SEMESTER II

DISCIPLINE SPECIFIC COURSE-II (DSC-2)

PLANT ECOLOGY AND TAXONOMOY

CODE: BOTGCOR02T (4 Credits) & BOTGCOR02P (2 Credits)

Learning Outcomes:

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

1) To understand ecological relationships between organisms and their environment.

2) To identify diversity of life forms in an ecosystem.

3) To know the conceptual development of 'taxonomy' and 'systematics'

4) To understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms.

5) To understand the general range of variations in the group of angiosperms.

6) To trace the history of development of systems of classification emphasizing angiospermic taxa.

7) To learn the wide activities in angiosperm and trends in classification.

8) To learn about the characters of biologically important families of angiosperms.

9) To know the floral variations in angiospermic families, their phylogeny and evolution.

10) To understand various rules, principles and recommendations of plant nomenclature produces in plant identification.

11) To understand major evolutionary trends in various parts of angiospermic plants.

SEM: 2 (DSC-2)

THEORY

BOTGCORO2T

PLANT ECOLOGY AND TAXONOMOY

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Theory course** has been adjusted to 47 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT				Botany						
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUG 2021				**HONS**		**GENERAL** √			
SEM		2	**Core Course DSC**		2		**CREDIT POINT**	4	**Course Code**	BOTGCORO2T
Name of the Course	PLANT ECOLOGY AND TAXONOMOY									
Course Co-ordinator	DR. AYANA CHAKRABORTY									
TOTAL MARKS	50	TH	√	TUT		PRAC				
TOTAL HOURS	~~60 Hrs~~ 47 Hrs	TH	√	TUT		PRAC				
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1									
NAME OF THE UNIT/MODULE	INTRODUCTION									
TOTAL HOURS	~~2 Hrs~~ 1Hr	**THEORY**	√	**TUTORIAL**		**PRAC**				

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	AC	APRIL
	~~General significance~~	**Reduced**		
	TOTAL	**1 HR**		

*** Alloted total 2 hours for the unit-1 has been adjusted to 1 hour according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			Ecological factors				
TOTAL HOURS	~~10 Hrs~~ 9 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	SS	APRIL
2.	Soil: Origin and composition	1	SS	APRIL
3.	Soil profile	1	SS	MAY
4.	Water: States of water in the environment,	1	SS	MAY
5.	Light: Variation Optimal and limiting factors;	1	SS	MAY
6.	Temperature: Variation Optimal and limiting factors;	1	SS	JUNE
	~~Shelford law of tolerance.~~		**Reduced**	
7.	Adaptation of hydrophytes	1	SS	JUNE
8.	Adaptation of xerophytes	1	SS	JUNE
9.	Doubt clearing class / Class test	1	SS	JUNE
	TOTAL	**9 HRS**		

*** Alloted total 10 hours for the unit-2 has been adjusted to 9 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			Plant communities				
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	AC	APRIL
2.	Characters OF Plant communities	1	AC	MAY
	~~Ecotone and edge effect~~	**Reduced**		MAY
3.	Succession: Processes and types	1	AC	MAY
4.	Succession: Hydrosere and Xerosere	1	AC	MAY
5.	Doubt clearing class	1	AC	JUNE
	TOTAL	**5 HRS**		

*** Alloted total 6 hours for the unit-3 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			Ecosystem				
TOTAL HOURS	~~8 Hrs~~ 7 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	AC	JUNE
2.	Structure and energy flow trophic organisation	1	AC	JUNE
3.	Food chains and food webs	1	AC	JUNE
4.	Ecological pyramids	1	AC	JULY
	~~Production and productivity~~		**Reduced**	
5.	Biogeochemical cycling	1	AC	JULY
6.	Cycling of carbon in atmosphere	1	AC	JULY
7.	Cycling of nitrogen	1	AC	JULY
	TOTAL	**7 HRS**		

*** Alloted total 8 hours for the unit-4 has been adjusted to 7 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			Phytogeography				
TOTAL HOURS	4	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	SS	JULY
2.	Principal biogeographical zones	1	SS	JULY
3.	Endemism: Definition, types and theories	1	SS/ ABJ	JULY
4.	Endemism: significance	1	SS/ ABJ	JULY
	TOTAL	**4 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			Introduction to plant taxonomy				
TOTAL HOURS	2 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Identification	1	ABJ	APRIL
2.	Classification, Nomenclature.	1	ABJ	APRIL
	TOTAL	2 HRS		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7				
NAME OF THE UNIT/MODULE			Identification				
TOTAL HOURS	~~4Hrs~~ 3 hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Introduction	1	ABJ	APRIL
2.	Functions of Herbarium	1	ABJ	MAY
3.	Important herbaria and botanical gardens of the world and India	1	ABJ	MAY
	~~Documentation: Flora, Keys~~	Reduced		
	TOTAL	3 HRS		

*** Alloted total 4 hours for the unit-7 has been adjusted to 3 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			~~Taxonomic evidences from palynology, cytology, phytochemistry and molecular data~~				
TOTAL HOURS	~~6~~	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	~~Introduction~~	Reduced		
2.	~~Taxonomic evidences from palynology~~	Reduced		
3.	~~Taxonomic evidences from cytology~~	Reduced		
4.	~~Taxonomic evidences from phytochemistry~~	Reduced		
5.	~~Taxonomic evidences from molecular data~~	Reduced		
6.	~~Doubt clearing class~~	Reduced		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			9			
NAME OF THE UNIT/MODULE			Taxonomic hierarchy			
TOTAL HOURS	2 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Ranks, categories	1	ABJ	MAY
2.	Taxonomic groups.	1	ABJ	MAY
	TOTAL	2 HRS		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			10			
NAME OF THE UNIT/MODULE			Botanical nomenclature			
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Principles and rules (ICN)	1	ABJ	MAY
2.	~~Ranks and names~~	**Reduced**		
3.	Binominal system, Typification	1	ABJ	MAY
4.	Author citation and rule of priority	1	ABJ	MAY
5.	Valid and effective publication	1	ABJ	MAY
6.	Class test	1	ABJ	JUNE
	TOTAL	5 HRS		

*** Alloted total 6 hours for the unit-10 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			11				
NAME OF THE UNIT/MODULE			Classification				
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction and criteria of classification	1	ABJ	JUNE
2.	Types of classification- artificial, natural and phylogenetic.	1	ABJ	JUNE
3.	Merits and demerits of artificial, natural and phylogenetic classification	1	ABJ	JUNE
4.	Bentham and Hooker (up to series),	1	ABJ	JUNE
5.	Merits and demerits of Bentham and Hooker classification	1	ABJ	JUNE
	~~General idea of Cronquist's classification (1981).~~		**Reduced**	
	TOTAL	**5 HRS**		

*** Alloted total 6 hours for the unit-11 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			12				
NAME OF THE UNIT/MODULE			Numerical taxonomy and cladistics				
TOTAL HOURS	4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Characters	1	ABJ	JUNE
2.	Variations and cluster analysis	1	ABJ	JUNE
3.	Phenograms and Cladograms (definitions and differences).	1	ABJ	JULY
4.	Class test	1	ABJ	JULY
	TOTAL	**4 HRS**		

……..

SEM: 2 (DSC-2)

PRACTICAL

BOTGCORO2P

PLANT ECOLOGY AND TAXONOMOY

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the Practical course has been adjusted to 30 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					**Botany**					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUG 2021				**HONS**		**GENERAL** √			
SEM		2	**Core Course DSC**		2		**CREDIT POINT**	2	**Course Code**	BOTGCORO2P
Name of the Course	PLANT ECOLOGY AND TAXONOMOY									
Course Co-ordinator	DR. AYANA CHAKRABORTY									
TOTAL MARKS	25	TH		TUT		PRAC	√			
TOTAL HOURS	60	TH		TUT		PRAC	√			
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1									
NAME OF THE UNIT/MODULE	PLANT ECOLOGY AND TAXONOMOY									
TOTAL HOURS	~~60 Hrs~~ 30 Hrs	**THEORY**		**TUTORIAL**		**PRAC**	√			

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

SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Study of Soil thermometer …….its working principal and use	2	AC	APRIL
2.	Study of maximum and minimum thermometer…….its working principal and use	2	AC	APRIL
3.	Study of anemometer…….its working principal and use	2	AC	MAY
4.	Study of psychrometer/hygrometer…….its working principal and use	2	AC	MAY
5.	Study of rain gauge…….its working principal and use	2	AC	MAY
6.	Study of lux meter…….its working principal and use	2	AC	MAY
	~~Determination of soil pH through pH meter (two soil samples)~~		**Reduced**	
	~~Determination of carbonate (two soil samples)~~		**Reduced**	
	~~Determination of chlorides (two soil samples)~~		**Reduced**	
	~~Determination of nitrates (two soil samples)~~		**Reduced**	
	~~Determination of sulphates (two soil samples)~~		**Reduced**	
	~~Determination of organic matter (two soil samples) by Rapid filtration test~~		**Reduced**	
	~~Study of morphological adaptations of hydrophytes (*Nymphaea*)~~		**Reduced**	

	~~Study of morphological adaptations xerophytes (*Nerium* leaf)~~		**Reduced**	
7.	Study of biotic interactions of stem parasite (*Cuscuta)*	2	AC	JUNE
8.	Study of biotic interactions of epiphytes (Orchid root)	2	AC	JUNE
9.	Determination of minimal quadrat size for the study of herbaceous vegetation	2	AC	JUNE
	~~Quantitative analysis of herbaceous vegetation in the college campus /suitable site for frequency and comparison with Raunkiaer's frequency distribution law~~		**Reduced**	
10.	Introduction to plant taxonomy, Bentham Hooker System, Bengal Plants, key preparation for identification of angiospermic plants.	2	AC & ABJ	JUNE
11.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Brassicaceae – *Nastertium indicum.*	2	AC & ABJ	JUNE
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Asteraceae - *Eclipta*~~	2	**Reduced**	
	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Asteraceae - *Tridax*	2	AC & ABJ	JULY
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Solanaceae–*Nicotiana plumbaginifolia*~~	2	**Reduced**	
12.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Solanaceae–*Solanum nigrum*	2	AC & ABJ	JULY
13.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae –*Leonurus sibiricus*	2	AC & ABJ	JULY
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae –*Leucas aspera*~~	2	**Reduced**	
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae –*Ocimum sanctum*~~	2	**Reduced**	
14.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Liliaceae - *Allium.*	2	AC & ABJ	JULY

15.	Demonstration of Herbarium preparation	2	AC & ABJ	JULY
	TOTAL	**30 HRS**		

***Due to the **Pandemic situation,** the allotted total 60 hours for the Practical course has been adjusted to 30 hours, **according to the reduced syllabus provided by WBSU.**

…….

SEMESTER II

GENERIC ELECTIVE COURSE-II (GE-2)

PLANT ECOLOGY AND TAXONOMOY

CODE: BOTHGEC02T (4 Credits) & BOTHGEC02P (2 Credits)

Learning Outcomes:

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

1) To understand ecological relationships between organisms and their environment.

2) To identify diversity of life forms in an ecosystem.

3) To know the conceptual development of ‘taxonomy’ and ‘systematics’

4) To understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms.

5) To understand the general range of variations in the group of angiosperms.

6) To trace the history of development of systems of classification emphasizing angiospermic taxa.

7) To learn the wide activities in angiosperm and trends in classification.

8) To learn about the characters of biologically important families of angiosperms.

9) To know the floral variations in angiospermic families, their phylogeny and evolution.

10) To understand various rules, principles and recommendations of plant nomenclature produces in plant identification.

11) To understand major evolutionary trends in various parts of angiospermic plants.

SEM: 2 (GE-2)

THEORY

BOTHGEC02T

PLANT ECOLOGY AND TAXONOMOY

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Theory course** has been adjusted to 47 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					Botany					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUG 2021				**HONS**		**GENERAL** √			
SEM		2	**Generic Elective** **GE**		2		**CREDIT POINT**	4	**Course Code**	BOTHGEC02T
Name of the Course	PLANT ECOLOGY AND TAXONOMOY									
Course Co-ordinator	DR. AYANA CHAKRABORTY									
TOTAL MARKS	50	TH	√	TUT		PRAC				
TOTAL HOURS	~~60 Hrs~~ 47 Hrs	TH	√	TUT		PRAC				
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1									
NAME OF THE UNIT/MODULE	INTRODUCTION									
TOTAL HOURS	~~2 Hrs~~ 1Hr	**THEORY**	√	**TUTORIAL**		**PRAC**				

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction	1	AC	APRIL
	~~General significance~~	**Reduced**		
	TOTAL	**1 HR**		

*** Alloted total 2 hours for the unit-1 has been adjusted to 1 hour according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2					
NAME OF THE UNIT/MODULE			Ecological factors					
TOTAL HOURS	~~10 Hrs~~ 9 Hrs	THEORY	√	TUTORIAL		PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	LECTURE HEAD/TOPIC					HR	TEACHER	MONTH
1.	Introduction					1	SS	APRIL
2.	Soil: Origin and composition					1	SS	APRIL
3.	Soil profile					1	SS	MAY
4.	Water: States of water in the environment,					1	SS	MAY
5.	Light: Variation Optimal and limiting factors;					1	SS	MAY
6.	Temperature: Variation Optimal and limiting factors;					1	SS	JUNE
	~~Shelford law of tolerance.~~						**Reduced**	
7.	Adaptation of hydrophytes					1	SS	JUNE
8.	Adaptation of xerophytes					1	SS	JUNE
9.	Doubt clearing class / Class test					1	SS	JUNE
	TOTAL					**9 HRS**		

*** Alloted total 10 hours for the unit-2 has been adjusted to 9 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3					
NAME OF THE UNIT/MODULE			Plant communities					
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	THEORY	√	TUTORIAL		PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	LECTURE HEAD/TOPIC					HR	TEACHER	MONTH
1.	Introduction					1	AC	APRIL
2.	Characters OF Plant communities					1	AC	MAY
	~~Ecotone and edge effect~~					**Reduced**		MAY
3.	Succession: Processes and types					1	AC	MAY
4.	Succession: Hydrosere and Xerosere					1	AC	MAY
5.	Doubt clearing class					1	AC	JUNE
	TOTAL					**5 HRS**		

*** Alloted total 6 hours for the unit-3 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4					
NAME OF THE UNIT/MODULE			Ecosystem					
TOTAL HOURS	~~8 Hrs~~ 7 Hrs	THEORY	√	TUTORIAL		PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	LECTURE HEAD/TOPIC					HR	TEACHER	MONTH
1.	Introduction					1	AC	JUNE
2.	Structure and energy flow trophic organisation					1	AC	JUNE
3.	Food chains and food webs					1	AC	JUNE
4.	Ecological pyramids					1	AC	JULY
	~~Production and productivity~~						**Reduced**	
5.	Biogeochemical cycling					1	AC	JULY
6.	Cycling of carbon in atmosphere					1	AC	JULY
7.	Cycling of nitrogen					1	AC	JULY
	TOTAL					**7 HRS**		

*** Alloted total 8 hours for the unit-4 has been adjusted to 7 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5					
NAME OF THE UNIT/MODULE			Phytogeography					
TOTAL HOURS	4	THEORY	√	TUTORIAL		PRAC		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	LECTURE HEAD/TOPIC					HR	TEACHER	MONTH
1.	Introduction					1	SS	JULY
2.	Principal biogeographical zones					1	SS	JULY
3.	Endemism: Definition, types and theories					1	SS/ ABJ	JULY
4.	Endemism: significance					1	SS/ ABJ	JULY
	TOTAL					**4 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			Introduction to plant taxonomy				
TOTAL HOURS	2 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Identification	1	ABJ	APRIL
2.	Classification, Nomenclature.	1	ABJ	APRIL
	TOTAL	2 HRS		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7				
NAME OF THE UNIT/MODULE			Identification				
TOTAL HOURS	~~4Hrs~~ 3 hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Introduction	1	ABJ	APRIL
2.	Functions of Herbarium	1	ABJ	MAY
3.	Important herbaria and botanical gardens of the world and India	1	ABJ	MAY
	~~Documentation: Flora, Keys~~	Reduced		
	TOTAL	3 HRS		

*** Alloted total 4 hours for the unit-7 has been adjusted to 3 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			~~Taxonomic evidences from palynology, cytology, phytochemistry and molecular data~~				
TOTAL HOURS	~~6~~	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	~~Introduction~~	Reduced		
2.	~~Taxonomic evidences from palynology~~	Reduced		
3.	~~Taxonomic evidences from cytology~~	Reduced		
4.	~~Taxonomic evidences from phytochemistry~~	Reduced		
5.	~~Taxonomic evidences from molecular data~~	Reduced		
6.	~~Doubt clearing class~~	Reduced		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			9			
NAME OF THE UNIT/MODULE			Taxonomic hierarchy			
TOTAL HOURS	2 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Ranks, categories	1	ABJ	MAY
2.	Taxonomic groups.	1	ABJ	MAY
	TOTAL	2 HRS		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			10			
NAME OF THE UNIT/MODULE			Botanical nomenclature			
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Principles and rules (ICN)	1	ABJ	MAY
2.	~~Ranks and names~~	Reduced		
3.	Binominal system, Typification	1	ABJ	MAY
4.	Author citation and rule of priority	1	ABJ	MAY
5.	Valid and effective publication	1	ABJ	MAY
6.	Class test	1	ABJ	JUNE
	TOTAL	5 HRS		

*** Alloted total 6 hours for the unit-10 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			11				
NAME OF THE UNIT/MODULE			Classification				
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Introduction and criteria of classification	1	ABJ	JUNE
2.	Types of classification- artificial, natural and phylogenetic.	1	ABJ	JUNE
3.	Merits and demerits of artificial, natural and phylogenetic classification	1	ABJ	JUNE
4.	Bentham and Hooker (up to series),	1	ABJ	JUNE
5.	Merits and demerits of Bentham and Hooker classification	1	ABJ	JUNE
	~~General idea of Cronquist's classification (1981).~~	**Reduced**		
	TOTAL	**5 HRS**		

*** Alloted total 6 hours for the unit-11 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			12				
NAME OF THE UNIT/MODULE			Numerical taxonomy and cladistics				
TOTAL HOURS	4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1.	Characters	1	ABJ	JUNE
2.	Variations and cluster analysis	1	ABJ	JUNE
3.	Phenograms and Cladograms (definitions and differences).	1	ABJ	JULY
4.	Class test	1	ABJ	JULY
	TOTAL	**4 HRS**		

.....

SEM: 2 (GE-2)

PRACTICAL

BOTHGEC02P

PLANT ECOLOGY AND TAXONOMOY

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Practical course** has been adjusted to 30 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)											
NAME OF THE DEPARTMENT					**Botany**						
HOD	DR. ARUNEEMA BARDHAN										
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ					
	MORN										
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUG 2021						**HONS**		**GENERAL** √		
SEM		2	**Generic Elective** **GE**		2		**CREDIT POINT**	2	**Course Code**	BOTHGEC02P	
Name of the Course	PLANT ECOLOGY AND TAXONOMOY										
Course Co-ordinator	DR. AYANA CHAKRABORTY										
TOTAL MARKS	25	TH		TUT		PRAC	√				
TOTAL HOURS	60	TH		TUT		PRAC	√				
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1										
NAME OF THE UNIT/MODULE	PLANT ECOLOGY AND TAXONOMOY										
TOTAL HOURS	~~60 Hrs~~ 30 Hrs	**THEORY**		**TUTORIAL**		**PRAC**	√				

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

SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1.	Study of Soil thermometer …….its working principal and use	2	AC	APRIL
2.	Study of maximum and minimum thermometer…….its working principal and use	2	AC	APRIL
3.	Study of anemometer…….its working principal and use	2	AC	MAY
4.	Study of psychrometer/hygrometer…….its working principal and use	2	AC	MAY
5.	Study of rain gauge…….its working principal and use	2	AC	MAY
6.	Study of lux meter…….its working principal and use	2	AC	MAY
	~~Determination of soil pH through pH meter (two soil samples)~~		**Reduced**	
	~~Determination of carbonate (two soil samples)~~		**Reduced**	
	~~Determination of chlorides (two soil samples)~~		**Reduced**	
	~~Determination of nitrates (two soil samples)~~		**Reduced**	
	~~Determination of sulphates (two soil samples)~~		**Reduced**	
	~~Determination of organic matter (two soil samples) by Rapid filtration test~~		**Reduced**	
	~~Study of morphological adaptations of hydrophytes~~		**Reduced**	

	~~(*Nymphaea*)~~			
	~~Study of morphological adaptations xerophytes~~ ~~(*Nerium* leaf)~~		**Reduced**	
7.	Study of biotic interactions of stem parasite (*Cuscuta)*	2	AC	JUNE
8.	Study of biotic interactions of epiphytes (Orchid root)	2	AC	JUNE
9.	Determination of minimal quadrat size for the study of herbaceous vegetation	2	AC	JUNE
	~~Quantitative analysis of herbaceous vegetation in the college campus /suitable site for frequency and comparison with Raunkiaer's frequency distribution law~~		**Reduced**	
10.	Introduction to plant taxonomy, Bentham Hooker System, Bengal Plants, key preparation for identification of angiospermic plants.	2	AC & ABJ	JUNE
11.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Brassicaceae – *Nastertium indicum.*	2	AC & ABJ	JUNE
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Asteraceae - *Eclipta*~~	2	**Reduced**	
	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Asteraceae - *Tridax*	2	AC & ABJ	JULY
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Solanaceae –*Nicotiana plumbaginifolia*~~	2	**Reduced**	
12.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Solanaceae–*Solanum nigrum*	2	AC & ABJ	JULY
13.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae –*Leonurus sibiricus*	2	AC & ABJ	JULY
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae –*Leucas aspera*~~	2	**Reduced**	
	~~Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Lamiaceae -*Ocimum sanctum*~~	2	**Reduced**	

14.	Study of vegetative and floral characters (Description, V.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification) of Liliaceae - *Allium.*	2	AC & ABJ	JULY
15.	Demonstration of Herbarium preparation	2	AC & ABJ	JULY
	TOTAL	**30 HRS**		

***Due to the **Pandemic situation,** the allotted total 60 hours for the Practical course has been adjusted to 30 hours, **according to the reduced syllabus provided by WBSU.**

……..

SEMESTER IV

DISCIPLINE SPECIFIC COURSE-IV (DSC-4)

Plant Physiology and Metabolism

CODE: BOTGCOR04T (4 Credits) & BOTGCOR04P (2 Credits)

Learning Outcomes:

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

1. To understand plant physiological processes and metabolism.

2. Understand the plants and plant cells in relation to water.

3. To explain the role of micro nutrients in plant growth and development.

4. To understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
5. To understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
6. To clarify the mechanism and breaking of dormancy.

7. To understand Structure and general features of enzymes.

8. To have concept of enzyme activity and enzyme inhibition.

9. To learn about the movement of sap and absorption of water in plant body.

10. To understand the plant movements.

LESSON PLAN FOR

SEM: 4 (DSC-4)

THEORY

BOTGCOR04T (CREDIT: 4)

Plant Physiology and Metabolism

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Theory course** has been adjusted to 45 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					BOTANY					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUGUST 2021						**HONS**		**GENERAL** √	
SEM		4	**Core Course DSC**	4			**CREDIT POINT**	4	**Course Code**	**BOTGCOR04T**
Name of the Course	**Plant Physiology and Metabolism**									
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	**Plant-water relations**						
TOTAL HOURS	~~8 Hrs~~ 6 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AB	APRIL
2	Importance of water	1	AB	MAY
3	Water potential and its components	1	AB	MAY
4	Transpiration and its significance	1	AB	MAY
5	Factors affecting transpiration	1	AB	MAY
	~~Root pressure and guttation~~		**Reduced**	
6	Doubt Clearing Class	1	AB	JUNE
TOTAL		**6 HRS**		

*** Alloted total 8 hours for the unit-1 has been adjusted to 6 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			**Mineral nutrition**				
TOTAL HOURS	~~8 Hrs~~ 6 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	AB	JUNE
2	Essential elements, macro and micronutrients	1	AB	JUNE
	~~Criteria of essentiality of elements; Role of essential elements~~	1	**Reduced**	JUNE
3	Transport of ions across cell membrane	1	AB	JULY
4	Active and passive transport	1	AB	JULY
5	Carriers, channels and pumps	1	AB	JULY
6	Doubt Clearing Class	1	AB	JULY
TOTAL		**6 HRS**		

*** Alloted total 8 hours for the unit-2 has been adjusted to 6 hours according to the reduced syllabus.

*** Alloted total 6 hours for the unit-3 has been adjusted to 4 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Translocation in phloem**				
TOTAL HOURS	6	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction; Composition of phloem sap	1	AC	JUNE
	Girdling experiment		**Reduced**	
2	Pressure flow model	1	AC	JULY
3	Phloem loading and unloading	1	AC	JULY
4	Doubt Clearing Class	1	AC	JULY
TOTAL		**4 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Photosynthesis**				
TOTAL HOURS	~~12 Hrs~~ 10 HRs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AC	APRIL
2	Photosynthetic Pigments (Chl a, b, xanthophylls, carotene)	1	AC	MAY
3	Photosystem I and II, Reaction centre, antenna molecules	1	AC	MAY
4	Electron transport and mechanism of ATP synthesis	1	AC	MAY
5	C_3, pathway of carbon fixation	1	AC	MAY
6	C_4 pathway of carbon fixation	1	AC	JUNE
7	CAM pathway of carbon fixation	1	AC	JUNE
8	Photorespiration	1	AC	JUNE
9	Doubt Clearing Class	1	AC	JUNE
10	Class Test	1	AC	JUNE
TOTAL		**10 HRS**		

*** Alloted total 12 hours for the unit-3 has been adjusted to 10 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			**Respiration**				
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	APRIL
2	Glycolysis	1	SS	APRIL
3	Anaerobic respiration, Oxidative phosphorylation,	1	SS	APRIL
4	TCA cycle	1	SS	APRIL
	~~Glyoxylate mechanism~~		**Reduced**	
5	Oxidative Pentose Phosphate Pathway	1	SS	MAY
TOTAL		**5 HRS**		

*** Alloted total 6 hours for the unit-5 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			**Enzymes**				
TOTAL HOURS	~~4 Hrs~~ 3 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Structure and properties enzymes	1	SS	MAY
2	Mechanism of enzyme catalysis	1	SS	MAY
3	Enzyme inhibition	1	SS	MAY
TOTAL		**3 HRS**		

*** Alloted total 4 hours for the unit-6 has been adjusted to 3 hours according to the reduced syllabus.

*** Alloted total 4 hours for the unit-7 has been adjusted to 3 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7				
NAME OF THE UNIT/MODULE			**Nitrogen metabolism**				
TOTAL HOURS	~~4 Hrs~~ 3 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONT**
1	Introduction	1	SS	MAY
2	Biological nitrogen fixation;	1	SS	MAY
3	Nitrate assimilation.	1	SS	MAY
4	Ammonia assimilation.	1	SS	JUNE
TOTAL		**3 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	8			
NAME OF THE UNIT/MODULE	**Plant growth regulators**			

TOTAL HOURS	~~6 Hrs~~ 4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	SS	JUNE
2	~~Discovery and~~ physiological roles of auxins and gibberellins	1	SS	JUNE
3	~~Discovery and~~ physiological roles of cytokinins and ABA	1	SS	JUNE
4	~~Discovery and~~ physiological roles of ethylene.	1	SS	JUNE
TOTAL		**4 HRS**		

*** Alloted total 6 hours for the unit-8 has been adjusted to 4 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			9				
NAME OF THE UNIT/MODULE			**Plant response to light and temperature**				
TOTAL HOURS	~~6 Hrs~~ 4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/ TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction	1	SS	JUNE
2	Photoperiodism (SDP, LDP, Day neutral plants)	1	SS	JUNE
3	~~Phytochrome (discovery and structure)~~		**Reduced**	
4	Red and far red light responses on photomorphogenesis	1	SS	JULY
5	Vernalization	1	SS	JULY
TOTAL		**4 HRS**		

*** Alloted total 6 hours for the unit-9 has been adjusted to 4 hours according to the reduced syllabus.

LESSON PLAN FOR

SEM: 4 (DSC-4)

PRACTICAL

BOTGCOR04P (CREDIT: 2)

Plant Physiology and Metabolism

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Practical course** has been adjusted to 24 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT				BOTANY						
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~						**HONS**		**GENERAL** √	

			FROM APRIL 2021 TO AUGUST 2021										
SEM		4	**Core Course DSC**	4				**CREDIT POINT**	2	**Course Code**	**BOTGCOR04P**		
Name of the Course			**Plant Physiology and Metabolism**										
Course Co-ordinator			DR. ARUNEEMA BARDHAN										
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	~~60 Hrs~~ 22 Hrs	**THEORY**		**TUTORIAL**		**PRAC**	√

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1.	Determination of osmotic potential of plant cell sap by plasmolytic method using *Rhoeo* leaf **(only Principles and methodology)**	2	AB & SS	
2.	To study the effect of environmental factor (light) on transpiration by excised twig **(only Principles and methodology)**	2	AB & SS	
3.	To study the effect of environmental factor (wind) on transpiration by excised twig **(only Principles and methodology)**	2	AB & SS	
4.	Calculation of stomatal index and stomatal frequency of leaf **(only Principles and methodology)**	2	AB & SS	
	~~Demonstration of activity of catalase~~		**Reduced**	
	~~Study of effect of pH and enzyme concentration on activity of catalase~~		**Reduced**	
5.	Study of effect of bicarbonate concentration on O_2 evolution in photosynthesis **(only Principles and methodology)**	2	AB & SS	
	~~Comparison of the rate of respiration in any two parts of a plant (leaf and petals)~~		**Reduced**	
	~~Comparison of the rate of respiration in any two parts of a plant (leaf and stem)~~		**Reduced**	
	~~Demonstration experiment: Effect of auxins on rooting in *Hibiscus*~~		**Reduced**	
	~~Demonstration experiment: Effect of auxins on rooting in *Tagetus*~~		AB & SS	
6.	Demonstration experiments: Suction due to transpiration. **(only Principles and methodology)**	2	AB & SS	
7.	Demonstration experiments: R.Q. (using petals) **(only Principles and methodology)**	2	AB & SS	
8.	Demonstration experiments: R.Q. (using germinating	2	AB & SS	

	seeds) **(only Principles and methodology)**			
	~~Demonstration experiment: Respiration in monocot roots.~~		**Reduced**	
	~~Demonstration experiment: Respiration in dicot roots.~~		**Reduced**	
9.	Practice class/ Doubt clearing class	2	AB & SS	
10.	Practice Class/ Doubt clearing class	2	AB & SS	
11.	Class test and viva	2	AB & SS	
Total		**22 HRS**		

***Due to the **Pandemic situation,** the allotted total 60 hours for the Practical course has been adjusted to 22 hours, **according to the reduced syllabus provided by WBSU.**

.....

SEMESTER IV

GENERIC ELECTIVE COURSE-IV (GE-4)

Plant Physiology and Metabolism

CODE: BOTHGEC04T (4 Credits) & BOTHGEC04P (2 Credits)

Learning Outcomes:

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

1. To understand plant physiological processes and metabolism.

2. Understand the plants and plant cells in relation to water.

3. To explain the role of micro nutrients in plant growth and development.

4. To understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
5. To understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
6. To clarify the mechanism and breaking of dormancy.

7. To understand Structure and general features of enzymes.

8. To have concept of enzyme activity and enzyme inhibition.

9. To learn about the movement of sap and absorption of water in plant body.

10. To understand the plant movements.

LESSON PLAN FOR

SEM: 4 (GE-4)

THEORY

BOTHGEC04T (CREDIT: 4)

Plant Physiology and Metabolism

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Theory course** has been adjusted to 45 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)	
NAME OF THE DEPARTMENT	BOTANY
HOD	DR. ARUNEEMA BARDHAN

INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUGUST 2021						**HONS**		**GENERAL** √	
SEM		4	**Generic Elective** **GE**	4			**CREDIT POINT**	4	**Course Code**	**BOTHGEC04T**
Name of the Course	**Plant Physiology and Metabolism**									
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	**Plant-water relations**						
TOTAL HOURS	~~8 Hrs~~ 6 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AB	APRIL
2	Importance of water	1	AB	MAY
3	Water potential and its components	1	AB	MAY
4	Transpiration and its significance	1	AB	MAY
5	Factors affecting transpiration	1	AB	MAY
	~~Root pressure and guttation~~		**Reduced**	
6	Doubt Clearing Class	1	AB	JUNE
TOTAL		**6 HRS**		

*** Alloted total 8 hours for the unit-1 has been adjusted to 6 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	2			

NAME OF THE UNIT/MODULE			Mineral nutrition				
TOTAL HOURS	~~8 Hrs~~ 6 Hrs	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AB	JUNE
2	Essential elements, macro and micronutrients	1	AB	JUNE
	~~Criteria of essentiality of elements; Role of essential elements~~	1	**Reduced**	JUNE
3	Transport of ions across cell membrane	1	AB	JULY
4	Active and passive transport	1	AB	JULY
5	Carriers, channels and pumps	1	AB	JULY
6	Doubt Clearing Class	1	AB	JULY
TOTAL		**6 HRS**		

*** Alloted total 8 hours for the unit-2 has been adjusted to 6 hours according to the reduced syllabus.

*** Alloted total 6 hours for the unit-3 has been adjusted to 4 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			Translocation in phloem				
TOTAL HOURS	6	THEORY	√	TUTORIAL		PRAC	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction; Composition of phloem sap	1	AC	JUNE
	Girdling experiment		**Reduced**	
2	Pressure flow model	1	AC	JULY
3	Phloem loading and unloading	1	AC	JULY
4	Doubt Clearing Class	1	AC	JULY
TOTAL		**4 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			Photosynthesis				
TOTAL HOURS	~~12 Hrs~~ 10 HRs	THEORY	√	TUTORIAL		PRAC	

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	AC	APRIL
2	Photosynthetic Pigments (Chl a, b, xanthophylls, carotene)	1	AC	MAY
3	Photosystem I and II, Reaction centre, antenna molecules	1	AC	MAY
4	Electron transport and mechanism of ATP synthesis	1	AC	MAY
5	C_3, pathway of carbon fixation	1	AC	MAY
6	C_4 pathway of carbon fixation	1	AC	JUNE
7	CAM pathway of carbon fixation	1	AC	JUNE
8	Photorespiration	1	AC	JUNE
9	Doubt Clearing Class	1	AC	JUNE
10	Class Test	1	AC	JUNE
TOTAL		**10 HRS**		

*** Alloted total 12 hours for the unit-3 has been adjusted to 10 hours.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			**Respiration**				
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)							

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Introduction	1	SS	APRIL
2	Glycolysis	1	SS	APRIL
3	Anaerobic respiration, Oxidative phosphorylation,	1	SS	APRIL
4	TCA cycle	1	SS	APRIL
	~~Glyoxylate mechanism~~		**Reduced**	
5	Oxidative Pentose Phosphate Pathway	1	SS	MAY
TOTAL		**5 HRS**		

*** Alloted total 6 hours for the unit-5 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6				
NAME OF THE UNIT/MODULE			**Enzymes**				
TOTAL HOURS	~~4 Hrs~~ 3 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)							

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1	Structure and properties enzymes	1	SS	MAY
2	Mechanism of enzyme catalysis	1	SS	MAY
3	Enzyme inhibition	1	SS	MAY
TOTAL		**3 HRS**		

*** Alloted total 4 hours for the unit-6 has been adjusted to 3 hours according to the reduced syllabus.

*** Alloted total 4 hours for the unit-7 has been adjusted to 3 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7					
NAME OF THE UNIT/MODULE			**Nitrogen metabolism**					
TOTAL HOURS	~~4 Hrs~~ 3 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**		
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)								
SL	**LECTURE HEAD/ TOPIC**				**HR**	**TEACHER**	**MONT**	
1	Introduction				1	SS	MAY	
2	Biological nitrogen fixation;				1	SS	MAY	
3	Nitrate assimilation.				1	SS	MAY	
4	Ammonia assimilation.				1	SS	JUNE	
TOTAL					**3 HRS**			

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			8				
NAME OF THE UNIT/MODULE			**Plant growth regulators**				
TOTAL HOURS	~~6 Hrs~~ 4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)							
SL	**LECTURE HEAD/ TOPIC**				**HR**	**TEACHER**	**MONTH**
1	Introduction				1	SS	JUNE
2	~~Discovery and~~ physiological roles of auxins and gibberellins				1	SS	JUNE
3	~~Discovery and~~ physiological roles of cytokinins and				1	SS	JUNE

	ABA			
4	~~Discovery and~~ physiological roles of ethylene.	1	SS	JUNE
TOTAL		**4 HRS**		

*** Alloted total 6 hours for the unit-8 has been adjusted to 4 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			9				
NAME OF THE UNIT/MODULE			**Plant response to light and temperature**				
TOTAL HOURS	~~6 Hrs~~ 4 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	
DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)							
SL	**LECTURE HEAD/ TOPIC**			**HR**	**TEACHER**	**MONTH**	
1	Introduction			1	SS	JUNE	
2	Photoperiodism (SDP, LDP, Day neutral plants)			1	SS	JUNE	
3	~~Phytochrome (discovery and structure)~~				**Reduced**		
4	Red and far red light responses on photomorphogenesis			1	SS	JULY	
5	Vernalization			1	SS	JULY	
TOTAL				**4 HRS**			

*** Alloted total 6 hours for the unit-9 has been adjusted to 4 hours according to the reduced syllabus.

……..

LESSON PLAN FOR

SEM: 4 (GE-4)

PRACTICAL

BOTHGEC04P (CREDIT: 2)

Plant Physiology and Metabolism

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Practical course** has been adjusted to 24 hours, **according to the reduced syllabus provided by WBSU**.

<table>
<tr><td colspan="14">BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)</td></tr>
<tr><td colspan="5">NAME OF THE DEPARTMENT</td><td colspan="9">BOTANY</td></tr>
<tr><td colspan="2">HOD</td><td colspan="12">DR. ARUNEEMA BARDHAN</td></tr>
<tr><td colspan="2" rowspan="2">INITIALS OF FACULTIES</td><td>DAY</td><td>AC</td><td>AB</td><td>SDG</td><td>SS</td><td>ABJ</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MORN</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3" rowspan="2">PERIOD OF SEMESTER</td><td colspan="6"><s>FROM JANUARY 2021 TO JUNE 2021</s></td><td colspan="2" rowspan="2">HONS</td><td colspan="2" rowspan="2">GENERAL
√</td></tr>
<tr><td colspan="6">FROM APRIL 2021 TO AUGUST 2021</td></tr>
<tr><td>SEM</td><td></td><td>4</td><td>Generic Elective
GE</td><td>4</td><td></td><td></td><td></td><td>CREDIT POINT</td><td>2</td><td>Course Code</td><td colspan="3">BOTHGEC04P</td></tr>
<tr><td colspan="4">Name of the Course</td><td colspan="10">Plant Physiology and Metabolism</td></tr>
<tr><td colspan="4">Course Co-ordinator</td><td colspan="10">DR. ARUNEEMA BARDHAN</td></tr>
</table>

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	~~60 Hrs~~ 22 Hrs	**THEORY**		**TUTORIAL**		**PRAC**	√

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

SL	LECTURE HEAD/ TOPIC	HR	TEACHER	MONTH
1.	Determination of osmotic potential of plant cell sap by plasmolytic method using *Rhoeo* leaf **(only Principles and methodology)**	2	AB & SS	
2.	To study the effect of environmental factor (light) on transpiration by excised twig **(only Principles and methodology)**	2	AB & SS	
3.	To study the effect of environmental factor (wind) on transpiration by excised twig **(only Principles and methodology)**	2	AB & SS	
4.	Calculation of stomatal index and stomatal frequency of leaf **(only Principles and methodology)**	2	AB & SS	
	~~Demonstration of activity of catalase~~		**Reduced**	
	~~Study of effect of pH and enzyme concentration on activity of catalase~~		**Reduced**	
5.	Study of effect of bicarbonate concentration on O_2 evolution in photosynthesis **(only Principles and methodology)**	2	AB & SS	
	~~Comparison of the rate of respiration in any two parts of a plant (leaf and petals)~~		**Reduced**	
	~~Comparison of the rate of respiration in any two parts of a plant (leaf and stem)~~		**Reduced**	
	~~Demonstration experiment: Effect of auxins on rooting in *Hibiscus*~~		**Reduced**	
	~~Demonstration experiment: Effect of auxins on rooting in *Tagetus*~~		AB & SS	
6.	Demonstration experiments: Suction due to transpiration. **(only Principles and methodology)**	2	AB & SS	
7.	Demonstration experiments: R.Q. (using petals) **(only Principles and methodology)**	2	AB & SS	
8.	Demonstration experiments: R.Q. (using germinating seeds) **(only Principles and methodology)**	2	AB & SS	
	~~Demonstration experiment: Respiration in monocot roots.~~		**Reduced**	
	~~Demonstration experiment: Respiration in dicot roots.~~		**Reduced**	

9.	Practice class/ Doubt clearing class	2	AB & SS	
10.	Practice Class/ Doubt clearing class	2	AB & SS	
11.	Class test and viva	2	AB & SS	
Total		**22 HRS**		

***Due to the **Pandemic situation,** the allotted total 60 hours for the Practical course has been adjusted to 22 hours, **according to the reduced syllabus provided by WBSU.**

……..

SEMESTER VI

DISCIPLINE SPECIFIC ELECTIVE BOTANY-II (DSE-2)

ANALYTICAL TECHNIQUES IN PLANT SCIENCES

CODE: BOTGDSE04T (4 Credits) & BOTGDSE04P (2 Credits)

Learning Outcomes:

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

- Develop conceptual understanding of cell wall degradation enzymes and cell fractionation.
- Classify different types of chromatography techniques.
- Explain the principles of Light microscopy, compound microscopy, Fluorescence microscopy and confocal microscopy.
- Apply suitable strategies in data collections and disseminating research findings.

LESSON PLAN FOR
SEMESTER: 6

DSE-2 THEORY

ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(BOTGDSE04T)

(CREDIT: 4)

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Theory course** has been adjusted to 50 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)												
NAME OF THE DEPARTMENT					BOTANY							
HOD	DR. ARUNEEMA BARDHAN											
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ	SPR (GUEST)					
	MORN											
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUGUST 2021						**HONS** √		**GENERAL**			
SEM	6	**DSE Discipline Specific Elective**		2	**CREDIT POINT**	4	**Course Code**	BOTADSE04T				
Name of the Course	**ANALYTICAL TECHNIQUES IN PLANT SCIENCES**											
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	**Imaging and related techniques**											
TOTAL HOURS	~~15 HRS~~ 12 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**						

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Principles of microscopy	1	SDG	APR
2	Light microscopy	1	SDG	APR
3	Fluorescence microscopy	1	SDG	APR
4	Confocal microscopy	1	SDG	APR
	~~Use of fluorochromes~~		**Reduced**	
5	Flow cytometry (FACS)	1	SDG	MAY
6	Applications of fluorescence microscopy	1	SDG	MAY
7	Chromosome banding	1	SDG	MAY
8	FISH chromosome painting	1	SDG	MAY
9	Transmission electron microscopy	1	SDG	MAY
10	Scanning electron microscopy	1	SDG	MAY
	~~Sample preparation for electron microscopy;~~		**Reduced**	
	~~Sample preparation for cryofixation~~		**Reduced**	
	~~Sample preparation for Negative staining~~		**Reduced**	
	~~Sample preparation for shadow casting~~		**Reduced**	
	~~Sample preparation for freeze fracture~~		**Reduced**	
	~~Sample preparation for freeze etching~~		**Reduced**	
11	Doubt clearing class	1	SDG	MAY
12	Doubt clearing class	1	SDG	MAY
	TOTAL	**12 HRS**		

*** Alloted total 15 hours for the unit-1 has been adjusted to 12 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2					
NAME OF THE UNIT/MODULE			**Cell fractionation**					
TOTAL HOURS	~~8 HRS~~ 6 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Principle of Centrifugation	1	SDG	JUNE
2	Study of Differential centrifugation	1	SDG	JUNE
3	Study of Density gradient centrifugation	1	SDG	JUNE
4	Study of sucrose density gradient	1	SDG	JUNE
5	Study of CsCl2 gradient centrifugation	1	SDG	JUNE
	~~Analytical centrifugation~~		**Reduced**	
6	Study of ultracentrifugation	1	SDG	JUNE
	~~Marker enzymes~~		**Reduced**	
	TOTAL	**6 HRS**		

*** Alloted total 8 hours for the unit-2 has been adjusted to 6 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3					
NAME OF THE UNIT/MODULE			**Radioisotopes**					
TOTAL HOURS	~~4 HRS~~ 3 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Radioisotopes	**1**	SDG	JUNE
2	Use OF Radioisotopes in biological research		SDG	JUNE
3	Auto-radiography	**1**	SDG	JULY
	~~Pulse chase experiment~~		**Reduced**	
	TOTAL	**3 HRS**		

*** Alloted total 4 hours for the unit-3 has been adjusted to 4 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Spectrophotometry**				
TOTAL HOURS	~~4 HRS~~ 3 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Principle of Spectrophotometry	**1**	SDG	JULY
2	Different types of Spectrophotometry	**1**	SDG	JULY
3	Application Spectrophotometry in biological research	**1**	SDG	JULY
	TOTAL	**3 HRS**		

*** Alloted total 4 hours for the unit-4 has been adjusted to 3 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			5				
NAME OF THE UNIT/MODULE			**Chromatography**				
TOTAL HOURS	8 HRS	**THEORY**	√	**TUTORIAL**		**PRAC**	

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Principle of Chromatography	1	AB	APR
2	Study of Paper chromatography	1	AB	APR
3	Study of Column chromatography	1	AB	APR
4	Study of TLC, GLC and HPLC	1	AB	APR
5	Study of Ion-exchange chromatography	1	AB	MAY
6	Study of Molecular sieve chromatography	1	AB	MAY
7	Study of Affinity chromatography	1	AB	MAY
8	Class test	1	AB	MAY
	TOTAL	**8 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			6					
NAME OF THE UNIT/MODULE			Characterization of proteins and nucleic acids					
TOTAL HOURS	~~6 HRS~~ 5 HRS	THEORY	√	TUTORIAL		PRAC		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Study of Mass spectrometry	**1**	AB	MAY
	X-ray diffraction		**Reduced**	
2	Study of X-ray crystallography	**1**	AB	MAY
3	Characterization of proteins and nucleic acids	**1**	AB	JUNE
4	Electrophoresis: AGE	**1**	AB	JUNE
5	Electrophoresis: PAGE, SDS-PAGE	**1**	AB	JUNE
	TOTAL	**5 HRS**		

*** Alloted total 6 hours for the unit-6 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			7					
NAME OF THE UNIT/MODULE			Biostatistics					
TOTAL HOURS	~~15 HRS~~ 13 HRS	THEORY	√	TUTORIAL		PRAC		

DISTRIBUTION OF LESSON PLAN (MODULE/ UNIT/ SECTION/ TOPIC WISE)				
SL	**LECTURE HEAD/TOPIC**	**HR**	**TEACHER**	**MONTH**
1	Introduction of Statistics	1	AB	JUN
2	Statistical data population and sample	1	AB	JUN
3	Statistical parameters	1	AB	JUN
4	Representation of Data: Tabular and Graphical	1	AB	JUN
5	Measures of central tendency: Arithmetic mean, mode, median	1	AB	JUN
	Problem solving	1	AB	JUN
6	Measures of dispersion: Range	1	AB	JUN
7	Measures of dispersion: mean deviation	1	AB	JULY
8	Measures of dispersion: variation	1	AB	JULY
9	Measures of dispersion: standard deviation	1	AB	JULY
	Problem solving	1	AB	JULY
10	Chi-square test for goodness of fit	1	SDG	JULY
11	Doubt clearing class	1	SDG	JULY
12	Doubt clearing class	1	AB	JULY
13	Class test	1	AB	JULY
	TOTAL	**13 HRS**		

*** Alloted total 15 hours for the unit-2 has been adjusted to 13 hours accordingly.

……

LESSON PLAN FOR
SEMESTER: 6

DSE-2 PRACTICAL

ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(BOTGDSE04P)

(CREDIT: 2)

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 60 hours for the **Practical course** has been adjusted to 28 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR GENERAL)										
NAME OF THE DEPARTMENT					BOTANY					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ	SPR (GUEST)			
	MORN									
PERIOD OF SEMESTER	FROM APRIL 2021 TO JULY 2021						**HONS** √		**GENERAL**	
SEM	6	**DSE -2** **Discipline Specific Elective**	PLANT BIOTECHNOLOGY	**CREDIT POINT**	4	**Course Code**	BOTADSE04P			
Name of the Course	**PLANT BIOTECHNOLOGY**									
Course Co-ordinator	DR. ARUNEEMA BARDHAN									
TOTAL MARKS	50	TH		TUT		PRAC	√			
TOTAL HOURS	60	TH		TUT		PRAC	√			
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC										
NAME OF THE UNIT/MODULE	**PLANT BIOTECHNOLOGY**									
TOTAL HOURS	60	**THEORY**		**TUTORIAL**		**PRAC**	√			

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

SL	LECTURE HEAD/TOPIC	HR	TEACHER	MONTH
1	Introduction to Blotting techniques	2	AB	APRIL
2	Study of Blotting techniques: Southern Blotting through photographs.	2	AB	APRIL
3	Study of Blotting techniques: Northern Blotting through photographs.	2	AB	MAY
4	Study of Blotting techniques: Western Blotting through photographs.	2	AB	MAY
5	Study of DNA fingerprinting through photographs.	2	AB	MAY
6	Study of DNA sequencing through photographs.	2	AB	MAY
7	Study of PCR through photographs.	2	AB	MAY
8	Separation of nitrogenous bases by paper chromatography.	2	AB	JUNE
9	Separation of sugars by thin layer chromatography.	2	AB	JUNE
	~~To estimate protein concentration through Lowry's methods.~~		**Reduced**	
10	Separation of proteins using PAGE.	2	AB	JUNE
11	Separation of DNA (marker) using AGE.	2	AB	JUNE
	~~Study of different microscopic techniques using photographs/micrographs (freeze fracture)~~		**Reduced**	
	~~Study of different microscopic techniques using photographs/micrographs (freeze etching)~~		**Reduced**	
	~~Study of different microscopic techniques using photographs/micrographs (negative staining)~~		**Reduced**	

	~~Study of different microscopic techniques using photographs/micrographs (positive staining)~~		**Reduced**	
12	Study of different microscopic techniques using photographs/micrographs (fluorescence)	2	AB	JUNE
13	Study of different microscopic techniques using photographs/micrographs (FISH)	2	AB	JULY
	~~Introduction to Preparation of permanent slides (double staining method)~~		**Reduced**	
	~~Preparation of permanent slides (double staining)- any material with saffranin and light green stain.~~		**Reduced**	
14	Doubt clearing class	2		JULY
	TOTAL	**28 HRS**		

……..

SEC (Ethnobotany)

BOTSSEC02M

LEARNING OUTCOMES:

The course deals with **Ethnobotany**. Ethnobotany is the study of interrelations between human and plants; however, current use of the term implies the study of indigenous or traditional knowledge of plants. It involves the indigenous knowledge of plant classification, cultivation, and use as food, medicine and shelter. The study of Ethnobotany is of great importance for the aid it gives to a proper understanding of the interrelations of all the several traits and of the whole material and intellectual culture of a people in its entirety.

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

- Understand the role plants in human welfare.
- Gain knowledge about various plants of economic use.
- Know importance of plants & plant products.
- Understand the chemical contents of the plant products.
- Know about the utility of plant resources.
- Know the interrelations of all the several traits and of the whole material and intellectual culture of a people in its entirety.

LESSON PLAN FOR

SEMESTER: 4

(DSC & GE)

SEC (Ethnobotany)

BOTSSEC02M

(According to the reduced syllabus)

***Due to the **Pandemic situation**, the allotted total 30 hours for the Theory course has been adjusted to 24 hours, **according to the reduced syllabus provided by WBSU**.

BASIRHAT COLLEGE LESSON PLAN FOR CBCS (FOR HONS and GENERAL)										
NAME OF THE DEPARTMENT					BOTANY					
HOD	DR. ARUNEEMA BARDHAN									
INITIALS OF FACULTIES	DAY	AC	AB	SDG	SS	ABJ				
	MORN									
PERIOD OF SEMESTER	~~FROM JANUARY 2021 TO JUNE 2021~~ FROM APRIL 2021 TO AUGUST 2021						**HONS**√		**GENERAL**√	
SEM	4		**SEC**		2		**CREDIT POINT**	2	**Course Code**	BOTSSEC02M
Name of the Course	**Ethnobotany**									
Course Co-ordinator	DR. ARUNEEMA BARDHAN									
TOTAL MARKS	25	TH	√	TUT		PRAC				
TOTAL HOURS	~~30 Hrs~~ 24 Hrs	TH	√	TUT		PRAC				
UNIT/ SECTION/ GROUP/ MODULE/ TOPIC	1									
NAME OF THE UNIT/MODULE	**Ethnobotany**									
TOTAL HOURS	~~6 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**				

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

SL	TOPIC	HR	TEACHER	MONTH
1	Introduction, concept, scope and objectives of Ethnobotany and Ethnobotany as an interdisciplinary science.	1	ABJ	APRIL
2	The relevance of ethnobotany in the present context.	1	ABJ	APRIL
	~~Major and minor ethnic groups or Tribals of India, and their life styles.~~		**Reduced**	
3.	Plants used by the tribals: Food plants.	1	ABJ	MAY
4.	Plants used by the tribals: intoxicants and beverages.	1	ABJ	MAY
5.	Plants used by the tribals: Resins and oils and miscellaneous uses.	1	ABJ	MAY
	TOTAL	**5 HRS**		

*** Alloted total 6 hours for the unit-1 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			2				
NAME OF THE UNIT/MODULE			**Methodology of Ethnobotanical studies**				
TOTAL HOURS	6 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	TOPIC	HR	TEACHER	MONTH
1	Field work	1	ABJ	MAY
2	Herbarium	1	ABJ	MAY
3	Ancient Literature	1	ABJ	MAY
4	Archaeological findings	1	ABJ	MAY
5	Temples and sacred places.	1	ABJ	MAY
6	Role of ethnic groups in conservation of plant genetic resources.Endangered taxa and forest management (participatory forest management).	1	ABJ	JUNE
	TOTAL	**6 HRS**		

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			3				
NAME OF THE UNIT/MODULE			**Role of Ethnobotany in modern medicine**				
TOTAL HOURS	~~10 Hrs~~ 5 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	**TOPIC**	**HR**	**TEACHER**	**MONTH**
	~~Medico-ethnobotanical sources in India~~	1	ABJ	JUNE
1.	Significance of ethno botanical practices of *Azadiractha indica* ~~(along with their habitat and morphology)~~ Significance of ethno botanical practices of *Ocimum sanctum* ~~(along with their habitat and morphology)~~	1	ABJ	JUNE
2.	Significance of ethno botanical practices of *Vitex negundo* ~~(along with their habitat and morphology)~~ Significance of ethno botanical practices of *Gloriosa superba* ~~(along with their habitat and morphology)~~	1	ABJ	JUNE
3.	Significance of ethno botanical practices of *Tribulus terrestris* ~~(along with their habitat and morphology)~~ Significance of ethno botanical practices of *Pongamia pinnata* ~~(along with their habitat and morphology)~~	1	ABJ	JUNE
4.	Significance of ethno botanical practices of *Cassia auriculata* ~~(along with their habitat and morphology)~~ Significance of ethno botanical practices of *Indigofera tinctoria* ~~(along with their habitat and morphology)~~	1	ABJ	JUNE
5.	Role of ethnobotany in modern medicine with special example *Rauvolfia sepentina, Trichopus zeylanicus, Artemisia,Withania*	1	ABJ	JUNE
	TOTAL	**5 HRS**		

*** Alloted total 10 hours for the unit-3 has been adjusted to 5 hours according to the reduced syllabus.

UNIT/ SECTION/ GROUP/ MODULE/ TOPIC			4				
NAME OF THE UNIT/MODULE			**Ethnobotany and Legal aspects**				
TOTAL HOURS	8 Hrs	**THEORY**	√	**TUTORIAL**		**PRAC**	

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

SL	TOPIC	HR	TEACHER	MONTH
1	Ethnobotany as a tool to protect interests of ethnic groups.	1	ABJ	JUNE
2	Sharing of wealth concept with few examples from India.	1	ABJ	JUNE
3	Significance of Biopiracy	1	ABJ	JULY
4	Intellectual Property Rights	1	ABJ	JULY
5	Traditional Knowledge	1	ABJ	JULY
6	Doubt clearing class	1	ABJ	JULY
7	Doubt clearing class	1	ABJ	JULY
8	Quiz	1	ABJ	JULY
	TOTAL	**8 HRS**		

…….