Report On Certificate course in plant Biotechnology





DEPARTMENT OF BIOTECHNOLOGY St. Edmund's College

	<u>CONTENTS</u>	<u>Page No</u>
1	Acknowledgement	1
2	General Information	2-3
3	Course Structure	4-5
4	List of Participants	6-7
5	Attendance	8-9
6	Subject Coverage	10-11
7	Examination & Grades	12-13
8	Learning Outcomes	14-23
9	Feedback from Guest Faculty	24-26
10	Feedback from students	27-32
11	Summary of the Course	33
12	Attachments (Registration form, Certificates & Feedback	34-40
	forms)	
13	Snippets	



Department of Biotechnology St. Edmund's College

(Affiliated to North Eastern Hill University, Shillong) Recognized by the University Grant Commission under 2 (f) and 12 (B) of UGC act 1956) Laitumkhrah, Shillong – 793003, Meghalaya, India

E-mail: secbiotech@gmail.com

Website: http://sec.edu.in

Acknowledgements

It gives me a deep sense of gratitude to appreciate the people who have helped the department to conduct such a wonderful certificate course. My heartfelt appreciation and the source of inspiration to

- ⇒ Br (Dr) Simon Coelho, IQAC Coordinator, St. Edmund's College, Shillong
- ⇒ Dr Sylvanus Lamare, Principal, St. Edmund's College, Shillong
- ⇒ Prof Monotosh Chakravarty, Vice Principal, St. Edmund's College, Shillong
- ⇒ Bro S Julius, Bursar, St. Edmund's College, Shillong
- ⇒ Prof Sumit Deb, IQAC Coordinator, St. Edmund's College, Shillong
- ⇒ Ms Shekinah Challam, Department of Biotechnology, St. Edmund's College, Shillong
- ⇒ Mr Koben John Nongkynrih, Department of Biotechnology, St. Edmund's College, Shillong
- ⇒ Dr Prasenjit Paul, Department of Botany, St. Edmund's College, Shillong
- \Rightarrow Dr Viki Manners, Department of Silviculture, Govt. of Meghalaya.
- \Rightarrow Dr Gayle Kharshiing, Guest Faculty, NEHU, Shillong
- ⇒ Ms Priya Paul, Technical Assistant, St. Edmund's College, Shillong
- ⇒ Mr Erwein Khshiar, Lab Attendant, Dept of Biotechnology, St. Edmund's College, Shillong
- \Rightarrow All the students of Biotechnology honours students.

1. Title of the Course:

		Certificate Course in Plant Biotechnology
2.	Course Code No:	
		SEC/BT-PT/CC/2022-23/001
3.	Total Contact Hours:	
		45 hrs
4.	Total Credits:	
		2.5
5.	Date of Approval	
_		26 th April 2022
5.	Opening of registration proc	Cess:
		26 th April 2022
6.	Closing of Registration Proc	cess:
		1 st May 2022
7.	Mode of Registration:	
		Online
8.	Weblink for Registration:	
		https://forms.gle/ZBUCGTMXwayojpii8
•		
9.	Date for Commencement of	the Course:
		4 th May 2022
10.	. Closing of the course:	
		26th May 2022
11.	Duration:	
		21 Days
12.	. Total No of Students Enrolle	ed:
		36 UG Students
13.	Registration Fees:	
		₹ 500/- (Five Hundred only)

14. Total Registration Fees Collected:

₹ 18000/- (Eighteen thousand only)

15. Course Coordinator:

Ms Baiakmenlang Manners, Department of Biotechnology St. Edmund's College, Shillong

Prof Sumit Deb, IQAC Coordinator St. Edmund's College, Shillong

16. Teachers Involved:

Dr Samrat Adhikari, Head, Department of Biotechnology St. Edmund's College

Dr Viki Manners, Department of Silviculture, Govt of Meghalaya, Shillong

Ms Shekinah Challam, Department of Biotechnology St. Edmund's College, Shillong

Mr Koben John Nongkynrih, Department of Biotechnology St. Edmund's College, Shillong

Dr Prasenjit Paul, Department of Botany St. Edmund's College, Shillong

Dr Gayle Kharshiing, Guest Faculty, Department of Botany NEHU, Shillong

Ms Baiakmenlang Manners, Department of Biotechnology St. Edmund's College, Shillong

Course description

In the present scenario, the field of plant sciences now comprises numerous topics, that modern plant biologists are expected to have an extensive knowledge on such areas. The applied field of plant biotechnology includes areas such as plant tissue culture, plant molecular biology and gene manipulation. This course is aimed to focus on these aspects and the course content is designed to impart basic knowledge and information on the plant growth and requirements in vitro. The course is so designed with substantial number of practical/hands on sessions weaved into each module, that will help students to apply their theoretical knowledge in experimenting and exploring the subject. Each of these contact hours has course on fundamentals plant tissue culture, plant gene manipulation and plant molecular biology. Furthermore, each of the units will have assessment period of 1 hour and finally at the end there will be a presentation from the participants about the journey and appropriate feedback.

Course structure

The certificate course syllabus proposed is of 45 contact hours with three units (Module 1, Module 2 & Module 3) comprising of 15 contact hours each.

Code	Name of the Paper		rs	TOTAL	
		Theory	Practical	Assessments	
PBCC202201	Basic Plant Tissue Culture	6 hrs	7 hrs	2 hrs	15
PBCC202202	Advanced Plant Tissue Culture	6 hrs	7 hrs	2 hrs	15
PBCC202203	Plant Biotechnology	6 hrs	7 hrs	2 hrs	15
				TOTAL	45

Mode of Conduct of the Course

The course will be conducted completely online using the College Linways Learning Management System (LMS). Each teacher will be assigning the roles in their respective accounts and the external faculty will be using the account of the course coordinator. The mode of presentation has been live sessions, Power point presentations, video recording which has been uploaded in the LMS system for the students to view at any time. The assessment of the students was completed using online exam tools and the students who intend to improve the marks were given a chance to go for a retest. Each day student

feedback was verbally recorded, and accordingly effective tools were implemented for making the teaching learning process in effective manner.

Each student was given a chance for their feedback after the completion of the course and the same were analyzed using appropriate tools.

Grading Policy

Students will be assigned the following grades, based on the complete course assessment

Marks	Final Grade
90-100	A+
80-90	A
70-80	B+
60-70	В
50-60	C+
50-60	С
Below 50	Needs Improvement

Outcome Based analysis

The certificate has been designed in a manner that the students grading policy can be reflected in terms of Programme Outcome (PO) and also at the same time the Course Outcome (CO) be measured. After the completion of each Module the marks will be analyzed for the CO mapping and the consolidated report will be used for the final PO-CO mapping. The details of the PO-CO mapping will be enclosed in the next section.

SI No	Student ID	Name	Semester	Subject
1	21/BIOT/401	Alarissa Jasmine Sawian	II	Biotechnology
2	21/BIOT/403	M Lhingneivah Haokip	II	Biotechnology
3	21/BIOT/405	Franky L Nongbri	II	Biotechnology
4	21/BIOT/406	Chanshim Kashung	II	Biotechnology
5	21/BIOT/407	Priyanuj Hazarika	II	Biotechnology
6	21/BIOT/408	Ankita Hazarika	I	Biotechnology
7	21/BIOT/410	Nisha Kumari Ray	II	Biotechnology
8	21/BIOT/411	Rahul Sunar	I	Biotechnology
9	21/BIOT/414	Vanshika Jasrasaria	II	Biotechnology
10	21/BIOT/416	Nairity Goswami	II	Biotechnology
11	21/BIOT/417	Sambunki Pakem	II	Biotechnology
12	21/BIOT/418	Rosy Lallawmawmi	II	Biotechnology
13	21/BIOT/419	Trilochan Debbarma	II	Biotechnology
14	21/BIOT/420	Susmita Das	II	Biotechnology
15	21/BIOT/421	Tapunishtha Borah	I	Biotechnology
16	21/BIOT/422	Rajdeep Paul	II	Biotechnology
17	21/BIOT/423	Amon Jyoti Goswami	I	Biotechnology
18	21/BIOT/424	Linda Zairemmawii	I	Biotechnology
19	21/BIOT/426	Rode Islary	I	Biotechnology
20	21/BIOT/427	Rani Shyrmang	II	Biotechnology
21	21/BIOT/428	Shimran Saigal	I	Biotechnology
22	21/BIOT/429	Bhaswati Chakraborty	I	Biotechnology
23	21/BIOT/431	Ankit Dasgupta	I	Biotechnology
24	21/BIOT/432	Dani Monya	II	Biotechnology
25	21/BIOT/433	Wilson Sutnga	II	Biotechnology
26	21/BIOT/436	Khusboo Sharma	II	Biotechnology
27	21/BIOT/442	Uranim K C Shaiza	II	Biotechnology
28	21/BIOT/444	Swagata Dutta	II	Biotechnology
29	21/BIOT/446	Ashakiran D Rai	II	Biotechnology
30	21/BIOT/447	Monica Jolsha Warjri	II	Biotechnology
31	20/BIOT/404	Sanjida Choudhury	IV	Biotechnology

List of Students Registered for the Certificate Course

Organized by Dept. Of Biotechnology, St. Edmund's College, Shillong

Report on the Certificate Course in Plant Biotechnology

Students Details

SI No	Student ID	Name	Semester	Subject
32	20/BIOT/407	Anindita Mudiar	IV	Biotechnology
33	20/BIOT/409	Antarleena Bhattacharjee	IV	Biotechnology
34	20/BIOT/422	Cassiana Pohshna	IV	Biotechnology
35	20/BIOT/425	Rebecca D L Marbaniang	IV	Biotechnology
36	19/BIOT/435	Aido Lego	VI	Biotechnology

SI No	Student ID Name		Semester	Total Hours	Attended	Attendance
1	21/BIOT/401	Alarissa Jasmine Sawian	II	45	45	100 %
2	21/BIOT/403	M Lhingneivah Haokip	II	45	45	100 %
3	21/BIOT/405	Franky L Nongbri	II	45	45	100 %
4	21/BIOT/406	Chanshim Kashung	II	45	45	100 %
5	21/BIOT/407	Priyanuj Hazarika	II	45	45	100 %
6	21/BIOT/408	Ankita Hazarika	II	45	45	100 %
7	21/BIOT/410	Nisha Kumari Ray	II	45	45	100 %
8	21/BIOT/411	Rahul Sunar	II	45	45	100 %
9	21/BIOT/414	Vanshika Jasrasaria	II	45	45	100 %
10	21/BIOT/416	Nairity Goswami	II	45	45	100 %
11	21/BIOT/417	Sambunki Pakem	II	45	45	100 %
12	21/BIOT/418	Rosy Lallawmawmi	II	45	45	100 %
13	21/BIOT/419	Trilochan Debbarma	II	45	45	100 %
14	21/BIOT/420	Susmita Das	II	45	45	100 %
15	21/BIOT/421	Tapunishtha Borah	II	45	45	100 %
16	21/BIOT/422	Rajdeep Paul	II	45	45	100 %
17	21/BIOT/423	Amon Jyoti Goswami	II	45	45	100 %
18	21/BIOT/424	Linda Zairemmawii	II	45	45	100 %
19	21/BIOT/426	Rode Islary	II	45	45	100 %
20	21/BIOT/427	Rani Shyrmang	II	45	45	100 %
21	21/BIOT/428	Shimran Saigal	II	45	45	100 %
22	21/BIOT/429	Bhaswati Chakraborty	II	45	45	100 %
23	21/BIOT/431	Ankit Dasgupta	II	45	45	100 %
24	21/BIOT/432	Dani Monya	II	45	45	100 %
25	21/BIOT/433	Wilson Sutnga	II	45	45	100 %
26	21/BIOT/436	Khusboo Sharma	II	45	45	100 %
27	21/BIOT/442	Uranim K C Shaiza	II	45	45	100 %
28	21/BIOT/444	Swagata Dutta	II	45	45	100 %
29	21/BIOT/446	Ashakiran D Rai	II	45	45	100 %
30	21/BIOT/447	Monica Jolsha Warjri	II	45	45	100 %
31	20/BIOT/404	Sanjida Choudhury	IV	45	45	100 %

Attendance

Organized by Dept. Of Biotechnology, St. Edmund's College, Shillong

Report on the Certificate Course in Plant Biotechnology

Students Attendance

SI No	Student ID	Name	Semester	Total Hours	Attended	Attendance
32	20/BIOT/407	Anindita Mudiar	IV	45	45	100 %
33	20/BIOT/409	Antarleena Bhattacharjee	IV	45	45	100 %
34	20/BIOT/422	Cassiana Pohshna	IV	45	45	100 %
35	20/BIOT/425	Rebecca D L Marbaniang	IV	45	45	100 %
36	19/BIOT/435	Aido Lego	VI	45	45	100 %

Syllabus Coverage						
Sl.no	Date	Contact Hours	Module	Topic Name	Topic Description	
1	4 th May 2022	0.5	PBCC202201	Introduction to Plant Tissue culture, Terms and definitions, Laboratory organization, Tools and techniques, methods of sterilization	Covered by Mr. Koben John Nongkynrih	
2	4 th May 2022	0.5	PBCC202201	Laboratory contaminants- it's control and measures.	Covered by Mr. Koben John Nongkynrih	
3	4 th May 2022	1.0	PBCC202201	Role of Micro and macro nutrients, Vitamins, and carbon source in tissue culture	Covered by Mr. Koben John Nongkynrih	
4	5 th May 2022	1.0	PBCC202201	Media preparation- pH, Temperature, Solidifying agents, Slant Preparations etc.	Covered by Ms. Shekinah Challam	
5	5 th May 2022	1.0	PBCC202201	Maintenance of cultures Callus and cell suspension culture.	Covered by Mr. Koben John Nongkynrih	
6	6 th May 2022	1.0	PBCC202201	Environmental Conditions, explants characteristics. Explants selection, sterilization, and inoculation; Various media preparations; MS, B5, etc.	Covered by Dr. Prasenjit Paul	
7	6 th May 2022	1.0	PBCC202201	Techniques and significance of Androgenesis and Gynogenesis (ovary, ovule, egg, synergids culture).	Covered by Dr. Prasenjit Paul	
8	7 th May 2022	1.5	PBCC202201	Principle and applications of Autoclave, Hot air oven, Incubator, Laminar Air Flow, Spectrophotometer, and pH meter.	Covered by B.Manners	
9	9 th May 2022	1.5	PBCC202201	Preparation of Stock solutions for Tissue culture media preparation	Covered by B. Manners	
10	9 th May 2022	1.0	PBCC202201	Sterilization methods & Explant inoculation	Covered by B.Manners	
11	10 th May 2022	1.0	PBCC202201	Examination – MCQ Based	Conducted by B. Manners	
12	11 th May 2022	1.0	PBCC202202	Micropropagation and its Applications; Types, Stages, Establishment of propagated plants	Covered by Ms. Shekinah Challam	
13	11 th May 2022	1.0	PBCC202202	Germplasm conservation - Definition, Importance and Methods, In-situ and Ex-situ conservation,	Covered by Dr. Prasenjit Paul	
14	12 th May 2022	1.0	PBCC202202	Hardening of tissue culture raised plants: stages and role of different factors involved in hardening process.	Covered by Dr. Prasenjit Paul	
15	12 th May 2022	1.0	PBCC202202	Disease and pest control in gardening- Fungicides and pesticides.	Covered by B.Manners	
16	13 th May 2022	2.0	PBCC202202	Floriculture – commercial floriculture, protected cultivation of cut flowers and home floriculture	Covered by B.Manners	
17	14 th May 2022	2.0	PBCC202202	Micropropagation of endangered plant species	Covered by B.Manners	

Syllabus Coverage							
Sl.no	Date	Contact Hours	Module	Topic Name	Topic Description		
18	15 th May 2022	2.0	PBCC202202	Preparation of artificial seeds	Covered by B.Manners		
19	17 th May 2022	2.0	PBCC202202	Hardening of Tissue culture raised plantlets and their maintenance in polyhouses	Covered by Dr. Viki Manners		
20	18 th May 2022	2.0	PBCC202202	Basic floriculture techniques	Covered by Dr. Viki Manners		
21	18 th May 2022	1.0	PBCC202202	Examination	Conducted by B.Manners		
22	19 th May 2022	1.0	PBCC202203	Genomic and organelle DNA isolation,	Covered by Dr Samrat Adhikari		
23	19 th May 2022	1.0	PBCC202203	Methods of gene identification, DNA amplification - vector mediated and vector less methods - Polymerase chain reaction (PCR).	Covered by Dr Samrat Adhikari		
24	20 th May 2022	1.0	PBCC202203	Restriction, digestion, and ligation; restriction mapping, genomic and cDNA libraries.	Covered by Dr Samrat Adhikari		
25	20 th May 2022	1.0	PBCC202203	Analysis and expression of cloned genes - DNA sequencing, DNA markers;	Covered by Dr Samrat Adhikari		
26	21 st May 2022	1.0	PBCC202203	Restriction fragment length polymorphism (RFLP) ; Random amplified polymorphic DNA (RAPD). Amplified fragment Length polymorphism (AFLP).	Covered by Dr. Gayle A. Kharshiing		
27	21 st May 2022	1.0	PBCC202203	Application of gene cloning and transformation techniques in plants-	Covered by Dr. Gayle A. Kharshiing		
28	23 rd May 2022	1.0	PBCC202203	Genetically modified organisms and foods (GMO/ GMF) – Social, Legal, and ethical considerations in Indian Scenario.	Covered by Dr. Gayle A. Kharshiing		
29	24 th May 2022	2.0	PBCC202203	Isolation of DNA from Plants.	Covered by B.Manners		
30	25 th May 2022	2.0	PBCC202203	Amplification of plant genomic DNA by using ISSR primer.	Covered by B.Manners		
31	26 th May 2022	2.0	PBCC202203	Analysis of bands and interpretation of results	Covered by B.Manners		
32	26 th May 2022	1.0	PBCC202203	Examination	Conducted by B.Manners		

EXAMINATION & GRADES

The examination (online mode) was conducted for the modules PBCC202201, PBCC202202 & PBCC202203 with a total of 100 marks with a time limit of 120 minutes. Each student has performed very well. The MCQ question was based on the reasoning ability to solve concept-based questions.

	Enrollment		PBCC202201	PBCC202202	PBCC202203		Grades	Attainment
SI	NO	Name	100	100	100	Average		Level
1	21/BIOT/401	Alarissa Jasmine Sawian	74	60	84	73	B⁺	2
2	21/BIOT/403	M Lhingneivah Haokip	60	50	66	59	C⁺	2
3	21/BIOT/405	Franky L Nongbri	68	54	88	70	B⁺	2
4	21/BIOT/406	Chanshim Kashung	68	52	80	67	В	2
5	21/BIOT/407	Priyanuj Hazarika	66	56	76	66	В	2
6	21/BIOT/408	Ankita Hazarika	74	64	86	75	B⁺	2
7	21/BIOT/410	Nisha Kumari Ray	66	44	68	59	C+	2
8	21/BIOT/411	Rahul Sunar	68	50	42	53	C+	2
9	21/BIOT/414	Vanshika Jasrasaria	66	54	76	65	В	2
10	21/BIOT/416	Nairity Goswami	66	54	74	65	В	2
11	21/BIOT/417	Sambunki Pakem	46	58	76	60	В	2
12	21/BIOT/418	Rosy Lallawmawmi	58	46	76	60	В	2
13	21/BIOT/419	Trilochan Debbarma	70	52	70	64	В	2
14	21/BIOT/420	Susmita Das	72	60	92	75	B⁺	2
15	21/BIOT/421	Tapunishtha Borah	76	56	82	71	B⁺	2
16	21/BIOT/422	Rajdeep Paul	60	58	74	64	В	2
17	21/BIOT/423	Amon Jyoti Goswami	78	54	56	63	В	2
18	21/BIOT/424	Linda Zairemmawii	38	24	18	27	С	1
19	21/BIOT/426	Rode Islary	68	44	64	59	C+	2
20	21/BIOT/427	Rani Shyrmang	0	34	54	29	С	2
21	21/BIOT/428	Shimran Saigal	68	54	56	59	C+	2
22	21/BIOT/429	Bhaswati Chakraborty	76	72	88	79	B⁺	2
23	21/BIOT/431	Ankit Dasgupta	62	58	0	40	С	2
24	21/BIOT/432	Dani Monya	72	62	86	73	B⁺	2
25	21/BIOT/433	Wilson Sutnga	52	2	66	40	С	2
26	21/BIOT/436	Khusboo Sharma	74	54	62	63	В	2
27	21/BIOT/442	Uranim K C Shaiza	64	50	60	58	C+	2
28	21/BIOT/444	Swagata Dutta	72	62	62	65	В	2
29	21/BIOT/446	Ashakiran D Rai	70	56	82	69	В	2
30	21/BIOT/447	Monica Jolsha Warjri	48	66	82	65	В	2
31	20/BIOT/404	Sanjida Choudhury	56	52	60	56	В	2
32	20/BIOT/407	Anindita Mudiar	80	70	90	80	Α	2

Report on the Certificate Course in Plant Biotechnology

Examination & Grades

33	20/BIOT/409	Antarleena Bhattacharjee	72	56	74	67	В	2
34	20/BIOT/422	Cassiana Pohshna	84	68	78	77	B⁺	2
35	20/BIOT/425	Rebecca D L Marbaniang	78	68	72	73	B⁺	2
36	19/BIOT/435	Aido Lego	78	42	80	67	В	2

PROGRAM EDUCATIONAL OUTCOMES (PEOs), PROGRAM OUTCOMES (POs) & PROGRAM SPECIFIC OUTCOMES (PSO) CERTIFICATE COURSE IN BIOINFORMATICS (Level O)

Vision:

St. Edmund's College, Shillong has a vision that is enshrined in the motto of the College: "*Facta Non Verba*" which translates "*Deeds Not Words*". It aims at imparting equitable quality education grounded on the core values of excellence, competition, and ideals. The College also stands on the principles advocated by Edmund Ignatius Rice, the Founder of the Institution.

Mission:

The College endeavors to create a stimulating environment in the Campus through various academic programmes and co-curricular activities to develop character, shape personality and build a sense of social responsibility among our young men and women. As the college prioritizes learning, teaching, and sharing of knowledge, education is therefore perceived as a potent vehicle that works towards transforming attitudes and mind-sets for the good of one and all in the society in particular and the world at large.

Program Educational Outcomes (PEOs)

The participants will:

- PEO1 Have the confidence and tenacity it takes to be life-long learners, keeping abreast with Knowledge and Skills.
- PEO2 Be looked up to, as young women and men, who can be counted on to be agents for transformation.
- PEO3 In keeping with the principles of Blessed Edmund Rice, be humble and at home with 'kings' and 'paupers.
- PEO4 Be generous in being able to give back to Society what they have received, by participating in various Health Missions.

Program Outcomes (POs)

At the end of the Certificate Course Programme, the graduates will be able to:

PBCCPO.01	Domain Expertise Apply knowledge of Biotechniques and experiments at an appropriate level to the discipline		
PBCCPO.02	Skills and Ethics Analyse a problem and define the biological requirements,		
	appropriate to its solution		
PBCCPO.03	Lifelong Learning Understand new concepts and be articulate while		
	executing knowledge with peers.		
PBCCPO.04	Modern Tool Usage Use current techniques, skills, and tools necessary for		
	Biotechnology practices		
PBCCPO.05	Social Contribution Follow passionate thinking for implementing the		
	technology for the larger benefit of the society.		

Program Specific Outcomes (PSOs)

At the end of the Certificate Course, the candidate will be able to

PSO1	Gain confidence in handling laboratory equipment's and also to perform
	experiments independently
PSO2	Be able to devise troubleshooting mechanisms in cases where problems in
	experimentation arises
PSO3	Learn about modern tools and techniques employed in plant biotechnology
PSO4	Have an edge over their peers as the hands-on sessions will be an added
	advantage to their skill development

Course Outcome

At the end of the Module, I PBCC202201 on Basic Plant Tissue Culture: Students will be able to:

- CCPB01.01 Relate the effectiveness of various medium composition in root and shoot Proliferation *in vitro*.
- CCPB01.02 Illustrate and examine the various aseptic techniques available for plant materials
- CCPB01.03 Recommend and relate the suitable medium used for varying types of plant tissue culture
- CCPB01.04 Design and corelate the applicability of the techniques learnt for future experiments.
- CCPB01.05 Skill improvement in handling plant tissue culture and it maintaining aseptic conditions at all levels.

At the end of the Module, II PBCC202202 on Advanced Plant Tissue Culture: Students will be able to:

- CCPB02.01 Connect and corelate the micropropagation of elite species of plants and its wider applications.
- CCPB02.02 Prioritization of hardening techniques post *in vitro* culture.
- CCPB02.03 Investigate various floriculture methods for commercialization of plants.
- CCPB02.04 Interpret various germplasm storage techniques for plants with horticultural, medicinal as well as of endangered species.
- CCPB02.05 Identify and outline the major diseases in crop plants and use of bio fertilizers.

At the end of the Module, III PBCC202203 on Advanced Plant Tissue Culture: Students will be able to:

- CCPB03.01 Relate and describe various molecular markers used in plant genome analysis
- CCPB03.02 Application of molecular markers in developing conservation strategies.
- CCPB03.03 Compare and contrast the available transgenic technologies for crop improvement

- CCPB03.04 Examine and investigate the role of GM crops in the society
- CCPB03.05 Illustrate and design the applicability of ISSR primers using PCR based techniques.

Attainment level for Certificate Course

Particulars	Levels of Attainment			
Students scoring above 80 % marks in assessments for Certificate course (level O)	3			
Students scoring above 70 % marks in assessments for Certificate course (level O)	2			
Students scoring above 50 % marks in assessments for Certificate course (level O)	1			
Student securing below 39% will be allowed for a retest for improving the performances.				

CO-PO Mapping for Certificate Course - Module 1

PBCC202201	PBCCPO.01	PBCCPO.02	PBCCPO.03	PBCCPO.04	PBCCPO.05
CCPB01.01	3	2	1	3	3
CCPB01.02	3	3	2	1	1
CCPB01.03	2	3	3	3	1
CCPB01.04	2	2	3	3	3
CCPB01.05	1	2	3	2	3

CO-PO Mapping for Certificate Course (Module 2

PBCC202202	PBCCPO.01	PBCCPO.02	PBCCPO.03	PBCCPO.04	PBCCPO.05
CCPB02.01	2	3	2	3	3
CCPB02.02	3	2	3	1	2
CCPB02.03	3	1	3	2	2
CCPB02.04	2	2	3	3	3
CCPB02.05	1	3	2	3	1

CO-PO Mapping for Certificate Course –(Module 3

<u> </u>	11100 9 9 1119	101 0010111						
	BCC03	PBCC202202	PBCCPO.01	PBCCPO.02	PBCCPO.03	PBCCPO.04		
	CCPB03.01	3	3	3	2	3		
	CCPB03.02	3	3	2	2	1		
	CCPB03.03	3	2	3	3	1		
	CCPB03.04	3	2	2	3	2		
	CCPB03.05	3	1	3	3	2		

Report on the Certificate Course in Plant Biotechnology

Learning Outcome for PBCC202201 (Module-1)



LEGEND 1: The Graph depicts the course outcome with the Percentage of Marks secured in the Examination of (Module 1). The data are represented in percentage and plotted using Excel software.



Learning Outcome for PBCC202202 (Module-2)



LEGEND 4: The Graph depicts the course outcome with the Percentage of Marks secured in the Examination of PBCC202202 (Module 2). The data are represented in percentage and plotted using Excel software.



LEGEND 5: Programme Outcome (PO) -Course Outcome (CO) mapping of the PBCC202202module.



- No of student mapped to at least one PO
- ----- No of students with marks greater than or equal to 60
- -----Average



LEGEND 6:

Average Attainment Level of the students in PBCC202202 module.

Report on the Certificate Course in Plant Biotechnology

Learning Outcome for PBCC202203 (Module-3)



LEGEND 7: The Graph depicts the course outcome with the Percentage of Marks secured in the Examination of PBCC202203 (Module 3). The data are represented in percentage and plotted using Excel software.



LEGEND 8: Programme Outcome (PO) -Course Outcome (CO) mapping of the PBCC202203 module.



LEGEND 9: Average Attainment Level of the students in PBCC202203 module.

Average Attainment level of the 3 modules – PBCC202201, PBCC202202 & PBCC202203



LEGEND 10: The Graph depicts the average attainment level of the 3 modules with the corresponding CO-PO mapping. The data are represented in percentage and plotted using Excel software.

Feedback of Guest Faculty

The Feedback form for the guest faculty was designed with inputs from the IQAC cell for the participants using google (https://forms.gle/xRvsRE5j7A38FbZa9) and was responded by 9 teachers. The analysis is depicted below.



The time management to conduct the course was efficient



The content of the course was



The response from the Learners during lecture/interactive session were

The Learning Management System (LMS) software used for running the course is up to date





Would you like to be a part of the next advanced level of the course

Suggestion(s) if any,



Feedback of Participants

The Feedback form was designed with inputs from the IQAC cell for the participants using google forms (<u>https://forms.gle/TR9af2hp9x7E7uEy7</u>) and was responded by 34 participants. The analysis is depicted below.

The objective of the course clear to me

34 responses



The course content met with my expectation 34 responses



The lectures/videos were well planned 34 responses



Organized by Department of Biotechnology, St. Edmund's College, Shillong 27

The course built on my knowledge & practices 34 responses



I would recommend the course to other colleagues 34 responses



The practicals were well planned

34 responses



Organized by Department of Biotechnology, St. Edmund's College, Shillong 28



The lecture were clear and easy to understand ³⁴ responses

The online teaching aids were used effectively 34 responses







Organized by Department of Biotechnology, St. Edmund's College, Shillong 29

The instructor encouraged interaction and was helpful 34 responses







New Concepts for me (50 words)

- ⇒ I was happy that i joined the course as I can learn many things from different teachers which will help me in further studies
- ⇒ I was able to gain a lot of practical knowledge like how to work in laminar flow, the overall practises of tissue culture with proper precautions. Overall I had a great experience through the certificate course and I am looking forward to attend such more courses.
- \Rightarrow DNA extraction projects
- ⇒ RAPD, RFLP, Concepts on practical hands-on like laminar flow hood, importance of sterile environment, PCR, Methods of gene identification and expression, etc.
- \Rightarrow Learned in depth about this topic
- ⇒ I came to learn many techniques about Plant biotechnology like PCR, AFLP, RFLP and many more. Also genetically produced crops/foods. I am glad that I joined this course.
- ⇒ Maybe I wanna learn more
- ⇒ As for me i have no new concept right now but whatever the new concept that maybe there i would like to learn more about them as the topic that i have heard so far is very interesting so I'm looking forward for more of it.
- ⇒ The certificate course added to my knowledge of many new and interesting topics. The lectures and practical's have improved my foundation and explained the basics of tissue culture of plants and genetic engineering of crops. The trip gave me ideas of what I may pursue later on in my career. It was not only educative but it was also a very nice and interesting experience. I will surely participate in more certificate courses like this one in the future and I would highly recommend it to my friends and dear ones.
- ⇒ It make's the doubt clarify to the student's.. There's a light way of studying about certificate course, there wasn't any problem handling about the course.I'm looking forward more on the course
- \Rightarrow Concepts of Molecular Biology
- ⇒ With the help of this certificate course i got a lots of new information on many new things and also got to know about new technology which we have used during this course.
- ⇒ Genetically modified plants, in vitro, types of plant tissue culture, techniques.
- ⇒ I enjoyed the course and learned from it. The content is well organised and focused on practicals....Thank you for organizing and a very special thanks to the great speakers...
- ⇒ Tissue culture though I have heard of it but in this course I learnt it in very details . Dna isolation was the best and the most interesting part of the course.
- ⇒ Most of the practical and classes were already covered in the class since I'm already in the last semester but the MCQ examination on each modules were very useful and knowledgeable
- \Rightarrow No new concept
- ⇒ This course was based in plant biotechnology. It helped us to learn about genetic engineering,

and tissue culture techniques. The trip to Upper Shillong increased our insights on tissue culture. We also learned how to extract DNA from leaves which was interesting.

- ⇒ This is a plant biotechnology course which helped us in knowing tissue culture and genetic engineering techniques. We also learned how to extract DNA from leaves and many more
- \Rightarrow The concept was clear and is useful for my further studies.
- ⇒ All the topics that were presented and explained were very insightful and I've learnt and understood the topics much better.
- ⇒ From this course i came to know more about plant tissue culture and i am encouraged and willing to participate in projects .
- ⇒ I got to know different aspects of plant tissue culture, the methods to prepare an explant, different applications of plant tissue culture, about the PCR, plant biotechnology and many more.
- \Rightarrow As this was as new concept of studies on biotechnology it was very nice.
- \Rightarrow Improve a lot
- ⇒ Certificate course on Tissue culture of animals
- \Rightarrow No concept
- ⇒ This course greatly broadened my point of view on PTC about how media for the culture is prepared and other interesting things like how all the cultures are well managed and kept in their optimum conditions. So far this course has been an interesting one.
- ⇒ Gene identification, Grafting, aesthetic value of plants' beauty in human life, plant tissue culture media and it's purpose, composition. Linsmaier and Skoog medium and It's different purpose, White's medium, Gellan gum, practical on plant DNA isolation
- \Rightarrow I learned a lot in the practical classes

Course Description/Overview

In the present scenario, the field of plant sciences now comprises numerous topics, that modern plant biologists are expected to have an extensive knowledge on such areas. The applied field of plant biotechnology includes areas such as plant tissue culture, plant molecular biology and gene manipulation. This course is aimed to focus on these aspects and the course content is designed to impart basic knowledge and information on the plant growth and requirements in vitro. The course is so designed with substantial number of practical/hands on sessions weaved into each module, that will help students to apply their theoretical knowledge in experimenting and exploring the subject. Each of these contact hours has course on fundamentals plant tissue culture, plant gene manipulation and plant molecular biology. Furthermore, each of the units will have assessment period of 1 hour and finally at the end there will be a presentation from the participants about the journey and appropriate feedback

- Fundamentals of computer basics.
- > Database design and articulation with knowledge of KDD and various Data Mining tools.
- ▶ Fundamentals to MY SQL and Oracle with special emphasis on FOSS.
- > Special file formats which are used in biotechnology & bioinformatics analysis.
- > Introduction to NCBI databases and its potential for retrieval of various biological data for effective analysis.
- > Some of the algorithms which are used in day to day activities by students, researchers for R & D activities.

Assessment & Examination.

Each students were assessed by the different module examination which comprise of 50 question with each carrying 2 mark. These question were designed based on the aptitude model with more reasoning ability thinking on key concepts and also their individual IQ levels. The questions were further formulated as key indicator of Bloom's taxonomy of various learning levels. The question were formulated based on the various course outcome (CO) with due weightage to each of the outcome.

The marks secured were then further evaluated and computed for the corelating with the Programme outcome (PO) which has further helped in the evaluation of individual attainment level.

Final Result:

The final result was computed with the average of the 3 module examination and appropriate grades were given to students.

REGISTRATION FORM

Certificate Course in Plant Biotechnology 4th - 26th May, 2022 Organised by Department of Biotechnology, St. Edmund's College, Shillong Registration Closes at 6:00 PM 2nd May 2022 Email * Valid email This form is collecting emails. Change settings	⊕ fi Fr (1)
Name of the Student * Short answer text	
Department * Short answer text	
University Roll No. * Short answer text	
College Roll No (To be provided in Linways format only) * Short answer text	
Mobile No. * Short answer text	
Reason for joining the Course * Short answer text	
I hereby declare that I will complete all the modules. * I agree I disagree	

FEEDBACK FORMS FOR TEACHERS

Section 1 of 2			Ð
FEEDBACK FORM (For Teachers)	~	:	9 Tr
Online Certificate Course in Bioinformatics (Level O)			
2nd March, - 21st March, 2021 Organised by Department of Biotechnology, St. Edmund's College, Shillong			Þ
Email address *			
Valid email address			
This form is collecting email addresses. Change settings			
Dear Teachers, Thank you very much for taking the trouble for delivering the lecture/practicals in the Certificate Course Your inputs/feedback on the overall conduct of the certificate course will help us to conduct better in the near future.	×	:	
Name *			
Short answer text			

Department * Short answer text	
The content of the course was * Satisfactory Needs Improvement Good	
The time management to conduct the course was efficient * Strongly agree Agree Disagree	
The response from the Learners during lecture/interactive session were * Very Good Good Average	
The Learning Management System (LHS) software used for running the course is up to date * Strongly agree Agree Disagree	
Would you like to be a part of the next advanced level of the course * Ves No	
Suggestion (if any) * Long answer text	

FEEDBACK FROM FOR STUDENTS



Report on the Certificate Course in Plant Biotechnology

ATTACHMENTS

3. The course content met with my expectation *

Check all that apply.

Satisfactory
Needs Improvement
Good
Very Good
Excellent

4. The lectures/videos were well planned *

Check all that apply.

Satisfactory
Needs Improvement
Good
Very Good
Excellent

5. The course built on my knowledge & practices *

Check all that apply.

Satisfactory
Needs Improvement
Good
Very Good
Excellent

6. I would recommend the course to other colleagues *

٦ Ja.	n. n.		+ 1-	 PR. 195	m h	
	-			 -		

Satisfactory
Needs Improvement
Good

7	V	er	y	G	0	od
_						

Excellent

I would like to do the next level *

Check all that apply.

Satisfactory
Needs Improvement
Good
Very Good
Excellent

9. The online teaching aids were used effectively *

			- 6	-	-	P		
				-	-			

Satisfactory

Needs Improvement
Good
Very Good
Excellent

10. The Learning Management System (LMS) was easy to use *

Check all that apply.
Satisfactory
Needs Improvement
Good
Very Good
Excellent

11. The instructor encouraged interaction and was helpful *

Charles 1	station -		- A.	
Unit	TGR -			DUY.

Satisfactory
Needs Improvement
Good
Very Good
Excellent

12. New Concepts for me (50 words)*

13. Suggestion (if any)*

Organized by Department Of Biotechnology, St. Edmund's College, Shillong 3

CERTIFICATE FOR GUEST FACULTY

	Department of Biotechnology St. Edmund's College, Shillong
	THIS IS TO CERTIFY THAT
T IN	UF HAS SUCCESSFULLY DELIVERED LECTURES IN CERTIFICATE COURSE IN PLANT BIOTECHNOLOGY FROM 4 [™] MAY — 26TH MAY. 2022 FOR HOURS. HIS COURSE IS ORGANIZED BY DEPARTMENT OF BIOTECHNOLOGY COLLABORATION WITH INTERNAL QUALITY ASSURANCE CELL IQAC. ST. EDMUND S COLLEGE. SHILLONG
MS	AIAAMMENLANG MANNERS DR SAMRAT ADHIKARI PROF SUMIT DEB DR SYLVANUS LAMARE Course Coordinator Head IQAC Coordinator Phropal

CERTIFICATE FOR STUDENTS

dmund's College, Shillong	
This is to certify that	
of has successfully complete	ted
"Certificate Course in Plant Biotechnology" from 4 th – 26 th May 20:	.022
ith a GRADE of and attainment level of This	is Course is
organized by Department of Biotechnology in collaboration with	th
Internal Quality Assurance Cell (IQAC), St. Edmund's College, Shil	illong
	VANUS LAMARE

SAMPLE ONLY















