SEM III: DSC- CORE COURSE III:PAPER III

PLANT ANATOMY AND EMBRYOLOGY

CODE: BOTGCOR03T (4 Credits) & BOTGCOR03P (2 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.

LESSON PLAN FOR
SEMESTER: 3

Session: July to December 2022

THEORY

(BOTGCOR03T)

** The allotted total 60 hours for the **Theory course** has been adjusted to 56 hours.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	AC	AB	SDG	SS	ABJ					
PERIOD OF SEMESTER	FROM JULY 2022 TO DECEMBER 2022					**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 HRS~~ 56 HRS	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	AB	AUG
2	Simple tissues	1	SS	AUG
3	Complex tissues	1	AB	AUG
4	Basic Concept of Root apical meristems	1	SS	AUG
5	Theories of Root Apical Meristem: Histogen	1	AB	AUG
6	Theories of Root Apical Meristem: korper kappe	1	SS	AUG
7	Basic Concept of Shoot apical meristems	1	SS	AUG
8	Theories of Shoot Apical Meristem: Histogen, Tunica Corpus	1	AB	SEPT
	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	AB	SEPT
2	Structure of dicot leaf	1	AB	SEPT
3	Structure of monocot root stem	1	AB	SEPT
4	Structure of monocot leaf	1	AB	OCT
	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	SS	SEPT
2	Vascular cambium – structure	1	SS	SEPT
3	Vascular cambium – function	1	SS	SEPT
4	Vascular cambium seasonal activity	1	SS	SEPT
5	Secondary growth in root	1	SS	NOV
6	Secondary growth in stem	1	SS	NOV
7	Wood (heartwood and sapwood)	1	SS	NOV
8	Class Test	1	SS	DEC
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			Adaptive and protective systems				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

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

** Alloted total 8 hours adjusted to 7 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			Structural organization of flower				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AC	AUG
2	Structure of pollen	1	AC	AUG
3	Structure of ovules; types of ovules	1	AC	AUG
4	Types of embryo sacs	1	AC	AUG
5	Organization of mature embryo sac	1	AC	AUG
6	Ultrastructure of mature embryo sac	1	AC	AUG
7	Doubt clearing class	1	AC	AUG
8				
	TOTAL HOURS	7		

** Alloted total 8 hours adjusted to 7 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			Pollination and fertilization				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

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

** Alloted total 8 hours adjusted to 7 hours.

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

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

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			Apomixis and polyembryony				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

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

** Alloted total 8 hours adjusted to 7 hours.

SEM: 3 (DSC-3)

PRACTICAL

BOTGCOR03P

(Plant Anatomy and Embryology)

*** The allotted total 60 hours for the **Practical course** has been adjusted to 56 hours.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					Botany						
HOD	DR. ARUNEEMA BARDHAN										
INITIALS OF FACULTIES	AC	MS	SDG	SS	ABJ						
PERIOD OF SEMESTER	FROM JULY 2022 TO DECEMBER 2022					**HONS**		**GENERAL √**			
SEM	1		**DSC**	3				**CREDIT POINT**	2	**Course Code**	BOTGCOR03P
Name of the Course	Plant Anatomy and Embryology										
Course Co-ordinator	DR. AYANA CHAKRABORTY										
TOTAL MARKS	25	TH		TUT		PRAC	√				
TOTAL HOURS	60	TH		TUT		PRAC	√				
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	PRACTICAL										
NAME OF THE UNIT/MODULE											
TOTAL HOURS	~~60 hrs~~ 56 hrs	**THEORY**		**TUTORIAL**		**PRAC**	√				

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

SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
	ANATOMY			
1	Study of meristems through permanent slides and photographs.	2	SS	AUG
2	Study of Tissues (parenchyma, collenchyma and sclerenchyma) (Permanent slides, photographs)	2	ABJ	AUG
3	Study of Tissues: Phloem (Permanent slides, photographs)	2	SS	AUG
4	Study of Tissues: Macerated Phloem elements (Permanent slides, photographs)		ABJ	AUG
5	Study of Stem: Monocot: *Zea mays* (only from Permanent slides / photographs)	2	SS	AUG
6	Study of Stem: Dicot: *Helianthus*; Secondary growth: *Helianthus* (only from Permanent slides / photographs)	2	ABJ	AUG
7	Study of Root: Monocot: *Zea mays* (only from Permanent slides / photographs)	2	SS	SEPT
8	Study of Root: Dicot: *Helianthus*; Secondarygrowth: *Helianthus* (only from Permanent slides / photographs)	2	ABJ	SEPT
9	Study of Leaf: Dicot (only from Permanent slides / photographs)	2	SS	SEPT
10	Study of Leaf: Monocot leaf (only from Permanent slides / photographs)	2	ABJ	SEPT
11	Study of Adaptive anatomy: Xerophyte (*Nerium* leaf)	2	SS	SEPT

12	Study of Adaptive anatomy: Hydrophyte (*Nymphaea* petiole)	2	ABJ	SEPT
	EMBRYOLOY			
13	Study of Structure of anther (young and mature) (Permanent slides / photographs)	2	SS	SEPT
14	Study of Structure of tapetum (amoeboid and secretory) (Permanent slides / photographs).	2	ABJ	SEPT
15	Study of Types of ovules: anatropous, orthotropous (from Permanent slides / photographs)	2	SS	OCT
16	Study of Types of ovules: circinotropous, amphitropous/campylotropous (from Permanent slides / photographs)	2	SS	NOV
17	Study of Ultrastructure of mature egg apparatus cells through electron micrographs / photographs	2	ABJ	NOV
18	Study of Pollination types (Photographs and specimens).	2	SS	NOV
19	Study of seed dispersal mechanisms (including appendages) (Photographs and specimens).	2	ABJ	NOV
20	Study of seed dispersal mechanisms (aril, caruncle) (Photographs and specimens).	2	SS	NOV
21	Dissection of embryo from developing seeds.	2	ABJ	NOV
22	Dissection of endosperm from developing seeds.	2	SS	NOV
23	Calculation of percentage of germinated pollen in a given medium.	2	ABJ	DEC
24	Practice class/ Doubt clearing class	2	SS	DEC
25	Practice class/ Doubt clearing class	2	ABJ	DEC
26	Practice class/ Doubt clearing class	2	SS	DEC
27	Practice class/ Doubt clearing class	2	ABJ	DEC
28	Practice class/ Doubt clearing class	2	SS	DEC
	TOTAL	**56 HRS**		

**** Total 60 hours adjusted to 56 hours.**

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SEM III: PAPER III: GENERIC ELECTIVE

PLANT ANATOMY AND EMBRYOLOGY

CODE: BOTHGEC03T (4 Credits) & BOTHGEC03P (2 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.

LESSON PLAN FOR
SEMESTER: 3

Session: July to December 2022

THEORY

(BOTHGEC03T)

** The allotted total 60 hours for the **Theory course** has been adjusted to 56 hours.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					BOTANY					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	AC	AB	SDG	SS	ABJ	AC				
PERIOD OF SEMESTER	FROM JULY 2022 TO DECEMBER 2022						**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 HRS~~ 56 HRS	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	AB	AUG
2	Simple tissues	1	SS	AUG
3	Complex tissues	1	AB	AUG
4	Basic Concept of Root apical meristems	1	SS	AUG
5	Theories of Root Apical Meristem: Histogen	1	AB	AUG
6	Theories of Root Apical Meristem: korper kappe	1	SS	AUG
7	Basic Concept of Shoot apical meristems	1	SS	AUG
8	Theories of Shoot Apical Meristem: Histogen, Tunica Corpus	1	AB	SEPT
	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	AB	SEPT
2	Structure of dicot leaf	1	AB	SEPT
3	Structure of monocot root stem	1	AB	SEPT
4	Structure of monocot leaf	1	AB	OCT
	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	SS	SEPT
2	Vascular cambium – structure	1	SS	SEPT
3	Vascular cambium – function	1	SS	SEPT
4	Vascular cambium seasonal activity	1	SS	SEPT
5	Secondary growth in root	1	SS	NOV
6	Secondary growth in stem	1	SS	NOV
7	Wood (heartwood and sapwood)	1	SS	NOV
8	Class Test	1	SS	DEC
	TOTAL HOURS	8		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			Adaptive and protective systems				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

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

** Alloted total 8 hours adjusted to 7 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			**Structural organization of flower**				
TOTAL HOURS	~~8 HRS~~ 7 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AC	AUG
2	Structure of pollen	1	AC	AUG
3	Structure of ovules; types of ovules	1	AC	AUG
4	Types of embryo sacs	1	AC	AUG
5	Organization of mature embryo sac	1	AC	AUG
6	Ultrastructure of mature embryo sac	1	AC	AUG
7	Doubt clearing class	1	AC	AUG
8				
	TOTAL HOURS	7		

** Alloted total 8 hours adjusted to 7 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			**Pollination and fertilization**				
TOTAL HOURS	~~8 HRS~~ 7 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

** Alloted total 8 hours adjusted to 7 hours.

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

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

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			Apomixis and polyembryony				
TOTAL HOURS	~~8 HRS~~ 7 HRS	THEORY	√	TUTORIAL		PRAC	

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

** Alloted total 8 hours adjusted to 7 hours.

SEM: 3 (GE-3)

PRACTICAL

BOTHGEC03P

(Plant Anatomy and Embryology)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Practical course** has been adjusted to 30 hours. Only demonstration and procedural study method followed instead of work out.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					Botany						
HOD	DR. ARUNEEMA BARDHAN										
INITIALS OF FACULTIES	AC	MS	SDG	SS	ABJ						
PERIOD OF SEMESTER	FROM JULY 2022 TO DECEMBER 2022					**HONS**		**GENERAL √**			
SEM	1		**GE**	3			**CREDIT POINT**	2	**Course Code**	BOTHGEC03P	
Name of the Course	Plant Anatomy and Embryology										
Course Co-ordinator	DR. AYANA CHAKRABORTY										
TOTAL MARKS	25	TH		TUT		PRAC	**√**				
TOTAL HOURS	60	TH		TUT		PRAC	**√**				

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	PRACTICAL			
NAME OF THE UNIT/MODULE				
TOTAL HOURS	~~60 hrs~~ 56 hrs	**THEORY**	**TUTORIAL**	**PRAC** **√**

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

SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
	ANATOMY			
1	Study of meristems through permanent slides and photographs.	2	SS	AUG
2	Study of Tissues (parenchyma, collenchyma and sclerenchyma) (Permanent slides, photographs)	2	ABJ	AUG
3	Study of Tissues: Phloem (Permanent slides, photographs)	2	SS	AUG
4	Study of Tissues: Macerated Phloem elements (Permanent slides, photographs)		ABJ	AUG
5	Study of Stem: Monocot: *Zea mays* (only from Permanent slides / photographs)	2	SS	AUG
6	Study of Stem: Dicot: *Helianthus*; Secondary growth: *Helianthus* (only from Permanent slides / photographs)	2	ABJ	AUG
7	Study of Root: Monocot: *Zea mays* (only from Permanent slides / photographs)	2	SS	SEPT
8	Study of Root: Dicot: *Helianthus*; Secondarygrowth: *Helianthus* (only from Permanent slides / photographs)	2	ABJ	SEPT
9	Study of Leaf: Dicot (only from Permanent slides / photographs)	2	SS	SEPT
10	Study of Leaf: Monocot leaf (only from Permanent slides /	2	ABJ	SEPT

	photographs)			
11	Study of Adaptive anatomy: Xerophyte (*Nerium* leaf)	2	SS	SEPT
12	Study of Adaptive anatomy: Hydrophyte (*Nymphaea* petiole)	2	ABJ	SEPT
	EMBRYOLOY			
13	Study of Structure of anther (young and mature) (Permanent slides / photographs)	2	SS	SEPT
14	Study of Structure of tapetum (amoeboid and secretory) (Permanent slides / photographs).	2	ABJ	SEPT
15	Study of Types of ovules: anatropous, orthotropous (from Permanent slides / photographs)	2	SS	OCT
16	Study of Types of ovules: circinotropous, amphitropous/campylotropous (from Permanent slides / photographs)	2	SS	NOV
17	Study of Ultrastructure of mature egg apparatus cells through electron micrographs / photographs	2	ABJ	NOV
18	Study of Pollination types (Photographs and specimens).	2	SS	NOV
19	Study of seed dispersal mechanisms (including appendages) (Photographs and specimens).	2	ABJ	NOV
20	Study of seed dispersal mechanisms (aril, caruncle) (Photographs and specimens).	2	SS	NOV
21	Dissection of embryo from developing seeds.	2	ABJ	NOV
22	Dissection of endosperm from developing seeds.	2	SS	NOV
23	Calculation of percentage of germinated pollen in a given medium.	2	ABJ	DEC
24	Practice class/ Doubt clearing class	2	SS	DEC
25	Practice class/ Doubt clearing class	2	ABJ	DEC
26	Practice class/ Doubt clearing class	2	SS	DEC
27	Practice class/ Doubt clearing class	2	ABJ	DEC
28	Practice class/ Doubt clearing class	2	SS	DEC
	TOTAL	**56 HRS**		

**** Total 60 hours adjusted to 56 hours.**

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SEM III: SKILL ENHANCEMENT COURSE
Plant Diversity and Human Welfare
Course code: BOTSSEC01M (Credits 2)

COURSEOUTCOME: 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.

On completion of the course, students will be able to:

1. Know about Genetic diversity, Species diversity and Plant diversity at the ecosystem level.
2. Understand the values and uses of Biodiversity and methodologies for valuation.
3. Know about the Organizations associated with biodiversity management and Biodiversity legislation and conservations.
4. Know various utilization and commercial aspects of forestry.

LESSON PLAN FOR

THEORY
(BOTSSEC01M)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)									
NAME OF THE DEPARTMENT	BOTANY								
HOD	DR. ARUNEEMA BARDAHN								
INITIALS OF FACULTIES	AC	AB	SDG	SS	ABJ				
PERIOD OF SEMESTER	FROM JULY 2022 TO DECEMBER 2022		**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. ARUNEEMA BARDAHN								
TOTAL MARKS	25	TH	√	TUT		PRAC			
TOTAL HOURS	~~30 hrs~~ (Adjusted to 29 hrs)								

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1			
NAME OF THE UNIT/MODULE	Plant diversity and its scope			
TOTAL HOURS	~~8 hrs~~ 7 hrs	**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 eco-system level	1	AB	AUG
2	Agrobiodiversity	1	AB	AUG
3	Cultivated plant taxa, wild taxa	1	AB	AUG
4	Values and uses of Biodiversity: Ethical and aesthetic values	1	AB	SEPT
5	Precautionary principle	1	AB	SEPT
6	Methodologies for valuation	1	AB	SEPT
7	Uses of plants and Uses of microbes	1	AB	OCT
8**				
	TOTAL HOURS	7 hrs		

***** Alloted total 8 hours adjusted to 7 hours.**

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2					
NAME OF THE UNIT/MODULE			**Loss of Biodiversity**					
TOTAL HOURS	8 hrs	**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	1	AB	NOV
2	Loss of ecosystem diversity Loss of agrobiodiversity	1	AB	NOV
3	Projected scenario of Bio-diversity loss	1	AB	NOV
4	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO	1	AB	NOV
5	**Management of Plant Biodiversity:** Organizations associated with biodiversity management-Methodology for execution-WWF, NBPGR	1	AB	DEC
6	Biodiversity legislation and conservations,	1	AB	DEC
7	Biodiversity information management and communication	1	AB	DEC
8	Class Test	1	AB	DEC
	TOTAL HOURS	8 hrs		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3			
NAME OF THE UNIT/MODULE			Conservation of Biodiversity:			
TOTAL HOURS	8 hrs	THEORY	√	TUTORIAL		PRAC

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

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

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Importance of forestry	1	SDG	NOV
2	Utilization and commercial aspects: Avenue trees and Ornamental plants of India	1	SDG	NOV
3	Alcoholic beverages through ages,	1	SDG	DEC
4	Fruits and nuts: Important fruit crops their commercial importance	1	SDG	DEC
5	Wood and its uses	1	SDG	DEC
6	Class Test	1	SDG	DEC
	TOTAL HOURS	**6 hrs**		

**** Total allotted 30 hours for this course has been adjusted to 29 hours keeping the total content unchanged.

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