

CORE COURS III: (Plant Anatomy And Embryology)

CODE: **BOTGCOR03T/BOTHCOR03T** (4 Credits) &
BOTGCOR03P/BOTHCOR03P (2 Credits)

COURSE OUTCOME:

- Plant anatomy is the study of internal structure of plants mostly at microscopic/cellular level. Students will acquire a clear knowledge of internal tissue structure of angiosperms along with their adaptive and protective system.
- Study of embryology will be helpful to know about the reproductive parts and fertilization process.
- Pollen study is called palynology and it is highly useful in palaeoecology, archeology and forensic. Students will know how pollen study is useful in solving taxonomic problems and in allergy study.

THEORY

(BOTGCOR03T/BOTHCOR03T)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)												
NAME OF THE DEPARTMENT						BOTANY						
HOD		DR. AYANA CHAKRAROBTY										
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB				
		MORN										
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL		
										√		
SEM	3	Core Course		3				CREDIT POINT	4	Course Code	BOTGCOR03 T & BOTHCOR03 T	
		GE/DSC										
Name of the Course			Plant Anatomy and Embryology									
Course Co-ordinator			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	SEPT			
8	Theories of Shoot Apical Meristem: Histogen, Tunica Corpus						1	AC	SEPT			
TOTAL HOURS						8						

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					BOTANY						
HOD		DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	AB	PB			
		MORN									
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019				HONS		GENERAL		
									√		
SEM	3	Core Course		3				CREDIT POINT	4	Course Code	BOTGCOR03 T & BOTHCOR03 T
		GE/DSC									
Name of the Course			Plant anatomy and Embryology								
Course Co-ordinator			DR. AYANA CHAKRAROBTY								
TOTAL MARKS		50	TH	√	TUT				PRAC		
TOTAL HOURS		60	TH	√	TUT				PRAC		
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	SEPT		
2	Structure of dicot leaf						1	AC	SEPT		

3	Structure of monocot root stem	1	AC	OCT
4	Structure of monocot leaf	1	AC	NOV
TOTAL HOURS		4		

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT						BOTANY					
HOD		DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB			
		MORN									
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL	
										√	
SEM	3	Core Course		3	CREDIT POINT		4	Course Code	BOTGCOR03 T & BOTHCOR03 T		
		GE/DSC									
Name of the Course			Plant anatomy and Embryology								
Course Co-ordinator			DR. AYANA CHAKRAROBTY								
TOTAL MARKS		50	TH	√	TUT			PRAC			
TOTAL HOURS		60	TH	√	TUT			PRAC			
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	NOV	
2	Vascular cambium - structure			1	AC	NOV	
3	Vascular cambium - function			1	AC	NOV	
4	Vascular cambium seasonal activity			1	AC	DEC	
5	Secondary growth in root			1	SS	DEC	
6	Secondary growth in stem			1	SS	DEC	
7	Wood (heartwood and sapwood)			1	SS	DEC	
8	Class Test			1	AC	DEC	
TOTAL HOURS				8			

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					BOTANY						
HOD		DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB			
		MORN									
PERIOD OF SEMESTER		FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL		
									√		
SEM	3	Core Course		3				CREDIT POINT	4	Course Code	BOTGCOR03 T & BOTHCOR03 T
		GE/DSC									
Name of the Course		Plant anatomy and Embryology									
Course Co-ordinator		DR. AYANA CHAKRAROBTY									
TOTAL MARKS		50	TH	√	TUT			PRAC			

TOTAL HOURS	60	TH	√	TUT		PRAC	
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	PB	JULY	
2	Epidermis			1	PB	JULY	
3	cuticle			1	PB	AUG	
4	stomata			1	PB	AUG	
5	General account of adaptations in xerophytes			1	PB	AUG	
6	General account of adaptations in hydrophytes			1	PB	AUG	
7	Doubt Clearing Class			1	PB	SEPT	
8	Class Test			1	PB	SEPT	
TOTAL HOURS				8			

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					BOTANY					
HOD		DR. AYANA CHAKRAROBTY								
INITIALS OF FACULTIES	DAY	AC	MS	SDG	SS	PB	AB			
	MORN									
PERIOD OF SEMESTER		FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL	
									√	

SEM	3	Core Course	3					CREDIT POINT	4	Course Code	BOTGCOR03 T & BOTHCOR03 T	
		GE/DSC										
Name of the Course			Plant anatomy and Embryology									
Course Co-ordinator			DR. AYANA CHAKRAROBTY									
TOTAL MARKS	50	TH	√	TUT		PRAC						
TOTAL HOURS	60	TH	√	TUT		PRAC						
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	MS	JULY		
2	Structure of pollen							1	MS	JULY		
3	Structure of pollen							1	MS	AUG		
4	Structure of ovules							1	MS	AUG		
5	types of ovules							1	MS	AUG		
6	Types of embryo sacs							1	MS	AUG		
7	organization of mature embryo sac							1	MS	SEPT		
8	ultrastructure of mature embryo sac							1	MS	SEPT		
TOTAL HOURS							8					

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)	
NAME OF THE DEPARTMENT	BOTANY

HOD		DR. AYANA CHAKRAROBTY										
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB				
		MORN										
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019					HONS	GENERAL √			
SEM	3	Core Course		3				CREDIT POINT	4	Course Code	BOTGCOR03 T & BOTHCOR03 T	
		GE/DSC										
Name of the Course			Plant anatomy and Embryology									
Course Co-ordinator			DR. AYANA CHAKRAROBTY									
TOTAL MARKS	50	TH	√	TUT				PRAC				
TOTAL HOURS	60	TH	√	TUT				PRAC				
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	MS	SEPT		
2	Pollination mechanisms							1	MS	SEPT		
3	Pollination adaptations							1	MS	NOV		
4	Double fertilization							1	MS	NOV		
5	Seed- structure appendages							1	MS	NOV		
6	Seed- dispersal mechanisms							1	MS	NOV		
7	Doubt clearing class							1	MS	DEC		
8	Class Test							1	MS	DEC		
TOTAL HOURS							8					

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					BOTANY						
HOD		DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB			
		MORN									
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019				HONS		GENERAL		
									√		
SEM	3	Core Course		3	CREDIT POINT		4	Course Code	BOTGCOR03 T & BOTHCOR03 T		
		GE/DSC									
Name of the Course			Plant anatomy and Embryology								
Course Co-ordinator			DR. AYANA CHAKRAROBTY								
TOTAL MARKS		50	TH	√	TUT			PRAC			
TOTAL HOURS		60	TH	√	TUT			PRAC			
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	JULY		
2	Endosperm types						1	SS	JULY		
3	Endosperm structure						1	SS	AUG		
4	Endosperm functions						1	SS	AUG		
5	Dicot embryo						1	SS	AUG		
6	Monocot embryo						1	SS	AUG		
7	Embryo endosperm relationship						1	SS	SEPT		
8	Class test						1	SS	SEPT		
TOTAL HOURS							8				

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)												
NAME OF THE DEPARTMENT						BOTANY						
HOD		DR. AYANA CHAKRAROBTY										
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB				
		MORN										
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL		
										√		
SEM	3	Core Course		3	CREDIT POINT		4	Course Code	BOTGCOR03 T & BOTHCOR03 T			
GE/DSC												
Name of the Course			Plant anatomy and Embryology									
Course Co-ordinator			DR. AYANA CHAKRAROBTY									
TOTAL MARKS	50	TH	√	TUT				PRAC				
TOTAL HOURS	60	TH	√	TUT				PRAC				
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	SEPT			
2	Apomixis - Definition, Types						1	SS	SEPT			
3	Apomixis - Types						1	SS	NOV			
4	Apomixis - practical applications						1	SS	NOV			
5	Polyembryony - Definition, Types						1	SS	NOV			
6	Polyembryony - Practical Application						1	SS	NOV			
7	Doubt clearing class						1	SS	NOV			
8	Class test						1	SS	DEC			
TOTAL HOURS							8					

PRACTICAL

(BOTGCOR03P)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT						BOTANY					
HOD		DR. AYANA CHAKRAROBTY									
INITIALS OF FACULTIES		DAY	AC	MS	SDG	SS	PB	AB			
		MORN									
PERIOD OF SEMESTER			FROM JULY 2019 TO DECEMBER 2019					HONS		GENERAL	
										√	
SEM	3	Core Course		3				CREDIT POINT	2	Course Code	BOTGCOR03 P & BOTHCOR03 P
		GE/DSC									
Name of the Course			Plant Anatomy and Embryology								
Course Co-ordinator			DR. AYANA CHAKRAROBTY								
TOTAL MARKS		25	TH				TUT		PRAC	√	
TOTAL HOURS		60	TH				TUT		PRAC	√	
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC											
NAME OF THE UNIT/MODULE						Practical					
TOTAL HOURS		60	THEORY			TUTORIAL		PRAC		√	
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)											
SL	TOPIC						HR	TEACHER	MONTH		
1	Study of meristems through permanent slides						2	PB	JULY		
2	Study of meristems through photographs						2	PB	JULY		
3	Study of parenchyma tissues						2	PB	AUG		
4	Study of collenchyma tissues						2	PB	AUG		
5	Study of sclerenchyma tissues						2	PB	AUG		
6	Study of xylary elements through tissue maceration						2	PB	SEPT		

7	Study of phloem through permanent slides & photographs	2	PB	SEPT
8	Study of monocot Stem: <i>Zea mays</i>	2	PB	SEPT
9	Study of dicot Stem: <i>Helianthus</i> (Permanent slides).	2	PB	SEPT
10	Study of monocot Root: <i>Zea mays</i> (Permanent slides).	2	PB	SEPT
11	Study of dicot Root: <i>Helianthus</i> (Permanent slides).	2	PB	NOV
12	Study of secondary growth in Stem: <i>Helianthus</i> (Permanent slides).	2	PB	NOV
13	Study of secondary growth in Root: <i>Helianthus</i> (Permanent slides).	2	PB	NOV
14	Study of dicot Leaf (Permanent slides).	2	PB	NOV
15	Study of monocot leaf (Permanent slides).	2	PB	DEC
16	Study of adaptive anatomy: Xerophyte (<i>Nerium</i> leaf);	2	PB	DEC
17	Study of adaptive anatomy: Hydrophyte (<i>Nymphaea</i> nettle)	2	SS	JULY
18	Study of structure of anther (young and mature), (Permanent slides).	2	SS	JULY
19	Study of tapetum (amoeboid and secretory) (Permanent slides).	2	SS	AUG
20	Study of types of ovules: anatropous permanent slides.	2	SS	AUG
21	Study of types of ovules: orthotropous, permanent slides.	2	SS	AUG
22	Study of types of ovules: amphitropous/ campylotropous from permanent slides.	2	SS	SEPT
23	Study of ultrastructure of mature egg apparatus cells through electron micrographs	2	SS	SEPT
24	Study of pollination types (Photographs and specimens).	2	SS	SEPT
25	Study of seed dispersal mechanisms appendages, aril, (Photographs and specimens).	2	SS	NOV
26	Study of seed dispersal mechanisms aril, (Photographs and specimens).		SS	NOV
27	Study of seed dispersal mechanisms caruncle (Photographs and specimens).	2	SS	NOV
28	Dissection of embryo/endosperm from developing seeds	2	SS	DEC
29	Calculation of percentage of germinated pollen in a given medium	2	SS	DEC
30	Practice class	2	SS & PB	DEC
TOTAL HOURS		60		

