



University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program: B. Sc

Semester: 3RD

Name of the Course: Biofertilizer

Course Code: BSB-306

Name of the Faculty: Dr. Milu Rani Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit I:	HOURS: 06 TOPICS: Introduction , Benefit and limitation of biofertilizer, Role of microorganism in improving soil health, Mode of action of bio fertilizer, Benefit over chemical fertilizers, application: Seed treatment; Root dipping, Soil application	06	06 and 08 OCT,2021 13 and 20 OCT,2021 22, 27,29 OCT,2021 03 NOV, 2021	CLASS ROOM DISCUSSION AND PPT		

					Test 1 17.11.21	
Unit II	HOURS: 6 TOPICS: Types of biofertilizer : Rhizobium, Azotobacter, Azospirillum, Cynobacter, Azolla, Phosphate solubilising micro organism(PSM), PGPR. Mass production of bio fertilizer, Constrains in bio fertilizer technology, Carrier materials, Criteria of a good carrier, Storage of biofertilizer	06	10AND 12 NOV 2021 17AND 19 NOV, 2021, 24 AND 26 DEC ,2021	CLASSROOM DISCUSSION , PPT	Test 2	
Unit III	Hours 6 Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	06	02 DEC 3,8 DEC,2021		Test 3 8 th Dec,2021	
Unit IV	Hours 6 Organic farming – Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, method of vermicomposting – field Application	06	10,15 DEC,2021 17, 22 DEC,2021 29 DEC,21		Test 4 Dec29,21	

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay _Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New _Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic _Farming Akta Prakashan, Nadiad

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program :B. Sc

Semester: 5th

Name of the Paper: Stress Physiology

Course Code: BSB-503

Name of the Faculty: Dr. Milu Rani Das

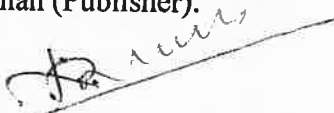
Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit 3 and 4:	Hours: 15 TOPIC: Unit 3: Developmental and physiological mechanisms that protect plants against environmental stress.	15	6 TH OCT 13,20 OCT	CLASS ROOM DISCUSSION AND PPT	Test-I	
	Adaptation in plants; Changes in root: shoot ratio;		27 OCT		11 NOV	

	Aerenchyna development; osmotic adjustment; Compatible solute production. Unit 4: Hours: 9 Reactive oxygen species: Production and scavenging mechanisms		3,10 NOV 17 NOV 1,8.15,22.2 9 DEC.		TEST 2 18 NOV	
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Suggested books:

1. Plant Physiology (1985).-Frank B.Salisbary and Cleon W.Rose.Wadsworth Pub. Co., 1985
2. Outline of Biochemistry (2009) - Eric.E.Conn, Paul K. Stumpf. 5th ed,John Wiley & Sons.
3. Lehninger Principle of Biochemistry (2004) - MichealM.Cox and David L. Nelson.4th Edition, W.H., Freeman and Company, New York, USA.
4. Biochemistry (2011) - U.Satyanarayana and U.Chakrapani. Book and Allied (P)Limited.
5. Biochemistry (2011) - Jeremy M. Berg, John L. Tymoczko,LubertStryer. W. H. Freeman (Publisher).


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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program : M. Sc

Semester: 3rd

Name of the Course : Biofertilizer and organic farming

Course Code: MSB-306

Name of the Faculty: Dr.Milu Rani Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit I:	Unit I Hour: 12 Bio fertilizer: Introduction , Concept, Production, Advantages ,Disadvantages, Benefit over chemical fertilizers, Types and their application : Rhizobium, Azotobacter, Azospirillum, Cynobacter, Azolla, Phosphate solubilising micro organism(PSM), AM fungi, Silicate solubilising bacteria (SSB), Plant growth promoting bacteria (PGPR).	01	7 TH OCT	CLASS ROOM DISCUSSION AND PPT	Test-I 8 TH NOV	
		03	09,14,21 OCT			
		03	27 OCT			
		02	23,28 OCT		TEST 2 29 TH NOV	

		03	30 OCT, 4,6 NOV			
Unit 2	Unit II Hour: 12 Mode of action of bio fertilizer, Liquid bio fertilizers: Characteristic, benefits, application, methodology of application: Seed treatment; Root dipping, Soil application, Doses of liquid bio fertilizer in different crops, Mass production of bio fertilizer, Constrains in bio fertilizer technology, Cost and availability of bio fertilizer, Economic.	01 03 03 2 HR REMEDIAL CLASS 1HR TEST 2(DEC 4 TH , 2021)	11 NOV 13,18,20 NOV 25,27 NOV, 2 DEC		TEST 2 DEC 4	

Suggested Books:

Suggested Books:

1. Agrios, G.N.; Plant Pathology 5/e 2005, 1997, 1988, 1978 First print in India 2006, Elsevier Inc. Reprint 2008.
2. Alexopoulos and W. Mims. John Wiley & Sons Inc. New York

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	stainability of Social Enterprise					
	Profit & non-profit entrepreneurs, Funding	3		PPT; Assignment		
	Corporate Social Responsibility, Importance of CSR, Key Issues in CSR, Role of NGO's & civil societies in CSR.	5		PPT; Lecture: Discussion		
4	HRM, Concepts ,Objectives, Policies and Scope	4	6 th Jan 2021- 25 th Jan 2021	PPT; Lecture		
	Job Design and analysis	2		PPT; Leture		
	Job Evaluation	2		PPT; Lecture		
	OB and Organisational Culture & Climate.	2		PPT; Lecture		
	Concept of Leadership	2		PPT; Lecture; Discussuin		
	Motivation and Work Performance	3		Lecture; Discussion		


Suggested Books:

1. PRIA . (2001). Historical Background of Non-profit Sector in India. New Delhi: PRIA

2. Dadarwala, N.H. (2005). Good Governance and Effective Boards for Voluntary/Non- profit Organisations. New Delhi: CAP

3. Allison, M. & Kaye, J. (2005). Strategic planning for Non-profit Organisations: A Practical guide and workbook. John Wiley & Sons.


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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program : B. Sc

Semester: 5th

Name of the Course: Economic Botany

Course Code: BSB-502

Name of the Faculty: Dr. Chayanika Bordoloi

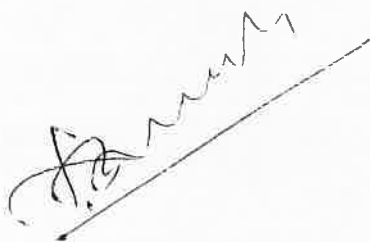
Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit I:	Hours: 12					
	TOPICS:					
	1. INTRODUCTION Plants for man.	01	7 TH OCT	CLASS ROOM DISCUSSION AND PPT	Test-I 8 TH NOV	
	2. Classification of Plants on botanical resources,	03	09,14,21 OCT			
	3. History, Origin of Cultivated Plants.	03	27 OCT			
	4. Concept of centers of origin.	02	23,28 OCT		TEST 2 29 TH NOV	
	5. Plant introduction; Crop domestication	03	30 OCT, 4,6 NOV			

Unit IV	Hours: 10					
	1. Ornamental plants.	01	11 NOV		TEST 2	
	2. Plants used as avenue trees for shade,	03	13,18,20 NOV		DEC 4	
	3. Pollution control and esthetics.	03	25,27 NOV, 2 DEC			
		2 HR REMEDIAL CLASS				
		1HR TEST 2(DEC 4 TH , 2021)				

Suggested Books:

1. Economic Botany , Pooja
2. Economic Botany, N.K.Patel
3. Studies in Botany-(2005)- S.K. Guna and S.K. Chowdhary, Moulik Library Vol-I Economic Botany, Albert F. Hill
4. Economic Botany , B. P. Pandey, S. Chand, 2014, 7th Ed.




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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program: B. Sc

Semester: 3RD

Name of the Course: Angiosperm Taxonomy (Theory)

Course Code: BSB-301

Name of the Faculty: Dr. Chayanika Bordoloi

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit II:	HOURS: 14 TOPICS: 1. Aims and objective of Plant Taxonomy. 2. Basic component of Taxonomy. Binomial nomenclature. 3. Different systems of classification. Artificial, natural, phylogeny. Phenetic, Cladistic,	02 02 04	06 and 08 OCT, 2021 13 and 20 OCT, 2021 22, 27, 29 OCT, 2021 03 NOV, 2021	CLASS ROOM DISCUSSION AND PPT		

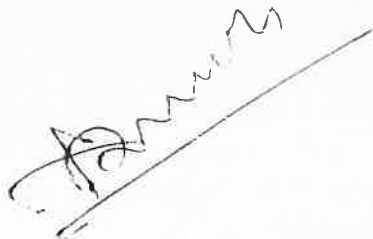
Dr. Chayanika Bordoloi

					Test 1 17.11.21	
	4. Linnaeus and Bentham and Hooker's system.	02	10AND 12 NOV 2021			
	5. H. John Hutchinson's phylogenetic system.	02	17AND 19 NOV, 2021.			
		02 REVISION	24 AND 26 DEC ,2021			
Unit IV	HOURS: 10 TOPICS: 1. Monocotyledones: Study of families 2. Poaceae, 3. Zingiberaceae, 4. Liliaceae, 5. Orchidaceae.	01 02 02 02 01	02 DEC 3,8 DEC,2021 10,15 DEC,2021 17, 22 DEC,2021 29 DEC,21	CLASSROOM DISCUSSION, PPT	Test 2 16 Dec,2021	

Suggested books:

1. Taxonomy of Botany , Angiosperm, B.P. Pandey, S. Cand, (2012)
2. Taxonomy of Angiosperm, B.P. Pandey, S. Cand, (2012)
3. Taxonomy of Angioperm, 2nd Ed.(2012), Rastogi publ, V. Singh
4. Embryology of Angiosperm by S.S Bhojwani and S. P. Batnagar, Vikash Publ. (1992)
5. Modern Plant Taxonomy, N. S. Subrahmanyam, Vikas Publishing House Pvt. Ltd., 2nd Ed. 2001.
6. Degree Botany , Part -II,2009 By Bhabananda Barua, Kalayni Publishers, 2009

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(ODD Semester)

Program: B. Sc

Semester: 5th

Name of the Course: Pharmacognosy

Course Code: BSB-501

Name of the Faculty: Dr. Chayanika Bordoloi


Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit I:	Hours: 12 TOPIC: 1. Introduction to Pharmacognosy, Ayurvedic Pharmacy. 2. History, definition and Scope of Pharmacognosy, 3. Traditional and alternative systems of medicine. 4. Classification of crude drugs. 5. Introduction, Tridosha concept, Humoral, Indigenous Systems of medicine, Ayurvedic principles, Ayurvedic formulations, Nutraceuticals & Cosmeuticals.	01 02 01 02 06	6 TH OCT 13,20 OCT 27 OCT 3,10 NOV 17 NOV 1,8,15,22,29 DEC.	CLASS ROOM DISCUSSION AND PPT	Test-I 11 NOV TEST 2 18 NOV	

Suggested Books:

1. A Pharmacognosy and Pharmaco-biotechnology. New Age international (P) Limited, Publishers (formerly wileyEastern Limited)
2. Kokate C.K. Practical Pharmacognosy, Vallabh prakashan, New Delhi,
3. Kokate C.K. Purohit A.P. and Gokhale S.B. Pharmacognosy, NiraliPrakashan pune
4. Trease G.E. and Evans. W.C. Pharmacognosy ELBS Twelfth Edition Tyler V.E Brady L,R and Robbers J.E. Pharmacognosy Lea and Febiger. Philadelphia. 8th edition KM Varghese and Co. Mumbai,
5. Vaidya S.S. and Dole. V.A. Bhaishyajakalpana, Anmol Prakashan, pune
6. Wallis, T.E. Test books of pharmacognosy CBS publishers and distributors New Delhi (Latest Edition)
7. Ashalota Razarioetal. A Hand Book of Ethno biology Kalyani Publishes 1999
8. Sinha R.R. & Sinha starlit 2005 Ethnobiology, Surabhi

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2021-22(Odd Semester)

Program: U.G.

Semester: Fifth

Name of the Course: Stress Biology

Course Code: BSB-503

Name of the Faculty: Dr. Bedabati Chowdhury

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
I	Defining plant stress Acclimation and adaptation.	5	4 th Oct-25 th Oct		Test-I Unit I and Part of Unit II	
II	Water stress;	6	27 th Oct- 17 th Nov			
II	Salinity stress,	3	22 nd Nov-29 th Nov		Test-II Unit II	
II	High light stress;	2	1 st and 6 th Dec			
II	Temperature stress;	2	8 th and 13 th Dec			
II	Hypersensitive reaction;	2	15 th and 20 th Dec		Test-III Unit II	
II	Pathogenesis-related (PR) proteins; Systemic acquired resistance;	2	22 nd and 29 th Dec			
II	Mediation of insect and disease resistance by jasmonates.	2	3 rd and 5 th Jan, 2022			

Suggested Books:

1. Plant Physiology (1985).-Frank B.Salisbary and Cleon W.Rose.Wadsworth Pub. Co., 1985

2. Outline of Biochemistry (2009) - Eric.F.Conn, Paul K. Stumpf. 5th ed, John Wiley & Sons.
3. Lehninger Principle of Biochemistry (2004) - MichealM.Cox and David L. Nelson. 4th Edition, W.H., Freeman and Company, New York, USA.
4. Biochemistry (2011) - U.Satyanarayana and U.Chakrapani. Book and Allied (P)Limited.
5. Biochemistry (2011) - Jeremy M. Berg, John L. Tymoczko, Lubert Stryer. W. H. Freeman (Publisher).

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2021-22(odd Semester)

ProgramP.G.

Semester:...Third

Name of the Course **Biophysical instrumentation, Biotechnology and Developmental Botany**
Course Code:... MSB-302

Name of the Faculty:.....Dr. Bedabati Chowdhury

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Unit Allotted for Sessional Test	Remarks
I	Basic principles and applications of pH meter;	2	29 th Oct to 5 th Nov	Test-I Unit-1 (Phmeter, spectrophotometer)	
I	UV-visible spectrophotometers;	2	13 th and 17 th Nov	Test-II Unit I (Centrifuge, electrophoresis, ELISA)	
I	Centrifuges (Table top centrifuge)	1	20 th Nov		
I	Ultra centrifuge)	1	24 th Nov		
I	Gel Electrophoresis: SDS PAGE;	2	27 th Nov and 1 st Dec		
1	Immunoassay systems, ELISA;	1	4 th Dec		
1	X-ray crystallography;	2	8 th and 11 th Dec	Test-III	
1	Chromatography: Principles and applications; Paper chromatography, Thin layer chromatography (TLC), Column chromatography;	3	15 th , 18 th and 29 th Dec	(X-ray crystallography, Chromatography)	

high performance liquid chromatography (HPLC).				
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Suggested Books:

1. Bajpai PK (2012) Biological Instrumentation & methodology (Tools and Techniques of Biology), S Chand & Company Pvt Ltd, Ram Nagar, New Delhi-110055
2. Narayanan P (2008) Essential of biophysics, New Age International Publishers, New Delhi.
3. Lieber DC (2006) Introduction to Proteomics: Tools for New Biology; Humana Press, NJ.
4. Sambrook J and Russell DW (2001). Molecular Cloning – A Laboratory Manual, Vols I – III, Cold Spring Harbor Laboratory, USA.

Redabati Choudhury

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21(Even Semester)

Program: MSc Botany

Semester: IIIrd semester

Name of the Paper: Plant Ecology

Course Code: MSB-303

Name of the Faculty: Dr. Mautushi Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Introduction to ecology	1	18/10/21		Test-I	
	Nature of ecosystem	3	20/10/21, 25/10/21, 27/10/21		UNIT 1	
	Food chains in Ecosystems, Food webs	2	1/11/21,3/11/21			
	Ecological pyramids	2	8/11/21,10/11/21			
	Energy flow	2	15/11/21, 17/11/21			
	Biogeochemical Cycles (global) of C, N, P and S	4	22/11/21,24/11/21,2/12/21, 6/12/21			
	The biosphere	1	8/12/21			
	Biomes and impact of climate on biomes.	2	13/12/21, 15/12/21		Test-II	
2	Population size and density	1	20/12/21			
	Spatial distribution		22/12/21			
	Age structure		27/12/21			
	Natality,					

	Mortality, Biotic potential; life history		3/1/22, 5/1/21			
	strategies (r and k selection) Population dynamics		10/1/22			
	Competition and coexistence		12/1/22			
	Intra-specific interactions, interspecific interactions		17/1/22, 19/1/22			
	Mutualism and commensalism		24/1/22, 26/1/22			
	Prey-predator interactions		1/2/22			
	Scramble and contest competition		3/2/22			

Suggested Books:

1. Fundamentals of Ecology E.P Odum

2. Ecology SC Das

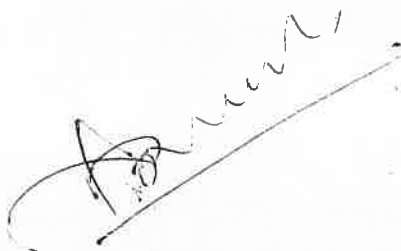
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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21 (Odd Semester)

Program: B.Sc.

Semester: 3rd semester

Name of the Course: Plant Pathology and Microbiology Course Code: BSB-302

Name of the Faculty: Dr. Dhritiman Chanda

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
3	History of Plant pathology	1	6/10/21		Test-I 26/11/21	
	Plant disease: symptoms of Plant Diseases viral, fungal and bacterial	3	19/10/21 22/10/21 29/10/21	Offline		
4	Plant diseases & their control measures	1	29/10/21	Offline	Test-II 10/12/21	
	a) Late blight disease of potato	1	6/11/21	Offline		
	b) White rust of Brassicaceae	1	10/11/21	Offline		
	c) Blast disease of rice	4	13/11/21 16/11/21 19/11/21 23/11/21	Offline		
	d) Rust diseases- -Black stem rust of wheat -Yellow rust of wheat -Rust of bean	1	3/12/21	Offline		
	e) Sugarcane disease : Red rot of sugarcane	1	14/12/21	Offline		
	f) Loose smut of wheat	1	17/12/21	Offline		
	g) Grey blight of tea	1	22/12/21	Offline		
	h) Citrus cancer i) TMV	1				

Suggested Books:

1. Plant Pathology by B.P. Pandey.
2. Introductions to Principles of Plant Pathology by R.S. Singh

Dhritiman Chanda

Dr. Dhritiman Chanda

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2020-21 (Odd Semester)

Program: M.Sc.

Semester: 3rd semester

Name of the Course: Plant Pathology and Microbiology

Course Code: MSB-301

Name of the Faculty: Dr. Dhritiman Chanda

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Introduction to plant pathology	1	18/10/21	Offline	Test-I 22/11/21	
	Classification of plant diseases (a) Major causal agents - biotic and abiotic, (b) General symptoms	3	20/10/21 25/10/21 27/10/21	Offline		
	Penetration and entry of pathogen into host tissue – mechanical, physiological and enzymatic.	2	1/11/21 3/11/21	Offline		
	Host-parasite interaction, enzymes and toxins in pathogenesis	1	8/11/21	Offline		
	Pre-existing structural and biochemical defense mechanisms	1	10/11/21	Offline		
	Structural and biochemical defense mechanisms	1	15/11/21	Offline		
	Plant disease management: exclusion, eradication and protection	1	17/11/21	Offline		
	Chemical and biological means of disease control.	1		Offline		
	Biotechnological approaches to disease resistance	1	24/11/21	Offline		
Unit -2	Cereals: Rice - blast disease, bacterial blight	1	29/11/21	Offline		

Vegetables: Chilly - leaf spot; Ladies finger - vein clearing disease	2	1/12/21 6/12/21	Offline	Test II 3/12/21	
Citrus - bacterial canker	1	13/12/21	Offline		
Ginger - rhizome rot; Pepper - quick wilt (spices)	1	15/12/21	Offline		
Oil seeds: Coconut - grey leaf spot, bud rot disease			Offline		
abnormal leaf fall, powdery mildew of Rubber	1	20/12/21	Offline		
Red rot of sugarcane	1	22/12/21	Offline		
Arecanut - nut fall disease			Offline		

Suggested Books:

1. Plant Pathology. J.C Walker, 1999 by The National Academy Press Washington.
2. Diseases of Crop Plants in India by G. Rangaswami & A. Mahadevan
3. Plant Pathology by B.P. Pandey.
4. Introduction to Principles of Plant Pathology
5. Plant Pathology by George N. Agrios
6. Introductions to Principles of Plant Pathology by R.S. Singh

Dhritiman Chanda

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Dr. Dhritiman Chanda

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University of Science & Technology Meghalaya

Department of BOTANY

Lesson Plan

Session: 2021(Odd Semester)

(Program: M.Sc

Semester 3RD

Name of the Course **Biophysical instrumentation, Biotechnology and Developmental Botany**
Course Code **MSB-302**

Name of the Faculty JYOTIMA NATH

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit 2	Introduction; History of Plant Tissue Culture and Biotechnology	1	22/10/21	PPT, LECTURES, NOTES	Test-I	
	Scope and Importance of Biotechnology	1	25/10/21	PPT, LECTURES, NOTES		
	Tissue and Cell Culture	1	29/10/21	PPT, LECTURES, NOTES		
	Micropropagation; Anther Culture;	1	1/11/21	PPT, LECTURES, NOTES		
	Somaclonal Variation	1	8/11/21	PPT, LECTURES, NOTES		
	Production of Secondary Metabolites	1	12/11/21	PPT, LECTURES, NOTES		
	Protoplasts Isolation and Fusion	1	15/11/21	PPT, LECTURES, NOTES		

	Somatic Hybrids	1	22/11/21	PPT, LECTURES, NOTES		
	Cryopreservation; Hydroponics	1	26/11/21	PPT, LECTURES, NOTES		
Unit 5	Male gametophyte: Pollen development, pollen tube growth and guidance; pollen storage	2	29/11/21-3/12/21	PPT, LECTURES, NOTES	Test-II	
	Female gametophyte; Types of embryo sacs; structure of embryo sac cells	2	6/12/21-10/12/21	PPT, LECTURES, NOTES		
	Pollination, pollen-pistil interaction and fertilization	1	13/12/21	PPT, LECTURES, NOTES		
	Seed development and fruit growth	1	17/12/21	PPT, LECTURES, NOTES		
	apomixis, polyembryony, somatic embryogenesis.	1	20/12/21	PPT, LECTURES, NOTES		

Suggested Books:

1. Thieman WJ & Palladino MA (2009) Introduction to Biotechnology, Second Edition Pearson.
2. Satyanarayana U (2010) Biotechnology, Books and allied (P) Ltd. Kolkata.
3. Singer M and Berg P (1991). Genes and Genomes: A Changing Perspective; University Science Books, CA, USA
4. Herman EB (2008) Media and Techniques for Growth, Regeneration and Storage 2005-2008. Agritech Publications, New York, USA.

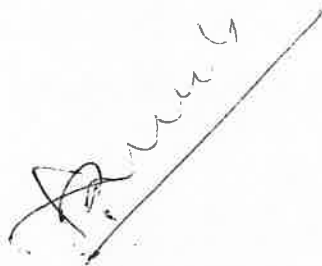
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Pyolma Nath

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University of Science & Technology Meghalaya

Department of BOTANY

Lesson Plan

Session: 2021(Odd Semester)

Program: BSC

Semester 5TH

Name of the Course: **Plant Breeding(Theory)** Course Code: **BSB-504**

Name of the Faculty: JYOTIMA NATH

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit 1	Definition and objectives of plant breeding.	1	27/09/21	PPT, LECTURES, NOTES	Test-I	
	Important national and international plant breeding institutes	1	29/09/21	PPT, LECTURES, NOTES		
	Principles involved in plant breeding.	7	22/10/21-15/11/21	PPT, LECTURES, NOTES		
Unit 4	Achievements with reference to the following crops in India: Green revolution with reference to Wheat, Rice and Cotton.	5	19/11/21-3/12/21	PPT, LECTURES, NOTES		

					Test-II	

Suggested Books:

1. Principles of Plant Breeding(1999) 2nd Ed. By, Allard R. W. , John Wiley and Sons.
2. Principles of Genetics (2009),Kalyani publication, New Delhi, B.D.Singh
3. Plant Breeding, Principles and Methods,(2000) Kalyani publication, B.D.Singh, New Delhi
4. Genetics, 2012, 6th Ed., International Students Version, Snustad P.D. & Michael & Simmons

Jyoti Naik

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University of Science & Technology Meghalaya

Department of BOTANY

Lesson Plan

Session: 2021(Odd Semester)

(Program ..B.SC.....

Semester:.....3RD.....

Name of the Course **Cytology, Genetics and Plant Breeding (Theory)** Course Code: **BSB-303**

Name of the Faculty: JYOTIMA NATH

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit II	Principles of inheritance- Mendel's laws of Inheritance	2	21/9/21-22/9/21	PPT, NOTES, LECTURES	Test-I	
	sex linked inheritance	1	25/9/21	PPT, NOTES, LECTURES		
	non mendelian inheritance,	2	27/09/21-28/09/21	PPT, NOTES, LECTURES		
	extra chromosomal inheritance.	1	4/10/21	PPT, NOTES, LECTURES		
Unit IV	Double helical structure of DNA	1	5/10/21	PPT, NOTES, LECTURES		
	A, B, Z DNA,	1	6/10/21	PPT, NOTES, LECTURES	Test-II	
	Transcription,	2	23/10/21-25/10/21	PPT, NOTES, LECTURES		
	Translation,	2	26/10/21-27/10/21	PPT, NOTES, LECTURES		
	DNA replication,	2	30/10/21-1/11/21	PPT, NOTES, LECTURES		
	concept of exons and introns	1	2/11/21	PPT, NOTES, LECTURES		

	DNA packaging.	2	3/11/21- 8/11/21	PPT, NOTES, LECTURES		

Suggested Books:

1. Molecular biology of the gene (2008). James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gam, Michel Levine, Richard Losick. 5th Edition, Pearson Education Inc and Dorling Kindersley Publishing.

2. Molecular biology of the cell (2008). Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. 5th Edition, Garland Science Publisher

3. Molecular cell biology (2008). H. Lodish, A. Berk, C A. Kaiser, M. Kreiger, M.P. Scott, A. Bretscher, A. Ploegh, P. Matsudira. 6th Edition, W. H. Freeman and Company, New York

4. MOLECULAR BIOLOGY, DR. P.S. VERMA, DR. V.K. AGARWAL

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

(Program): B.Sc.

Semester: 3rd

Name of the Course:: Diversity of Cryptogams

Course code: BSB-731

Name of the faculty: Dr. Pranita Hajong

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
3	Bryophytes-Morphology, structural organization, habit, reproduction and evolutionary significance.	5	15 th , 22 nd , 29 th October, 5 th , and 12 th November	PPT Presentation, Lecture and Discussion	Test-I	
					Unit 3	
					Test-II/Test III	
3	Type study: Marchantia, Anthoceros and Polytrichum	3	19 th , 26 th November and 3 rd December	PPT Presentation, Lecture and Discussion	Unit 3	

Suggested Books:

1. Botany for degree students Bryophyta by B.R. Vashishta, A.K. Sinha and Adarsh Kumar
2. An introduction to Embryophyta and Bryophyta. N.S. Pahrihar



UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

Program : B.Sc.

Semester: 5th

Name of the Course: Economic Botany

Course code: BSB-502

Name of the faculty: Dr. Pranita Hajong

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
3	A brief account of major spices, condiments, narcotics, mastigatories and funmitories, beverages	9	13 th , 20 th , 27 th October, 3 rd , 10 th , 17 th , 24 th November, 1 st , and 8 th December	PPT Presentation, Lecture and Discussion	Test-I	
					Unit 3	
					Test-II/ Test III	
3	Plants used in Sericulture (example of two plants)	2	15 th and 22 nd December	PPT Presentation, Lecture and Discussion	Unit 3	

Suggested Books:

1. Studies in Botany for degree students by D. Mitra, J. Guha, S.K.Chowdhuri
2. Economic Botany by S.L. Kochhar
3. Economic Botany by B.P. Pandey

Dr. P. Hajong

Pranita Hajong

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Pranita Hajong

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

Programme: M.Sc.

Semester: 3rd

Name of the Course: Plant Ecology Course code: MSB-303

Name of the faculty: Dr. Pranita Hajong

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
3	Concepts of community, Species Diversity and Pattern Diversity In Community	4	12 th , 15 th , 19 th and 22 nd October	PPT Presentation, Lecture and Discussion	Test-I	
3	Ecological succession, Trends of succession, Types and general process of succession.	4	26 th , 29 th October, 2 nd and 5 th November	PPT Presentation, Lecture and Discussion	Unit 3	
3	Concept of climax	1	9 th November	PPT Presentation, Lecture and Discussion		
3	Community evolution	1	12 th November	PPT Presentation, Lecture and		

				Discussion		
4	Environmental pollution: Origin of pollution, Types of pollutants	2	16 th , and 19 th November	PPT Presentation, Lecture and Discussion	Test-II	
					Unit 3 and 4	
4	Kinds of sources of air, soil and water pollution	3	23 th , 26 th and 30 th November	PPT Presentation, Lecture and Discussion		
					Test-III	
4	Parameters to assess the pollution level	2	3 rd , and 7 th December	PPT Presentation, Lecture and Discussion	Unit 4	
4	Effects of pollution on plants and ecosystems and pollution abatement	2	10 th , and 14 th December	PPT Presentation, Lecture and Discussion		

Suggested Books:

1. Concept of ecology. Kormondy
2. Fundamental of ecology E.P Odum
3. Plant ecology. R.S Shukla and P.S Chanda
4. Cunningham, W.P. and Saigo, B.W.1999. Environmental Science.WCB, McGraw Hill

Dr. P. Hajong

Pronita Hajong

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2021-22(Odd Semester)

Program : **M.Sc.**

Semester: **Third**

Name of the Course **Plant Pathology and Microbiology**

Course Code: **MSB-301.**

Name of the Faculty: **DR. SASHI PRAVA DEVI**

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
III	Introduction to microbiology	1	4 th Oct	Interaction , Lecture Classroom Discussion		
III	Scope of microbiology	1	8 th Oct	PPT Presentation, Lecture, Discussion,		
III	Microbiology in human welfare	1	11 th Oct	PPT Presentation Lecture, Question answer Method		
III	Bioterrorism.	1	22 th Oct	PPT Presentation Lecture, Discussion	Test-I Unit III	
III	Microbial diversity	2	29 th Oct to 12 th Nov	PPT Presentation Lecture		
III	Microbial taxonomy and phylogeny	3	19 th Nov to 3 rd Dec	PPT Presentation Lecture, Question answer Method		
III	Major groups and their characteristics (Five kingdom system and three domain system of classification).	3	10 th Dec to 24 th Dec	PPT Presentation Lecture and Discussion of Question and answers		

Suggested Books:

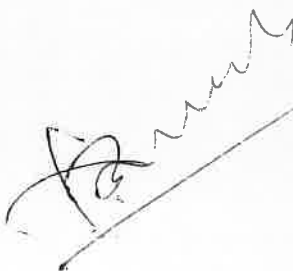
1. Microbiology by Lansing M Prescott, Donald A Klein, John P Harley, Mc Graw Hill 2004
2. Microbiology: Principles and Explorations by Jacquelyn Black 7e, John Wiley & Sons, inc., 2000 18
3. General Microbiology by Roger Y Stanier, John L Ingraham, Mark L Wheelis, 5th edition Tata, 1999 Mac Graw Hill.
4. Biology of microorganisms Madigan, Markinko, Dunlap, Clark 12th edition 2009, Pearson Benjamin Cumming.
5. Microbiology by Michael J Pelczar , Chan, Kreig 5th edition, 2006 Tata Mac Graw Hill
6. Microbiology by Tortore, Funke, Case (11th edition 2009, Pearson.

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University of Science & Technology Meghalaya

Department of Botany

Lesson Plan

Session: 2021-22(Odd Semester)

Program : **B.Sc.**

Semester: **Third**

Name of the Course **Mycology and Plant Pathology (Theory)**

~~Course~~
Paper Code: **BSB-302.**

Name of the Faculty: **DR. SASHI PRAVA DEVI**

Details Plan

Unit	Topic	Target ed No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
II	Introduction to Fungi, Morphology and reproduction of <i>Mucor</i>	2	5 th to 19 th Oct	Interaction , Lecture		
II	Morphology and reproduction of <i>Penicillium</i>	2	26 th Oct to 2 nd Nov	PPT Presentation, Lecture, Discussion,		
II	Morphology and reproduction of <i>Peziza</i>	1	9 th Nov	PPT Presentation Lecture, Question answer Method		
II	Morphology and reproduction of <i>Yeast</i>	1	16 th Nov	PPT Presentation Lecture, Discussion	Test-I Unit II	
II	Morphology and reproduction of <i>Agaricus</i>	1	23 rd Nov	PPT Presentation Lecture		
II	Morphology and reproduction of <i>Clavaria</i>	1	30 th Nov	PPT Presentation Lecture, Question answer Method		
II	Morphology and reproduction of <i>Helminthosporium</i>	1	7 th Dec	PPT Presentation Lecture		
II	Morphology and reproduction of <i>Fusarium</i>	1	14 th Dec	PPT Presentation Lecture, Discussion		

II	Morphology and reproduction of Alternaria	1	21 st Dec	PPT Presentation Lecture, Discussion		
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Suggested Books:

1. Botany for degree students. A.C Dutta, Oxford publication.
2. Studies in Botany-Vol-I. J. N. Mitra, D. Mitra and S.K.Chowdhuri, D. N. Moulik Publishing, Kolkata
3. Text book of fungi. O.P Sharma, Tata McGraw Hill Company, New Delhi.

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

Program e: B.Sc.

Semester: 5th

Name of the Course : Pharmacognosy Course' code: BSB-501

Name of the faculty: Dr.Nibedita Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
3	Study of drugs: occurrence, distribution, microscopic characters, constituents and uses of the following. Root Rhizome drugs: - Zinziber, Asparagus, Turmeric Stem drugs: - Ephedra Bark drugs: - Cinnamon, Cinchona Leaf drugs: - Aloe, Adhatoda, Basil, Andrographis, Brahmi	12	6 th , 9 th , 11 th , 20 th , 27 th , 28 th October, 3 rd , 10 th , 11 th , 12 th , 16, 17 th and 20 November	PPT Presentation, Lecture and Discussion	Test-I	
					3	
					Test-II 4	

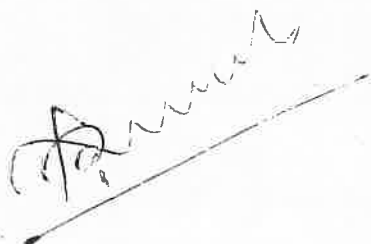
	Flower drugs: - Clove					
	Fruit drugs: - Coriandrum, Amla, Piper					
4	Introduction, Definition, concepts and relevance's, Branches of Ethno-botany, Methodology, importance of Ethnobotany in research and conservation, Ethnic Societies of North-East India and use of some plant by the tribes	5	22, 23, 25, 27, 30 th November	PPT Presentation , Lecture and Discussion	4	

Suggested Books:

1. Studies in Botany for degree students by A. C. Dutta
2. Economic Botany by S.L. Kochhar
3. Economic Botany by B.P. Pandey

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

Program : B.Sc.

Semester: 5th

Name of the Course: Angiosper taxonomy Course code: BSB-301

Name of the faculty: Dr.Nibcdita Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Field and Herbarium technique. General structure of typical leaf; types of leaf, leaf venation, inflorescence, flower, stamen, carpel, pollination and fertilization	6	5,9 th , 16 th , 19 th ,27, 30 th October	PPT Presentation, Lecture and Discussion	Test-I	
					1	
					Test-II	
3	Dicotyledones: Study of families- Ranunculaceae, Acanthaseae,	6	2, 6, 13, 16, 20 and 24rd November	PPT Presentation, Lecture and Discussion	3	

	Lamiaceae, Euphorbiaceae, Asteraceae					

Suggested Books:

1. Studies in Botany for degree students by J. N. Mitra

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Department of Botany

Lesson Plan

Session:2020-21 (Odds Semester)

Program : B.Sc.

Semester: 5th

Name of the Course: Economic Botany

Course code: BSB-502

Name of the faculty: Dr.Nibedita Das

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
2	History, Origin, cultivation and processing of Cereals wheat & rice, History, Origin, cultivation and processing of Tea, Sugarcane and Rubber. Characteristics and uses of Medicinal (Rawolfia, Cinchona, Azadirachta,	12	6 th ,9 th , 11 th , 20 th ,27 th , 28 th October, 3 rd , 10 th , 11 th , 12 th , 13 th and 15 th November	PPT Presentation, Lecture and Discussion	Test-I	
					Test-II	

	Androgaphis, Taxus). Fiber					
	(Cotton, Jhut), timber yielding plants (Sal, Sissoo, Teak). Fruits; Products and by-products of sugar industry					

Suggested Books:

1. Studies in Botany for degree students by J. N. Mitra
2. Economic Botany by S.L. Kochhar
3. Economic Botany by B.P. Pandey

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University of Science & Technology Meghalaya

Department Botany

Lesson Plan

Session: 2021-22(odd Semester)

Program: BP 106 RBT

Semester:First

Name of the Course Remedial Biology Course Code: BP 106 RBT

Name of the Faculty:Dr. Carefulness MacnelsonDirborne

Details Plan

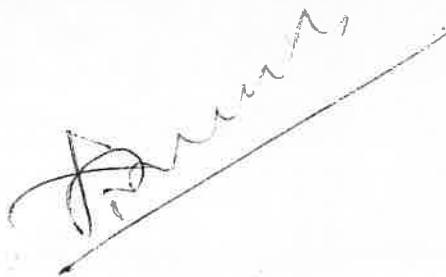
Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Defination and characters of living organisms- Diversity in the living world	1	9 th October	PPT Presentation, Lecture	Test 1	
1	Binomial nomenclature, Five kingdoms of life and basis of classification	2	23 rd October	PPT Presentation Lecture		
1	Salient features of Monera,Protista, Fungi, Animalia and Plantae, Virus	2	6 th November	PPT Presentation Lecture	Test 2	
1	Morphology of different flowering plants-Root, stem, Inflorescence, flower	2	20 th November	PPT Presentation Lecture		
2	Morphology of different flowering plants Leaf, fruit, seed	2	4 th December	PPT Presentation . Lecture& Discussion		
2	General anatomy of root and stem, leaf of monocots and dicots	2	18 th December	PPT Presentation Lecture& Discussion	Test 3	

Suggested Books:

1. A textbook of biology by B. V. Sreenivasa
 2. A textbook of biology by Naidu and Murthy
 3. Botany for degree students by A. C, Dutta
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Dr. Carefuiness M Dirborne



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University of Science & Technology Meghalaya

Department Botany

Lesson Plan

Session: 2021-22(odd Semester)

Program: BOT 731

Semester: Second

Name of the Course Archegoniate and Palaeobotany

Course Code: BOT-731

Name of the Faculty: Dr. Carefulness Macnelson Dirborne

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Introductory botany- Classification of plant kingdom	1	4 th October	PPT Presentation, Lecture	Test 1	
1	Importance of plant for human life and support system	1	11 th October	PPT Presentation Lecture, Question answer Method		
1	Algae-general characters- Classification	1	18 th October	PPT Presentation Lecture, Question answer Method		
1	Life history and economic importance of Cyanophyceae (Anabaena)	1	25 th October	PPT Presentation Lecture, Question answer Method Assignment		
1	Life history and economic importance of Chlorophyceae (Volvox)	1	1 st November	PPT Presentation Lecture & Discussion	Test 2	
1	Life history and economic importance of Pheophyceae (Ectocarpus)	1	22 nd November	PPT Presentation Lecture & Discussion		

4	Classification of pteridophytes	1	29 th November	PPT Presentation Lecture& Discussion		
4	Origin and evolutionary significance	1	6 th December	PPT Presentation Lecture& Discussion		
4	Type study- <i>Lycopodium</i>	1	20 th December	PPT Presentation Lecture& Discussion	Test 3	
4	Type study- <i>Selaginella</i>	1	28 th December	PPT Presentation Lecture& Discussion		
4	Type study- <i>Equisetum</i>	1	29 th December	PPT Presentation Lecture& Discussion		

Suggested Books:

1. Textbook of Algae. B.P Sarabhai, C.K Arora, Anmol Publishing Pvt. Ltd. New Delhi
2. Textbook of Algae. O.P Sharma, Tata McGraw Hill Company, New Delhi.
3. Botany for degree students Algae. B.R Vashista, A.K. Sinha, S. Chand Publishing, New Delhi.
4. Botany for degree students. A.C Dutta, Oxford publication.
5. Studies in Botany-Vol-I. J. N. Mitra, D. Mitra and S.K. Chowdhuri, D. N. Moulik Publishing, Kolkata.
6. The structure and reproduction of- The Algae. F.E. Fritsch (Vol-II), Vikas Publishing house, New Delhi, Bombay, Calcutta, Kanpur, Bangalore.

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Dr. Carefulness M Dirborne




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University of Science & Technology Meghalaya

Department Botany

Lesson Plan

Session: 2021-22(odd Semester)

Program MSB-303(CC-13)

Semester: Third

Name of the Course: Plant Ecology] Course Code: MSB-303

Name of the Faculty: Dr. Carefulness M Dirborne

Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
4	Plant diversity: Concept, status in India, utilization and concerns, Loss of diversity and causes,	1	7 th October	PPT Presentation, Lecture, Question answer Method, Assignment	Test 1	
4	Indigenous medicinal systems, Strategies for conservation - in situ conservation: International efforts and Indian initiatives,	2	20 th October	PPT Presentation Lecture, Question answer Method		
4	Protected areas in India - sanctuaries, national parks, Biosphere reserves.	2	28 th October	PPT Presentation Lecture, Question answer Method	Test 2	
4	Strategies for conservation - ex situ conservation:	1	8 th November	PPT Presentation Lecture, Question answer Method		

4	Principles and practices, botanical		25 th November	PPT Presentation Lecture, Question answer Method		
	gardens. Field gene banks, Seed banks, in vitro repositories, cryobanks,					
4	General account of the activities of Botanical Survey of India (BSI), Sustainable development	2	1 st & 22 nd December	PPT Presentation Lecture, Question answer Method	Test 3	

Suggested Books:

1. Concept of ecology. Kormondy
2. Ecology-concept & application. M.C Molles
3. Ecology-Theories & application. P.Stiling
4. Fundamental of ecology. E.P Odum
5. Ecology. C.Merchant
6. Plant ecology. R.S Shukla& P.S Chanda
7. Cunningham, W.P. and Saigo, B.W. 1999. Environmental Science. WCB, McGraw Hill
8. Hunter, M.L. 1996. Fundamentals of Conservation Biology. Blackwell Science, Oxford.
9. Jones, A.M. 1997. Environmental Biology.Routledge Publications, London and New
10. Mooney, H.A. and Gordon, M. 1983. Disturbance and Ecosystems components of Response. Springer Verlag. Berlin Heidelberg, New York, Tokyo.

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Dr. Carefulness M Dirborne



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