Department of Biotechnology

St. Edmund's College

Shillong

REPORT ON

CERTIFICATE COURSE IN BIOINFORMATICS (Level O)

Organized by

Bioinformatics Centre
Department of Biotechnology
St. Edmund's College, Shillong

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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

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⇒ Bro S Julius, Bursar, St. Edmund's College, Shillong
⇒ Prof Sumit Deb, Head, Department of Chemistry, St. Edmund's College, Shillong
⇒ Dr Sunil Sharma, Department of Biotechnology, St. Edmund's College, Shillong
⇒ Mr Yogesh Negi, Department of Biotechnology, 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
⇒ Ms Sarmistha Deb, Department of Computer Applications, St. Edmund's College, Shillong
⇒ Ms S Sunila Chanu, Department of Computer Applications, St. Edmund's College, Shillong
⇒ Dr Debulman Syiemiong, Department of Botany, St. Edmund's College, Shillong
⇒ Mr Dipankar Debnath, Department of Computer Applications, St. Mary's College, Shillong
⇒ Ms Priya Paul, Technical Assistant, St. Edmund's College, Shillong
⇒ Mr Erwein Khshiar, Lab Attendant, Dept of Biotechnology, St. Edmund's College, Shillong
⇒ All the students of Biotechnology 5th semester students.

****

1. **Title of the Course:**

   Certificate Course in Bioinformatics (Level O)

2. **Course Code No:**

   SEC/BT-BC/CC/2020-21/001

3. **Total Contact Hours:**

   36 hrs

4. **Total Credits:**

   1.7

5. **Date of Approval**

   5th February 2021

5. **Opening of registration process:**

   10th February 2021

6. **Closing of Registration Process:**

   24th February 2021

7. **Mode of Registration:**

   Online

8. **Weblink for Registration:**

   https://docs.google.com/forms/d/1izCFBeNJH1mBEaTxF1MvhXU8DYMDtpNbFewd9utWrjI/edit?usp=sharing

9. **Date for Commencement of the Course:**

   2nd March 2021

10. **Closing of the course:**

    22nd March 2021

11. **Duration:**

    21 Days

12. **Total No of Students Enrolled:**

    25 UG Students

13. **Registration Fees:**

    ₹ 500/- (Five Hundred only)

14. **Total Registration Fees Collected:**

    ₹ 12500/- (Twelve thousand & Five hundred only

15. Course Coordinator:

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

Prof Sumit Deb, Head, Department of Chemistry
St. Edmund's College, Shillong

16. Teachers Involved:

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

Dr Sunil Sharma, Department of Biotechnology
St. Edmund's College, Shillong

Mr Yogesh Negi, Department of Biotechnology
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

Ms Sarmistha Deb, Head, Department of Computer Applications
St. Edmund's College, Shillong

Ms Sunila S Chanu, Department of Computer Applications
St. Edmund's College, Shillong

Dr Debulman Syiemiong, Department of Botany
St. Edmund's College, Shillong

Mr Dipankar DebNath, Department of Computer Science
St. Mary's College, Shillong

Course description

Recent advancements in the mundane field of Biotechnology have generated various products for the benefit of mankind with the exploitation of natural resources. These products have been successfully implemented with the entrance of information technology in Biotechnology known as Bioinformatics. Bioinformatics combines all the processes of Biotechnology consequently it has a larger impact in development of such products in the market.

With the importance of wider application in the field of Bioinformatics there is a need to improve the Human Resource. In this context the present certificate course is proposed to generate ample job opportunities and also at the same time it will enhance student knowledge in pursuing higher studies.

Course structure

The certificate course syllabus proposed is of 36 contact hours with three units (Module 1, Module 2 & Module 3) comprising of 12 contact hours each. Each of these contact hours has course on fundamentals of computers, databases available for exploring and also basic bioinformatics tools. Furthermore, each of the units will have assessment period of 2 hour and finally at the end appropriate feedback will also be implemented.

Module	Code	Name of the Paper	Contact Hours			TOTAL
			Theory	Practical	Assessments	
I	BICC01	Computer Informatics	7 hrs	3 hrs	2 hrs	12
II	BICC02	Introduction to Databases	4 hrs	6 hrs	2 hrs	12
III	BICC03	Introduction to Bioinformatics	4 hrs	5 hrs	2 hrs	12
					TOTAL	36

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 assessments.

Marks	Final Grade
90-100	A^+
80-90	A
70-80	B+
60-70	B
50-60	C^+
50-60	C
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.

List of Students Registered for the Certificate Course

Sl No	Student ID	Name	Semester	Subject
1	18/BIOT/402	Ha U Mi Dewan Mukhim	V	Biotechnology
2	18/BIOT/403	Saurav Thapa	V	Biotechnology
3	18/BIOT/404	Srishti Chettri	V	Biotechnology
4	18/BIOT/406	Ilawandashisha Laso	V	Biotechnology
5	18/BIOT/408	Madhumita Paul	V	Biotechnology
6	18/BIOT/409	Daiarisa Kmen Lyngskor	V	Biotechnology
7	18/BIOT/411	SWEETY CHANDA	V	Biotechnology
8	18/BIOT/412	Happy Khanam	V	Biotechnology
9	18/BIOT/414	Eunica Pyntngen Tohtih	V	Biotechnology
10	18/BIOT/419	Riki Oo Lyngdoh	V	Biotechnology
11	18/BIOT/423	Payelinaa Sanyal	V	Biotechnology
12	18/BIOT/424	Malsawmkimi	V	Biotechnology
13	18/BIOT/434	Mariam Rahman	V	Biotechnology
14	18/BIOT/441	Rikiroplang Pyngrope	V	Biotechnology
15	18/BIOT/442	Manisha Limboo	V	Biotechnology
16	19/BIOT/431	Darshana Sarma	III	Biotechnology
17	19/BIOT/401	Akash Deep Paul	III	Biotechnology
18	19/BIOT/414	Proshila Rai	III	Biotechnology
19	19/BIOT/416	Shabnam Barbhuiya	III	Biotechnology
20	19/BIOT/425	Sinhenba Chirom	III	Biotechnology
21	19/BIOT/428	Arjit Kumar Das	III	Biotechnology
22	19/BIOT/427	Riyas Reang	III	Biotechnology
23	19/BIOT/418	Soumyarupa Sarma	III	Biotechnology
24	19/BIOT/432	Abhishek Borkakati	III	Biotechnology
25	19/BIOT/405	Geeta Chader	III	Biotechnology

Attendance

Sl No	Student ID	Name	Semester	Total Hours	Attended	Attendance
1	18/BIOT/402	Ha U Mi Dewan Mukhim	V	36	36	100 %
2	18/BIOT/403	Saurav Thapa	V	36	36	100 %
3	18/BIOT/404	Srishti Chettri	V	36	36	100 %
4	18/BIOT/406	Ilawandashisha Laso	V	36	36	100 %
5	18/BIOT/408	Madhumita Paul	V	36	36	100 %
6	18/BIOT/409	Daiarisa Kmen Lyngskor	V	36	36	100 %
7	18/BIOT/411	SWEETY CHANDA	V	36	36	100 %
8	18/BIOT/412	Happy Khanam	V	36	36	100 %
9	18/BIOT/414	Eunica Pyntngen Tohtih	V	36	36	100 %
10	18/BIOT/419	Riki Oo Lyngdoh	V	36	36	100 %
11	18/BIOT/423	Payelinaa Sanyal	V	36	36	100 %
12	18/BIOT/424	Malsawmkimi	V	36	36	100 %
13	18/BIOT/434	Mariam Rahman	V	36	36	100 %
14	18/BIOT/441	Rikiroplang Pyngrope	V	36	36	100 %
15	18/BIOT/442	Manisha Limboo	V	36	36	100 %
16	19/BIOT/431	Darshana Sarma	III	36	36	100 %
17	19/BIOT/401	Akash Deep Paul	III	36	36	100 %
18	19/BIOT/414	Proshila Rai	III	36	36	100 %
19	19/BIOT/416	Shabnam Barbhuiya	III	36	36	100 %
20	19/BIOT/425	Sinhenba Chirom	III	36	36	100 %
21	19/BIOT/428	Arjit Kumar Das	III	36	36	100 %
22	19/BIOT/427	Riyas Reang	III	36	36	100 %
23	19/BIOT/418	Soumyarupa Sarma	III	36	36	100 %
24	19/BIOT/432	Abhishek Borkakati	III	36	36	100 %
25	19/BIOT/405	Geeta Chader	III	36	36	100 %

Syllabus Coverage					
Sl.no	**Date**	**Contact Hours**	**Module**	**Topic Name**	**Topic Description**
1	07-03-2021	2.0	BCC01	Examination - MCQ Based	covered by Dr. Samrat Adhikari
2	06-03-2021	0.5	BCC01	Free and open-source software (FOSS)	covered by Dr. Samrat Adhikari
3	06-03-2021	0.5	BCC01	LAN connections, setting up the IP address, network security	covered by Dr. Samrat Adhikari
4	06-03-2021	0.5	BCC01	Internet surfing and searching information, downloading and installing software	covered by Dr. Samrat Adhikari
5	05-03-2021	0.6	BCC01	Basic architecture of Operating System	covered by Prof. S. Sunila Chanu
6	05-03-2021	0.4	BCC01	Intellectual property rights (IPR)	covered by Prof. Shekinah Challam
7	05-03-2021	1.0	BCC01	Plagiarism, licensing and copyright	covered by Prof. Shekinah Challam
8	04-03-2021	1.0	BCC01	Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP	covered by Prof. D. Debnath
9	04-03-2021	1.0	BCC01	Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies	covered by Prof. D. Debnath
10	03-03-2021	1.0	BCC01	Introduction to network: LAN, MAN, WAN	covered by Prof. D. Debnath
11	03-03-2021	1.0	BCC01	Network Devices: modem, hub, switch, repeater, router, gateway\\\\nNetwork Topologies: Star, Bus, Tree, Mesh	covered by Prof. D. Debnath
12	02-03-2021	0.5	BCC01	Introduction to BIO LINUX and its features	covered by Dr. Samrat Adhikari
13	02-03-2021	0.5	BCC01	Mainframe & Mini Frame- computers, CPU & GPU based system	covered by Dr. Samrat Adhikari
14	02-03-2021	0.5	BCC01	Computer basic knowledge; hardware, connection cables	covered by Dr. Samrat Adhikari
15	02-03-2021	0.5	BCC01	Bio Linux Demonstration, Internet browsers, search engines	covered by Dr. Samrat Adhikar
1	14-03-2021	2.0	BCC02	Examination	covered by Dr. Samrat Adhikari
2	13-03-2021	1.5	BCC02	Getting the gene sequences by exploring and querying the nucleic acid databases	covered by Shri. Yogesh Negi
3	12-03-2021	1.5	BCC02	Genome information and special features	covered by Prof. Koben J Nongkynrih
4	12-03-2021	0.5	BCC02	Analysis of curated databases with example - Primary, Secondary and Composite databases	covered by Shri. Yogesh Negi
5	11-03-2021	1.0	BCC02	Various types of databases	covered by Prof. S Sunila Chanu
6	11-03-2021	1.0	BCC02	Different types of databases and their applications	covered by Shri. Yogesh Negi

Syllabus Coverage					
Sl.no	**Date**	**Contact Hours**	**Module**	**Topic Name**	**Topic Description**
7	10-03-2021	1.0	BCC02	Introduction to My SQL for creation of database	covered by Prof. Sarmistha Deb
8	09-03-2021	1.0	BCC02	Concept of data, data models, data representation	covered by Prof. S Sunila Chanu
9	09-03-2021	0.5	BCC02	Database Management System (DBMS)	covered by Prof. Sarmistha Deb
10	08-03-2021	0.5	BCC02	Biological Databases	covered by Shri. Yogesh Negi
11	08-03-2021	0.5	BCC02	Biological Data mining	covered by Shri. Yogesh Negi
12	08-03-2021	1.0	BCC02	Related programs; Oracle, SQL, VB	covered by Dr. Samrat Adhikari
1	21-03-2021	2.0	BCC02	Examination	covered by Dr. Samrat Adhikari
2	20-03-2021	0.5	BCC02	Data retrieval from Bioinformatics resources	covered by Dr. Sunil Sharma
3	20-03-2021	0.5	BCC02	Sequence alignment	covered by Dr. Sunil Sharma
4	20-03-2021	1.0	BCC02	Sequence similarity search using BLAST algorithm	covered by Dr. Sunil Sharma
5	19-03-2021	1.0	BCC02	Introduction to different file formats used in Bioinformatics - Fasta, FastQ, Nexus, Aln	covered by Dr. Sunil Sharma
6	19-03-2021	1.0	BCC02	Exploring and understanding various features available in NCBI	covered by Prof. Debulman Syiemiong
7	18-03-2021	1.0	BCC02	BLAST and psiBLAST, application of BLAST algorithm as a tool	covered by Dr. Sunil Sharma
8	18-03-2021	1.0	BCC02	Sequence alignment, sequence identity, similarity and homology	covered by Dr. Sunil Sharma
9	17-03-2021	0.5	BCC02	Introduction to NCBI website- history and applications	covered by Prof. Debulman Syiemiong
10	16-03-2021	1.0	BCC02	Multiple sequence alignment	covered by Dr. Sunil Sharma
11	16-03-2021	1.0	BCC02	Introduction to various alignment tools	covered by Dr. Sunil Sharma
12	15-03-2021	0.5	BCC02	Definition and Scope of Bioinformatics	covered by Prof. Debulman Syiemiong
13	15-03-2021	0.5	BCC02	Major resources for Bioinformatics (NCBI, EBI, DDBJ, ENA)	covered by Prof. Debulman Syiemiong
	Total Hrs	36.0			
Complete Compilation done by Dr Samrat Adhikari, Course Coordinator					

RESULTS

The examination (online mode) was conducted for the modules BCC01, BCC02 & BCC03 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.

Sl	Enrollment No	Name	BCC01	BCC02	BCC03	Total	% of Marks	Grades	Attainment Level
			100	100	100	300			
1	18/BIOT/402	Ha U Mi Dewan Mukhim	76	72	88	236	79	B+	2
2	18/BIOT/403	Saurav Thapa	90	84	84	258	86	A	3
3	18/BIOT/404	Srishti Chettri	74	76	79	229	76	B+	2
4	18/BIOT/406	Ilawandashisha Laso	86	88	98	272	91	A+	3
5	18/BIOT/408	Madhumita Paul	90	86	96	272	91	A+	3
6	18/BIOT/409	Daiarisa Kmen Lyngskor	86	88	98	272	91	A+	3
7	18/BIOT/411	Sweety Chanda	90	84	96	270	90	A+	3
8	18/BIOT/412	Happy Khanam	90	84	96	270	90	A+	3
9	18/BIOT/414	Eunica Pyntngen Tohtih	78	88	98	264	88	A	3
10	18/BIOT/419	Riki Oo Lyngdoh	78	72	88	238	79	B+	3
11	18/BIOT/423	Payelinaa Sanyal	82	88	87	257	86	A	3
12	18/BIOT/424	Malsawmkimi	86	88	98	272	91	A+	3
13	18/BIOT/434	Mariam Rahman	72	84	92	248	83	A	3
14	18/BIOT/441	Rikiroplang Pyngrope	72	88	94	254	85	A	3
15	18/BIOT/442	Manisha Limboo	86	88	96	270	90	A+	3
16	19/BIOT/401	Akash Deep Paul	82	80	94	256	85	A	3
17	19/BIOT/405	Geeta Chader	82	82	90	254	85	A	3
18	19/BIOT/414	Proshila Rai	82	78	90	250	83	A	3
19	19/BIOT/416	Shabnam Barbhuiya	80	86	86	252	84	A	3
20	19/BIOT/418	Soumyarupa Sarma	82	80	90	252	84	A	3
21	19/BIOT/425	Sinhenba Chirom	84	74	82	240	80	A	3
22	19/BIOT/427	Riyas Reang	82	86	88	256	85	A	3
23	19/BIOT/428	Arjit Kumar Das	82	74	92	248	83	A	3
24	19/BIOT/431	Darshana Sarma	78	64	94	236	79	B+	2
25	19/BIOT/432	Abhishek Borkakati	80	84	72	236	79	B+	2

(Course Coordinator)

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 in order 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 Outomces (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 Outomces (POs)

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

PO1 **Problem solving**: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, and apply one's learning to real life situations

PO2 **Analytical reasoning**: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with

PO3 **Scientific reasoning**: Ability to analyze, interpret and draw conclusions from quantitative/qualitative

data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective

PO3 **Research-related skills**: A sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.

PO4 **Information/digital literacy**: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. .

PO5 **Ethics & Social Responsibility**: Ability to embrace moral/ethical values in conducting one‟s life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one‟s work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

Course Outcome Certificate Course (Level O)- Module 1

At the end of the BCC01 module of certificate course the students will be able to	
CC01	**Cognitive Knowledge**: To provide education that leads to comprehensive understanding of computer applications in Biotechnology & bioinformatics related allied subjects
CC02	**Information and Computer Literacy**: To educate and make them up to date with the current scientific literature, basic based web information
CC03	**Compare & Contrast:** Difference between various attributes of technical skills and their effective implementation
CC04	**Critical Thinking & Analyze**: To ensure students are able to effectively communication of network related information, analyze different operating system etc.
CC05	**Professional Attitude**: To produce responsible biotechnologists that can work within the interdisciplinary framework of bioinformatics and related fields

Course Outcome Certificate Course (Level O)- Module 2

At the end of the BCC03 module of certificate course the students will be able to	
CC01	**Cognitive Knowledge**: To provide education that leads to comprehensive understanding of the databases management system used in Bioinformatics research
CC02	**Information and Computer Literacy**: To educate and make them acquainted with the current scientific literature, computer programs like MY SQL, Oracle etc.
CC03	**Critical Thinking:** To empower students with the ability to think and solve problems by the use of computer base programs
CC04	**Scientific Communication**: To understand the various databases of biological origin and their applications in research in the field of biotechnology & bioinformatics.
CC05	**Professional Attitude**: To produce responsible biotechnologists that can work within the interdisciplinary framework of bioinformatics and related fields

Course Outcome Certificate Course (Level O)- Module 3

At the end of the BCC03 module of certificate course the students will be able to	
CC01	**Cognitive Knowledge**: To provide the knowledge of biological web networks & freeware's computer algorithms to solve biological problems.
CC02	**Information and Computer Literacy**: To educate and make them up to date with the current scientific literature, computer programs and web information related to bioinformatics
CC03	**Analyze & implement:** To make students acquainted with various databases features and their special application for particular problem to solve data involving bioresources
CC04	**Scientific Communication**: To ensure students are able to effectively communicate with professionals and a articulate themselves for effective scientific temperament
CC05	**Professional Attitude**: To produce responsible biotechnologists that can work within the interdisciplinary framework of bioinformatics and related fields

Attainment level for Certificate Course (Level O)

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 60 % marks in assessments for Certificate course (level O)	1
Student securing below 59% will be allowed for a retest for improving the performances.	

CO-PO Mapping for Certificate Course (Level O)- Module 1

BCC01	PO1	PO2	PO3	PO4	PO5
CC01	2	3	2	1	2
CC02	3	2	1	2	1
CC03	2	1	2	3	2
CC04	1	2	2	2	3
CC05	3	3	1	3	2

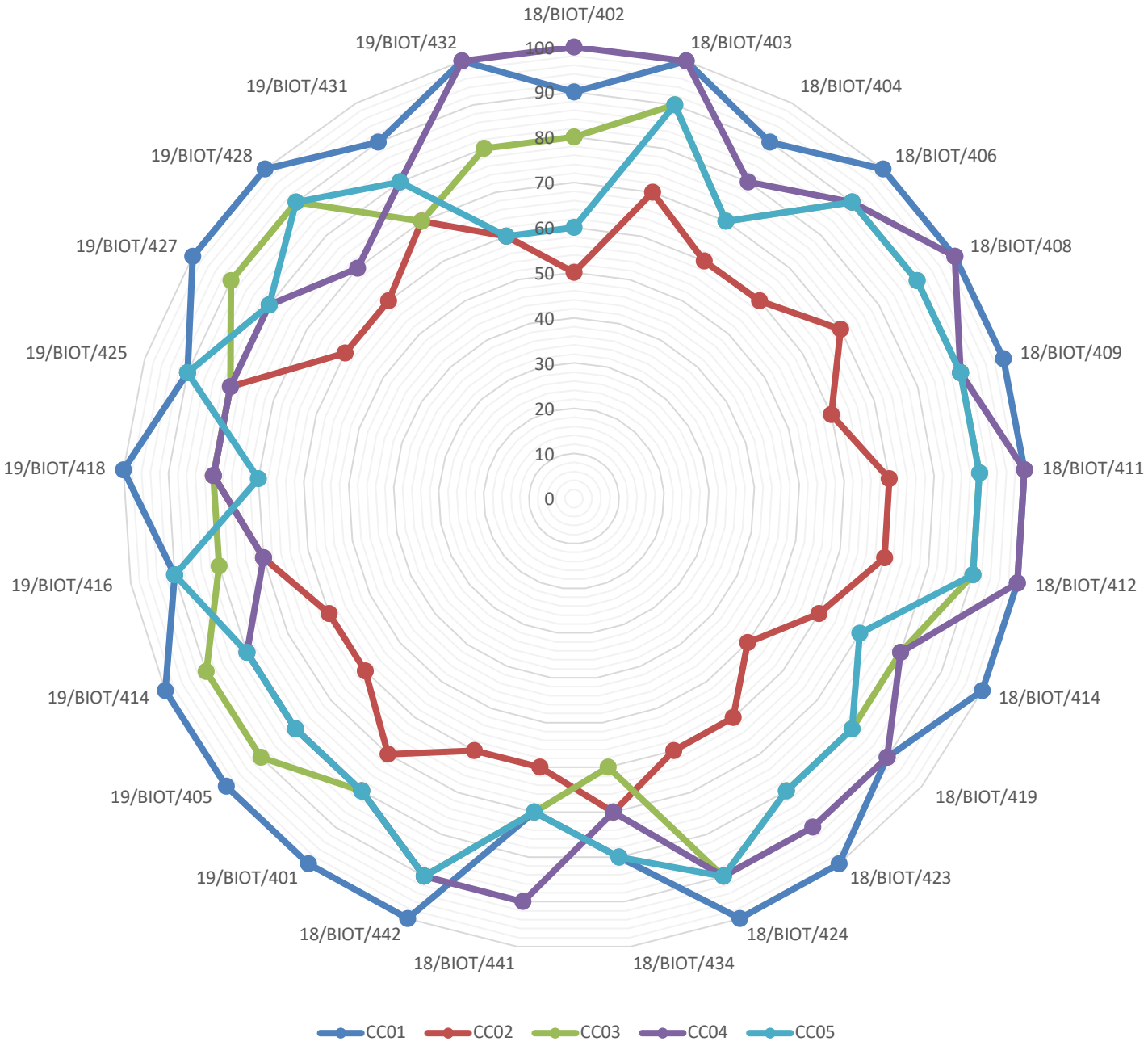
CO-PO Mapping for Certificate Course (Level O)- Module 2

BCC02	PO1	PO2	PO3	PO4	PO5
CC01	3	2	1	1	1
CC02	2	2	1	3	2
CC03	1	3	3	2	1
CC04	2	3	3	1	1
CC05	1	2	1	2	3

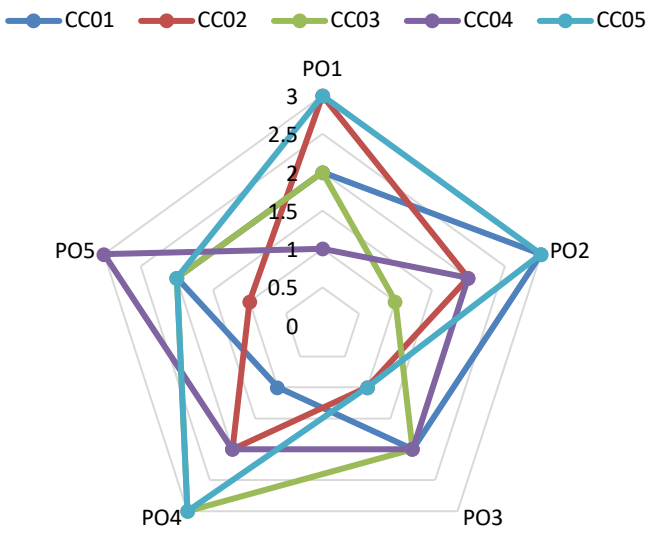
CO-PO Mapping for Certificate Course (Level O)- Module 3

BCC03	PO1	PO2	PO3	PO4	PO5
CC01	3	2	3	2	3
CC02	2	1	3	3	2
CC03	3	2	3	3	1
CC04	3	3	1	3	2
CC05	2	1	2	3	3

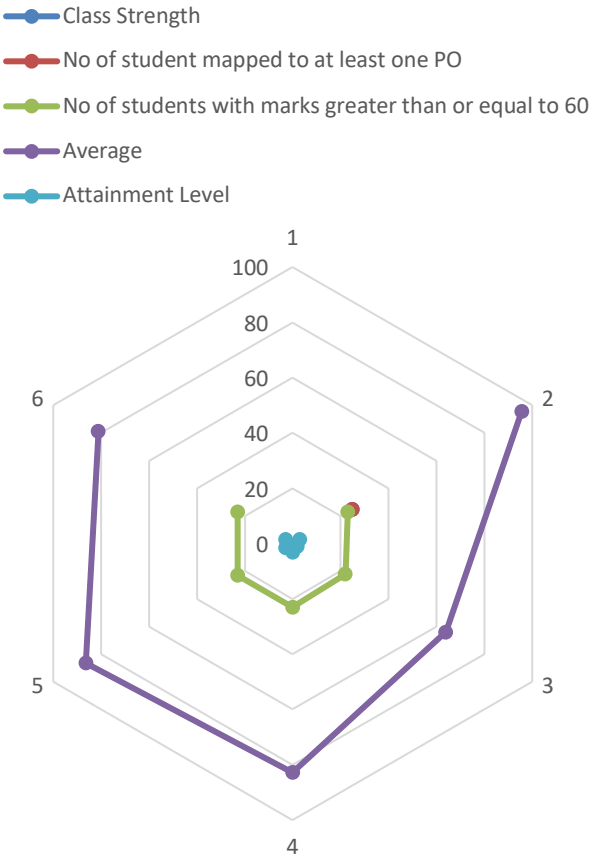
Learning Outcome for BCC01 (Module-1)



LEGEND 1: *The Graph depicts the course outcome (CC01, CC02, CC03, CC04 & CC05) with the Percentage of Marks secured in the Examination of BCC01 (Module 1). The data are represented in percentage and plotted using Excel software.*

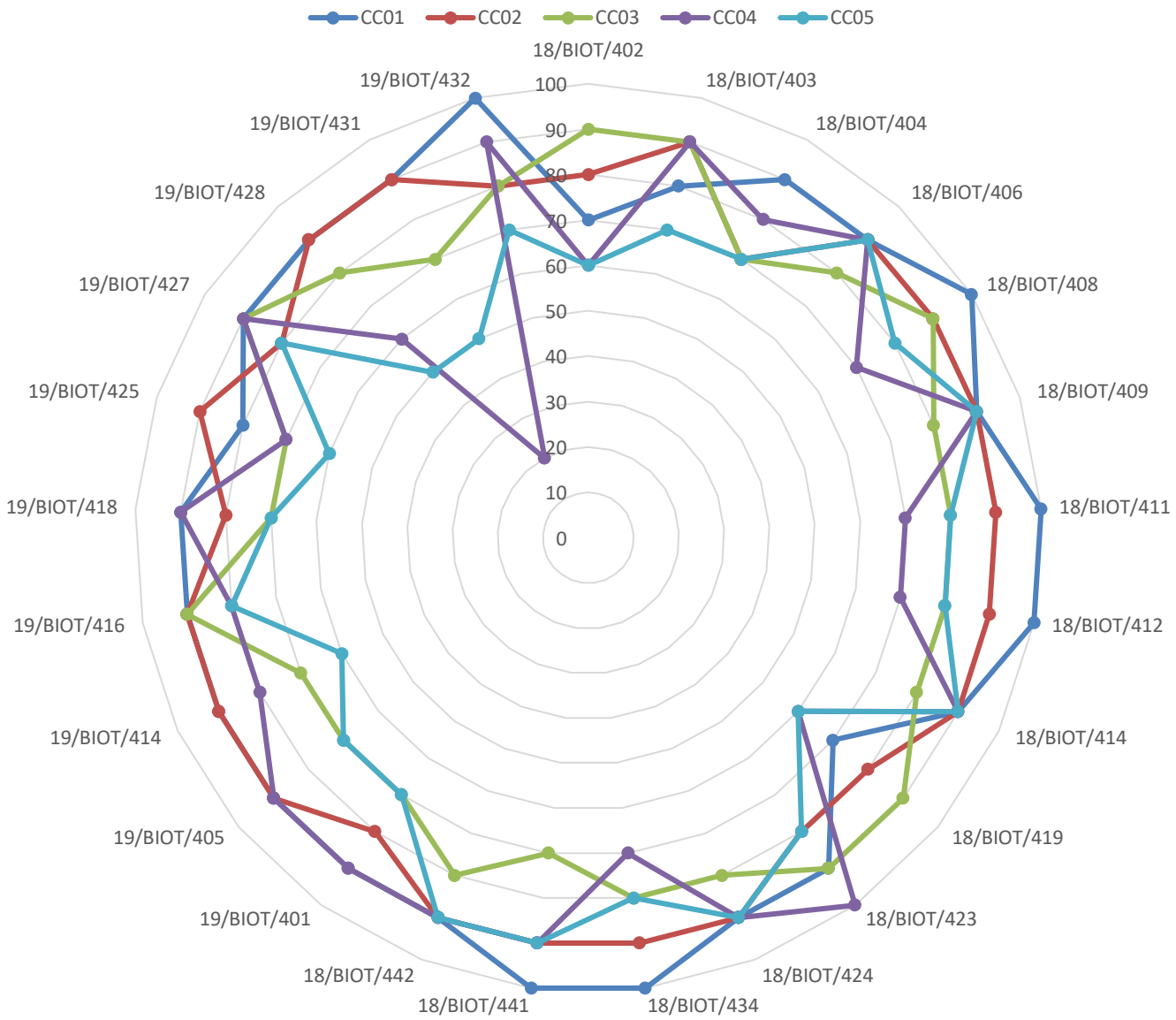


LEGEND 2:
Programme Outcome (PO) -Course Outcome (CO) mapping of the BCC01 module.

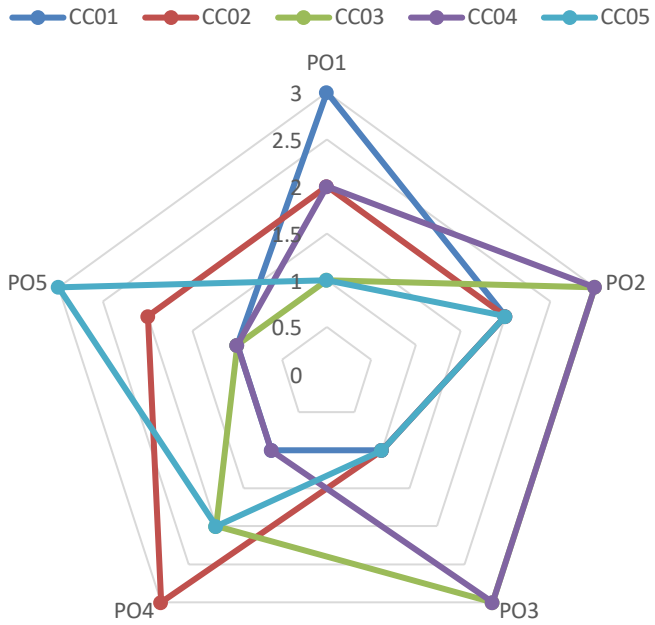


LEGEND 3:
Average Attainment Level of the students in BCC01 module.

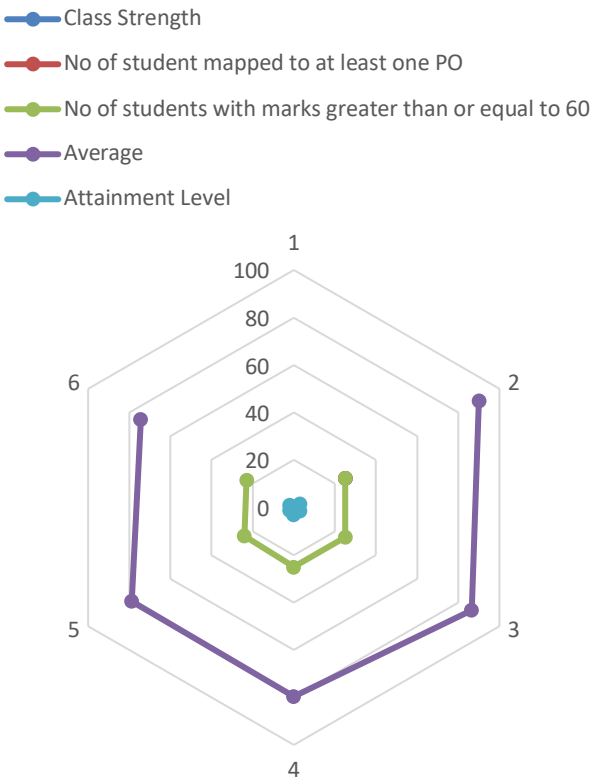
Learning Outcome for BCC02 (Module-2)



LEGEND 4: *The Graph depicts the course outcome (CC01, CC02, CC03, CC04 & CC05) with the Percentage of Marks secured in the Examination of BCC02 (Module 2). The data are represented in percentage and plotted using Excel software.*

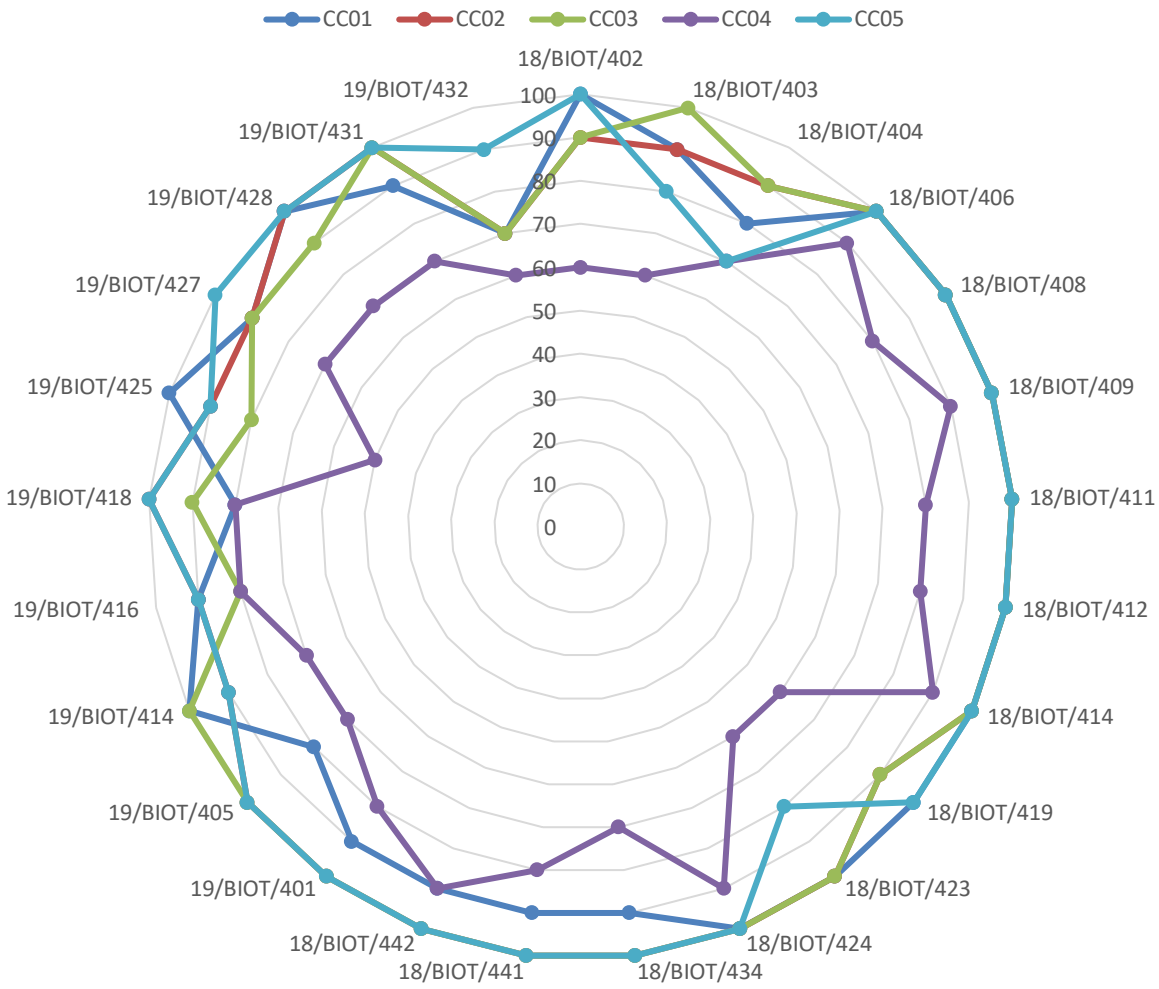


LEGEND 5:
Programme Outcome (PO) -Course Outcome (CO) mapping of the BCC02 module.

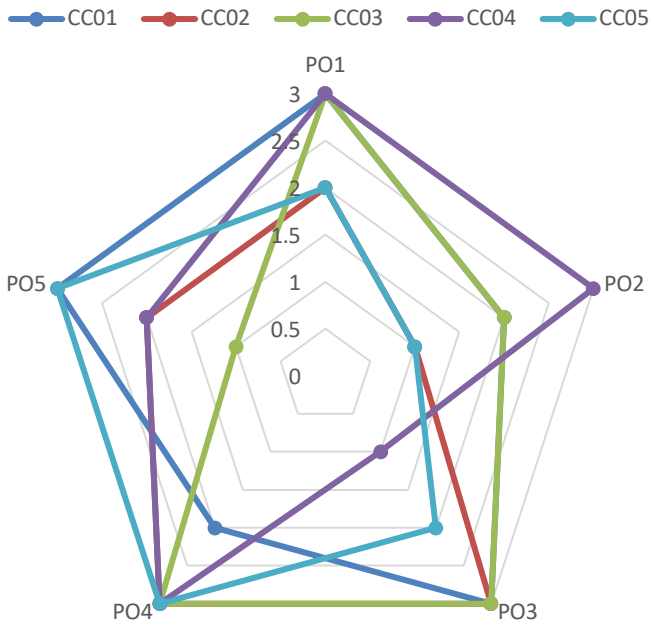


LEGEND 6:
Average Attainment Level of the students in BCC02 module.

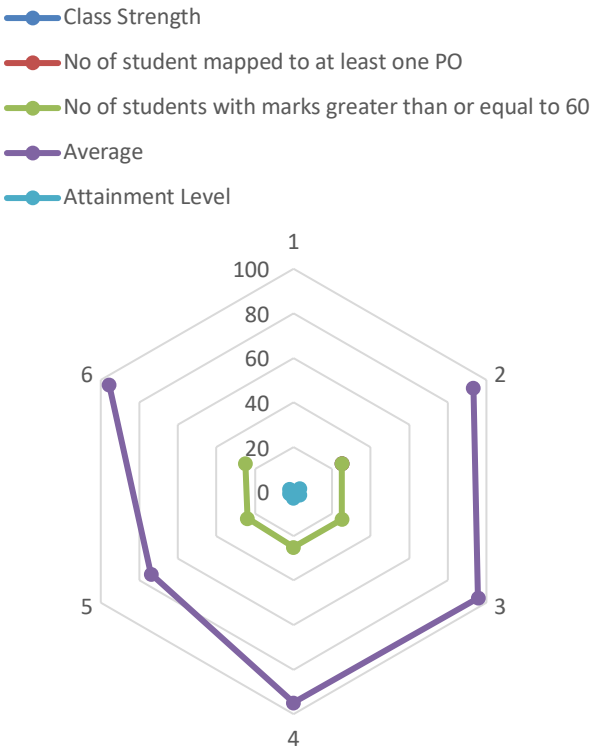
Learning Outcome for BCC02 (Module-3)



LEGEND 7: *The Graph depicts the course outcome (CC01, CC02, CC03, CC04 & CC05) with the Percentage of Marks secured in the Examination of BCC03 (Module 3). The data are represented in percentage and plotted using Excel software.*

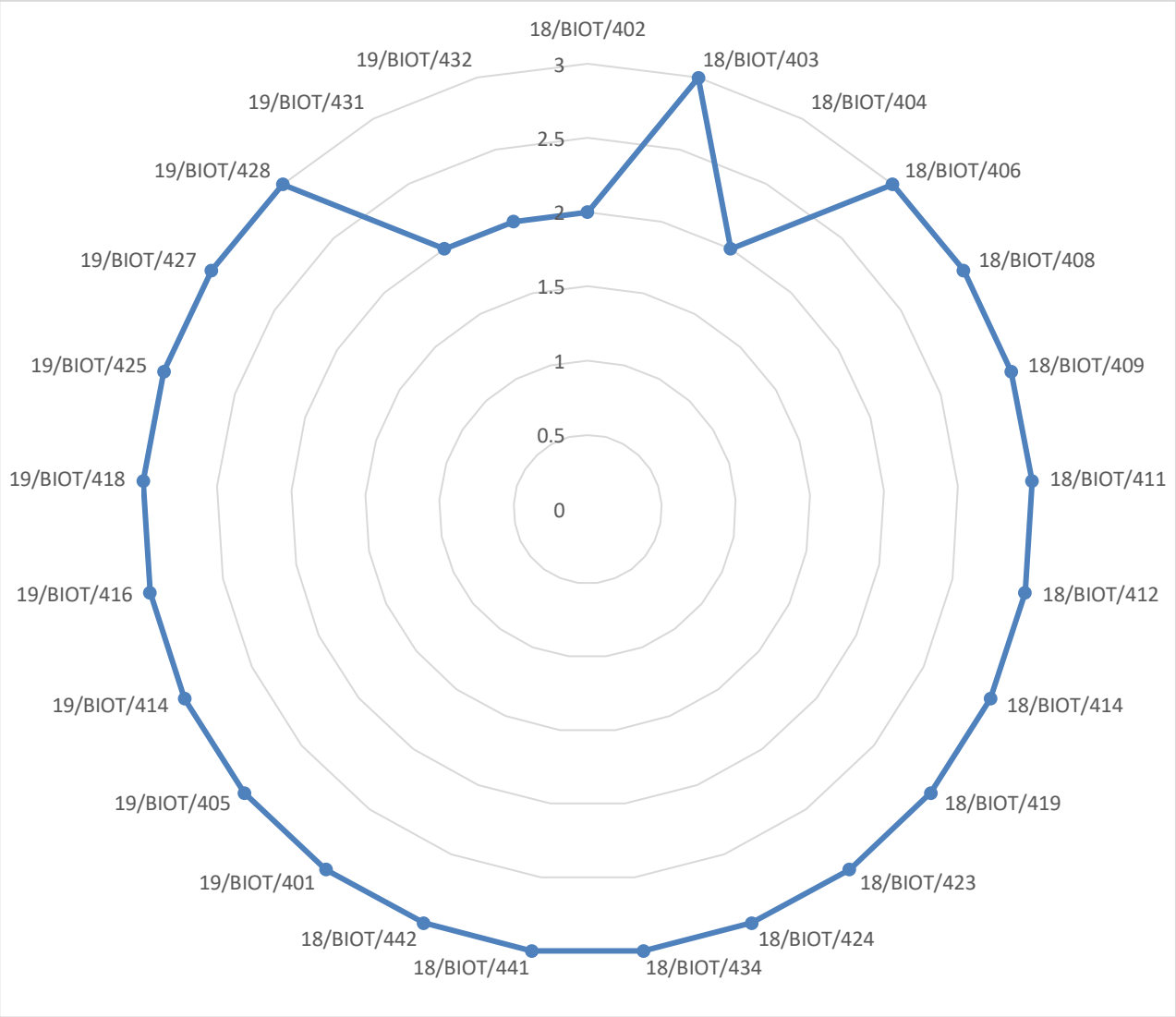


LEGEND 8:
Programme Outcome (PO) -Course Outcome (CO) mapping of the BCC03 module.



LEGEND 9:
Average Attainment Level of the students in BCC03 module.

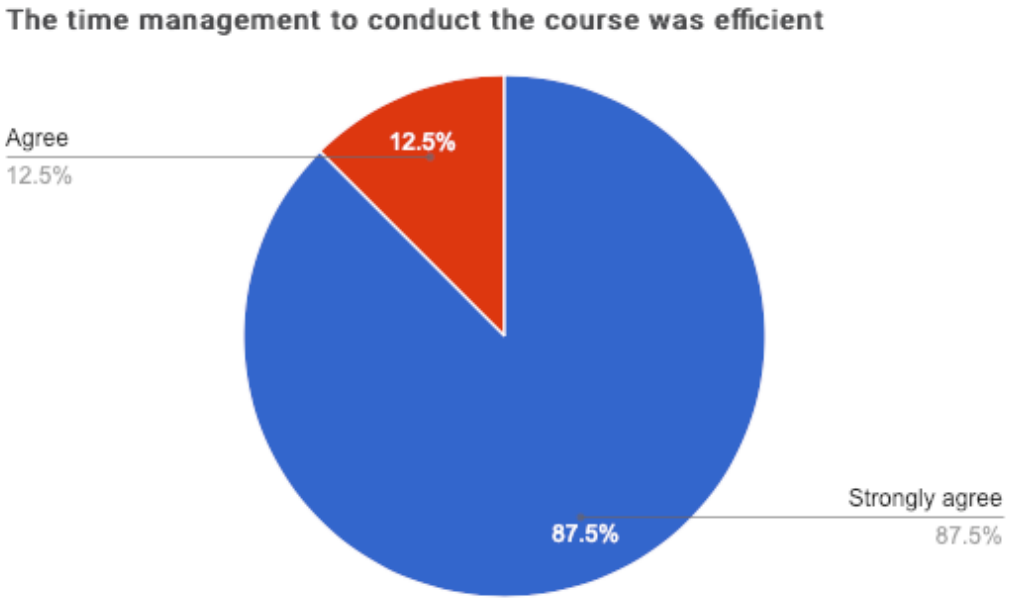
Average Attainment level of the 3 modules – BCC01, BCC02 & BCC03

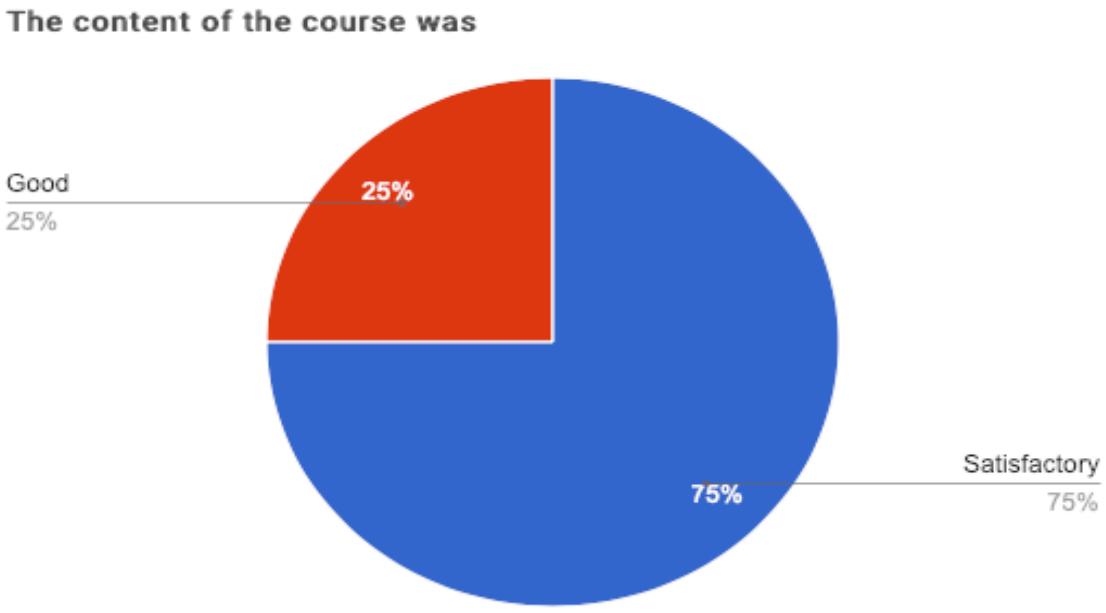


LEGEND 10: *The Graph depicts the average attainment level of the 3 modules with the corresponding CO-PO mapping. The data are represented in percentage and plotted using Excel software.*

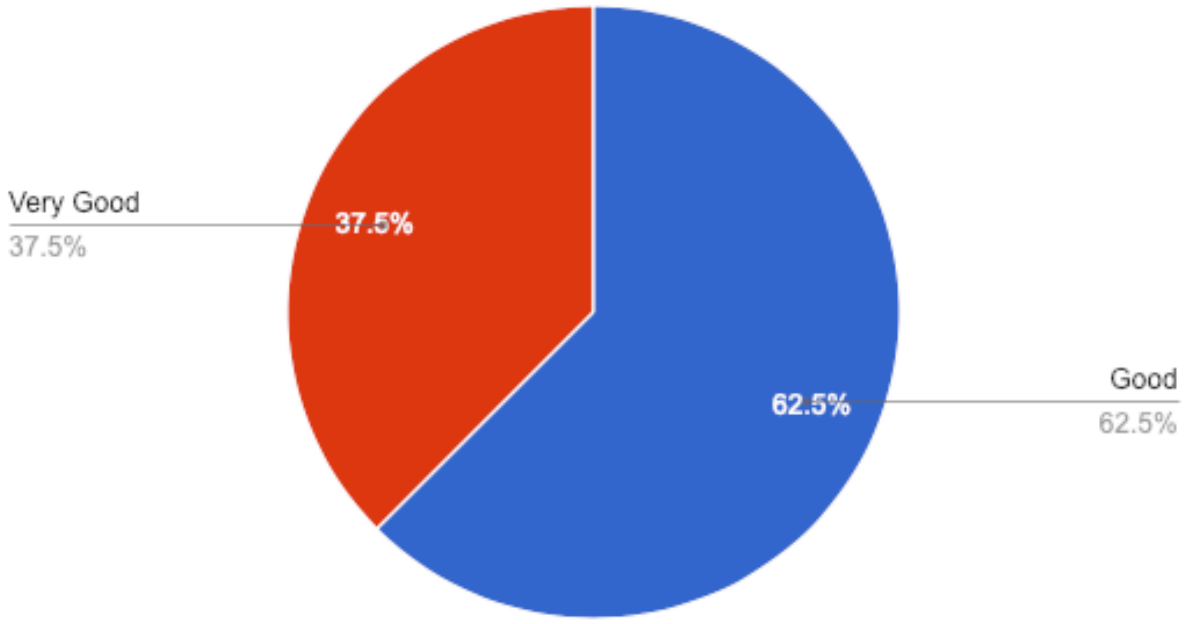
Feedback of Guest Faculty

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.

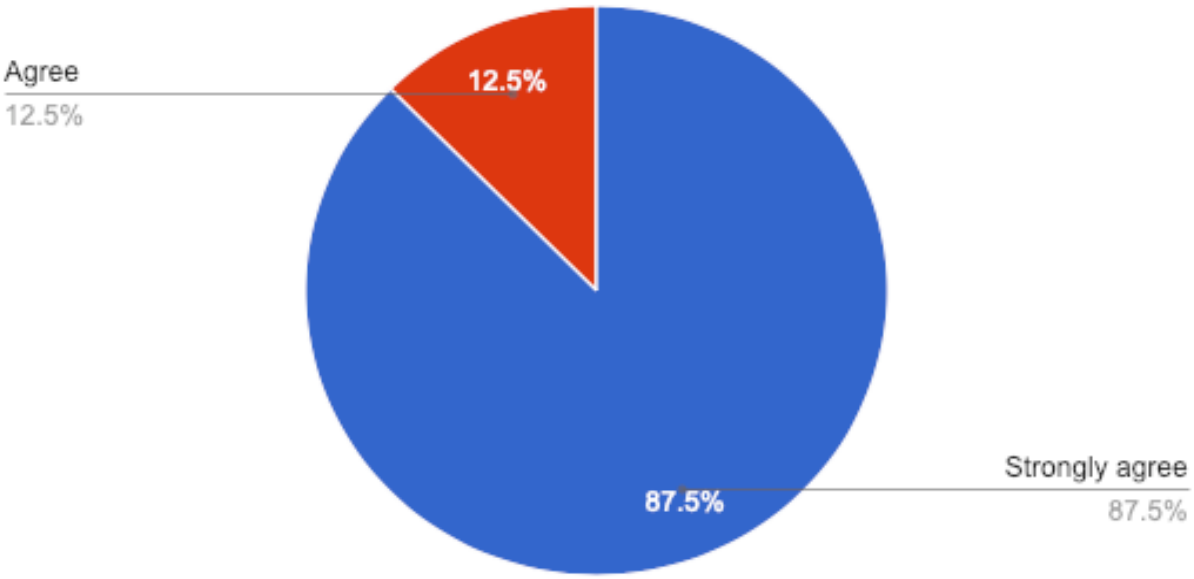


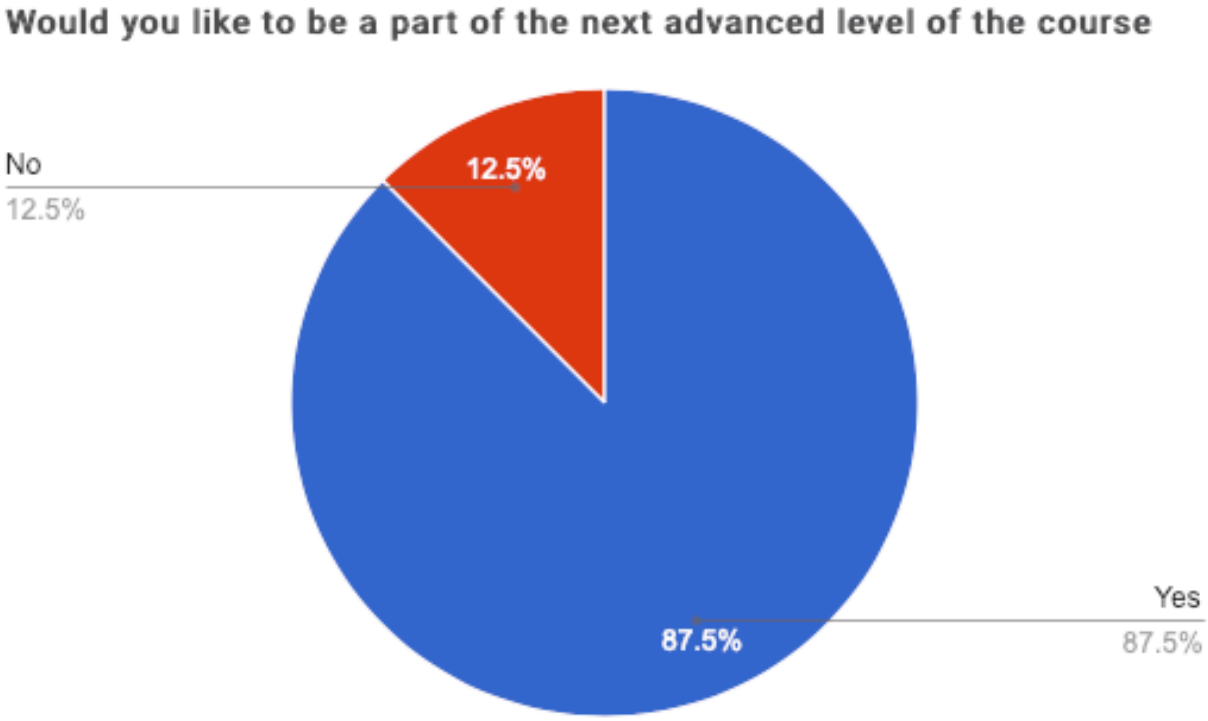


The response from the Learners during lecture/interactive session were



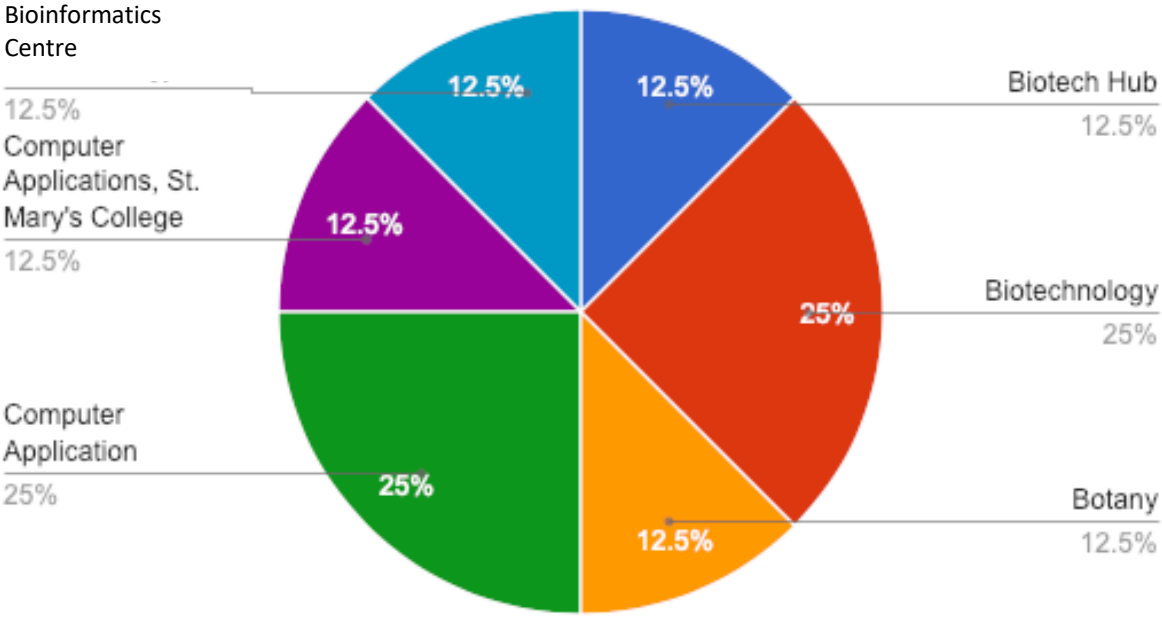
The Learning Management System (LMS) software used for running the course is up to date





Suggestion(s) if any,

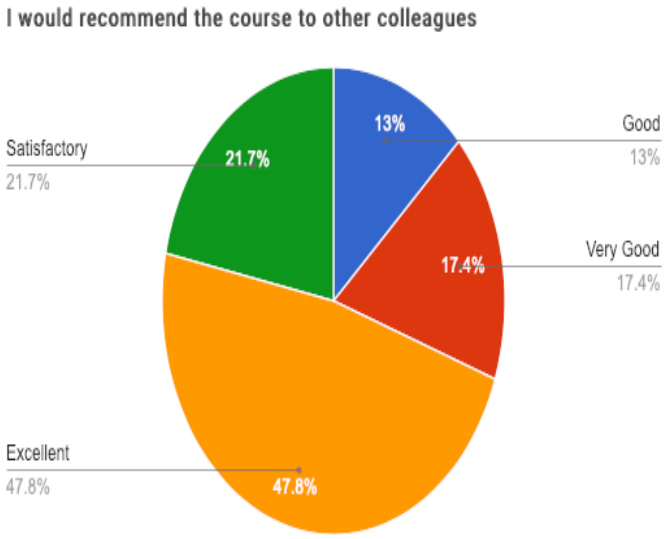
Department

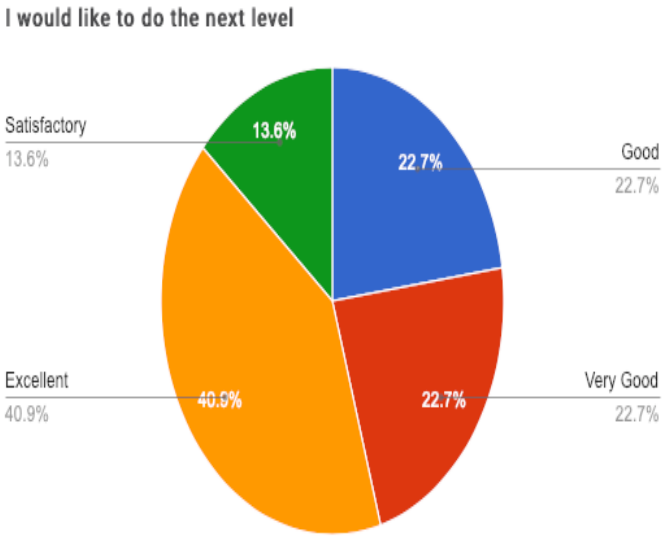


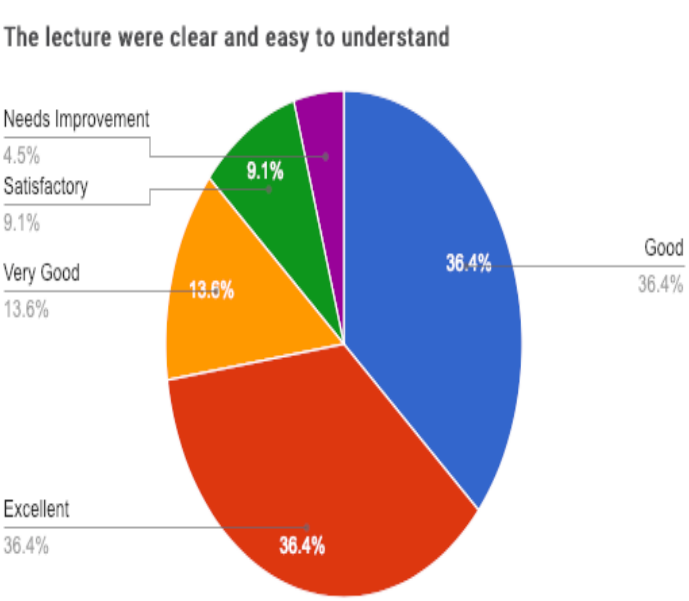
Name

Feedback of Participants

The Feedback form was designed with inputs from the IQAC cell for the participants using google forms (https://forms.gle/3eif11WqvZ14RzWz7) and was responded by 25 participants. The analysis is depicted below.

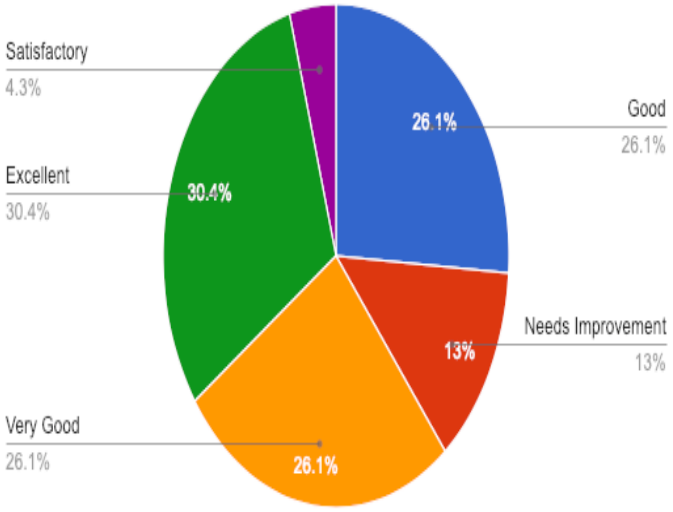




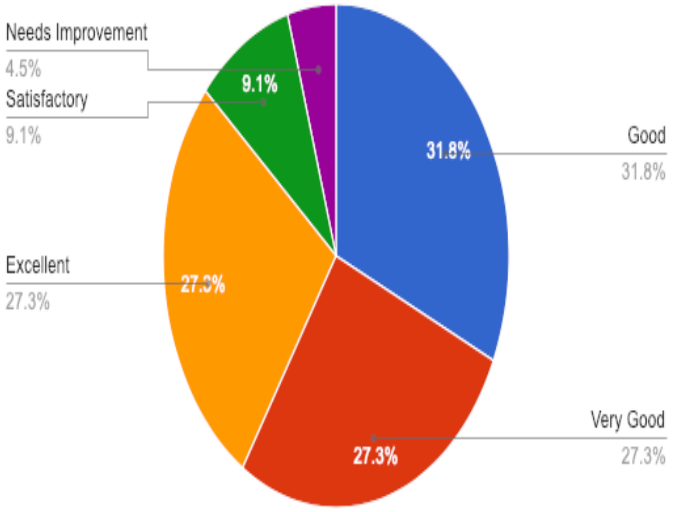


The online teaching aids were used effectively	Top results
Good	8
Excellent	7
Very Good	4
Satisfactory	3
Needs Improvement	2

The Learning Management System (LMS) was easy to use

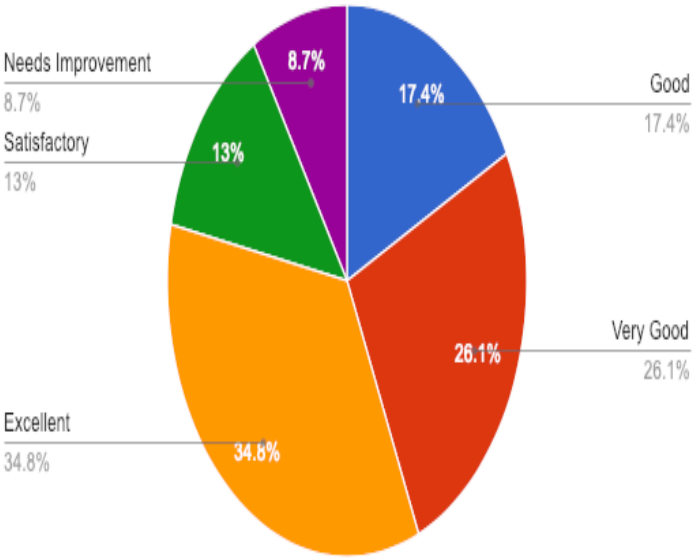


The instructor encouraged interaction and was helpful

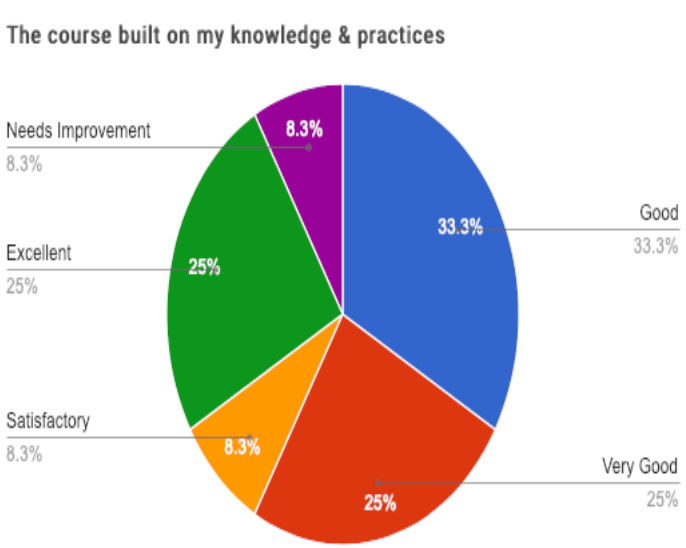


The objective of the course clear to me	Top results
Good	8
Very Good	7
Excellent	5
Satisfactory	3
Needs Improvement	2

The course content met with my expectation



The lectures/videos were well planned	Top results
Excellent	9
Good	6
Satisfactory	4
Very Good	3
Needs Improvement	2



New Concepts…

Suggestion (s)

TEACHING HOURS BY FACULTY

Dates	Time	Mode	Samrat Adhikari	D Debnath	S Sunila Chanu	Sarmista Deb	Yogesh Negi	Shekinah Challam	Koben Nongkynrih	Debulman Syiemiong	Sunil Sharma	Contact Hours
2nd March	5:00 - 5:30 PM	Lecture	0.5	-	-	-	-	-	-	-	-	0.5
	5:30 - 6:00 PM	Lecture	0.5	-	-	-	-	-	-	-	-	0.5
	6:00 - 6:30 PM	Practical	0.5	-	-	-	-	-	-	-	-	0.5
	6:30 - 7:00 PM	Practical	0.5	-	-	-	-	-	-	-	-	0.5
3rd March	5:00 - 6:00 PM	Lecture	-	1	-	-	-	-	-	-	-	1
	6:00 - 7:00 PM	Lecture	-	1	-	-	-	-	-	-	-	1
4th March	5:00 - 6:00 PM	Lecture	-	1	-	-	-	-	-	-	-	1
	6:00 - 7:00 PM	Lecture	-	1	-	-	-	-	-	-	-	1
5th March	5:00 - 6:00 PM	Lecture	-	-	1	-	-	-	-	-	-	1
	6:00 - 6:20 PM	Lecture	-	-	-	-	-	0.4	-	-	-	0.4
	6:20 - 7:00 PM	Lecture	-	-	-	-	-	0.6	-	-	-	0.6
6th March	5:00 - 5:30 PM	Lecture	0.5	-	-	-	-	-	-	-	-	0.5
	5:30 - 6:00 PM	Practical	0.5	-	-	-	-	-	-	-	-	0.5
	6:00 - 7:00 PM	Lecture	0.5	-	-	-	-	-	-	-	-	0.5
7th March	5:00 - 7:00 PM	EXAM	2	-	-	-	-	-	-	-	-	2
8th March	5:00 - 6:00 PM	Lecture	-	-	-	-	1	-	-	-	-	1
	6:00 - 6:30 PM	Lecture	-	-	-	-	0.5	-	-	-	-	0.5
	6:30 - 7:00 PM	Lecture	0.5	-	1	-	-	-	-	-	-	1.5
9th March	5:00 - 6:00 PM	Practical	-	-	-	1	-	-	-	-	-	1
	6:00 - 7:00 PM	Practical	-	-	-	2	-	-	-	-	-	2
10th March	5:00 - 7:00 PM	Practical	-	-	1	-	-	-	-	-	-	1
11th March	5:00 - 6:00 PM	Lecture	-	-	-	-	1	-	-	-	-	1
	6:00 - 7:00 PM	Lecture	-	-	-	-	-	-	1	-	-	1
12th March	5:00 - 5:30 PM	Lecture	-	-	-	-	1.5	-	-	-	-	1.5
	5:30 - 7:00 PM	Lecture	-	-	-	-	2	-	-	-	-	2
13th March	5:00 - 6:30 PM	Lecture	-	-	-	-	-	-	-	-	-	
14th March	5:00 - 7:00 PM	EXAM	2	-	-	-	-	-	-	-	-	2
15th March	6:00 - 6:30 PM	Lecture	-	-	-	-	-	-	-	0.5	-	0.5
	6:30 - 7:00 PM	Lecture	-	-	-	-	-	-	-	0.5	-	0.5
		Lecture	-	-	-	-	-	-	-	-	1	1
16th March	5:00 - 6:00 PM	Lecture	-	-	-	-	-	-	-	-	1	1
	6:00 - 7:00 PM	Lecture	-	-	-	-	-	-	-	0.5	-	0.5
17th March	6:00 - 6:30 PM	Practical	-	-	-	-	-	-	-	-	1	1
18th March	5:00 - 6:00 PM	Practical	-	-	-	-	-	-	-	-	1	1
	6:00 - 7:00 PM	Practical	-	-	-	-	-	-	-	-	1	1
19th March	5:00 - 6:00 PM	Practical	-	-	-	-	-	-	-	1	-	1
	6:00 - 7:00 PM	Lecture	-	-	-	-	-	-	-	-	1	1
20th March	5:00 - 6:00 PM	Lecture	-	-	-	-	-	-	-	-	0.5	0.5
	6:00 - 7:00 PM	Lecture	-	-	-	-	-	-	-	-	0.5	0.5
21st March	5:00 - 7:00	EXAM	2	-	-	-	-	-	-	-	-	2
		TOTAL Hrs	10	4	3	3	6	1	1	2.5	7	36

SYLLABUS DISTRIBUTION
CERTIFICATE COURSE IN
BIOINFORMATICS (Level O)

Bioinformatics Centre
Department of Biotechnology
St. Edmund's College
Shillong- 793003, Meghalaya, India

Renumeration

Sl No	Name of Faculty	Total Contact Hours Taken	Renumeration	Total Hours	Total
1	Samrat Adhikari	10	@ ₹ 500/- per hr	6.6	₹ 3300
2	S Sunila Chanu	3	@ ₹ 500/- per hr	3	₹ 1500
3	Yogesh Negi	5.5	@ ₹ 500/- per hr	6	₹ 3000
4	Sarmista Deb	3	@ ₹ 500/- per hr	3	₹1500
5	Shekinah Challam	1	@ ₹ 500/- per hr	1	₹500
6	Debulman Syiemiong	2.5	@ ₹ 500/- per hr	3	₹1500
7	Koben John Nongkynrih	0.5	@ ₹ 500/- per hr	1	₹500
8	Sunil Sharma	7	@ ₹ 500/- per hr	7	₹3500
9	Dipankar Debnath	4	@ ₹ 500/- per hr	4	₹2000
				Total Expense	₹ 17300.00
		Fees Collected	₹ 12500.00		
		College Contribution	₹ 4800.00		
		Total	₹17300.00	Balance	NIL

(Course Coordinator)

Course Description/Overview

The main purpose of the Online Certificate course in Bioinformatics (Level O) is to introduce students to the fundamentals of Bioinformatics and computer informatics in the context of the mastering these fundamentals which will allow students to apply the concepts more effectively to a variety of audiences, using a range of tools which are used in Biotechnology & allied fields. The course has been divided into 3 modules with diverse applications of computer fundamentals and its application in biotechnology & bioinformatics. The most key components of the course are

- 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 assesses 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

Online Certificate Course in Bioinformatics (Level 0)

1st March, - 21st March, 2021
Organised by Department of Biotechnology, St. Edmund's College, Shillong

* Required

1. Email address *

2. Name of the Student *

3. Department *

4. University Roll No *

5. College Roll No (Kindly provide in Linways account format) *

6. Mobile No *

7. Reason for joining the Certificate Course *

8. I hereby declare that the information provided is correct to my knowledge and belief *

Check all that apply.

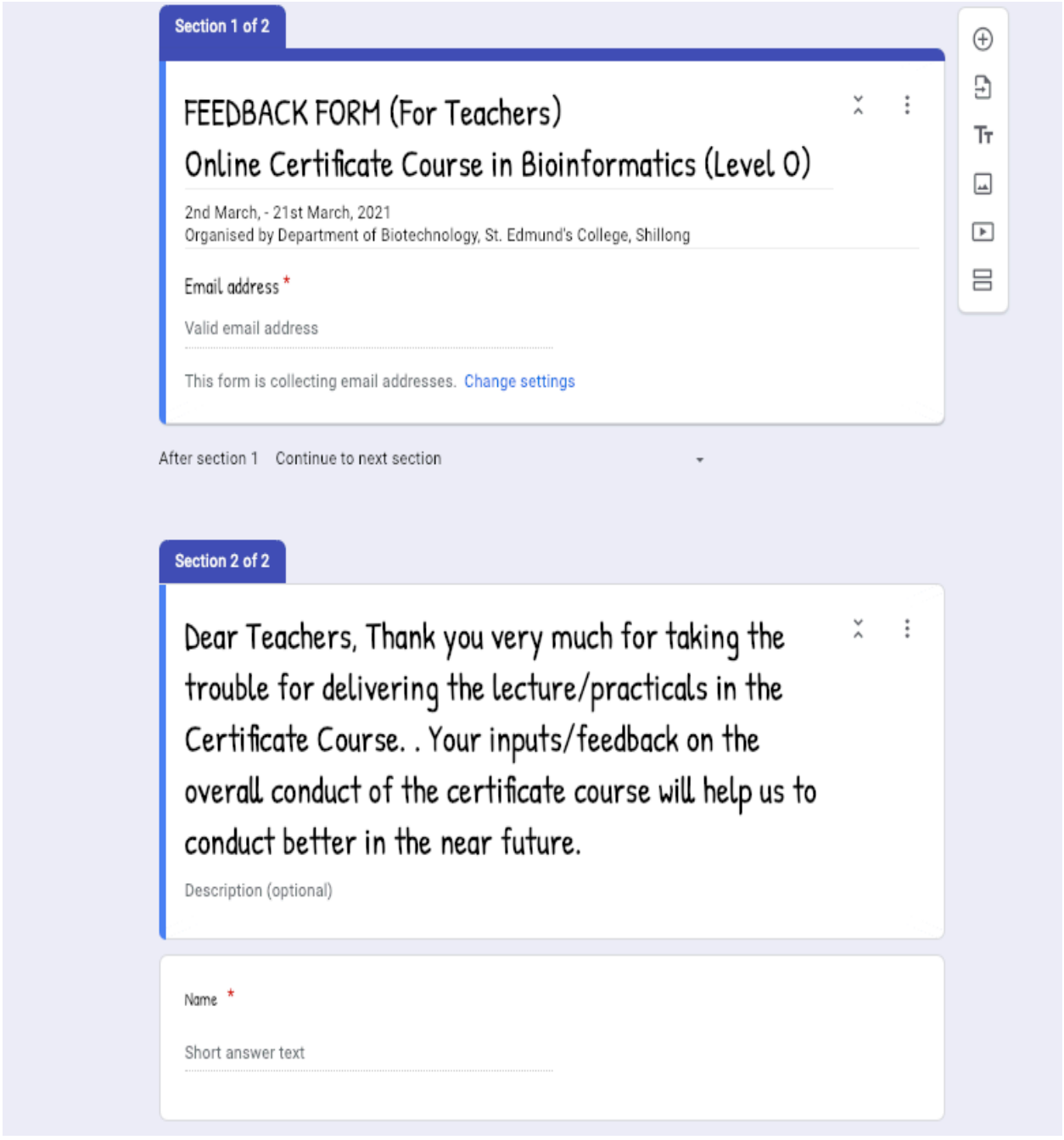
- [ ] I agree
- [ ] I disagree

This content is neither created nor endorsed by Google.

Google Forms

SAMPLE ONLY

FEEDBACK FORMS FOR TEACHERS



Section 1 of 2

FEEDBACK FORM (For Teachers)

Online Certificate Course in Bioinformatics (Level 0)

2nd March, - 21st March, 2021
Organised by Department of Biotechnology, St. Edmund's College, Shillong

Email address *

Valid email address

This form is collecting email addresses. Change settings

After section 1 Continue to next section

Section 2 of 2

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.

Description (optional)

Name *

Short answer text

SAMPLE ONLY

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 (LMS) 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 *

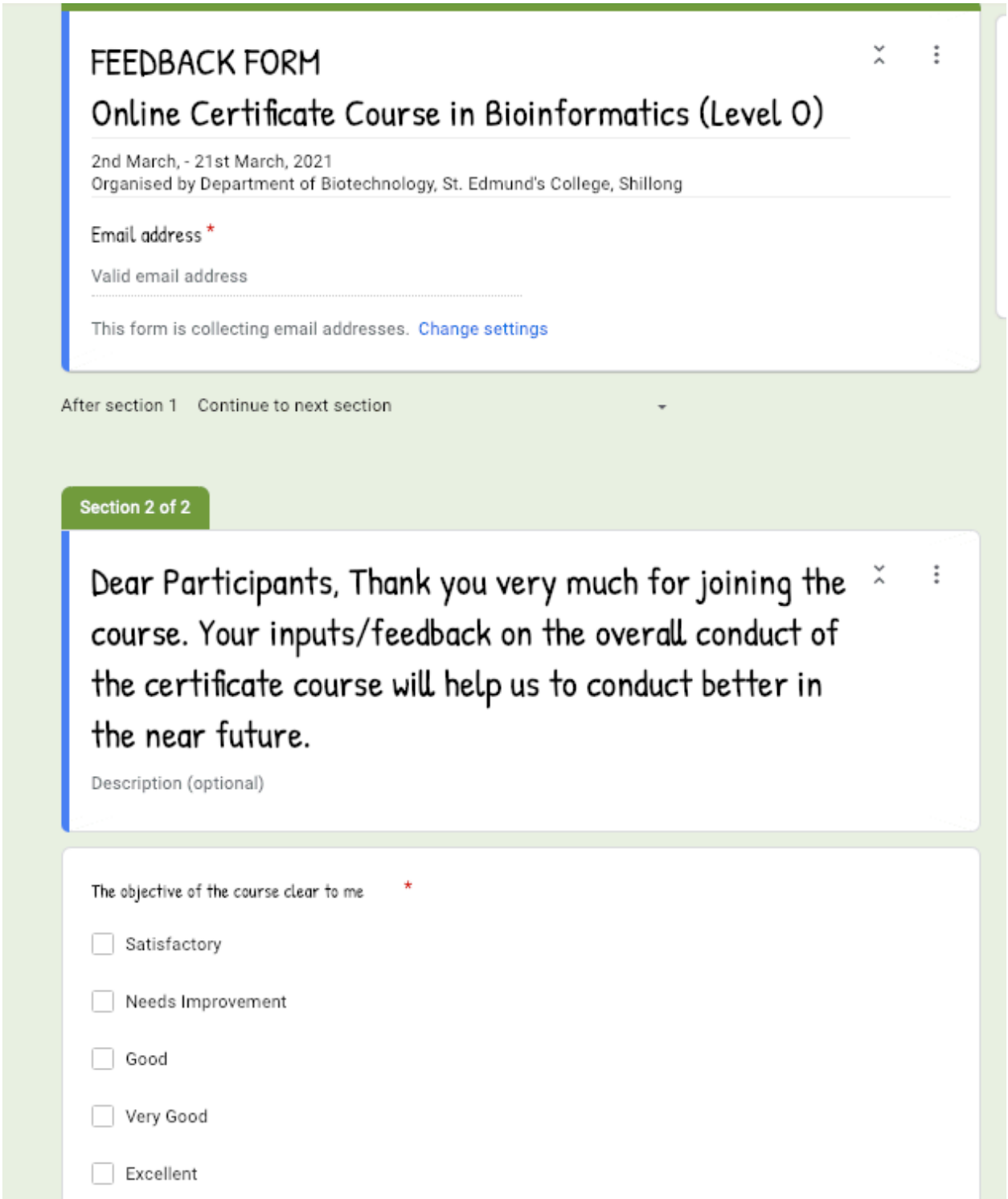
- [ ] Yes
- [ ] No

Suggestion (if any) *

Long answer text

SAMPLE ONLY

FEEDBACK FROM FOR STUDENTS



FEEDBACK FORM

Online Certificate Course in Bioinformatics (Level 0)

2nd March, - 21st March, 2021
Organised by Department of Biotechnology, St. Edmund's College, Shillong

Email address *

Valid email address

This form is collecting email addresses. Change settings

After section 1 Continue to next section

Section 2 of 2

Dear Participants, Thank you very much for joining the course. Your inputs/feedback on the overall conduct of the certificate course will help us to conduct better in the near future.

Description (optional)

The objective of the course clear to me *

- Satisfactory
- Needs Improvement
- Good
- Very Good
- Excellent

SAMPLE ONLY

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 *

Check all that apply.

- [ ] Satisfactory
- [ ] Needs Improvement
- [ ] Good
- [ ] Very Good
- [ ] Excellent

7. 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 *

Check all that apply.

- [ ] 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 *

Check all that apply.

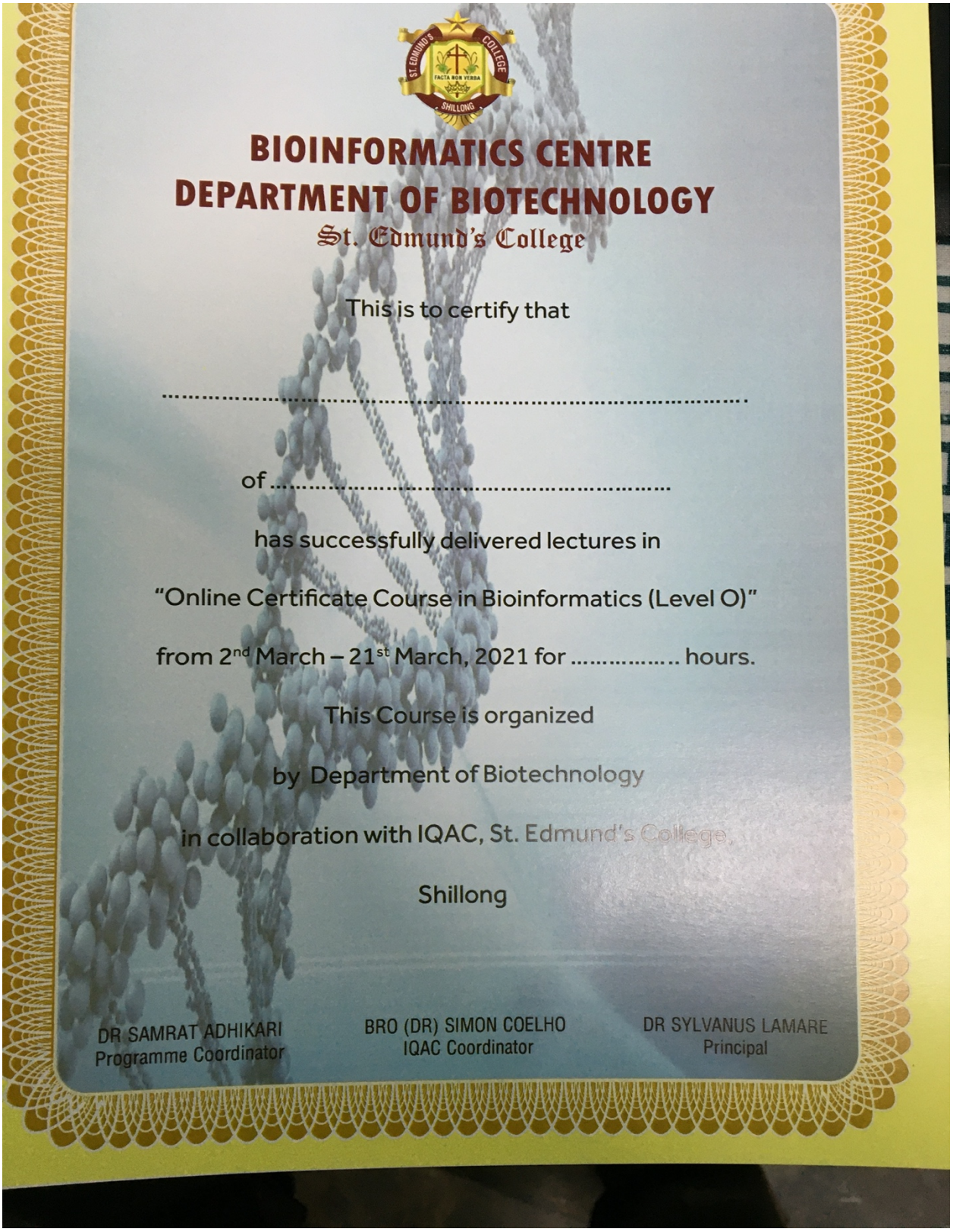
- [ ] Satisfactory
- [ ] Needs Improvement
- [ ] Good
- [ ] Very Good
- [ ] Excellent

12. New Concepts for me (50 words) *

13. Suggestion (if any) *

SAMPLE ONLY

CERTIFICATE FOR GUEST FACULTY



BIOINFORMATICS CENTRE
DEPARTMENT OF BIOTECHNOLOGY
St. Edmund's College

This is to certify that

.....

of .....

has successfully delivered lectures in

"Online Certificate Course in Bioinformatics (Level O)"

from 2nd March – 21st March, 2021 for ..... hours.

This Course is organized

by Department of Biotechnology

in collaboration with IQAC, St. Edmund's College,

Shillong

DR SAMRAT ADHIKARI
Programme Coordinator

BRO (DR) SIMON COELHO
IQAC Coordinator

DR SYLVANUS LAMARE
Principal

SAMPLE ONLY

CERTIFICATE FOR STUDENTS

BIOINFORMATICS CENTRE
DEPARTMENT OF BIOTECHNOLOGY
St. Edmund's College

This is to certify that .....

of ..... has successfully completed 36 hours

"Online Certificate Course in Bioinformatics (Level-O)"

from 2nd March – 21st March, 2021

with a GRADE of ..... and attainment level of .....

This Course is organized by Department of Biotechnology

in collaboration with

IQAC, St. Edmund's College, Shillong

DR SAMRAT ADHIKARI
Programme Coordinator

BRO (DR) SIMON COELHO
IQAC Coordinator

DR SYLVANUS LAMARE
Principal

SAMPLE ONLY