DEPARTMENT OF BOTANY

TEACHING PLAN

SEMESTER I

FOR 4 YEARS MAJORAND 3 YEARS MDC

(CCF)

ACADEMIC SESSION 2023-2024

TEACHERS:

MM- DR. MRIGANKA MANDAL

RP- RIMLI PAUL

DS- DR. DIPU SAMANTA

(SEC) MUSHROOM CULTIVATION TECHNOLOGY (THEORY) BOT-H-SEC-1-Th & BOT-MD-SEC-1-Th

TOPIC	TOPIC SUBTOPIC		TEACHER	TEACHING
		HOUR		METHODS
	Introduction, History of	3	MM	CLASS LECTURE,
	mushroom cultivation,Current			POWER POINT
	overview of mushroom			PRESENTATION,
MUSHROOM	production in the world,			DISCUSSION
CULTIVATION	Mushroom biology-classification			DISCUSSION
TECHNOLOGY	of mushrooms, edible			
	mushrooms in India, poisonous			
	mushrooms, mushroom			
	poisoning.			
	Infrastructure-structural design	5	MM	CLASS LECTURE,
	and layout of mushroom farm,			POWER POINT
	substrates (locally available).			PRESENTATION,
	Appliances- weighing balance.			INTERACTIVE
	autoclave, laminar air flow.			DISCUSSION
	incubator hot air oven, spirit			
	lamp, bunsen burner, pH meter,			
	laboratory heater low-cost			
	stoves water bath humidifier			
	water spraver vessels			
	inoculation book and inoculation			
	racks tray polythone bags			
	Mothods of starilization			
	of outivation strategies			CLASS LECTURE.
	of cultivation strategies,	6	MM	POWER POINT
	composting technology in			PRESENTATION,
	mushroom production,			INTERACTIVE
	mushroom bed preparation,			DISCUSSION
	culture media, pure culture,			
	maintenance and preservation of			
	pure culture, Production of			
	spawn- cultivation of oyster			

mushroom, paddy-straw mushroom, milky mushroom and white button mushroom, Cultivation of medicinal mushroom (<i>Cordyceps</i> and <i>Ganoderma</i>).			CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE DISCUSSION
Mushroom diseases and management strategies, Post- harvest technology-short-term storage (Refrigeration- up to 24 hours), long-term storage (canning, pickles, papads etc.), drying, storage in salt solutions, Food preparations from mushrooms.	2	MM	
Uses of spent mushroom substrate, Strain improvements in cultivated mushroom; Nutritional and medicinal value of edible mushrooms, Research centres- National level and regional level, Cost-benefit ratio, Mushroom based Industry, Mushroom market in India and abroad	3	ММ	CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE DISCUSSION

MUSHROOM CULTIVATION TECHNOLOGY (PRACTICAL) BOT-H-SEC-1-P& BOT-MD-SEC-1-P

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING	
		HOUR		METHODS	
	Macro and microscopic		MM		
MUSHROOM	identification of some common				
CULTIVATION	edible mushrooms (Agaricus,			DEMONSTRATION,	
TECHNOLOGY	Pleurotus)			WORK OUT	
	Media preparation		MM		
	Fungal tissue culture		MM		
Sub-culturing for maintenance of			MM		
	culture				
Spawn production			MM		
	Cultivation of Pleurotus/Calocybe		MM		

IDC for Honours and MDC

(IDC) PLANTS AROUND US (THEORY)

TODIC	SUDTODIC	CLARG	TEACHED	TEACHING
TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING
		HOUR		METHODS
Introduction	Introduction to plant groups: Algae,	3		
	Bryophytes, Pteridophytes,			
	Gymnosperms, Angiosperms (Monocot			
	and Dicot); Fungi -general characters;			
	Contributions of The ophrastus, Charak,		MM	
	Sushruta, Linnaeus, Mendel and J.C.		(FOR	
	Bose		HONOURS)	
Plant body	Plant cell and tissue; Morphology of	6		LECTURE.
	root, stem, leaf, flower, fruit and seed		&	POWER POINT
Plants and	Phytodiversity and conservation;	3		PRESENTATION,
ecosystem	Biodiversity hotspots of India; Forest		RP	INTERACTIVE
	types in India; Plant-based adaptations		(FOR MDC)	DISCUSSION
	to climate change; Concept of 'Carbon			
	footprint'- role of plants in reducing			
	carbon footprint.			
Plants and	Plants in day-to-day life (brief general	4		
society	information including uses)			
Plants and	Important medicinal plants and their	3		
human	uses			
health				

(IDC) PLANTS AROUND US (PRACTICAL)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHODS
Identification	Microscopic study - Nostoc,			
	Oedogonium (with oogoniu			
	m), Rhizopus, Penicillium	4	MM	
	(sporangiophore).		(FOR	
	Macroscopic study - Agaricus		HONOURS)	DEMONSTRATION.
	(fruit body), Marchantia with			INTERACTION,
	gemma cup, antheridiophore/		&	WORK OUT
	archaegoniophore, Moss			
	sporophyte, <i>Pteris</i> (fertile		RP	
	leaf/pinna), Pinus - male and		(FOR MDC)	
	female cone. Fruits of tomato,			
	peas, cucumber, citrus, apple			
	& banana.			
Work out of	Floral parts of Hibiscus rosa-	6		
flower	sinensis,			
	Clitoriaternatea&Daturametel.			

DSC/CORE PLANT DIVERSITY (THEORY) (BOT-H-CC1-1-Th)

&

CORE PLANT DIVERSITY (THEORY) BOT-MD-CC1-1-Th

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING
	Origin of life and evolution of	HOUK		METHODS
KINGDOM	Importance of plants as source			
KINGDOW	of food fuel and their role in		DS	
	or rood, ruer and their role in	2		CLASS
	sink sequestoring etc.)			LECTURE,
	Salient features of			PRESENTATION
ALGAE	Salient leatures of			INTERACTIVE
				DISCUSSION
	Charophyceae, Phaeophyceae,			
			DS	
	Bacillariophyceae			
	Criteria and system of			
	classification (Fritsch, 1935)	3		
	Economic importance of algae	5		
	in environment, agriculture,			
	biotechnology and industry			
FUNG	Salient features of Myxomycota			-
	Mastigomycotina	5		CLASS
	Zvgomycotina Ascomycotina		DS	LECTURE,
	Basidiomycotina			POWER POINT
	Deuteromycotina			INTERACTIVE
	System of classification up to			DISCUSSION
	Sub-division (Ainsworth 1973)			
	Economic importance of fungi			
	(food, medicine and agriculture)			
	Fungal symbioses: Mycorrhiza			
	Lichen and their importance			
BRYOPHVTFS	Saljent features of			4
BRIGHTIES	Henaticonsida			
	Anthocerotonsida and		DS	CLASS
	Bryonsida	4		LECTURE,
	System of classification up to			POWER POINT PRESENTATION
	Class (Proskauer 1957)			INTERACTIVE
	Amphihian nature of			DISCUSSION
	hrvonhutes			
	Economic and ecological			
	importance			
1	in portanec	1	1	1

PTERIDOPHYTES	Salient features of Psilophyta, Lycophyta, Sphenophyta and Filicophyta System of classification up to Division (Gifford & Foster 1989) Economic importance (food,	4	DS	CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE DISCUSSION
	medicine & agriculture)			
GYMNOSPERMS	Salient features of Cycadophyta, Coniferophyta and Gnetophyta Outline classification up to Division: Progymnospermophyta to Gnetophyta (Gifford & Foster 1989) Economic importance (wood, resin, essential oil & drugs)	3	DS	CLASS LECTURE, POWER POINT PRESENTATION
ANGIOSPERMS	Types and morphology of leaf, stem and root Inflorescence types with examples Flower: Different parts and forms of calyx, corolla, androecium and gynoecium; aestivation and placentation Types with examples-fruits and seeds	7	DS	INTERACTIVE DISCUSSION

PLANT DIVERSITY (PRACTICAL) BOT-H-CC1-1-P& BOT-MD-CC1-1-P

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING
		HOUR		METHODS
Flower-	a) Different parts,	4	DS	
dissection,	b) Adhesion and cohesion,			
drawing and	c) Placentation,			
study	d) Aestivation			
Study of ovules	Types	1	DS	
Fruits	Different types	2	DS	DEMONSTRATION,
Inflorescence	Types	3	DS	INTERACTION,
Identification	Algae (Nostoc, Oedogonium and	2	DS	WORK OUT, FIELD
	Ectocarpus), Fungi (Rhizopus,			V1511
	Ascobolus and Agaricus),			
	Bryophytes (Marchantia,			
	Anthoceros and Funaria),			
	Pteridophytes (Selaginella,			
	Equisetum and Pteris),			
	Gymnosperms (male cone and			
	female cone/ megasporophyll of			
	Cycas, Pinus and Gnetum)			
Field study	Comprehensive idea about	4	DS, MM	
	different types of inflorescence,			
	flowers and fruits			

TEACHING PLAN FOR HONOURSAND GENERAL COURSE

(UNDER SYSTEM)

SEMESTER- III HONOURS

TEACHERS:

MM- DR. MRIGANKA MANDAL DS- DR. DIPU SAMANTA RP- RIMLI PAUL

CC-5 (THEORETICAL) PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-TH)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
PALAEOBOTANY	PALAEOBOTANY	8	MM	CLASS LECTURE, POWER POINT
AND		4		PRESENTATION, INTERACTIVE DISCUSSION
PALYNOLOGY	PALYNOLOGY			

CC-5 (PRACTICAL) PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-P)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
PALAEOBOTANY AND	PALAEOBOTANY	4	MM	DEMONSTRATION, INTERACTION,
PALYNOLOGY		4		WORK OUT
	PALYNOLOGY			

CC 6 (THEORETICAL) REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-TH)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	MORPHOLOGY	8	DS	CLASS LECTURE, POWER POINT
REPRODUCTIVE	OF			PRESENTATION, INTERACTIVE
BIOLOGY OF	ANGIOSPERMS			DISCUSSION
ANGIOSPERMS	EMBRYOLOGY	4]	

CC- 6 (PRACTICAL) REPRODUCTIVE BIOLOGY OF ANGIOSPERMS (BOT-A-CC-3-6-P)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHODS
REPRODUCTIVE BIOLOGY OF	Inflorescence types	2		DEMONSTRATION, INTERACTION, WORK OUT, FIELD VISIT
ANGIOSPERMS	Flowers	2	DS	
	Fruits-	2		
	Study of	2		
	ovules			

CC - 7 (THEORETICAL) PLANT SYSTEMATICS (BOT-A-CC-3-7-TH)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHODS
	Introduction	2		
	Nomenclature	2		
TAXONOMY OF	Systems of classification	2		CLASS LECTURE
ANGIOSPERMS	Phenetics and Cladistics	2	RP	POWER POINT
	Data sources in Taxonomy	2		PRESENTATION, INTERACTIVE
	Diagnostic features,	6		
	Systematic position			DISCUSSION
	(Bentham & Hooker and			
Cronquist), Economical				
important plants (parts				
	used and uses) of different			
	families			

CC7 (PRACTICAL) PLANT SYSTEMATICS (BOT-A-CC-3-7-P)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHODS
ANGIOSPERMS	Workout on Angiosperms	12	RP	DEMONSTRATION, INTERACTION, WORK OUT, FIELD VISIT
	Spot Identification	2		

SKILL ENHANCEMENT COURSE- ELECTIVE (SEC) SEC-A BIOFERTILIZERS (BOT-A-SEC-A-3-2) (THEORETICAL)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	GENERAL ACCOUNT	2		
	ABOUT THE			
BIOFERTILIZERS	MICROBES USED AS			CLASS LECTURE, POWER
	BIOFERTILIZERS,			POINT PRESENTATION,
	RHIZOBIUM		MM	INTERACTIVE DISCUSSION
	AZOSPIRILLUM	2		
	AZOTOBACTER	2		
	CYANOBACTERIA	2		
	(BLUE GREEN			
	ALGAE)			
	MYCORRHIZAL	2		
	ASSOCIATION			
	ORGANIC FARMING	2		

SEMESTER- III GENERAL

GE-3/CC-3 CELL BIOLOGY, GENETICS AND MICROBIOLOGY (BOT-G-CC-3-3-TH) THEORETICAL

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	CELL BIOLOGY	4	MM	CLASS LECTURE, POWER POINT
	GENETICS	6		PRESENTATION, INTERACTIVE
CELL BIOLOGY,				DISCUSSION
GENETICS AND	MICROBIOLOGY	4	DS	CLASS LECTURE, POWER POINT
MICROBIOLOGY				PRESENTATION, INTERACTIVE
				DISCUSSION

GE-3/CC-3 PRACTICAL- CELL BIOLOGY, GENETICS AND MICROBIOLOGY

(BOT-G-CC-3-3-P)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
PRACTICAL-	CELL BIOLOGY,	6	MM	DEMONSTRATION,
CELL BIOLOGY,	GENETICS			INTERACTION, WORK OUT
GENETICS AND	MICROBIOLOGY	4	DS	DEMONSTRATION,
MICROBIOLOGY				INTERACTION, WORK OUT

SEC-A BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	Biofertilizers	2		CLASS LECTURE, POWER POINT
	Azospirillum	2	חח	PRESENTATION, INTERACTIVE DISCUSSION,
BIOFERTII IZERS	Cyanobacteria	2	KP	GOOGLE CLASSROOM
DIOPERTILIZERS	Mycorrhizal	2		
	association			
	Organic	2		
	farming			

TEACHERS:

MM- DR. MRIGANKA MANDAL DS- DR. DIPU SAMANTA RP- RIMLI PAUL BM- DR. BISWAJIT MUKHERJEE

CC-11 (THEORETICAL)

CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-TH)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	CELL	8	RP	CLASS LECTURE, POWER POINT
	BIOLOGY			PRESENTATION, INTERACTIVE
CELL AND				DISCUSSION
MOLECULAR	MOLECULAR	6	RP	CLASS LECTURE, POWER POINT
BIOLOGY	BIOLOGY			PRESENTATION, INTERACTIVE
				DISCUSSION

CC-11 (PRACTICAL) CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-P)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
CELL AND	Work out	10		DEMONSTRATION, INTERACTION,
MOLECULAR	Identification	2	RP	WORK OUT
BIOLOGY	Preparation	2		
	of			
	models/charts			

CC-12 (THEORETICAL) BIOCHEMISTRY (BOT-A-CC-5-12-TH)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHOD
BIOCHEMISTRY	Biochemical Foundations	2		CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE
	Molecules of life	2	BM	DISCUSSION
	Energy flow and enzymology	3		
	Cell membrane	2		
	Phosphorylation	2		

CC-12 (PRACTICAL) BIOCHEMISTRY (BOT-A-CC-5-12-P)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	Biochemistry-	8		DEMONSTRATION, INTERACTION,
BIOCHEMISTRY	qualitative		DS	WORK OUT
	Biochemistry-	12		
	quantitative			

DISCIPLINE SPECIFIC ELECTIVE COURSES

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING
		HOUR		METHODS
	Scope of microbes in	2		
	industry and environment			CLASS LECTURE, POWER POINT
INDUSTRIAL AND	Bioreactors/ Fermenters and	2		PRESENTATION,
ENVIRONMENTAL	fermentation process			INTERACTIVE
MICROBIOLOGY	Microbial production of	2	חח	DISCUSSION
	industrial products		KP	
	Microbial enzymes of	2		
	industrial interest and			
	enzyme immobilization			
	Microbes and quality of	3		
	environment			
	Microbial flora of water	2		
		2	-	
	Microbes in agriculture and	3		
	remediation of			
	contaminated soils			

DSE-A INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY (BOT-A-DSE-A-5-2-TH) THEORETICAL

DSE-A INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY (BOT-A-DSE-A-5-2-P) (PRACTICAL)

TOPIC	SUBTOPIC	CLASS HOUR	TEACHER	TEACHING METHODS
INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY	Principals and functioning of instruments in microbiology laboratory Hands on sterilization techniques and	2 2 2		METHODS
	preparation of culture media		RP	DEMONSTRATION, INTERACTION
	Preparation of slant, stab and pouring petriplate	4		WORK OUT, FIELD VISIT
	A visit to any educational institute/ industry to see an industrial fermenter, and other downstream	4		
	processing operations			

DSE-B PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-TH) (THEORETICAL)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
	PLANT TISSUE	1		
	CULTURE –			
	INTRODUCTION			CLASS LECTURE, POWER
PLANT	CALLUS CULTURE	2	BM	POINT PRESENTATION,
BIOTECHNOLOGY	PLANT	2		INTERACTIVE
	REGENERATION			DISCUSSION
	HAPLOID CULTURE	2		
	PROTOPLAST	2		
	CULTURE			
	PLANT GENETIC	2		
	ENGINEERING			

DSE-B PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-P) (PRACTICAL)

TOPIC	SUBTOPIC	CLASS TEACHER		TEACHING METHODS	
		HOUR			
	Familiarization of	2			
	basic equipments in				
PL ANT	plant tissue culture			DEMONSTRATION, INTERACTION, WORK OUT	
BIOTECHNOLOGY	Study through	4	ММ		
	photographs/ charts/				
	models of anther				
	culture, somatic				
	embyogenesis,				
	endosperm and				
	embryo culture,				
	micropropagation				
	Preparation of basal	4			
	media. Sterilization				
	techniques				
	Visit in a plant tissue		MM, DS		
culture lab					

SEMESTER V GENERAL

DSE A PHYTOCHEMISTRY AND MEDICINAL BOTANY

(BOT-G-DSE-A-5-1-TH) THEORETICAL

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
PHYTOCHEMISTRY AND MEDICINAL BOTANY	Medicinal botany	2		CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE
	Phramacognosy	2		
	Organoleptic	2		
	evaluation of crude		ММ	DISCUSSION
	drugs			
	Pharmcologically	1		
	active constituents			
	Ethnobotany and folk	2		
	medicine			

DSE-A PRACTICAL- PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-P)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS
		HOUR		
PHYTOCHEMISTRY AND MEDICINAL BOTANY	Preparations of	2		
	solution and buffers			
	Acquaintance with	3		
	laboratory			
	instruments			
	Qualitative test for	4		
	proteins and		DS	DEMONSTRATION,
	carbohydrates			INTERACTION, WORK
	Tests (chemical) for	2		OUT, FIELD VISIT
	tannin and alkaloid			
	Identification of	1		
	medicinal plants			

SEC-A BIOFERTILIZERS (BOT-G-SEC-A-3/5-2)

TOPIC	SUBTOPIC	CLASS	TEACHER	TEACHING METHODS	
		HOUR			
BIOFERTILIZERS	Biofertilizers	2			
	Azospirillum	2	RP	CLASS LECTURE, POWER POINT PRESENTATION, INTERACTIVE DISCUSSION	
	Cyanobacteria	2			
	Mycorrhizal	2			
	association				
	Organic	2			
	farming				