	DNA replication mechanism(ds-DNA, replicating the 5´end of linear chromosome including replication enzymes)	1	SDG	OCT
6	DNA replication mechanism(ds-DNA, replicating the 5´end of linear chromosome including replication enzymes)	1	SDG	OCT
	TOTAL HOURS	6		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**7**					
NAME OF THE UNIT/MODULE			**Transcription (Prokaryotes and Eukaryotes)**					
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Types and structures of RNA (mRNA, tRNA, rRNA)	1	SDG	OCT
2	Study on various types of RNA polymerase	1	SDG	OCT
3	Properties and experiments of genetic code	1	SDG	NOV
4	Prokaryotic Translation	1	SDG	NOV
5	Eukaryotic translation	1	SDG	NOV
6	Comparison between eukaryotic and prokaryotic translation	1	SDG	NOV
	TOTAL HOURS	6		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			**8**				
NAME OF THE UNIT/MODULE			**Regulation of gene expression**				
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction to operon system	1	SDG	DEC
2	Concepts and regulation of Lactose operon	1	SDG	DEC
3	Concepts and regulation of Tryptophan operon	1	SDG	DEC
4	Concepts on Eukaryotic gene regulation system	1	SDG	DEC
5	Doubt clearing class	1	SDG	DEC
6	Class test	1	SDG	DEC
	TOTAL HOURS	6		

SEM V: SKILL ENHANCEMENT COURSE
Plant Diversity and Human Welfare

CODE: BOTSSEC01M (Credits 2)

COURSE OUTCOME: The course deals with plant diversity and human welfare. Now a day's loss of biodiversity is a major problem which is threatening the earth. Through this course student will come to know the causes of diversity loss and also about the organization who have been continuously working for biodiversity management and sustainable development. We are hopeful enough that the course will be helpful in growing student's awareness about conservation of nature and natural recourses.

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THEORY

(BOTSSEC01M)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)										
NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									

PERIOD OF SEMESTER	FROM JULY 2020TO DECEMBER 2020	**HONS** √	**GENERAL** √

SEM	5	**SEC**	1	**CREDIT POINT**	2	**Course Code**	**BOTSSEC01M**

Name of the Course	**Plant Diversity and Human Welfare**						
Course Co-ordinator	DR. AYANA CHAKRAROBTY						
TOTAL MARKS	25	TH	√	TUT		PRAC	
TOTAL HOURS	30	TH	√	TUT		PRAC	

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1						
NAME OF THE UNIT/MODULE	Plant diversity and its scope						
TOTAL HOURS	8(Reduced to 4)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Genetic diversity, Species diversity and Plant diversity at the ecosystem level	1	ABJ	AUG
2	Agrobiodiversity; Cultivated plant taxa, wild taxa	1	ABJ	AUG
3	Values and uses of Biodiversity: Ethical and aesthetic values	1	ABJ	SEPT
4	Precautionary principle, Methodologies for valuation, Uses of plants and Uses of microbes	1	ABJ	SEPT
5**				
6**				
7**				
8**				

	TOTAL HOURS	4 hrs

***** Alloted total 8 hours adjusted to 4 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			**Loss of Biodiversity**				
TOTAL HOURS	8(Reduced to 5)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Loss of genetic diversity, Loss of species diversity and Loss of ecosystem diversity and Loss of agrobiodiversity, Projected scenario of Bio-diversity loss	1	ABJ	SEPT
2	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO	1	ABJ	SEPT
3	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution- WWF, NBPGR	1	ABJ	OCT
4	Biodiversity legislation and conservations, Biodiversity information management and communication	1	ABJ	OCT
5**				
6**				
7**				
8**				
	TOTAL HOURS	5 hrs		

***** Alloted total 8 hours adjusted to 4 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Conservation of Biodiversity:**				
TOTAL HOURS	8(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Conservation of genetic diversity, species diversity and ecosystem diversity	1	ABJ	OCT
2	*In situ* conservation and *ex situ* conservation	1	ABJ	NOV
3	Social approaches to conservation, Biodiversity awareness programmes and Sustainable development.	1	ABJ	NOV
4**				
5**				
6**				
7**				
8**				
	TOTAL HOURS	3 hrs		

***** Alloted total 8 hours adjusted to 3 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Role of plants in relation to Human Welfare**				
TOTAL HOURS	6(Reduced to 3)	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)

SL	TOPIC	HR	TEACHER	MONTH
1	Importance of forestry, Utilization and commercial aspects: Avenue trees and Ornamental plants of India	1	ABJ	DEC
2	Alcoholic beverages through ages, Fruits and nuts: Important fruit crops their commercial importance	1	ABJ	DEC
3	Wood and its uses	1	ABJ	DEC
4**				
5**				
6**				
	TOTAL HOURS	3 hrs		

***** Alloted total 6 hours adjusted to 3 hours.**
******Due to pandemic situation, Total allotted 30 hours for this course has been adjusted to 14 hours keeping the total content unchanged.**

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