

CORE COURSE V: (Morphology and anatomy of angiosperm)

CODE: BOTACOR05T (4 Credits) & BOTACOR05P (2 Credits)

COURSE OUTCOME: **Plant morphology** is the study of the physical form and external structure of plants, whereas **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.

This course will be helpful for the students to acquire a clear knowledge on the external and internal structure of angiosperms along with their different adaptive and protective systems.

THEORY

(BOTACOR05T)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)											
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			5	CREDIT POINT		4	Course Code	BOTACOR05T	
Name of the Course			Morphology and Anatomy of Angiosperms								
Course Co-ordinator			DR. AYANA CHAKRAROBTY								
TOTAL MARKS	50	TH	√	TUT				PRAC			
TOTAL HOURS	60	TH	√	TUT				PRAC			
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC											
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC				1							
NAME OF THE UNIT/MODULE				Inflorescence							
TOTAL HOURS	2	THEORY	√	TUTORIAL				PRAC			
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)											
SL	TOPIC						HR	TEACHER	MONTH		
1	Inflorescence – Types with examples						1	MS	JULY		
2	Concept of advanced and primitive inflorescence types						1	MS	JULY		
TOTAL HOURS						2					

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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			5			CREDIT POINT	4	Course Code	BOTACOR05T	
Name of the Course			Morphology and Anatomy of Angiosperms									
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				Flower								
TOTAL HOURS	5	THEORY	√	TUTORIAL		PRAC						
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)												
SL	TOPIC						HR	TEACHER	MONTH			
1	Flower– Types with examples						1	MS	JULY			
2	Aestivation						1	MS	AUG			
3	Floral parts – various types of cohesion and adhesion with examples						1	MS	AUG			
4	Carpel-types, advance and primitive ones and placentations						1	MS	AUG			
5	Doubt clearing class						1	MS	AUG			
TOTAL HOURS						5						

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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		5	CREDIT POINT		4	Course Code	BOTACOR05T	
Name of the Course		Morphology and Anatomy of Angiosperms								
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		Fruits and Seeds								
TOTAL HOURS	3	THEORY	√	TUTORIAL			PRAC			
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)										
SL	TOPIC					HR	TEACHER	MONTH		
1	Fruits –types with examples					1	MS	AUG		
2	Seeds –types with examples					1	MS	AUG		
3	Class Test					1	MS	AUG		
TOTAL HOURS					3					

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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	
SE M	3	Core Course		5	CREDIT POINT		4	Course Code	BOTACOR05T	
Name of the Course			Morphology and Anatomy of Angiosperms							
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				Introduction and scope of Plant Anatomy						
TOTAL HOURS	3	THEORY	√	TUTORIAL			PRAC			
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)										
SL	TOPIC						HR	TEACHER	MONTH	
1	Introduction to scope of Plant Anatomy						1	MS	SEPT	
2	Applications of plant anatomy in systematics						1	MS	SEPT	
3	Applications of plant anatomy in forensics and pharmacognosy						1	MS	SEPT	
TOTAL HOURS							3			

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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		5			CREDIT POINT	4	Course Code	BOTACOR05T
Name of the Course		Morphology and Anatomy of Angiosperms								
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		Structure and Development of Plant Body								
TOTAL HOURS	5	THEORY	√		TUTORIAL			PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)										
SL	TOPIC					HR	TEACHER	MONTH		
1	Introduction					1	MS	SEPT		
2	Internal organization of plant body					1	MS	SEPT		
3	The three tissue systems					1	MS	SEPT		
4	Types of cells and tissues					1	MS	SEPT		
5	Class test					1	MS	OCT		
TOTAL HOURS					5					

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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			5			CREDIT POINT	4	Course Code	BOTACOR05T
Name of the Course		Morphology and Anatomy of Angiosperms									
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		Tissues									
TOTAL HOURS	10	THEORY	√			TUTORIAL			PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)											
SL	TOPIC						HR	TEACHER	MONTH		
1	Introduction						1	AC	JULY		
2	Classification of tissues						1	AC	JULY		
3	Simple and complex tissues						1	AC	JULY		
4	Cytodifferentiation of tracheary elements						1	AC	AUG		
5	Cytodifferentiation of sieve elements						1	AC	AUG		
6	Pits, types, occurrence, structure						1	AC	AUG		
7	Plasmodesmata with ultrastructure						1	AC	AUG		

8	Ergastic substances	1	AC	AUG
9	Hydathodes, cavities, lithocysts and laticifers	1	AC	AUG
10	Doubt clearing class	1	AC	AUG
TOTAL HOURS		10		

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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		5	CREDIT POINT		4	Course Code	BOTACOR05T	
Name of the Course		Morphology and Anatomy of Angiosperms								
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		Apical meristems								
TOTAL HOURS	12	THEORY	√	TUTORIAL			PRAC			
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)										
SL	TOPIC					HR	TEACHER	MONTH		
1	Introduction					1	AC	AUG		
2	Evolution of the concept of organization of the shoot apex (Apical cell theory and Histogen theory)					1	AC	SEPT		
3	Evolution of the concept of organization of the shoot apex					1	AC	SEPT		

	(Tunica Corpus theory)			
4	Types of vascular bundles	1	AC	SEPT
5	Structure of dicot and monocot stem	1	AC	SEPT
6	Structure of dicot and monocot leaf, Kranz anatomy	1	AC	SEPT
7	Organization of root apex (Apical cell theory)	1	AC	SEPT
8	Organization of root apex (Histogen theory)	1	AC	SEPT
9	Organization of root apex (Korper-Kappe theory)	1	AC	OCT
10	Structure of dicot root	1	AC	NOV
11	Quiescent centre; Root cap and structure of monocot root	1	AC	NOV
12	Class test	1	AC	NOV
TOTAL HOURS		12		

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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			5			CREDIT POINT	4	Course Code	BOTACOR05T
Name of the Course		Morphology and Anatomy of Angiosperms									
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		Vascular Cambium and Wood									
TOTAL HOURS	12	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(of rays and axial parenchyma) and origin	1	AC	NOV
3	Vascular Cambium - function and seasonal activity of cambium	1	AC	NOV
4	Secondary growth in root	1	AC	NOV
5	Secondary growth in stem	1	AC	NOV
6	Concept of wood – structure and function	1	AC	DEC
7	Sapwood and heartwood; ring and diffuse porous wood	1	AC	DEC
8	Early and late wood, tyloses and Tylosoides	1	AC	DEC
9	Composition and development of periderm,	1	AC	DEC
10	Rhytidome and lenticels	1	MS	NOV
11	Doubt clearing class	1	MS	NOV
12	Class test	1	AC	NOV
TOTAL HOURS		12		

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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		5			CREDIT POINT	4	Course Code	BOTACOR05T		
Name of the Course			Morphology and Anatomy of Angiosperms									
Course Co-ordinator			DR. AYANA CHAKRAROBTY									
TOTAL MARKS		50	TH	√		TUT			PRAC			
TOTAL HOURS		60	TH	√		TUT			PRAC			
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			9									
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	TEACHE	MONTH			

			R	
1	Introduction	1	MS	NOV
2	Epidermal tissue system, cuticle	1	MS	NOV
3	Trichomes (uni and multicellular, glandular and nonglandular with examples of each)	1	MS	NOV
4	Stomata (classification)	1	MS	NOV
5	Adcrustation and incrustation	1	MS	DEC
6	Anatomical adaptations of xerophytes	1	MS	DEC
7	Anatomical adaptations of hydrophytes	1	MS	DEC
8	Class test	1	MS	DEC
TOTAL HOURS		8		

PRACTICAL

(BOTACOR05P)

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS)												
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 20					TO DECEMBER 20				
								HONS √		GENERAL		
SEM	3	Core Course			5	CREDIT POINT			2	Course Code	BOTACOR05P	
Name of the Course			Morphology and Anatomy of Angiosperms									
Course Co-ordinator			DR. AYANA CHAKRAROBTY									
TOTAL MARKS	25	TH			TUT			PRAC		√		
TOTAL HOURS	60	TH			TUT			PRAC		√		
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC					1							
NAME OF THE UNIT/MODULE					Practical							
TOTAL HOURS	30	THEORY			TUTORIAL			PRAC		√		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)												
SL	LECTURE HEAD/ TOPIC						HR	TEACHE	MONTH			

			R	
1	Study of anatomical details of root through preserve specimen and temporary stain	2	AC	JULY
2	Study of anatomical details of shoot through preserve specimen and temporary stain	2	MS	JULY
3	Study of anatomical details of vascular cambium through preserve specimen and temporary stain	2	AC	AUG
4	Study of anatomical details of details of parenchyma-types and distribution	2	MS	AUG
5	Study of anatomical details of details of collenchyma-types and distribution	2	AC	AUG
6	Study of anatomical details of details of sclerenchyma-types and distribution	2	MS	AUG
7	Study of anatomical details of xylem trachea tracheid vessels through permanent slides	2	AC	AUG
8	Study of anatomical details of xylem fiber, perforation plates	2	MS	AUG
9	Xylem- study of thickening (through permanent slide)	2	AC	AUG
10	Study of Wood: ring porous; diffuse porous; tyloses; heart and sapwood (through permanent slides)	2	MS	AUG
11	Study of Phloem: Sieve tubes, sieve plates(permanent slides)	2	AC	SEPT
12	Study of Phloem: companion cells; phloem fibres. (permanent slides)	2	MS	SEPT
13	Study of epidermal system: cell types(permanent slides)	2	AC	SEPT
14	Study of stomata types (permanent slides)	2	MS	SEPT
15	Study of trichomes: non-glandular and glandular (permanent slides)	2	AC	SEPT
16	Study of periderm and lenticels(permanent slides)	2	AC	SEPT
17	Study of anatomical features of C4 leaves (Krantz anatomy) through permanent slide and tempoprary mount	2	MS	SEPT
18	Study of secretory tissues (Cavities, secretory tissues, lithocyst and laticifers) through permanent slide	2	MS	SEPT
19	Introduction to permanent slide preparation, simple and double procedure and their different	2	MS	OCT
20	Study of monocot root (Orchid).....section and double staining(permanent slides preparation)	2	AC	NOV
21	Study of dicot root (sunflower).....section and double staining(permanent slides preparation)	2	MS	NOV
22	Study of monocot stem (Maize).....section and double staining(permanent slides preparation)	2	AC	NOV
23	Study of dicot stem (Cucurbita).....section and double staining(permanent slides preparation)	2	MS	NOV
24	Study of isobilateral leaf (Tuberose).....section and double staining(permanent slides preparation)	2	AC	NOV
25	Study of dorsiventral leaf(Mango).....section and double staining(permanent slides preparation)	2	MS	NOV
26	Study of adaptive anatomy of xerophytes (<i>Nerium</i> leaf)	2	AC	NOV
27	Study of adaptive anatomy of hydrophytes (<i>Nymphaea</i> petiole)	2	MS	NOV
28	Practice class	2	MS	DEC
29	Practice class	2	AC	DEC
30	Practice class	2	AC	DEC
	TOTAL	60		

