

ACADEMIC BULLETIN

2023 - 2024



COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

KOCHI 682 022, KERALA, INDIA

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Details of Courses offered in the various Departments/Schools/Centres

Faculty of Engineering	<ol style="list-style-type: none">1. Kunjali Marakkar School of Marine Engineering2. School of Engineering –B.Tech & M.Tech3. Cochin University College of Engineering, Kuttanad-MCA
Faculty of Environmental Studies	<ol style="list-style-type: none">1. School of Environmental Studies2. National Centre for Aquatic Animal Health
Faculty of Humanities	<ol style="list-style-type: none">1. Department of Hindi2. Department of English & Foreign Languages
Faculty of Law	<ol style="list-style-type: none">1. School of Legal Studies2. Inter University Centre for IPR Studies
Faculty of Marine Sciences	<ol style="list-style-type: none">1. School of Industrial Fisheries2. School of Marine Sciences:<ol style="list-style-type: none">i. Department of Atmospheric Sciencesii. Department of Chemical Oceanographyiii. Department of Marine Biology, Microbiology & Biochemistryiv. Department of Marine Geology and Geophysicsv. Department of Physical Oceanography
Faculty of Science	<ol style="list-style-type: none">1. Centre for Integrated Studies2. Department of Applied Chemistry3. Department of Biotechnology4. Department of Mathematics5. Department of Physics6. Department of Statistics
Faculty of Social Sciences	<ol style="list-style-type: none">1. Department of Applied Economics2. Centre for Budget Studies3. School of Management Studies
Faculty of Technology	<ol style="list-style-type: none">1. Department of Computer Applications2. Department of Computer Science3. Department of Electronics4. Department of Instrumentation5. Department of Polymer Science & Rubber Technology6. International School of Photonics7. Department of Ship Technology
	<ol style="list-style-type: none">1. Deen Dayal Upadhyay Kaushal Kendra2. Prof. N. R. Madhava Menon Interdisciplinary Centre for Research Ethics & Protocols (ICREP)

PREFACE

This edition of the Academic Bulletin aims at giving a brief overview of the course structure as well as regulations for the various graduate and post- graduate programmes offered in the University. We believe that this bulletin will enable the students to choose electives according to their interest in the topic. The details of the faculty in each Department along with their specialisations are given in the text. Information in this bulletin is organised faculty wise and Department wise- within each faculty. Clarifications regarding any detail which is not included in the bulletin can be obtained from the concerned Head of the Department. It may be noted that the rules and regulations are subject to changes, depending on subsequent decisions taken by the academic bodies.

The Academic Bulletin Committee is thankful to all the Directors of Schools/ Heads of Departments and the University authorities for extending all sort of Co-operation in bringing out this bulletin. We would also like to place on record our appreciation to the staff of Academic Section for their administrative help and support.

Dr.Usha K Aravind

Dr. S Sabu

Dr. Suja Haridas

Dr.Pankaj Sagar

Dr. Pramod Gopinath (Convenor)

Academic Committee

File Ref.No.Ac.C3/Academic Committee-Constitution/2020

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

(Abstract)

Post Graduate Courses- Choice Based Credit & Semester System- Reconstitution of Academic Committee for the period 2022-2024- Sanctioned- - Orders issued.

ACADEMIC C SECTION

No.CUSAT/AC(C).C3/5486/2022	Dated, KOCHI-22,08.12.2022
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Read:-	1. U.O No.CUSAT/AC(C).C3/108/2021 dated 06.01.2021. 2. Letter No. Ac.C3/ Academic Committee-Constitution/ 2020 dated 16.10.2022.
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ORDER

paperVide the U.O read as paper (1) above the Vice Chancellor had constituted the "Academic Committee" of the Choice Based Credit & Semester System, with a term of two years from 30.11.2020 to 29.11.2022. On the expiry of the period, nominations were invited from the Heads of the Departments conducting PG courses, vide the letter read as (2).

All the Heads of the Departments have forwarded the name of a faculty member nominated by the Department Council to the Committee. The Vice Chancellor, having considered the nominations, is pleased to reconstitute the "Academic Committee" as per Rule 10 of the 'Regulations for the Post Graduate Programmes' with the following members:

1	The Pro-Vice Chancellor	Chairman
2	The Registrar	Secretary
3	The Controller of Examinations	
4	Dr. Santhosh Kumar G	Vice Chairman, Professor, Department of Computer Science
5	Dr.Santhosh Kumar P K, Hon.Director, Centre for Budget Studies.	Centre for Budget Studies
6	Dr Manoj V J, Assoc.Professor & Head, Division of Electronics & Communication Engineering	Cochin University College of Engineering Kuttanad
7	Dr Zakkariya K A, Professor & Director	Deen Dayal Upadhyay Kaushal Kendra
8	Dr.Suja Haridas, Associate Professor	Department of Applied Chemistry

9	Dr.P R Suresh, Assistant Professor	Department of Applied Economics
10	Dr Midhun M, Assistant Professor	Department of Atmospheric Sciences
11	Dr Rajesh P P, Assistant Professor	Department of Biotechnology
12	Dr.Jorphin Joseph, Assistant Professor	Department of Chemical Oceanography
13	Smt. Malathi S, Assistant Professor	Department of Computer Applications
14	Dr Supriya M H, Professor & Head	Department of Electronics
15	Dr. Brinda Bala Sreenivasan, Assistant Professor & Head	Department of English & Foreign Languages
16	Dr Praneetha P, Associate Professor	Department of Hindi
17	Dr.Pankaj Sagar, Assistant Professor	Department of Instrumentation
18	Dr. Swapna P Antony, Assistant Professor	Department of Marine Biology, Microbiology & Biochemistry
19	Dr Ratheesh Kumar R T, Assistant Professor	Department of Marine Geology & Geophysics
20	Dr V B Kiran Kumar, Assistant Professor	Department of Mathematics
21	Dr Saji P K, Assistant Professor	Department of Physical Oceanography
22	Dr Sasidevan V, Assistant Professor	Department of Physics
23	Dr.Prasanth R, Professor	Department of Polymer Science & Rubber Technology
24	Dr.Manoj T Issac, Assistant Profess	Department of Ship Technology
25	Dr.Asha Gopalakrishnan, Sr.Professor	Department of Statistics
26	Dr Kavitha Chalakkal, Assistant Professor	Inter University Centre for IPR Studies(IUCIPRS)
27	Dr Honey John, Hon.Director,IUCND	Inter University Centre for Nanomaterials and Devices (IUCND)

28	Dr.Pramod Gopinath, Professor	International school of Photonics
29	Dr Akhil S Karun, Assistant Professor	Kunjali Marakkar School of Marine Engineering
30	Dr Shibin S P, Assistant Professor	National Centre for Aquatic Animal Health(NCAAH)
31	Dr Vani Kesari A, Associate Professor & Co Ordinator	Prof.N.R Madhava Menon Interdisciplinary Centre for Research Ethics and Protocols (ICREP)
32	Dr Glory Joseph, Professor, Division of Civil Engineering.	School of Engineering
33	Dr. Usha K Aravind, Professor & Director	School of Environmental Studies
34	Dr.S Sabu, Associate Professor	School of Industrial Fisheries
35	Dr P S Seema, Associate Professor	School of Legal studies
36	Dr.Rajitha Kumar S, Professor	School of Management Studies

The term of Office of the Committee will be two years from the date of this order and will continue in office until it is reconstituted by the Vice Chancellor.

Orders are issued accordingly.

Dr. Meera V *
Registrar

To:	<ol style="list-style-type: none"> 1. All members of the Academic Committee. 2. All Heads of Departments/Directors of Schools/Centres. 3. The Principal, SOE/CUCEK Pulinkunnu P.O, Alappuzha. 4. The Joint Director, Kerala State Audit Department. 5. Finance Officer/Controller of Examinations/Planning and Development Officer/Directorate of Public Relations and Publications. 6. PS to Vice Chancellor/PS to Pro Vice Chancellor/PA to Registrar. 7. All Joint Registrars/Deputy Registrar/ Assistant Registrars. 8. Conference Section/Academic A/All Exam sections. 9. Director , CIRM(for publishing on the University website). 10. Day File/Stock File/File Copy.
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FACULTY OF ENGINEERING

Dean:

<p>Dr. Narayanan Namboothiri V. N Professor School of Engineering, CUSAT</p>

KUNJALI MARAKKAR SCHOOL OF MARINE ENGINEERING

B.TECH. MARINE ENGINEERING

Scheme of Examinations (2019 admission) – SEMESTER I

SEMESTER I

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0101	Mathematics – I	4	1	0	3	40	60	100
19-208-0102	Engineering Physics	4	0	0	3	40	60	100
19-208-0103	Engineering Chemistry	4	0	0	3	40	60	100
19-208-0104	Engineering Mechanics	4	1	0	3	40	60	100
19-208-0105	Basic Electrical Engineering	4	0	0	3	40	60	100
19-208-0106	Environmental studies and Technical Communication	4	1	0	3	40	60	100
19-208-0107	Electrical Engineering Workshop	0	0	3	1	25	25	50
19-208-0108	Language Lab	0	0	2	1	25	25	50
19-208-0109	NSS/Nature Conservation Activity	0	0	1	0	-	-	-
TOTAL		24	3	6	20			

CA – Continuous Assessment, SEE –Semester End Examination

SEMESTER II

Code No.	Subject	L Hrs/Wk	T Hrs/ Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0201	Mathematics – II	4	1		3	40	60	100
19-208-0202	Applied Thermodynamics	4	1		3	40	60	100
19-208-0203	Engineering Graphics	3	1		3	40	60	100
19-208-0204	Basic Electronics and measurements	4	0		3	40	60	100
19-208-0205	Computer Programming	4	0		3	40	60	100
19-208-0206	Mechanics of solids	4	1		3	40	60	100
19-208-0207	Mechanical Engineering Workshop			3	1	25	25	50
19-208-0208	Computer Programming Laboratory			3	1	25	25	50
TOTAL		23	4	6	20			

SEMESTER III

Code No.	Subject	L Hrs/Wk	T Hrs/ Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0301	Mathematics – III	4	1	0	3	40	60	100
19-208-0302	Electrical Technology	4	1	0	3	40	60	100
19-208-0303	Production Technology	3	1	0	3	40	60	100
19-208-0304	Marine Electronics	3	1	0	3	40	60	100
19-208-0305	Fluid Mechanics	4	1	0	3	40	60	100
19-208-0306	Machine Drawing	3	1	0	3	40	60	100
19-208-0307	Strength of Materials Lab	0	0	3	1	25	25	50
19-208-0308	Workshop Practices	0	0	3	1	25	25	50
	TOTAL	21	6	6	20			

SEMESTER IV

Code No.	Subject	L Hrs/Wk	T Hrs/ Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0401	Mechanics of Machinery	3	1	0	3	40	60	100
19-208-0402	Thermal Engineering & Heat Transfer	3	1	0	3	40	60	100
19-208-0403	Metallurgy & Materials Science	4	0	0	3	40	60	100
19-208-0404	Marine Auxiliary Machinery – I	4		0	3	40	60	100
19-208-0405	Hydraulic Machinery	3	1	0	3	40	60	100
19-208-0406	Seamanship and Navigation	3	0	0	3	40	60	100
19-208-0407	Ship Technology	4	0		3	40	60	100
19-208-0408	Electrical Machines Lab	0	0	3	1	25	25	50
19-208-0409	Boiler Chemistry & Heat Engines Lab	0	0	3	1	25	25	50
	TOTAL	24	3	6	23			

SEMESTER V

Code No.	Subject	L Hrs/Wk	T Hrs/ Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0501	Dynamics of Machinery	3	1	0	3	40	60	100
19-208-0502	Marine Boiler and Steam Engineering	3	1	0	3	40	60	100
19-208-0503	Marine Economics and Commercial Geography	3	1	0	3	40	60	100
19-208-0504	Marine Auxiliary Machinery – II	3	1	0	3	40	60	100
19-208-0505	Marine Internal Combustion Engine – I	3	1	0	3	40	60	100

19-208-0506	Marine Engineering Drawing	2	1	3	3	40	60	100
19-208-0507	Naval Architecture – I	3	1	0	3	40	60	100
19-208-0508	Fluid Mechanics & Hydraulic Machinery Lab	0	0	3	1	25	25	50
19-208-0509	Electronics Lab	0	0	3	1	25	25	50
	TOTAL	20	7	9	23			

SEMESTER VI

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/Wk	C	Marks		Total
						CA	SEE	
19-208-0601	Management Science	3	1	0	3	40	60	100
19-208-0602	Marine Electrical Technology	3	1	0	3	40	60	100
19-208-0603	Ship fire Prevention and Control	3	1	0	3	40	60	100
19-208-0604	Marine Refrigeration and Air Conditioning	3	1	0	3	40	60	100
19-208-0605	Marine Internal Combustion Engines – II	3	1	0	3	40	60	100
19-208-0606	Machine Design	3	1	0	3	40	60	100
19-208-0607	Naval Architecture – I	3	1	0	3	40	60	100
19-208-0608	Fire Control Engineering Lab	0	0	3	1	25	25	50
19-208-0609	Mechanical Lab	0	0	3	1	25	25	50
	TOTAL	21	7	6	23			

SEMESTER VII

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/Wk	C	Marks		Total
						CA	SEE	
19-208-0701	Ship in Campus – I	0	0	3	1	50	-	50
19-208-0702	Ship in Campus – II	0	0	8	4	50	-	50
19-208-0703	Ship in Campus – III	0	0	4	2	50	-	50
19-208-0704	Ship in Campus – IV	0	0	6	3	50	-	50
19-208-0705	Ship in Campus – V	0	0	11	5	50	-	50
19-208-0706	Ship in Campus – VI	0	0	7	4	50	-	50
19-208-0707	Ship in Campus – VII	0	0	3	1	50	-	50
	TOTAL	0	0	42	20			

SEMESTER VIII

Code No.	Subject	L Hrs/W k	T Hrs/Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	SEE	
19-208-0801	Safe Watch Keeping and Engine Resource Management	4		0	3	40	60	100
19-208-0802	Ship Operation and Management	4		0	3	40	60	100
19-208-0803	Maritime Statutory Regulations	4			3	40	60	100
19-208-08**	Elective – I	3	1	0	3	40	60	100
19-208-08**	Elective- II	3	1	0	3	40	60	100
19-208-0812	Simulation and Control Lab			3	1	25	25	50
19-208-0813	Seminar	3			2	50	-	50
19-208-0814	Project			10	4	200	-	200
19-208-0815	Viva-voce			0	1		50	50
		21	2	13	23			

19-205-0804 to 0807 : ELECTIVE – I

19-208-0804 : Marine Machinery System Design
Pneumatic Drives
19-208-0805 : Renewable Energy Sources and Applications
Automation
19-208-0806 : Double Hull Tank Vessels
Autonomous Ships
19-208-0807 : Cryogenic Engineering

19-208-0808 to 0812: ELECTIVE – II

19-208-0808 : Fluid Circuits and Controls
19-208-0809 : Hydraulic and
19-208-0810 : Marine Control Engineering and
19-208-0811 : Information Technology for

DETAILS OF FACULTY (Permanent)

Sl. No.	Name and Designation	Specialization	Communication
1	Dr. Akhil S. Karun Assistant Professor (Course Co-Ordinator)	Mechanical Engineering, Machine Design, LLB, MBA	9496325080 akhilskarun@cusat.ac.in

DETAILS OF FACULTY (Contract)

Sl. No.	Name and Designation	Specialization	Communication
1	Prof. Venugopal R. Director	M.Tech (Marine Engineering) MEO CLASS I (M)	9961000760 venugopal@cusat.ac.in
2	Prof. Jis George Course in Charge	M.Tech (Marine Engineering) MEO CLASS I (M)	9895485037 mailjisgeorge@cusat.ac.in
3	Prof. (Dr.) S. Surendran Professor	Naval Architecture and Ship building	9884858108 ssurendran@cusat.ac.in
4	Mr. Rajappan T. B. Associate Professor	Mechanical Engineering MEO CLASS I (M)	9446217615 rajananka@gmail.com
5	Mr. Rajesh Kumar M. Associate Professor	Mechanical Engineering Marine Internal Combustion Engineering	9847000439 Rajeshmanovihar@gmail.com
6.	Mr. Rony Sebastian Associate Professor	Mechanical Engineering	9895481564 rony2moolayil@gmail.com
7	Mr. Biswajith H. Assistant Professor	Automotive Engineering	9495275832 haridasanbiswajit@gmail.com
8	Mr. Pramod Ramakrishnan Assistant Professor	Production and Industrial Engineering	9446950318 pramodram.84@gmail.com
9	Mr. Kriparaj K. G. Assistant Professor	Thermal Engineering	8921342623 kriparajkg@gmail.com
10	Mrs. Anitha George Assistant Professor	Electrical and Electronics Engineering, Power Electronics & Drives	9539396217 anithageorge22@gmail.com
11	Mr. Vishnu S. Kumar Assistant Professor	Thermal Engineering	9562728849 vishnuskumar7@gmail.com
12	Mrs. Rehna Rose Francis Assistant Professor	Electrical and Electronics Engineering, Power Electronics & Drives	8289988575 Rehname17@cusat.ac.in
13	Dr. Binimol Punnoose Assistant Professor	Mathematics	9447176856 binimolp@gmail.com

DETAILS OF FACULTY (Guest Faculty)

Sl. No.	Name and Designation	Specialization	Communication
1	Capt. Dilip K. Panangadan	Ship Operation and Management	9895195527 dilipcp@yahoo.com
2	Dr. Joseph George	Mechanical Engineering Design, Project Management	9895393877, josephgeorge@cusat.ac.in
3	Mr. Willy Mathews	Marine Engineering	9995802004 willymathews@cusat.ac.in
4	Mr. Ananthakrishnan	Mechanics of Solid	ananthakrishnan@cusat.ac.in 9744171128
5	Mr. P. M. Sukumaran	Naval Architecture	9895765865 Sukupm@yahoo.co.in
6	Mrs. Shalini Sanil	Computer Programming	9745046978 shalinisimon@cusat.ac.in
7	Ms. Sreelakshmi T. A.	Engineering Mathematics	7356643277 Sreelakshmi97@gmail.com
8	Mrs. Chinju Varghese	Electronics Measurements & Instrumentation	9496464138 chinchuvarghese@cusat.ac.in
9	Dr. M. B. Mohandas	Foreign Trade, International Business.	9958111605 Mbmohandas@gmail.com
10	Mr. Sanjeev K. K.	Leas Auditor in QMS, ISM and ISPS	8879366414 sanjeevkk@cusat.ac.in
11	Mr. Joseph Malcom Oliver	Marine Engineering	97012404553 malcolmkochi@gmail.com
12	Mr. Geethaprasad G.	Management Science	9995701849 gprasadgp@gmail.com
13	Mr. Ranees M. P.	Naval Architecture	7025020046 raneesnavarch@gmail.com
14	Mrs. Sonia Britto M.	Technical communication	9847006357 soniabritto@gmail.com
15	Dr. V. J. Peter	Engineering Physics	9447700025 petervj@cusat.ac.in
16	Dr. K. U. Abdel Salam	Engineering Chemistry	9447174078 abdelsalam@cusat.ac.in
17	Dr. Rakesh V. B.	Environmental Studies	9846801465 rakeshvbalkrishnan@gmail.com

SCHOOL OF ENGINEERING
M.Tech. Courses
M.Tech CIVIL ENGINEERING
(Full Time)
(Specialisation: Geotechnical Engineering)

Semester I

Course Code	C/E	Cred its	Marks		
			CE	ES	Total
22-449-0101	C	4	50	50	100
22-449-0102	C	4	50	50	100
22-449-0103	C	4	50	50	100
22-449-01**	E	3	50	50	100
22-449-01**	E	3	50	50	100
22-449-0113	C	1	100	0	100
22-449-0114	C	1	100	0	100
22-449-0112	C	2	50	50	100
		22	500	300	800

Semester II

Course Code	Course	C/E	Cred its	Marks		
				CE	ES	Total
22-449-0201	Soil Dynamics and Machine Foundations	C	4	50	50	100
22-449-0202	Advanced Foundation Engineering	C	4	50	50	100
22-449-0203	Earth Pressure and Retaining Structures	C	4	50	50	100
22-449-02**	Elective III	E	3	50	50	100
22-449-02**	Elective IV	E	3	50	50	100
22-449-0212	Computational Geomechanics Lab	C	1	100	0	100
22-449-0213	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Cred its	Marks		
				CE	ES	Total
22-449-0301	Internship/ MOOC Course	C	2	100	0	100
22-449-0307	Dissertation Phase – I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-449-0401	Dissertation Phase – II	C	15	100	0	100
Total			15	100	0	100

ELECTIVES I & II (Semester I)

Course Code	Course
22-449-0104	Finite Element Analysis
22-449-0105	Theoretical Soil Mechanics
22-449-0106	Geosynthetics and Reinforced Soil Structures
22-449-0107	Ground Water Engineering
22-449-0108	Soil Structure Interaction
22-449-0109	Forensic Geotechnical Engineering
22-449-0110	Landslide Engineering
22-449-0111	Remote Sensing, GIS and its Applications in Civil Engineering

ELECTIVES III & IV (Semester II)

Course Code	Course
22-449-0204	Geotechnical Earthquake Engineering
22-449-0205	Marine Geotechnical Engineering
22-449-0206	Pavement Design and Evaluation
22-449-0207	Structural Design of Foundations
22-449-0208	Earthquake Resistant Design of Structures
22-449-0209	Unsaturated Soil Mechanics
22-449-0210	Geo-environmental Engineering
22-449-0211	Rock Mechanics and Tunnelling

M.Tech COMPUTER SCIENCE AND ENGINEERING
(Full Time)
(Specialisation: Cyber Security)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-454-0101	Mathematical Foundation for Cyber Security	C	4	50	50	100
22-454-0102	Cryptography and Network Security	C	4	50	50	100
22-454-0103	Biometric System and Image Processing	C	4	50	50	100
22-454-01**	Elective I	E	3	50	50	100
22-454-01**	Elective II	E	3	50	50	100
22-454-0112	Research Methodology and Intellectual Property Rights	C	2	50	50	100
22-454-0113	Network Programming and Cryptography Lab	C	1	100	0	100
22-454-0114	Seminar I	C	1	100	0	100
Total			22	500	300	800

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-454-0201	Software Vulnerability Analysis	C	4	50	50	100
22-454-0202	Ethical Hacking and Cyber Forensics	C	4	50	50	100
22-454-0203	Cyber Crime Investigation and Digital Forensic	C	4	50	50	100
22-454-02**	Elective III	E	3	50	50	100
22-454-02**	Elective IV	E	3	50	50	100
22-454-0209	Ethical Hacking Digital Forensic Lab	C	1	100	0	100
22-454-0210	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-454-0301	Internship/ MOOC Course	C	2	100	0	100
22-454-0302	Dissertation Phase I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-454-0401	Dissertation Phase II	C	15	100	0	100
Total			15	100	0	100

Electives I & II (Semester I)

Course Code	Course
22-454-0104	Applied Cryptography
22-454-0105	Advances in data science
22-454-0106	Web Security
22-454-0107	IT Security metrics
22-454-0108	Information Storage Management
22-454-0109	Digital Watermarking and Steganography
22-454-0110	Database Security
22-454-0111	Embedded Systems Security

Electives III & IV (Semester II)

Course Code	Course
22-454-0204	Intrusion Detection and Prevision System
22-454-0205	Operating Systems and Security
22-454-0206	Information Theory and Coding
22-454-0207	Cyber Laws and Security Policies
22-454-0208	Cloud Computing
22-454-0209	Deep Learning
22-454-0210	Security and Privacy in Internet of Things
22-454-0211	Block Chain and Information Security

M.Tech. INFORMATION TECHNOLOGY

(Full-Time)

(SPECIALISATION: BUSINESS ANALYTICS AND INTELLIGENCE)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-0101	Introduction to Business Analytics and Data Science	C	4	50	50	100
-0102	Computational Thinking	C	4	50	50	100
-0103	Financial Analytics	C	4	50	50	100
-01**	Elective I	E	3	50	50	100
-01**	Elective II	E	3	50	50	100
-0112	Research Methodology and Intellectual Property Rights	C	2	50	50	100
-0113	Data Visualization and Descriptive Analytics Lab	C	1	100	0	100
-0114	Seminar I	C	1	100	0	100
Total			22	500	300	800

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-0201	Digital Marketing	C	4	50	50	100
-0202	E-Business and Information management	C	4	50	50	100
-0203	Block Chain Technology	C	4	50	50	100
-02**	Elective III	E	3	50	50	100
-02**	Elective IV	E	3	50	50	100
-0209	Design Thinking and Innovation Lab	C	1	100	0	100
-0210	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-0301	Internship/ MOOC Course	C	2	100	0	100
-0302	Dissertation Phase I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-0401	Dissertation Phase II	C	15	100	0	100
Total			15	100	0	100

Electives I & II (Semester I)

Course Code	Course
-0104	Machine Learning for Data Science
-0105	Agile Project Management
-0106	Recommender System
-0107	Cloud Computing & Big Data Analytics
-0108	Python for Business Analytics
-0109	Social Media & Web analytics
-0110	Knowledge Management Systems
-0111	Optimization Techniques

Electives III & IV (Semester II)

Course Code	Course
-0204	Operations Research
-0205	Cyber law and Ethics
-0206	Dev Ops for Enterprise Business Agility
-0207	Data Mining Techniques- Predictive Modelling & Pattern Discovery
-0208	Deep Learning
-0209	Graph Theory
-0210	Trend Analysis and Forecasting
-0211	Software Reliability for Information Technology

M.Tech INDUSTRIAL SAFETY (Full Time)

(Specialisation: HSE Management)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-455-0101	Statistical and Computational Methods	C	4	50	50	100
22-455-0102	Environmental Engineering and Management	C	4	50	50	100
22-455-0103	Industrial Safety Management- Concepts and Practices	C	4	50	50	100
22-455-01**	Elective I	E	3	50	50	100
22-455-01**	Elective II	E	3	50	50	100
22-455-0110	Research Methodology and Intellectual Property Rights	C	1	50	50	100
22-455-0111	HSE Laboratory	C	1	100	0	100
22-455-0112	Seminar I	C	2	100	0	100
Total			22	500	300	800

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-455-0201	Hazard Analysis and Risk Assessment	C	4	50	50	100
22-455-0202	Occupational Health and Hygiene	C	4	50	50	100
22-455-0203	Construction Safety and Fire Engineering	C	4	50	50	100
22-455-02**	Elective III	E	3	50	50	100
22-455-02**	Elective IV	E	3	50	50	100
22-455-0210	Fire Engineering Laboratory	C	1	100	0	100
22-455-0211	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-455-0301	Internship/ Mini Project/ MOOC	C	2	100	0	100
22-455-0302	Dissertation – Phase I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-455-0401	Dissertation – Phase II	C	15	100	0	100
Total			15	100	0	100

ELECTIVES I & II (Semester I)

22-455-0104	Reliability Engineering
22-455-0105	Principles of Disaster Management
22-455-0106	Industrial Noise and Vibration Control
22-455-0107	Corrosion and Surface Engineering
22-455-0108	Remote Sensing and Geographic Information System
22-455-0109	Food Safety and Sanitation

ELECTIVES III & IV (Semester II)

22-455-0204	Construction Safety and Fire Engineering
22-455-0205	HSE Management in Hydrocarbon Industry
22-455-0206	Health, Safety and Environmental Laws
22-455-0207	Hazard Control in Manufacturing
22-455-0208	Pipeline Engineering
22-455-0209	Environmental Impact Assessment

M.Tech MECHANICAL ENGINEERING
(Specialisation: Thermal Engineering)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-450-0101	Advanced Fluid Mechanics	C	4	50	50	100
22-450-0102	Advanced Thermodynamics	C	4	50	50	100
22-450-0103	Incompressible and Compressible Flows	C	4	50	50	100
22-450-01**	Elective I	E	3	50	50	100
22-450-01**	Elective II	E	3	50	50	100
22-450-0112	Research Methodology & IPR	C	2	50	50	100
22-450-0113	Thermal Engineering Laboratory I	C	1	100	0	100
22-450-0114	Seminar I	C	1	100	0	100
Total			22	500	300	800

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-450-0201	Advanced Heat & Mass Transfer	C	4	50	50	100
22-450-0202	Thermodynamics and Propulsion	C	4	50	50	100
22-450-0203	Combustion and Pollution	C	4	50	50	100
22-450-02**	Elective III	E	3	50	50	100
22-450-02**	Elective IV	E	3	50	50	100
22-450-0212	Thermal Engineering Laboratory II	C	1	100	0	100
22-450-0213	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-450-0301	Internship/ MOOC Course	C	2	100	0	100
22-450-0302	Dissertation Phase – I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-450-0401	Dissertation Phase – II	C	15	100	0	100
Total			15	100	0	100

ELECTIVES I & II (Semester I)

Course Code	Course
22-450-0104	Industrial Refrigeration and Air-Conditioning
22-450-0105	Computational Methods in Engineering
22-450-0106	Hydrodynamics
22-450-0107	Conduction and Radiation
22-450-0108	Introduction to Combustion
22-450-0109	Gas Turbines
22-450-0110	Introduction to Turbulence
22-450-0111	Heat Exchanger Design

ELECTIVES III & IV (Semester II)

Course Code	Course
22-450-0204	CFD and its Applications
22-450-0205	Finite Element Analysis
22-450-0206	Convection and Two Phase Flows
22-450-0207	Numerical Methods in Thermal Engineering
22-450-0208	Space Cryogenics
22-450-0209	Measurements in Thermal Engineering
22-450-0210	Principles of Turbo machinery
22-450-0211	Statistical Methods for Engineering

M.Tech CIVIL ENGINEERING
(Specialisation: Structural Engineering)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-472-0101	Theory of Elasticity and Plasticity	C	4	50	50	100
22-472-0102	Finite Element Analysis	C	4	50	50	100
22-472-0103	Structural Dynamics	C	4	50	50	100
22-472-01**	Elective I	E	3	50	50	100
22-472-01**	Elective II	E	3	50	50	100
22-472-0112	Research Methodology and Intellectual Property Rights	C	2	50	50	100
22-472-0113	Structural Engineering Lab	C	1	100	0	100
22-472-0114	Seminar I	C	1	100	0	100
Total			22	500	300	800

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-472-0201	Theory of Plates and shells	C	4	50	50	100
22-472-0202	Composite Structures	C	4	50	50	100
22-472-0203	Bridge Engineering	C	4	50	50	100
22-472-02**	Elective III	E	3	50	50	100
22-472-02**	Elective IV	E	3	50	50	100
22-472-0209	Structural Engineering Design Studio	C	1	100	0	100
22-472-0210	Seminar II	C	1	100	0	100
Total			20	450	250	700

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-472-0301	Internship/ MOOC Course	C	2	100	0	100
22-472-0302	Dissertation Phase - I	C	13	100	0	100
Total			15	200	0	200

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-472-0401	Dissertation Phase – II	C	15	100	0	100
Total			15	100	0	100

ELECTIVES I & II (Semester I)

Course Code	Course
22-472-0104	Stability of Structures
22-472-0105	Prestressed Concrete Structures
22-472-0106	Advanced Analysis and Design of Steel Structures
22-472-0107	Structural Optimization
22-472-0108	Soil Structure Interaction
22-472-0109	Precast and Prefabricated Structures
22-472-1010	Experimental Stress Analysis
22-472-0111	Advanced Concrete Technology

ELECTIVES III & IV (Semester II)

Course Code	Course
22-472-0204	Fracture Mechanics
22-472-0205	Design of Offshore Structures
22-472-0206	Structural Health Monitoring
22-472-0207	Structural design of Foundations
22-472-0208	Earthquake Resistant Design of Structures
22-472-0209	Advanced Design of Structures
22-472-0210	Reliability Analysis of Structures
22-472-0211	Retrofitting and Rehabilitation of Structures

M.Tech –Civil Engineering (Part Time)
(Specialization: Construction Engineering & Management)

Semester I

Course Code	Course	Credits
CEC 3101	Applied Mathematics	3
CEC 3102	Construction Management	3
CEC 3103	Foundation Engineering	3
CEC 3104	Dynamics of Structure	3
CEC 3105	Seminar	1
Total		13

Semester II

Course Code	Course	Credits
CEC 3201	Computational Techniques	3
CEC 3202	Construction Engineering	3
CEC 3203	Contracts and Legal Aspects in Construction	3
CEC 3204	Elective I	3
CEC 3205	Computational Laboratory	1
Total		13

Semester III

Course Code	Course	Credits
CEC 3301	Construction Equipments and Management	3
CEC 3302	Construction Safety and Fire Engineering	3
CEC 3303	Design of Prestressed Concrete Structures	3
CEC 3304	Elective II	3
CEC 3305	Computer Applications Laboratory	1
Total		13

Semester IV

Course Code	Course	Credits
CEC 3401	MIS & Finance Management	3
CEC 3402	Elective III	3
CEC 3403	Elective IV	3
CEC 3404	Project – Phase I	2
Total		11

Elective List

Course Code	Course
E1	Earthquake resistant design of structures
E2	Design of Metal structures
E3	Design of special structures
E4	Finite element Method
E5	Eco-friendly Constructions
E6	Building Services Engineering
E7	Modern Construction Materials
E8	Innovative Construction Practices
E9	Advanced Geotechnical Engineering
E10	Ground Improvement Techniques
E11	Maintenance and Rehabilitation of Structures
E12	Contracts and Legal Aspects in Construction
E13	Structural Design of Foundations
E14	Advanced Concrete Technology

Semester V

Course Code	Course	Credits
CEC 3501	Project- Phase II	11
Total		11

Semester VI

Course Code	Course	Credits
CEC 3601	Project- Phase III	11
Total		11

M.TECH. (Part Time) in
ELECTRICAL AND ELECTRONICS ENGINEERING
(SPECIALIZATION: POWER ELECTRONICS)

Semester I

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3101	Applied Mathematics	3
EEP 3102	Power Electronics Circuits	3
EEP 3103	Modern Control Theory	3
EEP 3104	Electric drives	3
EEP 3105	Seminar I	1
Total		13

Semester II

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3201	Advanced Power Electronics Circuits	3
EEP 3202	Distributed Energy Systems	3
EEP 3203	Power Quality	3
EEP 3204	Elective I	3
EEP 3205	Seminar II	1
Total		13

Elective I

EEP 3204 A	Digital Signal Processing
EEP 3204 B	Special Electric Machines & Control
EEP 3204 C	Modern Communication Engineering
EEP 3204 D	FPGA based system design

Semester III

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3301	Energy Management in Electrical System	3
EEP 3302	Solar Photovoltaic Systems	3
EEP 3303	Power Electronics Applications to Modern Power Systems	3
EEP 3304	Elective II	3
EEP 3305	Seminar III	1
Total		13

Elective II

EEP 3304 A	Statistical Methods for Engineers
EEP 3304 B	Process Control & Automation
EEP 3304 C	Dynamics of Electric Machines
EEP 3304 D	Reliability

Semester IV

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3401	Power Electronic Converters For Distributed Energy and EV applications	3
EEP 3402	Elective III	3
EEP 3403	Elective IV	3
EEP 3404	Project – Preliminary Evaluation	2
Total		11

Elective III

EEP 3402A	Research Methodology
EEP 3402B	Soft computing
EEP 3402C	Digital Simulation of Power electronic Systems
EEP 3402D	Industrial Instrumentation

Elective IV

EEP 3403A	Smart Grid Technologies & Applications
EEP 3403B	Hybrid & Electric vehicle
EEP 3403C	SCADA Systems & Applications
EEP 3403D	Digital Control System

Semester V

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3501	Project-Progress Evaluation	10
Total		10

Semester VI

<i>Course Code</i>	<i>Subject</i>	<i>No of Credits</i>
EEP 3601	Project-Dissertation Evaluation & Viva Voce	12
Total		12
Grand Total		72

M.Tech (Part Time) in Mechanical Engineering
(Specialization: Production Engineering)

Semester I

Course Code	Subject	Credit
MEP3101	Applied Mathematics	3
MEP3102	Advanced Materials and Processes	3
MEP3103	Metal Forming Theory	3
MEP3104	Maintenance and Reliability Engineering	3
MEP3105	Seminar	1
Total		13

Semester II

Course Code	Subject	Credit
MEP3201	Additive Manufacturing	3
MEP3202	Advanced Computer Integrated Manufacturing	3
MEP3203	Computational Methods in Engineering	3
MEP3204	Elective I	3
MEP3205	Computational Methods Laboratory	1
Total		13

Semester III

Course Code	Subject	Credit
MEP3301	Finite Element Method and Applications	3
MEP3302	Mechanical Behaviour of Materials	3
MEP3303	Modern Machining Processes	3
MEP3304	Elective II	3
MEP3305	CAD/CAM Laboratory	1
Total		13

Semester IV

Course Code	Subject	Credit
MEP3401	Computer Numerical Control of Machine Tools	3
MEP3402	Elective III	3
MEP3403	Elective IV	3
MEP3404	Project – Phase I	2
Total		11

Semester V

Course Code	Subject	Credit
MEP3501	Project – Phase II	11
Total		11

Semester VI

Course Code	Subject	Credit
MEP3601	Project – Phase III	11
Total		11

Total credits for the programme = 13 +13 +13+11+11+11 = 72

Electives

Course code	Subject	No of credits
E1	Mechatronics	3
E2	Nano Technology and Surface Engineering	3
E3	Six Sigma	3
E4	Process Control and Automation	3
E5	Machine Learning and AI	3
E6	Bio Materials	3
E7	Material Behaviour at High Temperatures	3
E8	Industrial Tribology	3
E9	Hydraulic and Pneumatic Drives	3
E10	Mechanical Vibrations	3
E11	Special Purpose Machine Tools	3
E12	Quality Engineering and Management	3
E13	Logistics and Supply Chain Management	3
E14	Engineering Optimization	3

B.TECH (FULL TIME)
C.(B.Tech. (FT) programmes are common to SOE & CUCEK)
DIVISION OF CIVIL ENGINEERING

B.TECH DEGREE PROGRAMME IN CIVIL ENGINEERING

Scheme of Examinations (2023 admissions)

SEMESTER I [STREAM A]

Stream A: Civil Engineering, Mechanical Engineering and Safety and Fire Engineering

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						C A	SEE	
23-200-0101A	Calculus	3	1	0	3	50	50	100
23-200-0102A	Engineering Chemistry	3	0	1	3	50	50	100
23-200-0103A	Engineering Graphics	2	0	3	3	50	50	100
23-200-0104A	Basic Civil Engineering	3	1	0	4	50	50	100
23-200-0105A	Basic Mechanical Engineering	3	1	0	4	50	50	100
23-200-0106A	Environmental and Life Sciences	3	0	0	3	50	50	100
23-200-0107A	Civil Engineering Workshop	0	0	3	1	25	25	50
23-200-0108A	Mechanical Engineering Workshop	0	0	3	1	25	25	50
	TOTAL	17	3	10	22			

A – Continuous Assessment, SEE – Semester End Examination

SEMESTER II [STREAM A]

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-200-0201A	Computer Programming and Problem Solving	3	1	0	4	50	50	100
23-200-0202A	Engineering Physics	3	0	1	3	50	50	100
23-200-0203A	Engineering Mechanics	3	1	0	4	50	50	100
23-200-0204A	Basic Electrical Engineering	3	0	0	3	50	50	100
23-200-0205A	Basic Electronics Engineering	3	0	0	3	50	50	100
23-200-0206A	Soft Skills Development	2	0	0	2	50	-	50
23-200-0207A	Computer Programming Laboratory	0	0	3	1	25	25	50

23-200-0208A	Basic Electrical and Electronics Engineering Laboratory	0	0	3	1	25	25	50
23-200-0209A	Language Laboratory	0	0	2	1	25	25	50
23-200-0210A	NSS/Nature conservation Activities/Yoga	0	0	2	0	-	-	-
	TOTAL	17	2	11	22			

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0301A*	Linear Algebra and Transform Techniques	3	1	0	3	50	50	100
23-201-0302	Surveying –I	3	1	0	3	50	50	100
23-201-0303	Strength of Materials	3	1	0	3	50	50	100
23-201-0304	Concrete Technology	3	1	0	3	50	50	100
23-201-0305	Fluid Mechanics –I	3	1	0	3	50	50	100
23-201-0306	Building Technology and Functional Planning	3	1	0	3	50	50	100
23-201-0307	Strength of Materials Lab	0	0	3	1	25	25	50
23-201-0308	Concrete Lab	0	0	3	1	25	25	50
23-201-0309	Internship-1	0	0	0	1	50	-	50
	TOTAL	18	6	6	21			

*Common for CE, ME and SE B.Tech Programmes

SEMESTER IV

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0401A*	Complex Variables and Partial Differential Equations	3	1	0	3	50	50	100
23-201-0402	Surveying –II	3	1	0	3	50	50	100
23-201-0403	Analysis of Structures -I	3	1	0	3	50	50	100
23-201-0404	Transportation Engineering -I	3	1	0	3	50	50	100
23-201-0405	Fluid Mechanics II	3	1	0	3	50	50	100
23-201-0406	Geotechnical Engineering -I	3	1	0	3	50	50	100
23-201-0407**	Universal Human Values	3	0	0	3	25	25	50
23-201-0408	Survey Practical	0	0	3	1	25	25	50
23-201-0409	Fluid Mechanics Lab	0	0	3	1	25	25	50
	TOTAL	21	6	6	23			

** The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H/ W	T H/ W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-201-0501	Numerical and Statistical Methods in Civil Engineering	3	1	0	3	50	50	100
23-201-0502	Design of Concrete Structures-I	3	1	0	3	50	50	100
23-201-0503	Analysis of Structures -II	3	1	0	3	50	50	100
23-201-0504	Transportation Engineering –II	3	1	0	3	50	50	100
23-201-0505	Geotechnical Engineering -II	3	1	0	3	50	50	100
23-201-05**	Professional Elective –I	3	1	0	3	50	50	100
23-201-0510	Geotechnical Engineering Lab	0	0	3	1	25	25	50
23-201-0511	Transportation Engineering Lab	0	0	3	1	25	25	50
23-201-0512	Internship-II	0	0	0	1	50	-	50
TOTAL		18	6	6	21			

23-201-0506 to 23-201-0509 Professional Elective – I	
Code No.	Subject
23-201-0506(IE)	Precast Construction of Structures
23-201-0507	Traffic Engineering and Management
23-201-0508	Engineering Geology and Seismology
23-201-0509	Disaster Management and Mitigation

SEMESTER VI

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-201-0601	Environmental Engineering –I	3	1	0	3	50	50	100
23-201-0602	Design of Steel Structures	3	1	0	3	50	50	100
23-201-0603	Advanced Methods of Structural Analysis	3	1	0	3	50	50	100
23-201-0604	Water Resources and Irrigation Engineering	3	1	0	3	50	50	100
23-201-0605	Construction Management	3	1	0	3	50	50	100
23-201-06**	Professional Elective – II	3	1	0	3	50	50	100
23-201-0610	Environmental Engineering Lab	0	0	3	1	25	25	50
23-201-0611	Architectural Design Studio	0	0	3	1	25	25	50
TOTAL		18	6	6	20			

23-201-0606 to 23-201-0609 Professional Elective – II	
Code No.	Subject
23-201-0606(IE)	Retrofitting and Rehabilitation of Structures
23-201-0607	Sustainable Construction Techniques
23-201-0608	Air Pollution Control and Management
23-201-0609	Machine Learning in Civil Engineering

SEMESTER VII

Code No.	Subject	L H/ W	T H/ W	P/D H/ W	C	Marks		Total
						CE	SEE	
23-201-0701	Environmental Engineering – II	3	1	0	3	50	50	100
23-201-0702	Quantity Surveying and Valuation	3	1	0	3	50	50	100
23-201-0703	Design of Concrete Structures – II	3	1	0	3	50	50	100
23-201 -07**	Professional Elective – III	3	1	0	3	50	50	100
23-201 -07**	Open Elective –I	3	0	0	3	50	50	100
23-201 -0712	Structural Design Studio	0	0	3	1	25	25	50
23-201 -0713	Computational Civil Engineering Laboratory	0	0	3	1	25	25	50
23-201 -0714	Entrepreneurship Development	0	0	2	1	50	-	50
23-201 -0715	Project –Phase I	0	0	3	2	50	-	50
23-201 -0716	Internship-III	0	0	0	1	50	-	50
TOTAL		15	4	11	21			

23-201 -0704 to 23-201-0707 Professional Elective – III	
Code No.	Subject
23-201 -0704 (IE)	Ground Improvement Techniques
23-201 -0705	Bridge Engineering
23-201 -0706	Pavement Analysis and Design
23-201 -0707	Architecture and Urban Planning

23-20 -0708 to 23-20 -0711 Open Elective – I	
Code No.	Subject
23-201-0708	Modern Construction Materials
23-201-0709	Housing Policy and Planning
23-201-0710	Industrial Waste Engineering and Management
23-201-0711	Non-destructive testing and Evaluation of Structures

SEMESTER VIII- Regular Track

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-201 -08**	Professional Elective IV	3	1	0	3	50	50	100
23-201 -08**	Professional Elective V	3	1	0	3	50	50	100
23-201 -08**	Professional Elective VI	3	1	0	3	50	50	100
23-201 -08**	Open Elective II	3	0	0	3	50	50	100
23-201 -0818	Seminar	0	0	3	1	50	-	50
23-201 -0819	Project Phase II	0	0	12	6	200	-	200
23-201 -0820	Comprehensive Viva Voce	-	-	0	1	-	50	50
TOTAL		12	3	15	20			

SEMESTER VIII- Internship Track

Code No.	Subject	L Hours/ Week	T Hours/ Week	P/D Hours/ Week	C	Marks		Total
						CA	SEE	
23-201 -08**	Professional Elective IV	3	1	0	3	50	50	100
23-201 -08**	Elective(Professional /Open)	3	1	0	3	50	50	100
23-201 -0818	Seminar			3	1	50	-	50
23-201 -0819	Project Phase – II			12	6	200	-	200
23-201 -0820	Comprehensive Viva Voce			0	1	-	50	50
23-201 -0821	Internship-IV				6	200		200
TOTAL		6	2	15	20			

23-201 -0801 to 23-201-0804 Professional Elective – IV

Code No.	Subject
23-201-0801	Design of special Structures
23-201-0802	Building Information Modelling
23-201-0803	Construction Safety and Fire Engineering
23-201-0804	Remote Sensing and GIS

23-201-0805 to 23-201-0808 Professional Elective – V

Code No.	Subject
23-201-0805	Construction Economics and Finance
23-201-0806	Construction Engineering and Materials Management
23-201-0807	Geo-environmental Engineering
23-201-0808	Design of Hydraulic Structures

23-201-0809 to 23-201-0812 Professional Elective – VI

Code No.	Subject
23-201 -0809	Earthquake Engineering
23-201 -0810	Structural Masonry and Alternative Building Technologies
23-201 -0811	Watershed Management
23-201-0812	Solid Waste Management

23-201-0813 to 23-201-0817 Open Elective – II	
Code No.	Subject
23-201-0813	Building Services Engineering
23-201-0814	Environmental Impact Assessment
23-201-0815	Sustainable Built Environment
23-201-0816	Experimental Stress Analysis
23-200-0817*	Constitutional Law

*Common to all programmes

List of Courses for Minor in Civil Engineering

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total Mark s	Offering Semester	Mode of learnin g
						CA	SEE			
23-201-0310	Civil Infrastructure Engineering-	3	0	0	3	50	50	100	III	Class room
23-201-0410	Concrete Technology-Theory and Practice	3	0	0	3	50	50	100	IV	Class room
23-201-0411	Sustainable Construction Practices/ *MOOC-I (Minor)				3				IV	Class room/ On-line
23-201-0513	Disaster Management/ *MOOC-II (Minor)				3				V	Class room/ On-line
23-201-0612	Building Services Engineering and Planning/ *MOOC-III (Minor)				3				VI	Class room/ On-line
23-201-0613	Mini Project			3	3	50	50	100	VI	

*For MOOC-I, MOOC- II and MOOC- III, students can select Swayam/NPTEL courses, approved by the BoS in Civil Engineering.

List of Courses for Honours in Civil Engineering

Code o.	Subject	L H/ W	T H/ W	P/D H/W	C	Marks		Total Marks	Offering Semester	Mode of learning
						CA	SEE			
23-201-0412	Advanced Concrete Technology	3	0	0	3	50	50	100	IV	Class room
23-201-0514	Subsurface Investigations and Instrumentation	3	0	0	3	50	50	100	V	Class room
23-201-0515	Research Methodology	3	0	0	3	50	50	100	V	Class room
23-201-0614	Contracts and Legal Aspects in Construction / *MOOC-I (Major)				3				VI	Class room/ On-line
23-201-0615	Advanced Foundation Engineering/ *MOOC-II (Major)				3				VI	Class room/ On-line
23-201-0717	Finite Element Methods /*MOOC –III (Major)				3				VII	Class room/ On-line

*For MOOC –I, MOOC- II and MOOC III students can select Swayam/NPTEL courses, approved by the BoS in Civil Engineering.

Details of Faculty

Sl. No.	Name & Designation	Specialization	Communication (Contact No.& email ID)
1	Dr.Job Thomas,Head & Professor	Structural Engineering	9846545824 job_thomas@yahoo.com
2	Dr. Sobha Cyrus, Professor	Geotechnical Engineering	9846146198 sobharoythomas@gmail.com
3	Dr.K.S Beena, Professor	Geotechnical Engineering	9447329888 beenavg@gmail.com
4	Sri. Arun Kumar T, Associate Professor	Environmental Engineering	9946510679 arunkumart2001@yahoo.co.uk
5	Dr.Renu Pawels, Professor	Environmental Engineering	9446556494 renupawels@gmail.com
6	Sri.S. Ramadass, Associate Professor	Structural Engineering	9446925748 subramanian.raamadass@gmail.com
7	Dr.Glory Joseph, Professor	Offshore Structures	9745229596 josephglory1@gmail.com
8	Dr.Abdu Rahiman K.U, Professor	Hydraulics Engineering	9497683196 arku@cusat.ac.in
9	Dr. Bindu C.S ,Professor	Transportation Engineering	9495429703 binduromeo@gmail.com
10	Dr.Subha V., Professor	Master of Housing	9447292584 subhakamal@gmail.com
11	Dr.Deepa Balakrishnan S., Professor	Structural Engineering & Construction Management	9495021727 deepa_balu@cusat.ac.in
12	Dr.D.S Narasimha, Associate Professor	Structural Engineering	8547775943 narasimhadhongdi@gmail.com
13	Dr.Deepa G. Nair, Professor	Habitat Technology	9846249839 deepalavanya1@gmail.com
14	Dr.Roy M. Thomas, Professor	Environmental Engineering	9447147194 roymthomas2007@gmail.com
15	Aryadevi S,Assistant Professor	Geotechnical Engineering	9188572181 aryadevisreekumar@gmail.com
16	Anasna Kareem, Assistant Professor	Structural Engineering & Construction Management	8129353468 anasnakrm@gmail.com
17	Vishnu Sasidharan, Assistant Professor	Geotechnical Engineering	9446671060 sasidharanvishnu@yahoo.in
18	Metilda Paulose N, Assistant Professor	Integrated Water Resources Management	8281291466 meticivil@gmail.com
19	Viji A J, Assistant Professor	Construction Engineering and Management	9947738887 aj_viji@yahoo.co.in

DIVISION OF SAFETY & FIRE ENGINEERING

B.TECH. (FT) DEGREE COURSE IN SAFETY & FIRE ENGINEERING

Scheme of Examinations (2023 admissions)

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-200-0301*	Linear Algebra & Transform Techniques*	3	1	0	3	50	50	100
23-206-0302	Chemical Process Principles	3	1	0	3	50	50	100
23-206-0303	Engineering Fluid Mechanics and Introduction to CFD	3	1	0	3	50	50	100
23-206-0304	Fire Engineering Fundamentals	3	1	0	3	50	50	100
23-206-0305	Occupational Safety and Industrial Hygiene	3	1	0	3	50	50	100
23-206-0306	Principles of Safety Management	3	1	0	3	50	50	100
23-206-0307	Fluid Mechanics and Machinery Laboratory	0	0	3	1	25	25	50
23-206-0308	Industrial Hygiene Laboratory	0	0	3	1	25	25	50
23-206-0309	Internship-1	0	0	0	1	50	-	50
	TOTAL	18	6	6	21			

*Common for CE, ME and SE branches

Internship-1 of a minimum duration of two weeks (10 working days) after second semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-200-0401*	Complex Variables and Partial Differential Equations*	3	1	0	3	50	50	100
23-206-0402	Heat Transfer Operations	3	1	0	3	50	50	100
23-206-0403	Strength of Materials	3	1	0	3	50	50	100
23-206-0404	Planning and Design of Fire Protection Systems	3	0	0	3	50	50	100
23-206-0405	Electrical Technology and Safety	3	0	0	3	50	50	100
23-206-0406	Manufacturing Processes	3	0	0	3	50	50	100

23-200-0407	Universal Human Values	3	0	0	3	25	25	50
23-206-0408	Strength of Materials Laboratory	0	0	3	1	25	25	50
23-206-0409	Electrical Technology Laboratory	0	0	3	1	25	25	50
TOTAL		21	3	6	23			

*Common for CE, ME and SE branches

*The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H/ W	T H/ W	P/D H/W	C	Marks		Total
						CA	SEE	
23-200-0501*	Numerical and Statistical Methods*	3	1	0	3	50	50	100
23-206-0502	Mass Transfer Operations	3	1	0	3	50	50	100
23-206-0503	Principles of Engineering Design	3	1	0	3	50	50	100
23-206-0504	Structural Fire Safety	3	1	0	3	50	50	100
23-206-0505	Chemical Technology and Reaction Engineering	3	1	0	3	50	50	100
23-206-05**	Professional Elective I	3	1	0	3	50	50	100
23-206-0510	Computer Applications in Safety and Fire Engineering Laboratory I	0	0	3	1	25	25	50
23-206-0511	Fire Safety Training	0	0	3	1	25	25	50
23-206-0512	Internship-II	0	0	0	1	50	-	50
TOTAL		18	6	6	21			

*Common for ME and SE branches

Internship-II of a minimum duration of two weeks (10 working days) after fourth semester and the evaluation will take place during the V semester.

23-206-0506 to 23-206-0509 Professional Elective – I	
Code No.	Subject
23-206-0506(IE)	Aviation Safety and Safety of Space Missions
23-206-0507	Disaster Management
23-206-0508	Safety in Fireworks Industry
23-206-0509	Introduction to Plant and Information Security

SEMESTER VI

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-206-0601	Legal Aspects of HSE	3	1	0	3	50	50	100
23-206-0602	IOT based Process Instrumentation and Control	3	1	0	3	50	50	100
23-206-0603	Chemical Process Safety	3	1	0	3	50	50	100
23-206-0604	Life Safety in Building Fire	3	1	0	3	50	50	100
23-206-0605	Environmental Engineering and Management	3	1	0	3	50	50	100
23-206-06**	Professional Elective – II	3	1	0	3	50	50	100
23-206-0610	Computer Applications in Safety and Fire Engineering Laboratory II	0	0	3	1	25	25	50
23-206-0611	Machine Shop	0	0	3	1	25	25	50
TOTAL		18	6	6	20			

23-206-0606 to 23-206-0609 Professional Elective – II

Code No.	Subject
23-206-0606(IE)	Safety in Petroleum and Petrochemical Industries
23-206-0607	Food and Biosafety
23-206-0608	Fault Detection and Diagnosis
23-206-0609	Explosive Engineering and Safety

SEMESTER VII

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-206-0701	Hazard Identification and Risk Assessment	3	1	0	3	50	50	100
23-206-0702	Hazard Control in Manufacturing	3	1	0	3	50	50	100
23-206-0703	Safety in Construction	3	1	0	3	50	50	100
23-206-07**	Professional Elective – III	3	1	0	3	50	50	100
23-206-07**	Open Elective III	3	0	0	3	50	50	100
23-206-0712	Chemical and Environmental Engineering Laboratory	0	0	3	1	25	25	50

23-206-0713	Fire Engineering Laboratory	0	0	3	1	25	25	50
23-206-0714	Entrepreneurship Development	0	0	2	1	50	-	50
23-206-0715	Project Phase I	0	0	3	2	50	-	50
23-206-0716	Internship-III	0	0	0	1	50	-	50
	TOTAL	15	4	11	21			

Internship-III of a minimum duration of two weeks (10 working days) after VI semester and the evaluation will take place during the VII semester.

23-206-0704 to 23-206-0707 Professional Elective – III	
Code No.	Subject
23-206-0704 (IE)	HSE Aspects of Fertiliser Industry
23-206-0705	Transportation Systems and Safety
23-206-0706	Principles of Industrial Management
23-206-0707	Industrial Ecology

23-206-0708 to 23-206-0711 Open Elective – I	
Code No.	Subject
23-206-0708	Industrial Psychology
23-206-0709	Entrepreneurship and Small Business Enterprises
23-206-0710	Science and Technology of Nano materials
23-206-0711	Energy Management and Conservation

SEMESTER VIII- Regular Track

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-206-08**	Professional Elective IV	3	1	0	3	50	50	100
23-206-08**	Professional Elective V	3	1	0	3	50	50	100
23-206-08**	Professional Elective VI	3	1	0	3	50	50	100
23-206-08**	Open Elective II	3	0	0	3	50	50	100
23-206-0818	Seminar	0	0	3	1	50	-	50
23-206-0819	Project Phase II	0	0	12	6	200	-	200
23-206-0820	Comprehensive Viva Voce	-	-	0	1	-	50	50
	TOTAL	12	3	15	20			

SEMESTER VIII- Internship Track

Code No.	Subject	L Hours/ Week	T Hours/ Week	P/D Hours/ Week	C	Marks		Total
						CA	SEE	
23-206-08**	Professional Elective IV	3	1	0	3	50	50	100
23-206-08**	Elective(Professional /Open)	3	1	0	3	50	50	100
23-206-0818	Seminar			3	1	50	-	50
23-206-0819	Project Phase - II			12	6	200	-	200
23-206-0820	Comprehensive Viva Voce			0	1	-	50	50
23-206-0821	Internship-IV	0	0	0	6	200	-	200
TOTAL		6	2	15	20			

23-206-0801 to 23-20-0804 Professional Elective – IV

Code No.	Subject
23-206-0801	Advanced Safety Engineering and Management
23-206-0802	Functional Safety Engineering
23-206-0803	Incident / Accident Investigation – Tools & Techniques
23-206-0804	System Safety Engineering

23-206-0805 to 23-20-0808 Professional Elective – V

Code No.	Subject
23-206-0805	Human Factors Engineering
23-206-0806	Operations Research
23-206-0807	Advanced Fire Dynamics
23-206-0808	Environmental Risk and Impact Assessment

23-206-0809 to 23-20-0812 Professional Elective – VI

Code No.	Subject
23-206-0809	Introduction to Occupational Epidemiology
23-206-0810	Quality Management Systems and Procedures
23-206-0811	Internet of Things (IoT), AI and Applications in Safety
23-206-0812	Reliability Engineering

23-206-0813 to 23-206-0816 and 23-200-0817 Open Elective – II

Code No.	Subject
23-206-0813	Non-destructive Testing Methods
23-206-0814	History and Philosophy of Science
23-206-0815	Principles of Industrial and Process Safety
23-206-0816	Safety, Fire and Environmental Management
23-200-0817*	Constitutional Law*

*Common to all branches

List of Courses for Minor in Safety and Fire Engineering

Code No.	Subject	L Hour/ week	T Hours/ Week	P/D Hours/ Week	C	Marks		Total Marks	Semest er in which offered	Mode of learning
						CA	SEE			
23-206-0310	Principles of Health, Safety and Environmental Management	3			3	50	50	100	III	Class room
23-206-0410	Fire Protection Engineering	3			3	50	50	100	IV	Class room
23-206-0612	Mini Project	-		3	3	50	-	50	VI	
23-206-0411	MOOC I (Minor) (Broad area: Safety Engineering and Management)				3				IV	On-line
23-206-0513	MOOC II (Minor) (Broad Area: Occupational health and Environment Management)				3				V	On-line
23-206-0613	MOOC III (Minor) (Broad Area: Fire Engineering)				3				VI	On-line

List of Courses for Honours

Code No.	Subject	L H/W	T H/ W	P/D H/W	C	Marks		Total Marks	Semeste r in which offered	Mode of learning
						CA	SEE			
23-206-0412	Soft computing Techniques for Safety Engineering	3			3	50	50	100	IV	Class room

23-206-0717	Dynamic Risk Analysis	3			3	50	50	100	VII	Class room
23-206-0514	Research Methodology	3			3	50	50	100	V	Class room
23-206-0413	MOOC I (Major)				3				IV	On-line
23-206-0515	MOOC II (Major)				3				V	On-line
23-206-0614	MOOC III (Major)				3				VI	On-line

Industry based Electives

Industry based Electives are offered in 5th, 6th and 7th Semesters and are listed among the Professional Electives with notation (IE) along with the subject code. A student should opt for at least one Industry based elective during the B.Tech. programme.

Open Electives:

Open Electives are offered in 7th and 8th Semesters. A student should opt for at least one Open Elective offered by any Division/Department other than their branch of study.

SEMESTER VIII Internship Track

Students who intend to go for internship track should inform the division head concerned before the commencement of 8th semester. The students will be given an option to change the track within 30 days from the commencement of 8th semester.

Students opting for Internship Track have to do Project-Phase – II and appear for the Comprehensive Viva- Voce.

The interns may opt for courses recommended by the division from the list of NPTEL/Swayam courses approved by BoS.

The students opting for divisional courses have to fulfill the requirements of continuous assessment and semester end examination.

One elective from Open Elective pool is mandatory if they have not completed one mandatory Open Elective in the seventh semester.

Project-phase –II is the continuation of Project-phase –I completed in the seventh semester.

The Internship -IV of minimum 6 weeks' duration must be done in an industry approved by either the Placement Cell or the respective Departments based on a valid MOU.

The Internship-IV is equivalent to two 3-credit courses of total 200 marks

The progress of Internship-IV will be evaluated twice during the semester, along with the internal examinations and finally after the completion of the internship.

Details of Faculty

Sl No	Name & Designation	Specialization	Communication (Contact No.& e-mail id)	
1	Dr. Dipak Kumar Sahoo Professor & Principal	Structural Fire Safety	9496215851	dkshoo@gmail.com
2	Dr. V. R. Renjith Professor & Head	Industrial Safety Engineering	9447108856	renjithvr75@gmail.com
3	Dr. George Mathew Professor	Structural Engineering	9447726194	cusat.george@gmail.com
Contract				
4	Anish Job Kurian	M.E(CAD/CAM)	8606707991	<i>anishjob1919@gmail.com</i>
5	Nithya Gopinath	M. Tech Computer Aided Process Design	8593939015	nithyakrishnang@gmail.com
6	Jiji Varghese	M.Tech in Industrial safety(HSE Management)	8921448305	jiji.jv27@gmail.com
7	Anju Roy	M.Tech in Industrial drives & Control	9946114216	anjurkp@gmail.com

DIVISION OF MECHANICAL ENGINEERING

B.TECH. (FT) DEGREE COURSE IN MECHANICAL ENGINEERING

Scheme of Examinations (2023 admissions)

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0301*	Linear Algebra & Transform Techniques*	3	1	0	3	50	50	100
23-205-0302	Electrical Technology	3	1	0	3	50	50	100
23-205-0303	Mechanics of Solids	3	1	0	3	50	50	100
23-205-0304	Fluid Mechanics	3	1	0	3	50	50	100
23-205-0305	Metallurgy & Materials Science	3	1	0	3	50	50	100
23-205-0306	Machine Drawing	3	1	0	3	50	50	100
23-205-0307	Strength of Materials Lab	0	0	3	1	25	25	50
23-205-0308	Fluid Mechanics Lab	0	0	3	1	25	25	50
23-205-0309	Internship-1	0	0	0	1	50		50
	TOTAL	18	6	6	21			

*Common CE, ME and SE

Internship-1 of a minimum duration of two weeks (10 working days) must be completed during the Summer vacation after II semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0401*	Complex Variables and Partial Differential Equations*	3	1	0	3	50	50	100
23-205-0402	Metrology & Instrumentation	3	1	0	3	50	50	100
23-205-0403	Mechatronics	3	1	0	3	50	50	100
23-205-0404	Applied Thermodynamics	3	1	0	3	50	50	100
23-205-0405	Hydraulic Machinery	3	1	0	3	50	50	100
23-205-0406	Manufacturing Processes	3	1	0	3	50	50	100
23-200-0407*	Universal Human Values *	3	0	0	3	50	0	50
23-205-0408	Metrology Lab	0	0	3	1	25	25	50
23-205-0409	Hydraulic Machinery Lab	0	0	3	1	25	25	50
	TOTAL	21	6	6	23			

*Common to CE, ME and SE

SEMESTER V

Code No.	Subject	L H / W	T H / W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0501*	Numerical and Statistical Methods*	3	1	0	3	50	50	100
23-205-0502	Mechanics of Machinery	3	1	0	3	50	50	100
23-205-0503	Machining Science & Machine Tools	3	1	0	3	50	50	100
23-205-0504	Thermal Engineering	3	1	0	3	50	50	100
23-205-0505	Power Plant Engineering	3	1	0	3	50	50	100
23-205-05**	Professional Elective I	3	1	0	3	50	50	100
23-205-0510	Computational Methods Lab	0	0	3	1	25	25	50
23-205-0511	Machine Shop	0	0	3	1	25	25	50
23-205-0512	Internship-II	0	0	0	1	50		50
	TOTAL	18	6	6	21			

Internship-II of a minimum duration of two weeks (10 working days) must be completed during the Summer vacation after IV semester and the evaluation will take place during the V semester.

*Common to ME and SE

23-205-0506 to 23-205-0509 Professional Elective – I	
Code No.	Subject
23-205-0506 (IE)	Industrial Management
23-205-0507	Computational Methods for Engineers
23-205-0508	Corrosion Engineering
23-205-0509	Principles of Turbomachinery

SEMESTER VI

Code No.	Subject	L H/ W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-205-0601	Dynamics of Machinery	3	1	0	3	50	50	100
23-205-0602	Design of Machine Elements – I	3	1	0	3	50	50	100
23-205-0603	Gas Dynamics	3	1	0	3	50	50	100
23-205-0604	Heat and Mass Transfer	3	1	0	3	50	50	100
23-205-0605	CAD/CAM	3	1	0	3	50	50	100
23-205-06**	Professional Elective – II	3	1	0	3	50	50	100
23-205-0610	CAD/CAM Lab	0	0	3	1	25	25	50
23-205-0611	Heat and Mass Transfer Lab	0	0	3	1	25	25	50
	TOTAL	18	6	6	20			

23-205-0606 to 23-205-0609 Professional Elective – II	
Code No.	Subject
23-205-0606 (IE)	Additive Manufacturing
23-205-0607	Operations Management
23-205-0608	Renewable Energy Engineering
23-205-0609	Energy Conservation and Environment Protection

SEMESTER VII

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-205-0701	Refrigeration and Air Conditioning	3	1	0	3	50	50	100
23-205-0702	Vibration & Noise Control	3	1	0	3	50	50	100
23-205-0703	Design of Machine Elements – II	3	1	0	3	50	50	100
23-205-07**	Professional Elective – III	3	1	0	3	50	50	100
23-205-07**	Open Elective I	3	0	0	3	50	50	100
23-205-0712	Thermal Engineering Lab	0	0	3	1	25	25	50
23-205-0713	Automation Lab	0	0	3	1	25	25	50
23-205-0714	Entrepreneurship Development	0	0	2	1	50	-	50
23-205-0715	Project Phase I	0	0	3	2	50	-	50
23-205-0716	Internship-III	0	0	0	1	50	-	50
TOTAL		15	4	11	21			

Internship-III of a minimum duration of two weeks (10 working days) must be completed during the Summer vacation after VI semester and the evaluation will take place during the VII semester.

3-205-0704 to 23-205-0707 Professional Elective – III	
Code No.	Subject
23-205-0704 (IE)	Automobile Engineering
23-205-0705	Robotics & Artificial Intelligence
23-205-0706	Supply Chain Management
23-205-0707	Aerospace Engineering

23-205-0708 to 23-205-0711 Open Elective – I	
Code No.	Subject
23-205-0708	Quality Engineering and Management
23-205-0709	Mechanics of Composite Materials
23-205-0710	HRD and Organizational Behaviour
23-205-0711	Computational Statistics for Engineers

SEMESTER VIII - Regular Track

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-205-08**	Professional Elective IV	3	1	0	3	50	50	100
23-205-08**	Professional Elective V	3	1	0	3	50	50	100
23-205-08**	Professional Elective VI	3	1	0	3	50	50	100
23-205-08**	Open Elective II	3	0	0	3	50	50	100
23-205-0818	Seminar	0	0	3	1	50	-	50
23-205-0819	Project Phase II	0	0	12	6	200	-	200
23-205-0820	Comprehensive Viva Voce	-	-	0	1	-	50	50
	TOTAL	12	3	15	20			

SEMESTER VIII - Internship Track*

Code No.	Subject	L Hours / Week	T Hours / Week	P/D Hours / Week	C	Marks		Tot al
						CA	SEE	
23-205-08**	Professional Elective IV	3	1	0	3	50	50	100
23-205-08**	Elective (Professional /Open)	3	1	0	3	50	50	100
23-205-0818	Seminar			3	1	50	-	50
23-205-0819	Project Phase - II			12	6	200	-	200
23-205-0820	Comprehensive Viva Voce			0	1	-	50	50
23-205-0821	Internship-IV	0	0	0	6	200		200
	TOTAL	6	2	15	20			

23-205-0801 to 23-205-0804 Professional Elective – IV	
Code No.	Subject
23-205-0801	Mechanical Behaviour of Materials
23-205-0802	Nano Technology and Surface Engineering
23-205-0803	Propulsion Engineering
23-205-0804	Hydraulic and Pneumatic Drives

23-205-0805 to 23-205-0808 Professional Elective – V	
Code No.	Subject
23-205-0805	Materials Management
23-205-0806	Quality Design and Control
23-205-0807	Convection and Two-Phase Flows
23-205-0808	Cryogenic Engineering
23-205-0809 to 23-205-0812 Professional Elective – VI	
Code No.	Subject
23-205-0809	Production Technology
23-205-0810	Nondestructive Testing Techniques
23-205-0811	Computational Fluid Dynamics
23-205-0812	Fundamentals of Combustion and Pollution

23-205-0813 to 23-205-0817 Open Elective – II	
Code No.	Subject
23-205-0813	Operation Research
23-205-0814	Engineering Economics, Estimation and Costing
23-205-0815	Finite Element Methods for Engineers
23-205-0816	Smart Materials
23-200-0817*	Constitutional Law*

*Common to all branches

Code No.	Subject	L Hour/ week	T Hour s/ Week	P/D Hour s/ Week	C	Marks		Total Marks	Seme ster in which offered	Mode of learning
						CA	SEE			
23-205-0310	Traditional and Non-Traditional Optimization Tools	3			3	50	50	100	III	Class room
23-205-0410	Product Design and Manufacturing	3			3	50	50	100	IV	Class room
23-205-0612	Mini Project	3			3	50	-	50	VI	
23-205-0411	MOOC I (Broad area: Management)				3				IV	Online/Class room

23-205-0513	MOOC II (Broad Area: Mechanical Engineering)				3				V	Online/Class room
23-205-0613	MOOC III (Broad Area: Materials Engineering)				3				VI	Online/Class room

List of Courses for Minor in Mechanical Engineering

List of Courses for Honours

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total Mark s	Seme ster in which offere d	Mode of learnin g
						CA	SEE			
23-205-0412	Advanced Mechanics of Solids	3			3	50	50	100	IV	Classroom
23-205-0717	Modelling and Simulation of Dynamic Systems	3			3	50	50	100	VII	Classroom
23-205-0514	Introduction to Uncertainty Analysis and Experimentation	3			3	50	50	100	V	Classroom
23-205-0413	MOOC I				3				IV	Online/Class room
23-205-0515	MOOC II				3				V	Online/Class room
23-205-0614	MOOC III				3				VI	Online/Class room

Details of Faculty

Sl.No	Name & Designation	Communication
1.	Dr.Ajithkumar.G. Professor	9446495639 ajithkumar@cusat.ac.in
2.	Dr.A.B.Bhassi Professor	8891745950 bhasiab@cusat.ac.in
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6.	Dr.Jacob Elias Professor,Chief Placement Officer	9447475268 jacob@cusat.ac.in
7.	Dr.James Varghese Professor (on deputation as Director,IRAA)	9495672695 jamesvar@cusat.ac.in
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9.	Shri.Joshy.P.J. Associate Professor	9496904280 pjjoshy@gmail.com
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DIVISION OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.TECH. (FT) DEGREE COURSE IN ELECTRONICS AND COMMUNICATION ENGINEERING

Scheme of Examinations (2023 admissions)

Stream B: Electrical and Electronics Engineering, Electronics & Communication,
Computer Science Engineering & Information Technology

SEMESTER I [Stream B]

CA – Continuous Assessment SEE – Semester End Examination

SEMESTER I

Code No.	Subject	L H / W	T H / W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0101B	Calculus	3	1	0	4	50	50	100
23-200-0102B	Engineering Physics	3	0	1	3	50	50	100
23-200-0103B	Introduction to Electronics devices & Circuits	3	1	0	4	50	50	100
23-200-0104B	Introduction to Electrical Engineering	3	0	0	3	50	50	100
23-200-0105B	Computer programming	3	1	0	3	50	50	100
23-200-0106B	Soft Skills Development	2	0	0	2	50	-	50
23-200-0107B	Computer Programming Laboratory	0	0	3	1	25	25	50
23-200-0108B	Basic Electrical lab	0	0	3	1	25	25	50
23-200-0109B	Language Laboratory	0	0	2	1	25	25	50
23-200-0110B	NSS/Nature conservation Activities/Yoga	0	0	1	0	-	-	-
	TOTAL	17	3	10	22			

SEMESTER II (STREAM B)

Code No.	Subject	L H/ W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0201B	Linear Algebra & Transform Techniques	3	1	0	4	50	50	100
23-200-0202B	Engineering Chemistry	3	0	1	3	50	50	100
23-200-0203B	Digital Electronics	3	1	0	3	50	50	100
23-200-0204B	Object Oriented Programming in C++	3	1	1	4	50	50	100
23-200-0205B	Introduction to Cyber Physical Systems	3	1	0	3	50	50	100
23-200-0206B	Environmental and Life Sciences	3	0	0	3	50	50	100
23-200-0207B	Digital Electronics Lab	0	0	3	1	25	25	50
23-200-0208B	Basic Electronics Lab	0	0	3	1	25	25	50
	TOTAL	18	4	8	22			

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0301B	Complex Variables and Partial Differential Equations	3	1	0	3	50	50	100
23-203 -0302	Network Theory	3	1	0	3	50	50	100
23-203 -0303	Electronic Circuits-I	3	1	0	3	50	50	100
23-203 -0304	Digital System Design	3	1	0	3	50	50	100
23-203-0305	Microprocessor Architecture	3	1	0	3	50	50	100
23-203 -0306	Solid State Devices	3	1	0	3	50	50	100
23-203 -0307	Electronic Circuits Lab	0	0	3	1	25	25	50
23-203 -0308	Digital Systems & Programming Laboratory	0	0	3	1	25	25	50
23-203 -0309	Internship-1	0	0	0	1	50		50
	TOTAL	18	6	6	21			

Internship-1 of a minimum duration of two weeks (10 working days) after second semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/W	T H/W	P/D H/W	C	Marks		Total
						CA	SEE	
23-200-0401B	Numerical and Statistical Methods	3	1	0	3	50	50	100
23-203 -0402	Analog integrated Circuits	3	1	0	3	50	50	100
23-203 -0403	Signals & Systems	3	1	0	3	50	50	100
23-203 -0404	Electromagnetic Theory	3	1	0	3	50	50	100
23-203 -0405	Introduction to Communication Engineering	3	1	0	3	50	50	100
23-203 -0406	Universal Human Values **	3	0	0	3	25	25	50
23-203 -0407	Mini Project	1	0	3	2	25	25	50
23-203 -0408	Analog Integrated Circuit Lab	0	0	3	1	25	25	50
TOTAL		19	5	6	21			

** The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H / W	T H / W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-203 -0501	Computer organization & micro controllers	3	1	0	3	50	50	100
23-203 -0502	Microwave Engineering	3	1	0	3	50	50	100
23-203 -0503	Digital Communication Engineering	3	1	0	3	50	50	100
23-203 -0504	VLSI design	3	1	0	3	50	50	100
23-203 -0505	Digital Signal Processing	3	1	0	3	50	50	100
23-203 -05**	Professional Elective I	3	1	0	3	50	50	100
23-203 -0510	Digital Signal Processing Lab	0	0	3	1	25	25	50
23-203 -0511	Communication Lab	0	0	3	1	25	25	50
23-203 -0512	Internship-II	0	0	0	1	50		50
TOTAL		18	6	6	21			

Internship-II of a minimum duration of two weeks (10 working days) after fourth semester and the evaluation will take place during the V semester.

23-203-0506 to 23-203-0509 Professional Elective – I	
Code No.	Subject
23-203 -0506(IE)	FPGA based System Design
23-203 -0507	Power Electronics
23-203 -0508	Advanced Digital System Design
23-203 -0509	Photonics

SEMESTER VI

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-203 -0601	Information theory & Wireless Communication	3	1	0	3	50	50	100
23-203 -0602	Digital Image Processing	3	1	0	3	50	50	100
23-203 -0603	Control System	3	1	0	3	50	50	100
23-203 -0604	Antenna Theory	3	1	0	3	50	50	100
23-203 -060*	Professional Elective – II	3	1	0	3	50	50	100
23-203 -06**	Open Elective – I	3	1	0	3	50	50	100
23-203 -0613	Minor Project based on embedded systems	0	0	3	2	25	25	50
23-203 -0614	Microwave Engineering Laboratory	0	0	3	1	25	25	50
TOTAL		18	6	6	21			
23-203-0606 to 23-203-0609 Professional Elective – II								
Code No.	Subject							
23-203 -0605(IE)	(IE) AI & ML							
23-203 -0606	Statistical Signal processing							
23-203 -0607	Flexible Electronics							
23-203 -0608	Electronic Measurements & Instrumentation							
23-203-0606 to 23-203-0609 Open Elective – I								
Code No.	Subject							
23-203 -0609	Embedded and real time System							
23-203 -0610	Modern communication systems							
23-203 -0611	Non-Conventional Sources of Energy							
23-203 -0612	MEMS and NEMS							

SEMESTER VII

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-203 -0701	Principles of Management	3	1	0	3	50	50	100
23-203 -07**	Professional Elective – III	3	1	0	3	50	50	100
23-203 -07**	Professional Elective – IV	3	1	0	3	50	50	100
23-203 -07**	Open Elective II	3	0	0	3	50	50	100
23-203 -0714	Seminar	0	0	4	2	50		50
23-203 -0715	Minor Project based on signal processing	0	0	3	2	25	25	50
23-203 -0716	Entrepreneurship Development	0	0	2	1	25	25	50
23-203 -0717	Project phase I	0	0	6	4	50	-	50
23-203 -0718	Industrial Internship-III	0	0	0	1	50	-	50
TOTAL		12	3	15	22			

Internship-III of a minimum duration of two weeks (10 working days) after VI semester and the evaluation will take place during the VII semester.

23-20 -0704 to 23-20 -0707 Professional Elective – III	
Code No.	Subject
23-203 -0702 (IE)	IoT based System Design
23-203 -0703	Computational Electromagnetics
23-203 -0704	Digital Integrated Circuit Design
23-203 -0705	Adaptive Signal Processing

23-20 -0704 to 23-20 -0707 Professional Elective –IV	
Code No.	Subject
23-203 -0706	Device modelling
23-203 -0707	Advanced Computer Architecture
23-203 -0708	5G Communication Techniques
23-203 -0709	RF Circuit Design

23-20 -0708 to 23-20 -0711 Open Elective – II	
Code No.	Subject
23-203 -0710	Universal Human Values-Understanding Human Being, Nature and Existence Comprehensively
23-203 -0711	Advanced Wireless Communication
23-203 -0712	Constitutional Law
23-203 -0713	Intellectual Property Rights

SEMESTER VIII- Regular Track

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-203-08**	Professional Elective V	3	1	0	3	50	50	100
23-203-08**	Professional Elective VI	3	1	0	3	50	50	100
23-203-08**	Professional Elective VII	3	1	0	3	50	50	100
23-203-0813	Project phase II	0	0	18	10	200	-	200
23-203-0814	Comprehensive Viva Voce	-	-	0	1	-	50	50
	TOTAL	9	3	18	20			

SEMESTER VIII- Internship Track *

Code No.	Subject	L Hours / Week	T Hours / Week	P/D Hours / Week	C	Marks		Total
						CA	SEE	
23-203-08**	Professional Elective V/VI/VII	3	1	0	3	50	50	100
23-203-08*	Internship-IV	0	0	-	6	200	-	200
23-203-0813	Project phase II	0	0	18	10	200	-	200
23-203-0814	Comprehensive Viva Voce	0	0	0	1	-	50	50
	TOTAL	3	1	18	20			

23-203 -0801 to 23-203 -0804 Professional Elective – V

Code No.	Subject
23-203 -0801	Computer Communication and Networking
23-203 -0802	Systems Engineering
23-203 -0803	Neuro-Fuzzy Systems
23-203 -0804	Electric Vehicle Design

23-203-0805 to 23-203-0809 Professional Elective – VI

Code No.	Subject
23-203-0805	MIMO and OFDM Communication Systems
23-203-0806	Mathematical Algorithms for Signal processing
23-203-0807	Neural Networks & Deep learning
23-203-0808	Electronic Defence Systems

23-203-0810 to 23-203-0813 Professional Elective – VII	
Code No.	Subject
23-203-0809	Multimedia Communication System
23-203-0810	Electromagnetic Interference and Compatibility
23-203-0811	ASIC Design
23-203-0812	Memory and interconnects

List of Courses for Minor in Embedded Systems

Code No.	Subject	L Hour / wee ek	T Hour s/ Wee k	P/D Hour s/ Wee k	C	Marks		Total Mark s	Offering Semeste r	Mode of learnin g
						CA	SEE			
23-203 - 0310	Analog Circuits	3	1	0	3	50	50	100	S3	classroom
23-203 - 0409	Digital Circuits	3	1	0	3	50	50	100	S4	classroom
23-203 - 0513	Mini Project	0	0	3	3	25	25	50	S5	
23-203 - 0410	MOOC 1 – Broad area: Microproc essors				3	50	50	100	S4	Online/Clas s room
23-203 - 0514	MOOC 2 – Broad area: Embedded Systems				3	50	50	100	S5	Online/Clas s room
23-203 - 0615	MOOC 3 – Broad area: Sensors and Actuators				3	50	50	100	S6	Online/Clas s room

List of Courses for Honours

Code No.	Subject	L Hour/week	T Hours/Week	P/D Hours/Week	C	Marks		Total Marks	Offering semester	Mode of learning
						CA	SEE			
23-203-0513	Low Power VLSI	3	1	0	3	50	50	100	S5	classroom
23-203-0615	Image Forensics	3	1	0	3	50	50	100	S6	classroom
23-203-0719	Radar Signal Processing	3	1	0	3	50	50	100	S7	classroom
23-203-0514	MOOC 1 (Major)				3				S5	On-line
23-203-0616	MOOC 2 (Major)				3				S6	On-line
23-203-0720	MOOC 3 (Major)				3				S7	On-line

B.TECH. PROGRAMME IN ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0301*	Complex Variables and Partial Differential Equations*	3	1	0	3	50	50	100
23-209 - 0302	Electrical Machines-I	3	1	0	3	50	50	100
23-209 - 0303	Circuits and Networks	3	1	0	3	50	50	100
23-209-0304	Measurements & Instrumentation	3	1	0	3	50	50	100
23-209 - 0305	Linear Integrated Circuits	3	1	0	3	50	50	100
23-209 - 0306	Microprocessor and Microcontroller Based systems	3	1	0	3	50	50	100
23-209 - 0307	Simulation Lab	0	0	3	1	25	25	50
23-209 - 0308	Cyber Physical Systems Lab	0	0	3	1	25	25	50
23-209 - 0309	Internship-1	0	0	0	1	50		50
	TOTAL	18	6	6	21			

*Common to EE, EC, CS & IT branches

Internship-1 of a minimum duration of two weeks (10 working days) after second semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-200-0401*	Numerical and Statistical Methods*	3	1	0	3	50	50	100
23-209 -0402	Circuits, Signals & Systems	3	1	0	3	50	50	100
23-209 -0403	Electrical Machines-II	3	1	0	3	50	50	100
23-209 -0404	Power Electronics	3	1	0	3	50	50	100
23-209 -0405	Control System I	3	1	0	3	50	50	100
23-200-0406*	Universal Human Values *	3	0	0	3	50	0	50
23-209 -0407	Measurements & Instrumentation Lab	0	0	3	1	25	25	50
23-209 -0408	Electrical Machines Lab-I	0	0	3	1	25	25	50
	TOTAL	18	6	6	20			

*Common to EE, EC, CS & IT branches

*The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H/ W	T H / W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-209 -0501	Design of Solar Photovoltaic Systems	3	1	0	3	50	50	100
23-209 -0502	Electromagnetic field Theory	3	1	0	3	50	50	100
23-209 -0503	Machine Learning	3	1	0	3	50	50	100
23-209 -0504	Digital Signal Processing	3	1	0	3	50	50	100
23-209-0505	Power Systems-I	3	1	0	3	50	50	100
23-209-05**	Professional Elective I	3	1	0	3	50	50	100
23-209-0510	Power Electronics Lab	0	0	3	1	25	25	50
23-209 -0511	Linear Integrated Circuits Lab	0	0	3	1	25	25	50
23-209 -0512	Internship-II	0	0	0	1	50		50
	TOTAL	18	6	6	21			

Internship-II of a minimum duration of two weeks (10 working days) after fourth semester and the evaluation will take place during the V semester.

23-203-0506 to 23-203-0509 Professional Elective – I	
Code No.	Subject
23-209 - 0506(IE)	Industrial Automation
23-209 -0507	Special Electrical Machines
23-209 -0508	SMPS Design
23-209-0509	Data Structures & Algorithms

SEMESTER VI

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-209 -0601	Power Systems-II	3	1	0	3	50	50	100
23-209 -0602	Control Systems-II	3	1	0	3	50	50	100
23-209 -0603	Electric Drives	3	1	0	3	50	50	100
23-209 -0604	VLSI Design	3	1	0	3	50	50	100
23-209 -0605	Electric Vehicles	3	1	0	3	50	50	100
23-209 -06**	Professional Elective – II	3	1	0	3	50	50	100
23-209 -0610	Control Systems Lab	0	0	3	1	25	25	50
23-209-0611	Electrical Machines Lab- II	0	0	3	1	25	25	50
	TOTAL	18	6	6	20			

23-203-0606 to 23-203-0609 Professional Elective – II	
Code No.	Subject
23-209 - 0606(IE)	HVDC & FACTS
23-209 -0607	Python Programming
23-209 -0608	Dynamics of Electric Machines
23-209 -0609	Digital Control System

SEMESTER VII

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-209 - 0701*	Principles of Management*	3	1	0	3	50	50	100
23-209 - 0702	Electrical System Design	3	1	0	3	50	50	100
23-209 - 0703	Communication Engineering	3	1	0	3	50	50	100
23-209 - 07**	Professional Elective – III	3	1	0	3	50	50	100
23-209 - 07**	Open Elective -I	3	0	0	3	50	50	100
23-209 - 0712	Computer Aided Design Lab	0	0	3	1	25	25	50
23-209 - 0713	Power Systems Lab	0	0	3	1	25	25	50
23-209 - 0714	Entrepreneurship Development	0	0	2	1	50	-	50
23-209 - 0715	Project Phase I	0	0	3	2	50	-	50
23-209 - 0716	Internship-III	0	0	0	1	50	-	50
TOTAL		15	4	11	21			

*Common for CS/EC/EE/ITComputer Science

Internship-III of a minimum duration of two weeks (10 working days) after VI semester and the evaluation will take place during the VII semester.

23-20 -0704 to 23-20 -0707 Professional Elective – III	
Code No.	Subject
23-209-0704 (IE)	Battery Pack Design
23-209 -0705	Smart Grid Technologies & Applications
23-209 -0706	Advanced Power Electronics
23-209 -0707	Robotics

23-20 -0708 to 23-20 -0711 Open Elective – I	
Code No.	Subject
23-209 -0708	Electric Vehicles
23-209 -0709	Control Systems
23-209 -0710	Power Electronics
23-209 -0711	Automotive Electronics

SEMESTER VIII- Regular Track

Code No.	Subject	L H/W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-209 -08**	Professional Elective IV	3	1	0	3	50	50	100
23-209 -08**	Professional Elective V	3	1	0	3	50	50	100
23-209 -08**	Professional Elective VI	3	1	0	3	50	50	100
23-209 -08**	Open Elective II	3	0	0	3	50	50	100
23-209 -0815	Seminar	0	0	3	1	50	-	50
23-209 -0816	Project Phase II	0	0	12	6	200	-	200
23-209 -0817	Comprehensive Viva Voce	-	-	0	1	-	50	50
	TOTAL	12	3	15	20			

SEMESTER VIII- Internship Track *

Code No.	Subject	L Hours / Week	T Hours / Week	P/D Hours / Week	C	Marks		Total
						CA	SEE	
23-209 -08**	Professional Elective IV	3	1	0	3	50	60	100
23-209 -08**	Elective(Professional /Open)	3	1	0	3	50	60	100
23-209 -0815	Seminar			3	1	50	-	50
23-209 -0816	Project Phase - II			12	6	200	-	200
23-209 -0817	Comprehensive Viva Voce			0	1	-	50	50
23-209 -0818	Internship-IV	0	0	0	6	200		200
	TOTAL	6	2	15	20			

****23-20 -0801 to 0809 PROFESSIONAL ELECTIVE**

****23-20 -0810 to 0814: OPEN ELECTIVE – II**

23-20 -0801 to 23-20 -0805 Professional Elective – IV	
Code No.	Subject
23-20 -0801	System Identification & Adaptive Control
23-20 -0802	Digital Simulation of Power Electronic Systems
23-20 -0803	Electrical Safety
23-20 -0804	Soft Computing
23-20-0805	Energy Auditing and Analysis

23-20 -0806 to 23-20 -0809 Professional Elective – V	
Code No.	Subject
23-20-0806	Digital Image Processing
23-20-0807	Power System Operation and Control
23-20-0808	Data Driven Control
23-20-0809	Advanced Electric Drives

23-20 -0810 to 23-20 -0813 Professional Elective – VI	
Code No.	Subject
23-20 -0810	Computer Communication and Networking
23-20 -0811	Computer Vision
23-20 -0812	Adaptive Signal Processing
23-20-0813	Automotive Electronics

23-20 -0814 to 23-20 -0818 Open Elective – II	
Code No.	Subject
23-20 -0814	Statistical Methods for Engineers
23-20 -0815	Biomedical Instrumentation
23-20 -0816	Optimization Techniques and Algorithms
23-20-0817	Electrical Engineering Materials
23-20 -0818*	Constitutional Law*

*Common to all branches

List of Courses for Minor in Smart Mobility & Electric Vehicles

Code No.	Subject	L Hour/week	T Hours/Week	P/D Hours/Week	C	Marks		Mark sTotal	Offering Semester	Mode of learning
						CA	SEE			
23-209-0310	Power Electronics & Drives	3	1	0	3	50	50	100	3	Class Room
23-209-0409	Fundamentals of EVs	3	1	0	3	50	50	100	4	Class Room
23-209-0513	MOOC-I				3				5	Online/Class room
23-209-0514	MOOC-II				3				5	Online/Class room
23-209-0612	MOOC-III				3				6	Online
23-209-0613	Mini Project				3	50		50	6	

List of Courses for Honours in Electrical & Electronics

Code No.	Subject	L Hour/week	T Hour s/Week	P/D Hour s/Week	C	Marks		Total Marks	Offering semester	Mode of learning
						CA	SEE			
	Advanced Electric Drives	3	1	0	3	50	50	100	5	Class Room
	Robust & Adaptive Control	3	1	0	3	50	50	100	6	Class Room
	Power Quality Improvement Techniques	3	1	0	3	50	50	100	7	Class Room
	MOOC-I				3				5	Online
	MOOC-II				3				6	Online
	MOOC-III				3				7	Online

DETAILS OF FACULTY

Sl No	Name & Designation	Specialization	Communication (Contact No.& e-mail id)	
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16	NIDYA	M. Tech Instrumentation and Control Systems	nidyamv@gmail.com	9847558332

DIVISION OF COMPUTER SCIENCE AND ENGINEERING

B.TECH (FT) DEGREE COURSE IN COMPUTER SCIENCE AND ENGINEERING

SEMESTER III

Code No.	Subject	L H/W	T H/W	P/ D H/ W	C	Marks		Total
						CA	SEE	
23-200-0301B	Complex Variables and Partial Differential Equations*	3	1	0	3	50	50	100
23-202 -0302	Computer Architecture and Organization	3	1	0	3	50	50	100
23-202 -0303	Discrete Computational Structures**	3	1	0	3	50	50	100
23-202 -0304	Data Structures and Algorithms	3	1	0	3	50	50	100
23-202 -0305	Principles of Programming Languages	3	1	0	3	50	50	100
23-202 -0306	Automata Languages and Computations	3	1	0	3	50	50	100
23-202 -0307	Data Structures Laboratory	0	0	3	1	25	25	50
23-202 -0308	Object Oriented Programming Laboratory	0	0	3	1	25	25	50
23-202 -0309	Internship-1	0	0	0	1	50		50
	TOTAL	18	6	6	21			

*Common for CS/EE/EC/IT

** Common for CS/IT

Internship-1 of a minimum duration of two weeks (10 working days) after second semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/ W	T H/ W	P / D H / W	C	Marks		Total
						C A	S E E	
23-200-0401B	Numerical and Statistical Methods*	3	1	0	3	50	50	100
23-202 -0402	Operating Systems	3	1	0	3	50	50	100
23-202 -0403	Database Management Systems	3	1	0	3	50	50	100
23-202 -0404	Data and Computer Communication	3	0	0	3	50	50	100
23-202 -0405	Object Oriented Software Engineering	3	0	0	3	50	50	100
23-202 -0406	Microprocessors	3	0	0	3	50	50	100
23-202-0407	Universal Human Values **	3	0	0	3	25	25	50
23-202 -0408	Database Management Systems Laboratory	0	0	3	1	25	25	50
23-202 -0409	Operating System Laboratory	0	0	3	1	25	25	50
TOTAL		21	3	6	23			

*Common for CS/EE/EC/IT

**The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H / W	T H / W	P / D H/ W	C	Marks		Total
						C A	S E E	
23-202 -0501	Mathematical Foundations for Machine Learning	3	1	0	3	50	50	100
23-202 -0502	System Programming	3	1	0	3	50	50	100
23-202 -0503	Data Mining	3	1	0	3	50	50	100
23-202 -0504	Computer Graphics	3	1	0	3	50	50	100
23-202 -0505	Advanced Microprocessors and Embedded Systems	3	1	0	3	50	50	100
23-202 -05**	Professional Elective I	3	1	0	3	50	50	100
23-202 -0510	Computer Graphics Laboratory	0	0	3	1	25	25	50

23-202 -0511	IoT and Embedded Systems Laboratory	0	0	3	1	25	25	50
23-202 -0512	Internship-II	0	0	0	1	50		50
	TOTAL	18	6	6	21			

Internship-II of a minimum duration of two weeks (10 working days) after fourth semester and the evaluation will take place during the V semester.

23-202-0506 to 23-202-0509 Professional Elective – I	
Code No.	Subject
23-202 -0506(IE)	Web Technologies
23-202 -0507	Software Project Management
23-202 -0508	Embedded System Design
23-202 -0509	Fundamentals of Cyber Security

SEMESTER VI

Code No.	Subject	L H/ W	T H/ W	P / D H / W	C	Marks		Total
						C A	SE E	
23-202 -0601	Computer Networks	3	1	0	3	50	50	100
23-202 -0602	Compiler Construction	3	1	0	3	50	50	100
23-202 -0603	Analysis and Design of Algorithms	3	1	0	3	50	50	100
23-202 -0604	Artificial Intelligence	3	1	0	3	50	50	100
23-202 -0605	Cryptography and Network Security	3	1	0	3	50	50	100
23-202 -06**	Professional Elective – II	3	1	0	3	50	50	100
23-202 -0610	Networks Laboratory	0	0	3	1	25	25	50
23-202 -0611	Mini Project	0	0	3	1	25	25	50
	TOTAL	18	6	6	20			

23-202-0606 to 23-202-0609 Professional Elective – II	
Code No.	Subject
23-202 -0606(IE)	Neural Networks and Deep Learning
23-202 -0607	Distributed Computing
23-202 -0608	Digital Image Processing
23-202 -0609	Information Retrieval

SEMESTER VII

Code No.	Subject	L H/ W	T H / W	P / D H / W	C	Marks		Total
						CA	S E E	
23-202 -0701	Principles of Management	3	1	0	3	50	50	100
23-202 -0702	Advanced Architecture and Parallel Processing	3	1	0	3	50	50	100
23-202 -0703	Bigdata Analytics	3	1	0	3	50	50	100
23-202 -07**	Professional Elective – III	3	1	0	3	50	50	100
23-202 -07**	Open Elective I	3	0	0	3	50	50	100
23-202 -0712	Language Processors Laboratory	0	0	3	1	25	25	50
23-202 -0713	Data Analytics Lab	0	0	3	1	25	25	50
23-202 -0714	Entrepreneurship Development	0	0	2	1	50	-	50
23-202 -0715	Project Phase I	0	0	3	1	50	-	50

23-202 -0716	Internship-III	0	0	0	1	50	-	50
TOTAL		15	4	11	20			

23-202-0704 to 23-202-0707 Professional Elective – III	
Code No.	Subject
23-202 -0704 (IE)	BlockChain Technologies
23-202 -0705	Internet of Things and Applications
23-202 -0706	Biometric Technologies
23-202 -0707	Cloud Computing
23-202-0708 to 23-202-0711 Open Elective – I	
Code No.	Subject
23-202 -0708	Mobile Application Development
23-202 -0709	System Modeling and Simulation
23-202 -0710	Cyber Law and Ethics
23-202 -0711	Business Intelligence and Analytics

Internship-III of a minimum duration of two weeks (10 working days) after VI semester and the evaluation will take place during the VII semester.

SEMESTER VIII- Regular Track

Code No.	Subject	L H/ W	T H / W	P/ D H/ W	C	Marks		Total
						CA	S E E	
23-202 - 08**	Professional Elective IV	3	1	0	3	50	50	100
23-202 - 08**	Professional Elective V	3	1	0	3	50	50	100
23-202 - 08**	Professional Elective VI	3	1	0	3	50	50	100
23-202 - 08**	Open Elective II	3	0	0	3	50	50	100
23-202 - 0818	Seminar	0	0	3	1	50	-	50
23-202-0819	Project Phase II	0	0	12	6	200	-	200
23-202 - 0820	Comprehensive Viva Voce	0	0	0	2	-	50	50
TOTAL		12	3	15	21			

SEMESTER VIII- Internship Track*

Code No.	Subject	L Hours / Week	T Hou r s/ W e e k	P/D Hour s/ Wee k	C	Marks		Total
						CA	SEE	
23-202 -08**	Professional Elective IV	3	1	0	3	50	50	100
23-202 -08**	Elective(Professional /Open)	3	1	0	3	50	50	100
23-202 -0818	Seminar	0	0	3	1	50	-	50
23-202 -0819	Project Phase - II	0	0	12	6	200	-	200
23-202 -0820	Comprehensive Viva Voce	0	0	0	2	-	50	50
23-202 -0821	Internship-IV	0	0	0	6	200		200
TOTAL		6	2	15	21			

****23-202 -0801 to 0812 PROFESSIONAL ELECTIVE**

****23-202 -0813 to 0817: OPEN ELECTIVE – II**

23-202 -0801 to 23-202-0804 Professional Elective – IV	
Code No.	Subject
23-202 -0801	Randomized Algorithms
23-202 -0802	Augmented Reality
23-202 -0803	Computational Linguistics
23-202 -0804	Advanced Graph Theory

23-202 -0805 to 23-202 -0818 Professional Elective – V	
Code No.	Subject
23-202 -0805	Computer Vision
23-202 -0806	Agent Based Intelligent System
23-202 -0807	Cloud Security
23-202 -0808	Social Network Analysis

23-202 -0809 to 23-202 -0812 Professional Elective – VI	
Code No.	Subject
23-202 -0809	Natural Language Processing
23-202 -0810	Pattern Recognition
23-202 -0811	Real Time Data Analysis
23-202 -0812	Advanced Compiler Design and Optimization

23-202 -0813 to 23-202 -0817 Open Elective – II	
Code No.	Subject
23-202 -0813	Ethical Hacking
23-202 -0814	Cyberspace and Information System Security
23-202 -0815	Soft Computing
23-202 -0816	Internet of Things
23-202 -0817	Constitutional Law *

*Common to all branches

List of Courses for Minor in Machine Learning

Code No.	Subject	L Hour / week	T Hou rs/ Wee k	P/D Hou rs/ Wee k	C	Marks		Total Marks	Offering Semester	Mode of learning
						CA	SEE			
23-202-0310	Python for Machine learning	3	0	0	3	50	50	100	III	Classroom
23-202-0410	Mathematical foundation for machine learning	3	0	0	3	50	50	100	IV	Classroom
23-202-0513	MOOC I (Minor)				3				V	Online/Classroom
	(Broad area: Applied Data Science)									
23-202-0612	MOOC II (Minor) (Broad area: Neural networks and machine Learning)				3				VI	Online/Classroom
23-202-0717	MOOC III (Minor) (Broad area: Deep learning with python and keras)				3				VII	Online/Classroom
23-202-0822	Project				3				VII	

List of Courses for Honours

Code No.	Subject	L Hour / week	T Hours/ Week	P/D Hours/ Week	C	Marks		Total Marks	Offering semester	Mode of learning
						CA	SEE			
23-202-0411	Python for Machine Learning	3	0	0	3	50	50	100	IV	Classroom
23-202-0514	Applied Machine Learning	3	0	0	3	50	50	100	V	Classroom
23-202-0613	Optimization Techniques	3	0	0	3	50	50	100	VI	Classroom
23-202-0614	MOOC I (Major) Recommender Systems				3				VI	Online/Classroom
23-202-0718	MOOC II (Major) Reinforcement learning using python				3				VII	Online/Classroom
23-202-0823	MOOC III (Major) Image Analysis using Deep learning				3				VIII	Online/Classroom

Details of Faculty

Permanent				
Sl No.	Name & Designation	Specialization	Contact No:	Email ID
1	Dr. Latha R Nair, Professor	Artificial Intelligence and Machine Learning	9567489098	latharnair@cusat.ac.in
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4	Mr. Vinod Kumar P P, Associate Professor	Computer & Information Science	9447222647	ppvino@gmail.com
5	Dr. Pramod Pavithran, Associate Professor	Cryptography and finite automata	09447106663	pramodpavithran@gmail.com
6	Mr. V Damodaran, Associate Professor	Computer and information science	9447001195	dams72@gmail.com
7	Ms. Ancy Zachariah, Associate Professor	Machine learning	9544884424	ancy.za@gmail.com
8	Ms. Sheena S, Assistant Professor	Image Processing	9446457531	sheenababuraj@gmail.com
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10	Ms. Minu Poulouse, Assistant Professor	Computer Science and Engineering	9440539990	minupoulouse88@gmail.com
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DIVISION OF INFORMATION TECHNOLOGY

B.TECH DEGREE COURSE IN INFORMATION TECHNOLOGY

SEMESTER III

Code No.	Subject	L H / W	T H / W	P / D H / W	C	Marks		Total
						CA	SEE	
23-200-0301B	Complex Variables and Partial Differential Equations*	3	1	0	3	50	50	100
23-204 -0302	Internet Programming	3	1	0	3	50	50	100
23-204 -0303	Discrete Computational Structures**	3	1	0	3	50	50	100
23-204 -0304	Database Management Systems	3	1	0	3	50	50	100
23-204-0305	Data Structures and Algorithms in C++	3	1	0	3	50	50	100
23-204 -0306	Computer Organization & Architecture	3	1	0	3	50	50	100
23-204 -0307	Hardware Design Laboratory	0	0	3	1	25	25	50
23-204 -0308	Data structures Laboratory in C++	0	0	3	1	25	25	50
23-204 -0309	Internship-I	0	0	0	1	50		50
	TOTAL	18	6	6	21			

*Common for CS/EEE/ECE/IT

**Common for CS/IT

Internship-1 of a minimum duration of two weeks (10 working days) after second semester and the evaluation will take place during the III semester.

SEMESTER IV

Code No.	Subject	L H/ W	T H/ W	P/ D H/ W	C	Marks		Total
						C A	SE E	
23-200-0401B	Numerical and Statistical Methods *	3	1	0	3	50	50	100
23-204 -0402	Data Communication	3	1	0	3	50	50	100
23-204 -0403	Operating Systems	3	0	0	3	50	50	100
23-204 -0404	Software Engineering	3	0	0	3	50	50	100
23-204 -0405	Formal Languages and Automata Theory	3	0	0	3	50	50	100
23-204 -0406	Design and Analysis of Algorithms	3	1	0	3	50	50	100
23-204 -0407	Universal Human Values **	3	0	0	3	25	25	50
23-204 -0408	OS & Networking Lab	0	0	3	1	25	25	50
23-204 -0409	Mini Project– RDBMS based	0	0	3	1	25	25	50
	TOTAL	21	3	6	23			

*Common for CS/EE/EC/IT

** The evaluation pattern for Universal Human Values will be the same as that for a Laboratory course.

SEMESTER V

Code No.	Subject	L H/ W	T H / W	P / D H / W	C	Marks		Total
						CA	SEE	
23-204 -0501	Compiler Design	3	1	0	3	50	50	100
23-204 -0502	Object Oriented Modeling & Design	3	1	0	3	50	50	100
23-204 -0503	Internet of Things	3	1	0	3	50	50	100
23-204 -0504	Big Data Analytics	3	1	0	3	50	50	100
23-204 -0505	Internet Architecture & Design	3	1	0	3	50	50	100
23-204 -05**	Professional Elective – I	3	1	0	3	50	50	100
23-204 -0510	Internet of Things lab	0	0	3	1	25	25	50
23-204 -0511	Software Engineering Lab	0	0	3	1	25	25	50
23-204 -0512	Internship-II	0	0	0	1	50		50
	TOTAL	18	6	6	21			

Internship-II of a minimum duration of two weeks (10 working days) after fourth semester and the evaluation will take place during the V semester.

23-204-0506 to 23-204-0509 Professional Elective – I	
Code No.	Subject
23-204 -0506(IE)	Augmented Reality
23-204 -0507	Digital marketing
23-204 -0508	Digital Canvas
23-204 -0509	Artificial Intelligence & Machine Learning

SEMESTER VI

Code No.	Subject	L H/ W	T H / W	P / D H / W	C	Marks		Total
						C A	S E E	
23-204 -0601	Agile Project Methodology	3	1	0	3	50	50	100
23-204 -0602	Data Security and Cryptography	3	1	0	3	50	50	100
23-204 -0603	Deep Learning	3	1	0	3	50	50	100
23-204 -0604	Cloud Computing	3	1	0	3	50	50	100
23-204 -0605	Design and Development Mobile Application	3	1	0	3	50	50	100
23-204 -06**	Professional Elective – II	3	1	0	3	50	50	100
23-204 -0610	Cloud and Data Analytics Laboratory	0	0	3	1	25	25	50
23-204 -0611	Mini Project – Mobile App Development	0	0	3	1	25	25	50
TOTAL		18	6	6	20			

23-204-0606 to 23-204-0609 Professional Elective – II	
Code No.	Subject
23-204 -0606(IE)	DevOps Engineering
23-204 -0607	Computer Vision
23-204 -0608	Recommender System
23-204 -0609	Mining of Massive Datasets

SEMESTER VII

Code No.	Subject	L H / W	T H / W	P/ D H/ W	C	Marks		Total
						CA	SE E	
23-204 -0701	Mobile Computing Technology	3	1	0	3	50	50	100
23-204 -0702	Design Thinking and Innovations	3	1	0	3	50	50	100
23-204 -0703	Computer Graphics and Visual Computing	3	1	0	3	50	50	100
23-204 -07**	Professional Elective - III	3	1	0	3	50	50	100
23-204 -07**	Open Elective - I	3	1	0	3	50	50	100
23-204 -0712	Computer Graphics Laboratory	0	0	3	1	25	25	50
23-204 -0713	Mini Project – Multimedia Project	0	0	3	1	25	25	50
23-204 -0714	Seminar	0	0	2	2	50	-	50
23-204 -0715	Project Phase I	0	0	2	1	50	-	50
23-204 -0716	Internship-III	0	0	0	1	50	-	50
	TOTAL	15	5	10	21			

Internship-III of a minimum duration of two weeks (10 working days) after VI semester and the evaluation will take place during the VII semester.

23-204-0704 to 23-204 -0707 Professional Elective – III	
Code No.	Subject
23-204 -0704 (IE)	Principles of Management
23-204 -0705	Generative Adversarial Networks
23-204 -0706	Quantum Computing
23-204 -0707	Transformers United

23-204-0708 to 23-204-0711 Open Elective – I	
Code No.	Subject
23-204 -0708	Educational Technology
23-204 -0709	Game Design
23-204 -0710	Multimedia Computing
23-204-0711	Web Mining

SEMESTER VIII- Regular Track

Code No.	Subject	L H/ W	T H/W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-204-0801	Financial Management & E-banking	3	1	0	3	50	50	100
23-204-080*	Professional Elective - IV	3	1	0	3	50	50	100
23-204-080*	Professional Elective - V	3	1	0	3	50	50	100
23-204-080*	Open Elective - II	3	1	0	3	50	50	100
23-204-08014	Entrepreneurship Development	0	0	2	1	50	-	50
23-204-08015	Project Phase - II	0	0	12	6	200	-	200
23-204-08016	Comprehensive Viva Voce	0	0	0	1	-	50	50
	TOTAL	12	4	14	20			

SEMESTER VIII- Internship Track *

Code No.	Subject	L H/ W	T H/ W	P/D H/ W	C	Marks		Total
						CA	SEE	
23-204-0801	Financial Management & E-banking	3	1	0	3	50	50	100
23-204-08**	Elective (Professional /Open)	3	1	0	3	50	50	100
23-204-0814	Entrepreneurship Development	0	0	2	1	50	-	50
23-204-0815	Project Phase - II	0	0	12	6	200	-	200
23-204-0816	Comprehensive Viva Voce	0	0	0	1	-	50	50
23-204-0817	Internship-IV	0	0	0	6	200		200
	TOTAL	6	2	14	20			

23-204-0802 to 0805 PROFESSIONAL ELECTIVE -IV

- 23-204-0802 Block Chain Technology
 23-204-0803(IE) Robotic Process Automation
 23-204-0804 Patents and Intellectual Property Rights
 23-204-0805 Cyber Laws and Information Security

23-204-0806 to 0809 PROFESSIONAL ELECTIVE -V

- 23-204-0806 Software Quality and Testing
 23-204-0807 Electronic Business and Services
 23-204-0808 Ethical Hacking
 23-204-0809 Cognitive Computing

23-204-0810 to 0813: OPEN ELECTIVE – II

- 23-204-0810 Software Project Management
 23-204-0811 Social Computing
 23-204-0812 Research Methodology
 23-200-0813 Constitutional Law*

*Common to all branches

List of Minor Courses (Data Engineering)

Code No.	Subject	L	T	P/ D	C	Marks		Total Mark s	Offerin g semeste r	Mode of learnin g
						CA	SEE			
23-204-0410	Introduction to Massive Data Sets	3	1	0	3	50	50	100	IV	Classroom
23-204-0513	Big Data Analytics and Machine Learning	3	1	0	3	50	50	100	V	Classroom
23-204-0717	Mini Project: Cloud Computing Project for Big Data Analytics			3	3	50	50	100	VII	
23-204-0310	MOOC1/ Introduction to Data Communications and Networking				3				III	Online/offline
23-204-0311	MOOC2/ Web Designing Technologies				3				III	Online/offline
23-204-0612	MOOC3/ Cloud Computing				3				VI	Online/offline

List of Courses for Honours

Code No.	Subject	L Hour/ week	T Hour s/ Week	P/D Hour s/ Week	C	Marks		Total Mark s	Offerin g semest er	Mode of learning
						CA	SEE			
23-204-	Research Methodology and Intellectual Property Rights	3	1	0	3	50	50	100		Classroom
23-204-	Optimization Techniques	3	1	0	3	50	50	100		Classroom
23-204-	Computational Thinking	3	1	0	3	50	50	100		Classroom
23-204-	MOOC 1				3					Online/classroom
23-204-	MOOC 2				3					Online/classroom
23-204-	MOOC 3				3					Online/classroom

Details of Faculty

Sl. No	Name & Designation	Specialization	Communication (Contact No.& email ID)
1	Dr.Binsu C Kovoov, Professor & Head	Computer & Information Science	9847788551 binsu.kovoov@gmail.com
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4	Dr.Renumol V G Professor	Computer Engineering,Software Engineering,Education Technology	9446475103 renumolvg@gmail.com
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7	Akhil P V Assistant Professor	Computer Science And Information Systems	9447785097 akhil.soe@gmail.com
8	Shilpa Elsa Abraham Assistant Professor	Information Technology	7403287546 shilpamat75@gmail.com
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14	Nafsiya C A Assistant Professor	Computer Science And Engineering	9037222420 nafsiyaca33@gmail.com
15	Deepa Paul Assistant Professor	Computer Science And Engineering	9447701778 deepapaulep@gmail.com

COCHIN UNIVERSITY COLLEGE OF ENGINEERING, KUTTANADU

MASTER OF COMPUTER APPLICATIONS (MCA) COURSE STRUCTURE

SEMESTER I

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	TOTAL
20-381-0101	Data Structures using C	50	3	50	50	100
				50	50	100
20-381-0102	Mathematical Foundations and Numerical Techniques	50	3	50	50	100
20-381-0103	Digital Electronics and Computer Organization	50	3	50	50	100
20-381-0104	Database Management System	50	3	50	50	100
20-381-0105	Operating Systems (MOOC Course)	50	2	50	50	100
20-381-0106	C Programming LAB	50	2	50	50	100
20-381-0107	DBMS LAB	50	1	50	50	100

SEMESTER II

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	TOTAL
20-381-0201	Object Oriented Programming	50	3	50	50	100
				50	50	100
20-381-0202	Design and Analysis of Algorithms	50	3	50	50	100
20-381-0203	Fundamentals of Software Engineering.	50	3	50	50	100
20-381-0204	Data Mining and Machine Learning	50	3	50	50	100
20-381-0205	Information Security	50	2	50	50	100
20-381-0206	JAVA Programming LAB	50	2	50	50	100
20-381-0207	Data Mining LAB using Python	50	2	50	50	100

SEMESTER III

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	TOTAL
20-381-0301	Data Communication and Networks	50	3	50	50	100
	Elective I	50	3	50	50	100
	Elective II	50	3	50	50	100
	Elective III(Industry Elective)	50	3	50	50	100
	Elective IV(Industry Elective)	50	3	50	50	100
20-381-0306	Mini Project	50	2	50		50
20-381-0307	Technical Communication	50	2	50	50	100

SEMESTER IV

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	TOTAL
20-381-0601	Project Work and Course Viva Voce	50	17	200	200	400

Elective II

Course Code	Course
20-381-0321	BlockChain
20-381-0322	Bioinformatics
20-381-0323	Internet of Things
20-381-0324	Real Time Systems
20-381-0325	Distributed and Cloud Computing
20-381-0326	Software project management/ Software testing
20-381-0327	Technology Introduction to Cryptography

Elective III

Course Code	Course
20-381-0331	Big Data Analytics
20-381-0332	Natural Language Processing
20-381-0333	Digital Image Processing
20-381-0334	Deep Learning

Elective IV

Course Code	Course
20-381-0341	Design Thinking
20-381-0342	Project Management

DETAILS OF FACULTY

Sl. No.	Name	Designation	Division	Contact No.& e-mail ID	
				Mobile	
1	DR. JOSEPH KUTTY JACOB	Professor & Principal		9447364175	josephkutti@cusat.ac.in josephkutti@yahoo.com
2	DR.SHINY PAUL	Assoc.Professor		9496721408	shinypaulj@cusat.ac.in
3	SRI.SAJAN JOSEPH	Assoc.Professor		9447877333	sajanjoseph@cusat.ac.in
4	DR . ASALETHA. R	Asso. Professor & Head	Applied Sciences & Humanities	9400050826 9496720973	asalethar@cusat.ac.in
5	DR. MANOJ V. J	Asso. Professor & Head	Electronics and Communication Engineering	9447440260	manojmvj@gmail.com
6	ANIL KUMAR K. K	Asso. Professor		9447058981	kkamil@cusat.ac.in
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8	DR.MATHEW CHERIAN	Asso.Professor	Mechanical Engineering	9447369654	mathewchl@cusat.ac.in mathewchl@gmail.com
9	DR.SENTHIL PRAKASH M. N	Professor		9496226791	senthil@cusat.ac.in
10	THOMAS .T	Asso. Professor		9447041819	thomas@cuat.ac.in
11	DR.SHIYAS C. R	Asso. Professor		9447893107	crshiyas@gmail.com
12	Dr. SALAJI .S	Asso. Professor		9497675088	salajisabu@gmail.com salajis@cusat.ac.in

Details of Faculty: Permanent- Division of CSE

Sl No.	Name & Designation	Specialization	Communication
1	Dr. Preetha Mathew K Professor & Head	Theoretical Computer Science	9446249706 preethamk@cusat.ac.in
2	Mrs. Bindu P K Assoc Professor	Computer Science & Engineering	9656225652 bindupk@cusat.ac.in
3	Mr. Manoj Kumar P Asst Professor	Software Engineering	9895508929 manojkumarpeeth ambaran@cusat.ac.in

Details of Faculty: Contract

Sl No.	Name & Designation	Specialization	Communication
1	Alice Joseph	Computer Science & Engineering	
2	Anitha Mary M O Chacko	Information Systems	
3	Aswathy V Shaji	Computer Science & Engineering	
4	Aryachandran S	Image Processing	
5	Hafeesa M Habeeb	Computer Science & Engineering	
6	Jiby T C	Computer and Information Science	

Details of Faculty: Permanent-IT division

SL NO	NAME & DESIGNATION	SPECIALIZATION	COMMUNICATION
1	Dr. Harikrishnan D Assoc.Professor	Biometric Security	9496800632
2	Jayaprabha P Assoc.Professor	Digital Electronics	9349921686
3	Jabir K V T Assoc.Professor	Software Engineering	9447328532

Details of Faculty: Contract

SL NO	NAME & DESIGNATION	SPECIALIZATION	COMMUNICATION
1	Nidhin Sani	Network & Internet Engineering	9947249427
2	Vineeth M V	Computer Science & Engineering	8848297887
3	Santhi Krishna M S	Computer Science & Engineering	8593820825
4	Sreedevi Sreedharan	Computer Science & Engineering	8078380292
5	Sreelakshmy H	Network Engineering	8281381871

FACULTY, DIVISION OF CIVIL ENGINEERING, CUCEK, CUSAT as on 13/04/2022.

Sl. No	Name of Faculty Member	Designation	Specialization	email	Mobile
1	Dr.Sunilkumar N.	Professor and Head	Civil and Structural Engineering	sunilkumarn@cusat.ac.in	9447706426
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3	Smt. Neethu Lukose	Assistant Professor (contract)	Civil and Infrastructure Engineering	neethulukose@cusat.ac.in	9544434624
4	Smt. Sreelekshmi R.	Assistant Professor (contract)	Civil and Geotechnical Engineering	sreelekshmi4293@cusat.ac.in	9496958483
5	Smt. Sreelakshmi K Nair	Assistant Professor (contract)	Civil, Structural Engineering and Construction Management	sreelakshmiknair@cusat.ac.in	9496708666
6	Smt. Kavya M. S.	Assistant Professor (contract)	Civil and Geotechnical Engineering	kavyams@cusat.ac.in	9400830861
7	Smt. Anjana Jose	Assistant Professor (contract)	Civil and Environmental Engineering	anjana jose@cusat.ac.in	9446001833
8	Smt. Aarsha Balan	Assistant Professor (contract)	Civil and Structural Engineering	aarshabalan@cusat.ac.in	8547475729
9	Smt. Nithya Chandran	Assistant Professor (contract)	Civil and Structural Engineering	nithyahpd@cusat.ac.in	9400515120
10	Smt. Harija K S	Assistant Professor (contract)	Civil and Structural Engineering	harijaks93@gmail.com	8547429717

Details of Faculty-Contract

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1	Akshaya K, Assistant Professor	MTech in Computer Science and Engineering	8590427606 iamakshayakrishnan@cusat.ac.in
2	Anoop S, Assistant Professor	MTech in Computer Science and Engineering	9847656715 anoopsulaiman777@cusat.ac.in
3	Fanny May Joseph, Assistant Professor	MTech in Computer Science and Engineering	9809959429 fannymayjoseph@cusat.ac.in
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List of contract faculty

Sl No	Name & Designation	Specialization	Communication (contact No&email id)
1	Jithin Jose (Assistant Professor on contract)	Electrical and Electronics Engineering	9633046990, jithinjose@cusat.ac.in
2	NakulSasikumar (Assistant Professor on contract)	Electrical and Electronics Engineering	9633069724, nakulsasikumar@cusat.ac.in
3	SankaranNampoothiri K (Assistant Professor on contract)	Electrical and Electronics Engineering	9947957892, ksnampoothiri@cusat.ac.in
4	Dr.Sarika . E.P (Assistant Professor on contract)	Electrical and Electronics Engineering	9400690339, sarikaep@cusat.ac.in
5	GeethuZacharia (Assistant Professor on contract)	Electrical and Electronics Engineering	9446994512, geethuzacharia@cusat.ac.in

FACULTY OF ENVIRONMENTAL STUDIES

Dean:

**Dr.V. Sivanandan Achari
Professor
School of Environmental Studies
Cochin University of Science and Technology**

SCHOOL OF ENVIRONMENTAL STUDIES

M.Sc. ENVIRONMENTAL SCIENCE & TECHNOLOGY

Semester I

Course Code	Course	C/E	Credits
20-360-0101	Environmental Biology	C	3
20-360-0102	Environmental Chemistry	C	3
20-360-0103	Environmental Physics	C	2
20-360-0104	Applied Mathematics & Statistics	C	2
20-360-0105	Environmental Microbiology	C	3
20-360-0109	Environmental Chemistry Lab	C	2
20-360-0110	Environmental Microbiology Lab	C	1
Total			16

Elective I

Course code	Course	C/E	Credits
20-360-0106	Environmental Pollution	E	2
20-360-0107	Chemometrics & Good Laboratory Practices	E	2
20-360-0108	Contemporary Environmental Issues and Laws	E	2
Total			6

Inter Departmental Electives I

Course Code	Course	C/E	Credits
20-360-0111	Introduction to Environmental Studies	IDE	3
Total			3

Semester II

Course code	Course	C/E	Credits
20-360-0201	Methods in Environmental Analysis	C	2
20-360-0202	Environmental Engineering- Paper I	C	2
20-360-0203	Fluid Mechanics	C	2
20-360-0204	Geo informatics	C	2
20-360-0205	Environmental Toxicology	C	2
20-360-0206	Applied Environmental Microbiology	C	2
20-360-0207	Environmental Biotechnology	C	2
20-360-0212	Environmental Engineering Lab	C	1
20-360-0213	Chemical and Biological Methods in Environmental Analysis-Lab	C	1
20-360-0214	Environmental Toxicology Lab	C	1
Total			17

Elective II

Course code	Course	C/E	Credits
20-360-0208	Environmental Modeling	E	2
20-360-0209	Environmental Management and Legal Aspects	E	2
20-360-0210	Industrial Ecology	E	2
20-360-0211	Energy Resources and Management	E	2
Total			8

Inter Departmental Electives-II

Course Code	Course	C/E	Credits
20-360-0216	Intellectual Property Right, Biosafety and Bioethics	IDE	3
Total			3

Semester III

Course Code	Course	C/E	Credits
20-360-0301	Chemistry of Water and Wastewater Treatment	C	3
20-360-0302	Environmental Engineering-Paper II	C	2
20-360-0303	Biodiversity and Conservation	C	1
20-360-0304	Applied Eco-Toxicology	C	1
20-360-0305	Environmental Impact and Risk Assessment	C	1
20-360-0310	Environmental Engineering Graphics Lab	C	1
20-360-0311	Environmental Biotechnology and Bioremediation Lab	C	1
20-360-0312	Biodiversity Lab	C	1
Total			11

Elective III

Course Code	Course	C/E	Credits
20-360-0306	Bioremediation	E	2
20-360-0307	Solid and Hazardous Waste Management	E	2
20-360-0308	Bio-nanotechnology	E	2
20-360-0309	Applied Eco Toxicology - Tests and Evaluation Methods	E	2

22-360-0315	Aquatic Microbiology	E	3
22-360-0316	Climate Change and Environment	E	3
Total			14

Inter Departmental Electives III

Course Code	Course	C/E	Credits
20-360-0313	Energy Resources and Management	IDE	3
20-360-0314	Industrial Ecology	IDE	3
Total			6

Semester IV

Course Code	Course	C/E	Credits
20-360-0401	Final Semester Project Work Interim Report- Presentation [Internal] Project- Dissertation [External]	C	14
20-360-0402	Viva-Voce [Internal]	C	2
Total			16

Details of Faculty

Sl. No.	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1.	Dr. Usha K Aravind, Professor & Director	Environmental Chemistry	9447779269, uka@cusat.ac.in
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6.	Dr. Preethy Chandran, Assistant Professor	Environmental Microbiology	9751275798, preethychandran@cusat.ac.in
7.	Dr. Krishna Mohan K S, Assistant Professor	Environmental Physics	9846392428, krishnamohan@cusat.ac.in
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NATIONAL CENTRE FOR AQUATIC ANIMAL HEALTH

M.Tech. MARINE BIOTECHNOLOGY

Semester I

Course Code	Course	Hours/Week			Credits	Marks		
		L	T	P		Internal	External	Total
22-431-0101	Biotechnological Interventions in Marine Biodiversity Conservation		2		2	50	50	100
22-431-0102	Marine Genomics and Proteomics		3		3	50	50	100
22-431-0103	Marine Bioprospecting and Drug Discovery		3		3	50	50	100
22-431-0104	Bioprocess Engineering -1		3		3	50	50	100
22-431-0109	Skill Development in Recombinant DNA Technology (Lab)			2	2	50	50	100
22-431-0110	Skill Development in Marine Microbial Diversity Determination (Lab)			2	2	50	50	100
22-431-0111	Skill Development in Cell culture and hybridoma/Antibody Technology (Lab)			1	1	50	50	100

Electives

Course Code	Course	Credits
22-431-0105	Cell and Hybridoma Technology	2
22-431-0106	Marine Microbiology	2
22-431-0107	Bio informatics, Systems and Computational Biology	3
22-431-0108	Nano-biotechnology	2

Total Credit: Core 16; Elective 9

Semester II

Course Code	Course	Hours/Week			Credits	Marks		
		L	T	P		Internal	External	Total
22-431-0201	Biotechnological interventions in Aquatic Animal Health		3		3	50	50	100
22-431-0202	Bioprocess Engineering (Marine Natural Products, Biomaterials and Probiotics)-II		3		3	50	50	100
22-431-0203	Marine Algal Biotechnology		3		2	50	50	100
22-431-0204	Genetic Improvement for High health brood stock		3		2	50	50	100
22-431-0209	Skill Development in Biotechnological Interventions in Aquatic Animal Health Management			2	2	50	50	100
22-431-0210	Skill Development in Marine Bioprospecting and Bioprocess Engineering.			2	2	50	50	100
22-431-0211	Skill Development in Model systems, Molecular genetics and Genome engineering			1	1	50	50	100

Electives

Course Code	Course	Credits
22-431-0205	Model systems, Molecular Genetics and Genome engineering	2
22-431-0206	Advances in marine drug discovery	2
22-439-0202	Environmental Ocean Technology (Inter disciplinary Elective)	3
22-431-0208	Enzyme Engineering & Technology	2

Total Credit: 25, Core 15; Elective 10

Semester III

Course Code	Course	Hours/Week			Credits	Marks		
		L	T	P		Internal	External	Total
22-431-0301	Bioentrepreneurship and industry management		2		2	50	50	100
22-431-0302	Research Methodology and Scientific Communication		2		2	50	50	100
22-431-0303	Intellectual Property Rights, Biosafety and Bioethics		2		2	50	50	100
22-431-0304	Project proposal preparation and submission		2		2	50	50	100
22-431-0310	Research Project in the Area of Specialization: Progress Review 1			10	10	50	50	100

Electives

Skill development in any one of the areas given below

Course Code	Course	Credits
22-431-0305	Drug discovery from marine biologicals	5
22-431-0306	Model systems, molecular genetics and Genome engineering	5
22-431-0307	Marine algae for bio-fuel production and animal nutrition	5
22-431-0308	Molecular diagnostics and therapeutics/ health management strategies	5
22-431-0309	Bioprocess engineering and computational modeling	5

Total Credit:23, Core 18; Elective 5

Semester IV

Course Code	Course	C/E	Credits
22-431-0401	Research Project in the Area of Specialization: Progress Review 2 and Report Submission and Presentation	C	12
22-431-0402	Viva Voce Examination (Comprehensive)	C	6
Total Credit			18

Credits

Total credits: 91 (Core: 67 Elective: 24)

Semester 1: 25; Semester 2: 25; Semester 3: 23; Semester 4: 18.

Details of Faculty

Coordinating Department: National Centre for Aquatic Animal Health

Sl. No.	Name and Designation	Specialization	Communication
1.	Valsamma Joseph Professor & Director Course Co-ordinator	Marine Biotechnology	04842863806 (O) 9846047433 (Mob) valsamma@cusat.ac.in.
2	Prof. I.S. Bright Singh University-Emeritus Professor	Aquatic Animal Health/ Marine Biotechnology	9447631101 isbsingh@gmail.com
3.	Dr. Jayesh Puthumana Assistant Professor	Marine Biotechnology	9447719804 jayesh@cusat.ac.in
4.	Mr. Shibin S.P. Assistant Professor	Bioprocess Technology	09447714543 sp.shibin@gmail.com

Core and Associated Faculty Members from Collaborating Departments

S. No.	Name and Designation	Specialization	Contact Details
1.	Dr. Suja P. Devipriya, Associate Professor, School of Environmental Studies	Biotechnology	M: 9442234169 E-mail: devipriyasuja@cusat.ac.in
2.	Dr. Baby Chakrapani P.S., Assistant Professor, Department of Biotechnology	Environmental Biotechnology	M: 9495109908 E-mail: bcps80@gmail.com
3.	Dr. N. Manoj, Professor , Department of Applied Chemistry	Organic Chemistry	M: 9447704531 E-mail: manoj.n@cusat.ac.in
4.	Dr. SM Sunoj, Professor, Department of Statistics	Statistics	M: 9495109908 E-mail: bcps80@gmail.com
5.	Dr. Judy MV, Professor, Department of Computer Applications	Big Data Analytics	M: 9048991368 E-mail: judy.nair@gmail.com

6.	Dr. Jereesh C.S., Assistant Professor, Department of Computer Science	Bioinformatics	M: 9495576665 E-mail: jereesh@cusat.ac.in
7.	Dr. Swapna P.Antony, Assistant Professor, Department of Marine Biology, Microbiology, and Biochemistry	Aquaculture and Marine Biotechnology	M: 8089131058 E-mail: swapnapantony@gmail.com
8.	Dr. Priyaja P., Assistant Professor, Department of Marine Biology, Microbiology, and Biochemistry	Marine biodiversity conservation	M: 9447444882 E-mail: priyaja@cusat.ac.in
9.	Dr. KB Padmakumar, Assistant Professor, Department of Marine Biology, Microbiology, and Biochemistry	Marine Biology and Phytoplankton ecology	M: 9847255972 E-mail: kbpadmakumar@gmail.com
10.	Dr. A.A. Ambily, Assistant Professor, Department of Mathematics	Mathematics	M: 908751352 E-mail: ambily@cusat.ac.in

FACULTY OF HUMANITIES

Dean:

**Dr. K.Ajitha
Professor
Department of Hindi
Cochin University of Science and Technology
Kochi- 682 022**

DEPARTMENT OF HINDI

Name of the Programme: M.A HINDI

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-362-0101	Ancient and Post Medieval Poetry (प्राचीन और उत्तर मध्यकालीन कविता)	Core	5	50	50	100
23-362-0102	Hindi Short Story (हिन्दी कहानी)	Core	4	50	50	100
23-362-0103	Functional Hindi and Translation (प्रयोजनमूलक हिंदी और अनुवाद)	Core	4	50	50	100
23-362-0104	History of Literature: Ancient and Medieval Periods (हिंदी साहित्य का इतिहास: प्राचीन और मध्यकाल)	Core	4	50	50	100
23-362-01 - -	Elective – (वैकल्पिक)	Elective	3	50	50	100
	Total Credits		20			

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-362-0201	Bhakti Poetry (भक्ति काव्य)	Core	5	50	50	100
23-362-0202	Essays, Sketches and Other Prose Forms (निबंध, रेखाचित्र एवं गद्य की अन्य गद्यविधाएँ)	Core	4	50	50	100
23-362-0203	History of Literature: Modern Period (हिंदी साहित्य का	Core	4	50	50	100

	इतिहास : आधुनिक काल)					
23-362-0204	Hindi Drama and Theatre (हिंदी नाटक और रंगमंच)	Core	4	50	50	100
23-362- 02 - -	Elective – (वैकल्पिक)	Core	3	50	50	100
	Total Credits		20			

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-362-0301	Modern Poetry – I (आधुनिक कविता – I)	Core	5	50	50	100
23-362-0302	Hindi Novel (हिंदी उपन्यास)	Core	4	50	50	100
23-362-0303	Development and Structure of Hindi Language (हिंदी भाषा का विकास और संरचना)	Core	4	50	50	100
23-362-0304	Indian Literary Thoughts (भारतीय साहित्यिक चिंतन)	Core	4	50	50	100
23-362- 03 - -	Elective – (वैकल्पिक)		3	50	50	100
	Total Credits		20 Credits			

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-362-0401	Modern Poetry II (आधुनिक कविता –II)	Core	5	50	50	100
23-362-0402	Indian Literature (भारतीय साहित्य)	Core	4	50	50	100
23-362-0403	Western Literary Thoughts (पाश्चात्य साहित्यिक चिंतन)	Core	4	50	50	100
23-362-0404	General Linguistics (सामान्य भाषाविज्ञान)	Core	4	50	50	100
23-362- 04 - -	Elective – (वैकल्पिक)		3	50	50	100
	Total Credits		20			

List of Electives offered

(Code of electives start only from no. 10 for clarity)

10. Indian Culture
11. Hindi Renaissance
12. Hindi Literature (for the Students of Other Departments)
13. Comparative Literature
14. Hindi Writings of Kerala
15. Feminine Discourse in Hindi Literature
16. Ecological Discourse in Hindi Literature
17. Adivasi Discourse in Hindi Literature
18. Dalit Discourse in Hindi Literature
19. Human Rights in Hindi Literature
20. Communicative Hindi
21. Mass Communication and Media Writing
22. Special Author: Premchand
23. Special Author: Sarveshwar Dayal Saxena
24. Special Author: Bhishma Sahni
25. Gandhian Literature in Hindi
26. Transgender Literature in Hindi
27. Secularism and Hindi Literature
28. Film Studies

**POSTGRADUATE DIPLOMA IN TRANSLATION,
JOURNALISM AND COMPUTING**

(HINDI ↔ ENGLISH)

PROGRAMME STRUCTURE

Sl. No.	Course Code	Title of Paper	Continuous Evaluation (50)	Year End Examination (50)	Total Marks (100)	Hours /Week	Credits
1	PGDT 01	COURSE- I THEORY AND PRINCIPLES OF TRANSLATION	50	50	100	4 HOURS	7
2	PGDT -02	COURSE -II OFFICIAL LANGUAGE AND HINDI LANGUAGE COMPUTING	50	50	100	4 HOURS	7
3	PGDT -03	COURSE -III TRANSLATION OF SCIENCE, TECHNOLOGY AND SOCIAL SCIENCE LITERATURE HINDI TO ENGLISH & VICE VERSA	50	50	100	2 HOURS	6
Total Credits for the first semester							20
SECOND SEMESTER							
4	PGDT -04	COURSE-IV LITERARY TRANSLATION HINDI TO ENGLISH, HINDI TO MALAYALAM & VICE VERSA	50	50	100	5 HOURS	6

5	PGDT -05	COURSE-V JOURNALISM AND MEDIA TRANSLATION HINDI TO ENGLISH	50	50	100	5 HOURS	6
6	PGDT -06	COURSE-VI INTERNSHIP/TRANSLA TION PROJECT	-	-	100		6
7	PGDT -07	VIVA -VOCE	-	-	100		2
	TOTAL CREDITS FOR THE SECOND SEMESTER						
TOTAL CREDITS FOR THE PROGRAMME					700	10	40

PROGRAMME STRUCTURE COMPUTER AIDED LANGUAGE TRAINING (CALT COURSE)

Duration : 2 Months

Computer Fundamentals:

- Introduction to Computers
- History of Computers
- Components of Hardware Peripherals
- Concept of Operating System – Windows XP
- Exploring & Configuring the Windows XP
- Desk top Environment – Customize the Desktop, Start Menu, and Task bar etc
- Configuring & Migrating Files, Folders & Settings
- Accessibility Settings
- Features of Windows XP

MS – Office

Ms Word

- Creating, Organizing & Formatting Content
- Collaborating – Merge, Insert, View, Track Mode etc.

- Formatting & managing documents
- Create and run the Mail merge

Ms Excel

- Creating, Analyzing & Formatting Data & Content
- Collaborating – Insert, View, Edit etc.
- Managing Workbooks
- Creating the various types Charts
- Create and Run Macros

MS Power Point

- Creating & Formatting Content
- Collaborating – Track, Edit, Add, Delete Comments, Merge
- Managing & Delivering Presentation

Internet

- Opening Websites and downloading data from them
- Understanding concepts of URL
- Creating and Opening an E-mail account
- Receiving and sending emails with attachments
- Searching information on Internet
- Social Media

Hindi

- Hindi Software-Kruti Dev, Leap Office, Microsoft Indic Language tool, Hindi, Unicode, Hindi Indic, IMI, ISM, Lipikaar, Sonma Type
- Use proper Keyboarding techniques.
- Improve speed and accuracy while keyboarding
- Identify and correct common typing errors.

Data base – Operations

Sl. No.	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1	Dr. K Ajitha, Senior Professor & Head	Modern and Contemporary Hindi Literature, Drama and Theatre, Subaltern Studies	9447646240 ajiravi@cusat.ac.in
2	Dr.Praneetha P, Associate Professor	Ancient & Modern Hindi Literature, Drama and Theatre, Comparative Literature	9495677720 dr.praneetha.p@cusat.ac.in
3	Dr.A K Bindhu, Associate Professor	Comparative Literature, Ancient and Modern Poetry, Fiction, Criticism & Drama	9447980447 dr.bindhu789@gmail.com
4	Dr. Aneesh. K. N, Assistant Professor	Modern Hindi Literature, Drama and Theatre, Comparative Literature	9446426447 aneeshkn1@gmail.com
5	Dr. Girish Kumar. K.K, Assistant Professor	Modern and Contemporary Hindi Literature, Comparative Literature, Contemporary Hindi Poetry	9495106637 girish372@gmail.com
6	Dr.Sreelekha K.N, Assistant Professor	Hindi Short Story, Linguistics, Tribal Discourse & Translation	8330013928 sayinith@gmail.com
7	Dr. Sheena M. A Assistant Professor	Modern Hindi Literature, Hindi Novel & Short Story	8547403966 sheenus.ma@gmail.com

Details of Faculty : Permanent

Emeritus Professor

Sl.No.	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1	Dr.R.Sasidharan, Emeritus Professor	Ancient and Modern Hindi Literature, Drama & Theatre, Comparative Literature, Translation Studies, Dalit Literature	9447052840, rsd@cusat.ac.in

DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGE

POST GRADUATE DIPLOMA IN COMMUNICATIVE ENGLISH

REGULATION AND COURSE STRUCTURE (REVISED WITH EFFECT FROM 2020 ADMISSIONS)

Regulations

1. Eligibility for Admission

2. Candidate for admission to this programme should be Bachelor's Degree holder of any University recognised by CUSAT. The selection for the programme will be based on an entrance test to be conducted by the Department.

Matters concerning admission procedure, payment of fee etc., will be as per University rules and regulations.

3. Duration

The Programme will be of one year duration with terminal University Examinations.

4. Course of Study

The course work for the P.G. Diploma Programme in Communicative English shall be in accordance with the scheme of examination and syllabi prescribed.

5. Eligibility for the Post Graduate Diploma in Communicative English

No candidate is eligible for the Post Graduate Diploma in Communicative English unless he/she has undergone the prescribed Course of study in the Department for one Academic Year and has passed all the prescribed examinations.

Examinations

There will be University Examination at the end of the Programme in the subjects as prescribed under the Scheme of Evaluation.

6. Pass minimum

A Candidate who secures not less than 50% aggregate marks and 40% separate minimum both in written and oral examinations shall be declared to have passed the examination.

7. Classification

Range of Marks Class

75% and above	I Class with Distinction
60% and above & less than 75%	I Class
50% and above & less than 60%	II Class
Below 50%	Failed

There will be a paper minimum of 40

8. Course Structure

Sl. No.	Course Code	Title of Paper	Continuous Evaluation (50)	Year- end Examinati on (50)	Total Marks (100)	Hours/ Week
1	PGDCE-01	PAPER -1 COMMUNICATIVE GRAMMAR	50	50	100	2 Hours
2	PGDCE-02	PAPER- II VOCABULARY AND WRITING	50	50	100	2 Hours
3	PGDCE-03	PAPER- III ENGLSIH LANGUAGE AND ITS VARIETIES	50	50	100	2 Hours
4	PGDCE-04	PAPER –IV ASPECTS AND PATTERNS OF COMMUNICATION	50	50	100	2 Hours
5	PGDCE-05	PAPER –V COMMUNICATION SKILLS	50	50	100	2 Hours
6	PGDCE-06	PAPER –VI DISSERTATION/ VIVAVOCE	50	50	100	

CERTIFICATE PROGRAMME IN GERMAN

INTRODUCTION: German is an official language of Austria, Switzerland, Luxembourg, and Liechtenstein. And it is the native language of a significant portion of the population in northern Italy, eastern Belgium, the Netherlands, Denmark, eastern France, parts of Poland, the Czech Republic, Russia, and Romania, as well as in other parts of Europe.

It is the 3rd most popular foreign language taught worldwide and the second most popular in Europe and Japan, after English. Multinational business opportunities exist throughout the European Union and in the Eastern European countries, where German is the second most spoken language after Russian. Companies like BMW, Daimler, Siemens, Lufthansa, SAP, Bosch, Infineon, BASF, and many others need international partners.

OBJECTIVE:

This course focuses on basic linguistic and communicative structures of the German language. Students will be introduced to various aspects of German culture and learn to communicate in simple everyday situations and personal interaction.

The module will adopt an integrated approach to language learning and will emphasize equally all the four skills of reading, writing, listening and speaking as well as the acquisition of grammar structures and vocabulary. Audio and video materials will also be used to supplement the textbook and to provide students with a better insight into Germany, her culture and the life of her people.

Course Structure and Scheme of Exam:

The duration of the course is 180 hours and final exam will be conducted at the end of the course. The exam comprises reading, listening, writing and speaking sections of total 100 marks. As these all four sections have equal weightage, each section will contain 25 marks. To pass the exam one has to score minimum 60 out of 100.

1. Listening

The student understands authentic texts related to situations, the contents of which correspond to their spheres of experience and interest.

They are ready and able to hear others speaking and to listen to them attentively. They are in a position to grasp what they hear from the context, even when some expressions are unknown to them.

2. Speaking

- Self introduction

Communication

The students are ready and able to participate actively in a conversation. They express their thoughts, opinions and feelings as the situation requires.

- Use of language

They make use of vocabulary available and employ their knowledge of grammar structures.

- Pronunciation and Intonation

3. Reading

- Reading and understanding

The student understands graded texts, grasp their contents, order the information acquired and combine new with known. They also enjoy reading texts in a foreign language.

4. Writing

Informal letter writing and filling the application form or Profile creation form.

Course Content

Topics/Communicative Situations	Grammar
Greetings	Intonation of Words and Sentences
Self-Introduction	Conjugation of Regular Verbs
German Alphabet	Conjugation of Irregular Verbs
International Words in German Vocabulary	Nouns and Gender
Working with a Dictionary	Plural Forms of Nouns
Numbers 0-1000	Definite and Indefinite Articles
Communication and Things in the Classroom	Word Order: Statements and Questions
Asking Questions about a Person	Interrogative Pronouns
Travelling/Living Abroad	Personal Pronouns
Geography of Europe	Interrogative Pronouns
Describing One's Hobbies and Interests	Sentence Structures
Describing a Person	Negation using nicht
Conversational Discourse (Dialogues)	Negation using kein/keine
Conversing over the Phone	Imperative (formal, informal)
Vocabulary Learning & Grouping	Nominative, Accusative Case and Dativ Case
Meeting People	Negation in Accusative Case
Small Talk in a Café	Syntax: Nominative, Accusative Complements
Food & Drinks	Separable Verbs
Ordering Food in a Restaurant	Modalverbs: möchten, können, wollen, sollen, müssen & mögen
Writing a Letter	Prepositions with the Accusative and Dative Case
Payment in a Restaurant	Possessive Pronouns
Telling Time	Demonstrative Pronouns
Time Phrases	Possessivpronoun in Nominative and Accusative
Days of the Week	Welcher/dieser in Nominative and Accusative
Fixing an Appointment	
Making and Accepting an Invitation	
Introducing the Family/Family Life	
Food Items	
Measurements,	
Clothing & Colours	
Doing the Groceries	

CERTIFICATE PROGRAMME IN FRENCH

SYLLABUS AND SCHEME OF EXAMINATION W.E.F 2021 ADMISSIONS

REGULATIONS

1. PROGRAMME STRUCTURE: -

The duration of the Certificate Programme in French is 180 hours in one academic year and the University Examination will be conducted at the end of the course. The examination consists of three papers, two written examinations and one oral examination, each carrying a total of 100 marks (i.e. Internal marks 40 plus final exam marks 60). In the case all the three papers continuous evaluation will be conducted and internal marks will be awarded out of 40 marks. Final examinations will be out of 60 marks.

2. Eligibility for Admission

Candidates who have passed Plus Two examination of Higher Secondary / Vocational Higher Secondary Department of Kerala or an examination equivalent thereto are eligible for admission. Holders of 3 year diploma of issued by the Directorate of Technical Education, Government of Kerala or and equivalent diploma are also eligible for admission.

3. Requirements for Passing / Classification:

A candidate should get aggregate minimum of 50% in the examination. A separate minimum of 40% each in the three papers is also essential. A minimum of 75% attendance is also required.

Candidates who get 50% and above but below 60% shall be declared to have passed the examination in SECOND CLASS.

Candidates who get 60% but below 75% shall be declared to have passed in FIRST CLASS.

Candidates who secure 75% and above shall be declared to have passed in FIRST CLASS WITH DISTINCTION.

Those who secure less than 50% marks are deemed to have failed in the examination.

The marks obtained in all the three papers will be considered for classification.

4. SCHEME OF THE EXAM: -

The Examination shall consist of three papers, two written examinations and one oral examination.

PAPER I: INTRODUCTION TO FRENCH CULTURE AND LANGUAGE

DURATION: 3 Hours

TOTAL MARKS -100 [External Assessment: 60 Marks and Internal Assessment:40 Marks]

- a) One simple unseen comprehension passage (a factual/descriptive passage based on all the vocabulary and grammar learnt from the prescribed text book in one academic year) and replying to questions based on the given passage - 10 marks
- b) Writing section: Informal letter (80 words)/ short messages (invitation, accepting or refusing an invitation) / email /French recipe – 10 marks
- c) Grammar – 30 marks.
- d) Culture and civilisation (questions based on prescribed text book) – 10 marks

PAPER II: TRANSLATION

DURATION: 3 hours

TOTAL MARKS: 100 [External Assessment: 60 Marks and Internal Assessment: 40 Marks]

- a) Translation from French to English
(seen passage from the prescribed text) – 20 marks
- b) Translation from English to French
(Simple unseen passage based on all the vocabulary and grammar learnt from the prescribed text book in one academic year) – 20 marks
- c) Translation of simple sentences into French – 20 marks

PAPER III: ORAL EXAM (To be conducted in a person to person manner by the examiner).

DURATION: 3 hours

TOTAL MARKS: 100 [External Assessment: 60 and Internal Assessment: 40]

- a) Listening to a French audio and noting down the main information from the audio and then afterwards, answering the questions related to it. - 20 marks
- b) Reading a text/ passage /dialogue from the prescribed text. – 20 marks
- c) Guided conversation /exchanging information / role play - 20 marks

INTEGRATED DIPLOMA IN JAPANESE PROGRAMME

REVISED SYLLABUS AND REGULATIONS W.E.F 2021-22 ADMISSIONS

Regulations

1. Eligibility

Candidates for admission to the integrated Diploma in Japanese Programme in shall be required to have passed Pre-Degree/ Plus-Two examination or equivalent thereof recognized by CUSAT (qualifying examination). Previous knowledge in the language is not essential. If necessary, applicants may be ranked on the basis of their total marks obtained for qualifying examination and admission shall be done on the basis of the rank.

z. Duration

The duration of the Course is one academic year. Total of 240 teaching hours is recommended for the whole programme. This is a part-time Course and daily classes of two hours duration shall be conducted either in the morning or in the evening. Online or off line mode of classes or even hybrid mode may be resorted to.

3. Course Work

The Course work for the study for the Integrated Diploma in Japanese shall be according to the Scheme of Examination and syllabi prescribed. No candidate is eligible for the examinations unless the student has undergone the prescribed Course in the Department kinder the University for one academic year and has completed all the prescribed tests and assignments.

The minimum attendance required by a candidate will be 75% of the total number of working hours.

4. Examinations

There will be University examinations at the end of the Course as per the Scheme of Examination. There shall be two written papers and viva-voce as detailed in the Scheme of Examination.

5. Eligibility for Integrated Diploma in Japanese

A Candidate should get a separate minimum of 40% in each paper and aggregate minimum of 50% in the examination. A minimum 40% in viva-voce is also essential.

6. Gradation

Those who get 50% and above but below 60% shall be declared to have passed the examination in **Second Class**. Candidates who get 60% and above but below 75% shall be declared to have passed in **First Class**. Candidates who secure 75% and above shall be declared to have passed in **First Class with Distinction**.

Faculty

1. Dr.Brinda Bala Sreenivasan, Assistant Professor

FACULTY OF LAW

Dean:

**Dr. K.C. Sunny
Professor, Dept. of Law,
Central University of Kerala**

SCHOOL OF LEGAL STUDIES

P.G. Course – Two Year LL.M.

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-405-0101	Theories of Law and Justice	C	4	50	50	100
22-405-0102	Seminar	C	1	50	-	50
22-405-0103	Clinical Legal Education	C	1	50	-	50
22-405-01...	Core Specialisation 1	C	4	50	50	100
22-405-01...	Core Specialisation 2	C	4	50	50	100
22-405-01...	Elective 1	E	4	50	50	100

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-405-0201	Research Methodology and Design of Blueprint of Curriculum	C	4	150	50	200
22-405-0202	Seminar	C	1	50	-	50
22-405-0203	Clinical Legal Education	C	1	50	-	50
22-405-02...	Core Specialisation 1	C	4	50	50	100
22-405-02...	Core Specialisation 2	C	4	50	50	100
22-405-02...	Elective 1	E	4	50	50	100

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-405-0301	Law and Social Transformation	C	4	50	50	100
22-405-0302	Seminar	C	1	50	-	50
22-405-0303	Clinical Legal Education	C	1	50	-	50
22-405-03...	Core Specialisation 1	C	4	50	50	100
22-405-03...	Core Specialisation 2	C	4	50	50	100

22-405-0304	Quantitative Analysis	C	4	50	50	100
22-405-0305	Dissertation (Synopsis)	C	2	100	-	100

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-405-0402	Seminar	C	1	50	-	50
22-405-0403	Clinical Legal Education	C	1	50	-	50
22-405-04...	Core Specialisation 1	C	4	50	50	100
22-405-04...	Core Specialisation 2	C	4	50	50	100
22-405-0405	Dissertation and Viva	C	14	300	100	400

Core Specialization Courses and Elective Courses

<u>Group A: Administrative Law:</u>		
22-405-0109	Administrative Process – Nature & Scope	Core
22-405-0209	Administrative Process and Judicial Control	Core
22-405-0309	Administrative Process and Law Making	Core
22-405-0409	Public Authorities – Liabilities and Control	Core
22-405-0231	Administrative Regulation of Public Enterprises	Elective
22-405-0232	Law Regulating Government Services	Elective
22-405-0131	Law Relating to Democratic Decentralisation	Elective

<u>Group B : Commercial Law</u>		
22-405-0110	Foundations of Contractual Liability	Core
22-405-0210	Corporate Governance	Core

22-405-0310	Insurance Law	Core
22-405-0410	Banking and Financial Services Law	Core
22-405-0233	International Trade Law	Elective
22-405-0234	Sale and Supply of Goods	Elective
22-405-0235	Remedies under Contract Law	Elective
22-405-0133	Law of Carriages	Elective
22-405-0134	Law on Capital Markets	Elective
22-405-0135	Law on Corporate Insolvency Resolution	Elective

<u>Group C: Constitutional Law</u>		
22-405-0111	Centre-State Legislative Relationship	Core
22-405-0211	Fundamental Rights and Constitutional Protection	Core
22-405-0311	Parliamentary Form of Government	Core
22-405-0411	Emergency and Defence Powers under the Constitution	Core
22-405-0236	Judiciary under the Indian Constitution	Elective
22-405-0237	Interstate Trade and Commerce and Right to Property	Elective
22-405-0136	Constitutional Scheme and Pluralist Society	Elective
22-405-0137	Constitutionalism	Elective
22-405-0138	Protection of Life and Personal Liberty	Elective

<u>Group D: Consumer and Competition Law</u>		
22-405-0112	General Principles of Consumer Law	Core
22-405-0212	Quality Control and Professional Services	Core
22-405-0312	Consumer Dispute Resolution	Core

22-405-0412	Competition Law	Core
22-405-0139	International and Comparative Competition Law	Elective
22-405-0239	Contemporary Issues in Competition Law	Elective

<u>Group E: Corporate Governance & Securities Law</u>		
22-405-0113	Corporate Governance	Core
22-405-0213	Law of Corporate Finance	Core
22-405-0313	Law of Corporate Restructuring	Core
22-405-0413	Securities Laws	Core
22-405-0240	Law on Corporate Insolvency Resolution	Elective
22-405-0241	Law on Capital Markets	Elective
22-405-0242	Law of Securities Intermediaries	Elective
22-405-0140	Law on Mutual Funds and Collective Investment Schemes	Elective
22-405-0141	Investor Protection Laws	Elective
22-405-0142	Disclosure Regulations under Company Law	Elective

<u>Group F : Criminal Law</u>		
22-405-0114	General Principles of Criminal Law	Core
22-405-0214	Criminology	Core
22-405-0314	Penology	Core
22-405-0414	Comparative Criminal Procedure (India, England, U.S., France)	Core
22-405-0143	Juvenile Justice	Elective
22-405-0144	Socio-economic Offences and the Criminal Justice Process	Elective
22-405-0243	Forensic Science and the Law of Evidence	Elective

22-405-0145	Criminal Justice Administration and Protection of Human Rights	Elective
22-405-0244	Deprivation of Personal Liberty-International Standards	Elective
22-405-0245	International Standards on Sentencing Procedure	Elective
22-405-0246	International Norms on Treatment of Prisoners	Elective

<u>Group G: Environmental Law</u>		
22-405-0115	Environmental Protection: National and International Perspective	Core
22-405-0215	Protection and Management of Land, Water and Air	Core
22-405-0315	Conservation of Forests, Wild life and Biological Diversity	Core
22-405-0415	Regulation of Transboundary Pollution	Core
22-405-0147	Legal Control of Industrial Pollution	Elective
22-405-0247	Environment and Development	Elective
22-405-0148	Coastal Zone Management	Elective
22-405-0248	Legal Control of Marine Pollution	Elective
22-405-0149	Climate Change Law and Governance	Elective

<u>Group H: Human Rights and Duties Education</u>		
22-405-0116	International Human Rights Law	Core
22-405-0216	Human Rights and the Indian Legal System	Core
22-405-0316	Science, Technology and Human Rights	Core
22-405-0416	International Refugee and Humanitarian Law	Core
22-405-0150	Natural Rights and Duties: Origin and Development	Elective
22-405-0250	Human Rights and the Weaker Sections	Elective

22-405-0251	Experiments Involving Humans – Human Rights Issues	Elective
22-405-0252	International Crimes and Criminal Tribunals	Elective
22-405-0151	Affirmative Action by the State and its Impact on Human Rights	Elective
22-405-0253	Genetic Engineering and Human Rights	Elective
22-405-0152	Environment and Human Rights	Elective
22-405-0254	Law Enforcement Agencies and Human Rights	Elective
22-405-0153	Rights of the Accused under the Domestic and International Laws	Elective
22-405-0154	Farmers' Rights and Globalization	Elective
22-405-0155	Human Right to Education- The Changing Trends in India	Elective

<u>Group I: Intellectual Property Laws</u>		
22-405-0117	General Principles of Intellectual Property	Core
22-405-0217	Nature and Content of Intellectual Property	Core
22-405-0317	Acquisition of Intellectual Property	Core
22-405-0417	Enforcement of Intellectual Property Rights	Core
22-405-0156	General Principles of International Intellectual Property System	Elective
22-405-0157	Copyright and Entertainment Industry	Elective
22-405-0158	Protection of Broadcasting Organisations	Elective
22-405-0256	IPR and Computer Programmes	Elective
22-405-0257	IPR and Biotechnology	Elective
22-405-0258	Intellectual Property and Right to Health	Elective
22-405-0159	Collective Property as Intellectual Property	Elective
22-405-0259	Intellectual Property and Human Rights	Elective
22-405-0260	Intellectual Property Rights and Competition Law	Elective

<u>Group J: International Dispute Resolution and Arbitration</u>		
22-405-0118	Introduction to International Adjudication	Core
22-405-0218	Dispute Settlement under the World Trading System	Core
22-405-0318	Arbitration of International Commercial Disputes	Core
22-405-0418	Investor-State Dispute Settlement	Core
22-405-0161	International Law and the Global Economy	Elective
22-405-0162	Law of the World Trade Organisation	Elective
22-405-0261	International Investment Law	Elective

<u>Group K: International Trade & Investment Law</u>		
22-405-0119	Law of the World Trade Organisation	Core
22-405-0219	International Investment Law	Core
22-405-0319	International Commercial Transactions	Core
22-405-0419	State Control of International Trade	Core
22-405-0263	International Trade and Environment	Elective
22-405-0163	International Trade in Agriculture and Food	Elective
22-405-0164	Understanding TRIPS Mandates and Flexibilities	Elective
22-405-0264	International Commercial Arbitration	Elective

<u>Group L: Labour Law</u>		
22-405-0120	Trade Unionism, Collective Bargaining and Industrial Democracy	Core
22-405-0220	Industrial Disputes and Resolution	Core
22-405-0320	Law relating to Wages and other Monetary Benefits	Core
22-405-0420	Law relating to Social Security	Core

22-405-0165	International Labour Organization	Elective
22-405-0265	Law relating to Public Servants	Elective
22-405-0266	Law relating to Informal Sector	Elective

Group M: Maritime and International Trade Law

22-405-0121	Admiralty Jurisdiction: Law and Practice	Core
22-405-0221	Ownership and Management of Ships	Core
22-405-0321	Law of Carriage of Goods by Sea and International Trade	Core
22-405-0421	International Maritime Commercial Arbitration and Conciliation	Core
22-405-0267	Maritime Safety and Security Law	Elective
22-405-0268	Marine Insurance	Elective
22-405-0167	International Law of the Sea	Elective
22-405-0269	Law relating to General Average and Ancillary Shipping Contracts	Elective
22-405-0168	Maritime Environmental Law	Elective

U.G. Course – Five year B.Com. LL.B. (HONS.)**Semester I**

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0101	General English -1	6	2		5	50	50	100
21-273-0102	Business Organisation and Management	6	2		5	50	50	100
21-273-0103	Managerial Economics	6	2		5	50	50	100
21-273-0104	Business Statistics	6	2		5	50	50	100
21-273-0105	Law of Torts and Motor Vehicles Accidents	6	2		5	50	50	100
21-273-0106	General Principles of Contract	6	2		5	50	50	100

Semester II

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0201	General English–II	6	2		5	50	50	100
21-273-0202	Business Communication	6	2		5	50	50	100
21-273-0203	Business Environment	6	2		5	50	50	100
21-273-0204	Financial Accounting	6	2		5	50	50	100
21-273-0205	Constitutional Law–I	6	2		5	50	50	100
21-273-0206	Special Contracts (Law of Contract - II)	6	2		5	50	50	100

Semester III

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0301	Life Insurance And Social Security	6	2		5	50	50	100
21-273-0302	Cost Accounting	6	2		5	50	50	100
21-273-0303	Modern Banking	6	2		5	50	50	100
21-273-0304	Constitutional Law–II	6	2		5	50	50	100
21-273-0305	Jurisprudence (Legal Method, Indian Legal System and Basic Theory of Law)	6	2		5	50	50	100
21-273-0306	Law of Crimes-I	6	2		5	50	50	100

Semester IV

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0401	Financial Management	6	2		5	50	50	100
21-273-0402	Human Resource Management	6	2		5	50	50	100
21-273-0403	Marketing Management	6	2		5	50	50	100
21-273-0404	Administrative Law	6	2		5	50	50	100
21-273-0405	Family Law-I	6	2		5	50	50	100
21-273-0406	Law of Crimes-II	6	2		5	50	50	100

Semester V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0501	Co-Operation And Rural Development	6	2		5	50	50	100
21-273-0502	Information Technology for Business and Law	6	2		5	50	50	100
21-273-0503	Consumer Protection Law	6	2		5	50	50	100
21-273-0504	Family Law-II	6	2		5	50	50	100
21-273-0505	Law of Criminal Procedure	6	2		5	50	50	100
21-273-0506	Law of Evidence	6	2		5	50	50	100

Semester VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0601	Corporate Accounting	6	2		5	50	50	100
21-273-0602	Entrepreneurship Development	6	2		5	50	50	100
21-273-0603	Civil Procedure Code and Limitation Act	6	2		5	50	50	100
21-273-0604	Company Law	6	2		5	50	50	100
21-273-0605	Labour Law-I (Trade Unions and Industrial Disputes)	6	2		5	50	50	100
21-273-0606	Public International Law	6	2		5	50	50	100

Semester VII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0701	Accounting for specialised Institutions	6	2		5	50	50	100
21-273-0702	Environmental Law	6	2		5	50	50	100
21-273-0703	Labour Law–II (Social Securities Law)	6	2		5	50	50	100
21-273-0704	Principles of Taxation Law	6	2		5	50	50	100
21-273-0705	Property Law	6	2		5	50	50	100
21-273-0706	Drafting, Pleading and Conveyancing	6	2		4	50	50	100

Semester VIII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0802	Auditing Principles and Practice	6	2		5	50	50	100
21-273-0801	Professional Ethics and Professional Accounting System	6	2		4	100	0	100

General Electives for VIII (Any Four)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0803	Air and Space Law	6	2		5	50	50	100
21-273-0804	Criminology, Penology and Victimology	6	2		5	50	50	100
21-273-0805	Disaster Management Law	6	2		5	50	50	100
21-273-0806	Human Rights Law	6	2		5	50	50	100
21-273-0807	Intellectual Property Laws	6	2		5	50	50	100
21-273-0808	International Humanitarian and Refugee Law	6	2		5	50	50	100
21-273-0809	International Trade Law	6	2		5	50	50	100
21-273-0810	Interpretation of Statutes	6	2		5	50	50	100
21-273-0811	Land Utilization Law	6	2		5	50	50	100

21-273-0812	Law and Medicine	6	2		5	50	50	100
21-273-0813	Law Governing Scientific Research	6	2		5	50	50	100
21-273-0814	Law of Co-operative Societies	6	2		5	50	50	100
21-273-0815	Law on Building and Engineering Contracts	6	2		5	50	50	100
21-273-0816	Law Relating to Child	6	2		5	50	50	100
21-273-0817	Law Relating to Ships	6	2		5	50	50	100
21-273-0818	Law Relating to Armed Forces	6	2		5	50	50	100
21-273-0819	Marine Safety Law	6	2		5	50	50	100
21-273-0820	Science, Technology and Law	6	2		5	50	50	100
21-273-0821	Securities Laws	6	2		5	50	50	100

Semester IX

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0901	Mediation, Conciliation and Arbitration	6	2		4	100	0	100

General Electives for IX (Any Two)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0902	Animal Protection Law	6	2		5	50	50	100
21-273-0903	Disability Law	6	2		5	50	50	100
21-273-0904	Forensic Science and Medical Jurisprudence	6	2		5	50	50	100
21-273-0905	Healthcare Law	6	2		5	50	50	100
21-273-0906	Law of Local Self Government	6	2		5	50	50	100
21-273-0907	Law of the Sea	6	2		5	50	50	100
21-273-0908	Law, Poverty and Development	6	2		5	50	50	100
21-273-0909	Law Relating to Agriculture	6	2		5	50	50	100

21-273-0910	Private International Law	6	2		5	50	50	100
21-273-0911	Women and Criminal Law	6	2		5	50	50	100

Special Electives for IX (Any Three)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-0931	Bankruptcy and Insolvency Law	6	2		5	50	50	100
21-273-0932	Information Technology Law	6	2		5	50	50	100
21-273-0933	Insurance Law	6	2		5	50	50	100
21-273-0934	Law of Merger and Acquisition	6	2		5	50	50	100

Semester X

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-1001	Moot Court Exercise and Internship	6	2		4	100	0	100

Special Electives for X (Any Five)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-273-1002	Banking Law	6	2		5	50	50	100
21-273-1003	Competition Law	6	2		5	50	50	100
21-273-1004	Foreign Trade Law	6	2		5	50	50	100
21-273-1005	Law of Carriages	6	2		5	50	50	100
21-273-1006	Law on Corporate Finance	6	2		5	50	50	100
21-273-1007	Law of Corporate Governance	6	2		5	50	50	100

* The Elective courses will be decided according to the availability of teachers at the beginning of each semester.

U.G. Course – Five year BBA LL.B. (HONS.)

Semester I

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0101	General English-1	6	2		5	50	50	100
21-272-0102	Business Organisation and Management	6	2		5	50	50	100
21-272-0103	Business Statistics	6	2		5	50	50	100
21-272-0104	Managerial Economics	6	2		5	50	50	100
21-272-0105	General Principles of Contract (Law of Contract-I)	6	2		5	50	50	100
21-272-0106	Law of Torts and Motor Vehicle Accidents	6	2		5	50	50	100

Semester II

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0201	General English–II	6	2		5	50	50	100
21-272-0202	Business Communication	6	2		5	50	50	100
21-272-0203	Business Environment	6	2		5	50	50	100
21-272-0204	Financial Accounting	6	2		5	50	50	100
21-272-0205	Constitutional Law–I	6	2		5	50	50	100
21-272-0206	Special Contracts (Law of Contract - II)	6	2		5	50	50	100

Semester III

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0301	Advertising and Publicity Management	6	2		5	50	50	100
21-272-0302	Cost Accounting	6	2		5	50	50	100
21-272-0303	Modern Banking	6	2		5	50	50	100
21-272-0304	Constitutional Law–II	6	2		5	50	50	100
21-272-0305	Jurisprudence (Legal Method, Indian Legal System and Basic Theory of Law)	6	2		5	50	50	100
21-272-0306	Law of Crimes-I	6	2		5	50	50	100

Semester IV

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0401	Financial Management	6	2		5	50	50	100
21-272-0402	Human Resource Management	6	2		5	50	50	100
21-272-0403	Marketing Management	6	2		5	50	50	100
21-272-0404	Administrative Law	6	2		5	50	50	100
21-272-0405	Family Law-I	6	2		5	50	50	100
21-272-0406	Law of Crimes-II	6	2		5	50	50	100

Semester V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0501	Business Ethics	6	2		5	50	50	100
21-272-0502	Information Technology for Business and Law	6	2		5	50	50	100
21-272-0503	Consumer Protection Law	6	2		5	50	50	100
21-272-0504	Family Law-II	6	2		5	50	50	100
21-272-0505	Law of Criminal Procedure	6	2		5	50	50	100
21-272-0506	Law of Evidence	6	2		5	50	50	100

Semester VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0601	Research Methodology	6	2		5	50	50	100
21-272-0602	Operations Management	6	2		5	50	50	100
21-272-0603	Civil Procedure Code and Limitation Act	6	2		5	50	50	100
21-272-0604	Company Law	6	2		5	50	50	100
21-272-0605	Labour Law-I (Trade Unions and Industrial Disputes)	6	2		5	50	50	100
21-272-0606	Public International Law	6	2		5	50	50	100

Semester VII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0701	Management Project	6	2		5	100	0	100

21-272-0702	Environmental Law	6	2		5	50	50	100
21-272-0703	Labour Law-II (Social Security Laws)	6	2		5	50	50	100
21-272-0704	Principles of Taxation Law	6	2		5	50	50	100
21-272-0705	Property Law	6	2		5	50	50	100
21-272-0706	Drafting, Pleading and Conveyancing	6	2		4	100	0	100

Semester VIII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0802	Organisational Dynamics	6	2		5	50	50	100
21-272-0801	Professional Ethics and Professional Accounting System	6	2		4	100	0	100

General Electives for VIII (Any Four)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0803	Air and Space Law	6	2		5	50	50	100
21-272-0804	Criminology, Penology and Victimology	6	2		5	50	50	100
21-272-0805	Disaster Management Law	6	2		5	50	50	100
21-272-0806	Human Rights Law	6	2		5	50	50	100
21-272-0807	Intellectual Property Laws	6	2		5	50	50	100
21-272-0808	International Humanitarian and Refugee Law	6	2		5	50	50	100
21-272-0809	International Trade Law	6	2		5	50	50	100
21-272-0810	Interpretation of Statutes	6	2		5	50	50	100
21-272-0811	Land Utilization Law	6	2		5	50	50	100
21-272-0812	Law and Medicine	6	2		5	50	50	100
21-272-0813	Law Governing Scientific Research	6	2		5	50	50	100
21-272-0814	Law of Co-operative Societies	6	2		5	50	50	100

21-272-0815	Law on Building and Engineering Contracts	6	2		5	50	50	100
21-272-0816	Law Relating to Child	6	2		5	50	50	100
21-272-0817	Law Relating to Ships	6	2		5	50	50	100
21-272-0818	Law Relating to Armed Forces	6	2		5	50	50	100
21-272-0819	Marine Safety Law	6	2		5	50	50	100
21-272-0820	Science, Technology and Law	6	2		5	50	50	100
21-272-0821	Securities Laws	6	2		5	50	50	100

Semester IX

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0901	Mediation, Conciliation and Arbitration	6	2		4	100	0	100

General Electives for IX (Any Two)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0902	Animal Protection Law	6	2		5	50	50	100
21-272-0903	Disability Law	6	2		5	50	50	100
21-272-0904	Forensic Science and Medical Jurisprudence	6	2		5	50	50	100
21-272-0905	Healthcare Law	6	2		5	50	50	100
21-272-0906	Law of Local Self Government	6	2		5	50	50	100
21-272-0907	Law of the Sea	6	2		5	50	50	100
21-272-0908	Law, Poverty and Development	6	2		5	50	50	100
21-272-0909	Law Relating to Agriculture	6	2		5	50	50	100
21-272-0910	Private International Law	6	2		5	50	50	100
21-272-0911	Women and Criminal Law	6	2		5	50	50	100

Special Electives for IX (Any Three)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-0931	Bankruptcy and Insolvency Law	6	2		5	50	50	100
21-272-0932	Information Technology Law	6	2		5	50	50	100
21-272-0933	Insurance Law	6	2		5	50	50	100
21-272-0934	Law of Merger and Acquisition	6	2		5	50	50	100

Semester X

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-1001	Moot Court Exercise and Internship	6	2		4	100	0	100

Special Electives for X (Any Five)

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-272-1002	Banking Law	6	2		5	50	50	100
21-272-1003	Competition Law	6	2		5	50	50	100
21-272-1004	Foreign Trade Law	6	2		5	50	50	100
21-272-1005	Law of Carriages	6	2		5	50	50	100
21-272-1006	Law on Corporate Finance	6	2		5	50	50	100
21-272-1007	Law of Corporate Governance	6	2		5	50	50	100

- * The Elective courses will be decided according to the availability of teachers at the beginning of each semester.

U.G. Course – 3 Year LL.B.

Semester I

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0101	Family Law – I	5	1		4	50	50	100
21-271-0102	General Principles of Contract (Law of Contract – I)	5	1		4	50	50	100
21-271-0103	Law of Crimes	5	1		4	50	50	100
21-271-0104	Law of Torts including Motor Vehicles Accidents & Consumer Protection Laws	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

Semester II

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0201	Administrative Law	5	1		4	50	50	100
21-271-0202	Constitutional Law – I	5	1		4	50	50	100
21-271-0203	Family Law – II	5	1		4	50	50	100
21-271-0204	Special Contracts (Law of Contract – II)	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

Semester III

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0302	Constitutional Law – II	5	1		4	50	50	100
21-271-0303	Jurisprudence (Legal Method, Indian Legal System and Basic Theory of Law)	5	1		4	50	50	100
21-271-0304	Law of Evidence	5	1		4	50	50	100
21-271-0301	Drafting, Pleading and Conveyance	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

Semester IV

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0402	Civil Procedure Code and Limitation Act	5	1		4	50	50	100
21-271-0403	Company Law	5	1		4	50	50	100
21-271-0404	Law of Criminal Procedure	5	1		4	50	50	100
21-271-0401	Professional Ethics and Professional Accounting System	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

Semester V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0502	Property Law	5	1		4	50	50	100
21-271-0503	Public International Law	5	1		4	50	50	100
21-271-0504	Labour Law – I (Trade Unions and Industrial Disputes)	5	1		4	50	50	100
21-271-0501	Mediation, Conciliation and Arbitration	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

Semester VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-271-0602	Environmental Law	5	1		4	50	50	100
21-271-0603	Labour Law – II (Social Security Laws)	5	1		4	50	50	100
21-271-0604	Principles of Taxation Law	5	1		4	50	50	100
21-271-0601	Moot Court Exercise and Internship	5	1		4	50	50	100
	General Elective*	5	1		4	50	50	100

* The Elective courses will be decided according to the availability of teachers at the beginning of each semester.

General Elective Courses in Law:

Semester I

- 1.Criminology, Penology and Victimology
- 2.Human Rights Law
- 3.International Humanitarian and Refugee Law
- 4.Law of Co-operative Societies

Semester II

- 1.Animal Protection Laws
- 2.Disability Law
- 3.Law and Medicine
- 4.Law of the Sea
- 5.Laws Relating to Agriculture

Semester III

- 1.Disaster Management Law
- 2.Law on Building and Engineering Contracts
- 3.Law, Poverty and Development
- 4.Laws Relating to Armed Forces
- 5.Law Relating to Ships

Semester IV

1. Interpretation of Statutes
2. Land Utilization Law
3. Law Relating to Child
4. Marine Safety Law
5. Women and Criminal Law

Semester V

1. Forensic Science and Medical Jurisprudence
2. Healthcare Laws
3. Intellectual Property Laws
4. Law Governing Scientific Research
5. Science, Technology and Law

Semester VI

1. Air and Space Law
2. International Trade Law
3. Law of Local Self Government
4. Private International Law
5. Securities Laws

Details of Faculty:

Permanent Faculty:

Sl. No.	Name & Designation	Specialisation	Communication
1.	Dr. Harigovind P.C. (Assistant Professor & Director)	Jurisprudence, Human Rights Law & Criminal Law	harigovindpc@gmail.com , harigovindpc@cusat.ac.in 9446633249
2	Dr. P.S. Seema (Associate Professor)	Jurisprudence, Criminal Law, Constitutional Law & Human Rights Law	pss_sls@yahoo.co.in , drpsseema@gmail.com Ph: 0484-2233411 9496943875
3	Dr. VaniKesari A. (Associate Professor)	Jurisprudence, Administrative Law, Human Rights Law & Constitutional Law	vanikesaria@gmail.com Ph: 0484-2543744 9495953744
4	Dr. Preetha S. (Associate Professor)	Jurisprudence, Commercial Law & Criminal Law	preetha.sadasivan@gmail.com preetha@cusa.ac.in 9446208509
5	Dr. Aneesh V. Pillai (Assistant Professor)	Consumer Law & Human Rights Law	dr.avpillai@cusat.ac.in , advavpillai@gmail.com 8606558242
6	Smt. Arathi Ashok (Assistant Professor)	Jurisprudence, IPR & Labour Law	arathi.ashokd@gmail.com arathiashok@cusat.ac.in 9847982918
7	Dr. Binu Mole K. (Assistant Professor)	Jurisprudence, Maritime Law, Environmental Law & Labour Law	binumolek@gmail.com drbinumolek@cusat.ac.in 9497804305
8	Sri. Induraj V.R. (Assistant Professor)	Jurisprudence, Commercial Law & Consumer Law	vrinduraj@gmail.com , Induraj@cusat.ac.in 9446417548
9	Smt. Jean Vinitha Peter (Assistant Professor)	Jurisprudence, Criminal Law & Constitutional Law	vinithajeon@gmail.com , jeanvinithapeter@cusat.ac.in 9947987614
10	Dr. Naveen S. (Assistant Professor)	Environmental Law, Constitutional Law, IPR , International Organisation and Human Rights	naveensukumaran@gmail.com naveensukumaran@cusat.ac.in 9400250724
11	Dr. Nemat Sheereen S. (Assistant Professor)	Financial Management, Marketing Management	nematsheerin3@gmail.com 9446208502
12	Dr. Sreejith S. (Assistant Professor)	Management, Finance, Marketing	lamjith@gmail.com 9995510007
13	Dr. Asif E. (Assistant Professor)	Administrative Law, IPR, Public Law	drasife@cusat.ac.in 9995206262

INTER UNIVERSITY CENTRE FOR IPR STUDIES

Two Year LLM (IPR)

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-406-0101	Law and Social Transformation	C	4	50	50	100
22-406-0102	Research Methodology and Design of Blueprint of Curriculum	C	4	50	50	100
22-406-0103	An Introduction to General Principles and Legal Regimes of IPR	C	4	50	50	100
22-406-0104	Patent and Right to Health	C	4	50	50	100
22-406-0105	Seminar Course - 1	C	2	100	00	100
	Total		18	300	200	500

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-406-0201	Theories of Law and Justice	C	4	50	50	100
22-406-0202	Quantitative Analysis	C	4	50	50	100
22-406-0203	IPR- Developmental Perspectives and its Impact on Society	C	4	50	50	100
22-406-0204	International Acquisition of Intellectual Property	C	4	50	50	100
22-406-0205	Seminar Course - 2	C	2	100	00	100
	Total		18	300	200	500

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-406-0301	TRIPS Flexibilities and Development	C	4	50	50	100
22-406-0302	IPR and Competition Law	C	4	50	50	100
	Elective - 1	E	4	50	50	100
	Elective - 2	E	4	50	50	100
22-406-0303	Clinical Legal Education - 1	C	2	100	00	100
22-406-0304	Dissertation Proposal Defence	C	2	100	00	100
	Total		20	400	200	600

Semester IV

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	Total
22-406-0401	IPR and International Trade Law	C	4	50	50	100
22-406-0402	Copyright and Entertainment Industry	C	4	50	50	100
22-406-0403	Clinical Legal Education - 2	C	2	100	00	100
22-406-0404	Dissertation	C	8	00	300	300
22-406-0405	Dissertation Viva-Voce	C	2	00	100	100
	Total		20	200	500	700

ELECTIVE COURSES

Course Code	Course	Credits
22-406-0305	Comparative Public Law	4
22-406-0306	Patent and Biotechnology	4
22-406-0307	IPR and Computer Programs	4
22-406-0308	Access to Information and Copyright	4
22-406-0309	Collective Property as Intellectual Property	4

LLM (IPR) Ph.D

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0101	Law and Social Transformation	C	4	50	50	100
22-404-0102	Research Methodology and Design of Blueprint of Curriculum	C	4	50	50	100
22-404-0103	Intellectual Property - General Principles, Nature and Content	C	4	50	50	100
22-404-0104	Seminar course - I	C	4	100	00	100
	Total		16	250	150	400

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0201	Theories of Law and Justice	C	4	50	50	100
22-404-0202	Quantitative Analysis	C	4	50	50	100
22-404-0203	Intellectual Property Rights - The Social Relevance	C	4	50	50	100
22-404-0204	Seminar Course - II	C	4	100	00	100
	Total		16	250	150	400

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0301	Acquisition of Intellectual Property: International Aspects	C	4	50	50	100
22-404-0302	Seminar on Dissertation - I	C	4	100	00	100
22-404-0303	Seminar on Dissertation - II	C	4	100	00	100
	Elective - I	E	4	50	50	100
	Elective - II	E	4	50	50	100
	Total		20	350	150	500

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0401	Seminar on Dissertation - III	C	4	100	00	100
22-404-0402	Seminar on Dissertation - IV	C	4	100	00	100
	Elective - III	E	4	50	50	100
22-404-0403	Dissertation	C	8	00	300	300
22-404-0404	Dissertation Viva-Voce	C	2	00	100	100
	Total		22	250	450	700

Semester V

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0501	Ph.D Course work on IPR - I	C	8	200	00	200
22-404-0502	Ph.D Course work on IPR - II	C	8	200	00	200
	Total		16	400	00	400

Semester VI

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0601	Ph.D Course work on IPR - III	C	8	200	00	200
22-404-0602	Ph.D Course work on IPR - IV	C	8	200	00	200
	Total		16	400	00	400

Semester VII

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0701	Ph.D Course work on IPR - V	C	8	200	00	200
22-404-0702	Ph.D Course work on IPR - VI	C	8	200	00	200
	Total		16	400	00	400

Semester VIII

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-404-0801	Ph.D Course work on IPR - VII	C	8	200	00	200
22-404-0802	Ph.D Course work on IPR - VIII	C	8	200	00	200
	Total		16	400	00	400

Semester IX & X

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-	Ph.D Thesis on IPR	-	-	-	-	-
	Total					

ELECTIVE COURSES

Course Code	Course	Credits
22-404-0304 22-404-0405	IPR and Computer Programs	4
22-404-0305 22-404-0406	WTO Dispute Settlement and TRIPS Agreement	4
22-404-0306 22-404-0407	Copyright and Entertainment Industry	4
22-404-0307 22-404-0408	TRIPS Agreement and Access to Medicine	4

22-404-0308 22-404-0409	Patent Law and TRIPS Agreement	4
22-404-0309 22-404-0410	Protection of Broadcasting Organisations	4
22-404-0310 22-404-0411	Protection of Traditional Knowledge	4
22-404-0311 22-404-0412	Genetic Resources and Associated Traditional Knowledge	4

LLM (IP) Ph.D.

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0101	Law and Social Transformation	C	4	50	50	100
22-403-0102	Research Methodology and Design of Blueprint of Curriculum	C	4	50	50	100
22-403-0103	Intellectual Property – General Principles, Nature and Content	C	4	50	50	100
22-403-0105	Legal Method - I	C	2	50	50	100
22-403-0104	Seminar course - I	C	4	100	00	100
	Total		18	300	200	500

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0201	Theories of Law and Justice	C	4	50	50	100
22-403-0202	Quantitative Analysis	C	4	50	50	100
22-403-0203	Intellectual Property Rights - The Social Relevance	C	4	50	50	100
22-403-0204	Legal Method - II	C	2	50	50	100
22-403-0205	Public International Law: Treaty making and Enforcement	C	2	50	50	100
22-403-0206	Seminar Course - II	C	4	100	00	100
	Total		20	350	250	600

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0301	Acquisition of Intellectual Property: International Aspects	C	4	50	50	100
22-403-0302	Seminar on Dissertation - I	C	4	100	00	100
22-403-0303	Seminar on Dissertation - II	C	4	100	00	100
	Elective - I	E	4	50	50	100
	Elective - II	E	4	50	50	100
	Total		20	350	150	500

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0401	Seminar on Dissertation - III	C	4	100	00	100
22-403-0402	Seminar on Dissertation - IV	C	4	100	00	100
	Elective - III	E	4	50	50	100
22-403-0403	Dissertation	C	8	00	300	300
22-403-0404	Dissertation Viva-Voce	C	2	00	100	100
	Total		22	250	450	700

Semester V

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0501	Ph.D Course work on IPR - I	C	8	200	00	200
22-403-0502	Ph.D Course work on IPR - II	C	8	200	00	200
	Total		16	400	00	400

Semester VI

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0601	Ph.D Course work on IPR - III	C	8	200	00	200
22-403-0602	Ph.D Course work on IPR - IV	C	8	200	00	200
	Total		16	400	00	400

Semester VII

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0701	Ph.D Course work on IPR - V	C	8	200	00	200
22-403-0702	Ph.D Course work on IPR - VI	C	8	200	00	200
	Total		16	400	00	400

Semester VIII

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
22-403-0801	Ph.D Course work on IPR - VII	C	8	200	00	200
22-403-0802	Ph.D Course work on IPR - VIII	C	8	200	00	200
	Total		16	400	00	400

Semester IX & X

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
-	Ph.D Thesis on IPR	-	-	-	-	-
	Total					

ELECTIVE COURSES

Course Code	Course	Credits
22-403-0304 22-403-0405	IPR and Computer Programs	4
22-403-0305 22-403-0406	WTO Dispute Settlement and TRIPS Agreement	4
22-403-0306 22-403-0407	Copyright and Entertainment Industry	4
22-403-0307 22-403-0408	TRIPS Agreement and Access to Medicine	4
22-403-0308 22-403-0409	Patent Law and TRIPS Agreement	4
22-403-0309 22-403-0410	Protection of Broadcasting Organisations	4
22-403-0310 22-403-0411	Protection of Traditional Knowledge	4
22-403-0311 22-403-0412	Genetic Resources and Associated Traditional Knowledge	4

ELECTIVE COURSES OFFERED TO NON-LAW STUDENTS OF CUSAT

Course Code	Course	C/E	Credits
22-403-0311 22-403-0411	IP and Management	E	3
22-403-0312 22-403-0412	Patent Drafting	E	3
22-403-0313 22-403-0413	Patenting Inventions: Practice and Introduction to Relevant Tools	E	3

DETAILS OF FACULTY

Sl. No.	Name & Designation	Specialisation	Communication
1	Dr. N.S. Gopalakrishnan (NSG) (Honorary Professor)	Commercial Law, Criminal Law & IPL	gopalakrishnan.n.s@gmail.com Ph: 0484-2577542 9447077542
2	Dr. I G Rathish Assistant Professor (Tenure Track)	Chemistry	rathishig@gmail.com Ph:8108074199 8921982102
3	Dr. Anson C J Assistant Professor (Tenure Track)	IPR & Management	777anson@gmail.com 9400610461
4	Dr. Kavitha Chalakkal Assistant Professor (Tenure Track)	IPR, Public International Law, & International Environmental Law	kavithachalakkal@gmail.com 9811095405
5	Dr. Vishnu Sankar P Assistant Professor (Tenure Track)	IPR	vishnusankar.cusat@gmail.com 8089726467

FACULTY OF MARINE SCIENCES

Dean:

Dr. S Bijoy Nandan
Professor
Department of Marine Biology,
Microbiology & Biochemistry
Cochin University of Science and Technology
Kochi- 682 016

SCHOOL OF INDUSTRIAL FISHERIES

M.SC. (INDUSTRIAL FISHERIES)

SEMESTER I

Course Code	Course	Core/ Elective	Credits	Marks		
				Contin uous assess ment	End Sem. Exam.	Total
20-308-0101	Taxonomy and Life history traits of commercially important fin fishes and shell fishes	C	3	50	50	100
20-308-0102	Principles of Fishing Technology	C	2	50	50	100
20-308-0103	Food chemistry and Fish Biochemistry	C	3	50	50	100
20-308-0104	Managerial Economics	C	3	50	50	100
20-308-0107	Taxonomy and life history traits of commercially Important Fin Fishes and Shell Fishes (Practical)	C	1	100		100
20-308-0108	Food chemistry and Fish Biochemistry (Practical)	C	1	100		100

ELECTIVE I

Course Code	Course	Core/ Elective	Credits	Marks		
				Contin uous assess ment	End Sem. Exam.	Total
20-308-0105	Principles of Fisheries Business Management	E	3	50	50	100
20-308-0106	Research methodology and Quantitative techniques	E	2	50	50	100
20-308-0109	Climate change impact on marine ecosystem and fisheries	E	2	50	50	100

Maximum Total Credit Offered in 1st Semester: 20 (13 credits for Core and 07 credits for Elective Courses)

SEMESTER II

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-308- 0201	Fisheries Resources and Management	C	3	50	50	100
20-308- 0203	Freezing, Canning and Packaging Technology	C	3	50	50	100
20-308- 0204	Production and Operations Management in Fisheries Industry	C	3	50	50	100
20-308- 0205	Economics of Fisheries Production & Marketing	C	3	50	50	100
20-308- 0208	Fish processing and quality control (Practical)	C	1	100		100
20-308- 0209	Fishing Craft and Gear Technology (Practical)	C	1	100	-	100

ELECTIVE II

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-308- 0202	Fishing Craft and Gear Technology	E	3	50	50	100
20-308- 0206	Analytical methods for Seafood quality assurance	E	2	50	50	100
20-308- 0207	Fisheries Resources and Management (Practical)	E	1	100	-	100
20-308- 0210	Field study of Economics of Fisheries Production and Marketing (Practical)	E	1	100	-	100
20-308- 0211	Oceanic and Deep Sea fisheries	E	3	50	50	100
20-308- 0212	Food Science and Nutrition	E	3	50	50	100
20-308- 0213	Aquaculture Economics	E	3	50	50	100
20 -308-0214	Entrepreneurship Development	E	2	50	50	100
20 -208-0215	Business Analytics for Fisheries	E	2	50	50	100
Maximum Total Credits offered in Second Semester: 34 Credits (14 Credits for Core and 20 Credits for Elective Courses)						

SEMESTER III

Course Code	Course	Core/ Elective	Credits	Marks		
				Contin uous assess ment	End Sem Exa m.	Total
20-308- 0301	Seed Production and Hatchery Management of Cultivable Finfishes and Shellfishes	C	3	50	50	100
20-308- 0303	Fishing operation, Seamanship and Navigation	C	2	50	50	100
20-308- 0304	Byproducts and Value Added Products Technology	C	3	50	50	100
20-308- 0306	Fisheries Management for Sustainable Development	C	3	50	50	100
20-308- 0307	Marketing Management	C	2	50	50	100
20-308- 0310	Byproducts, Value added products and Microbiology (Practical)	C	1	100	-	100

ELECTIVE III

Course Code	Course	Core/ Elective	Credits	Marks		
				Conti nuous assess ment	End Sem. Exam.	Total
20-308- 0302	Aquaculture Systems and Practices	E	3	50	50	100
20-308- 0305	Quality Assurance and Seafood Safety	E	3	50	50	100
20-308- 0308	Management Accounting and Finance Management for Fisheries	E	3	50	50	100
20-308- 0309	Aquaculture Systems and practices (Practical)	E	1	100		100
20-308- 0311	Fishing operation/Onboard Training (Practical)	E	1	100		100
20-308- 0312	Fish Genetics and Hybridization	E	3	50	50	100
20-308- 0313	Inland Fishing Gears, Designs and Operation	E	3	50	50	100
20-308- 0314	Fisheries and Rural Development	E	3	50	50	100
Maximum Total Credits offered in Third Semester: 34 Credits (14 Credits for Core and 20 Credits for Elective Courses)						

SEMESTER IV

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-308- 0401	Internship in Seafood Industry & Report evaluation	C	4	100		100
20-308- 0404	Dissertation/ Project Report Evaluation	C	8	100	100	100
20-308- 0405	Course Viva-voce	C	1	100		100

ELECTIVE IV

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-308- 0402	Internship in Hatchery/Farm/Aquaculture industry	E	4	100		100
20-308- 0403	Entrepreneurship / Startups/ Business Incubation Initiatives	E	2	100		100
Maximum Total Credit Offered in 4 th Semester: 19 (13 credits for Core and 6 credits for Electives)						

TOTAL CREDITS OFFERED IN DIFFERENT SEMESTERS

Maxi-mum Credits Offered	Semester 1	Semester 2	Semester 3	Semester 4	Total Credits
CORE	13	14	14	13	54
ELECTIVE	07	20	20	06	53
TOTAL	20	34	34	19	107

TOTAL CREDITS OF BOTH ELECTIVES AND CORE PAPERS FOR THE AWARD OF THE DEGREE WILL BE ADJUSTED ACCORDING TO THE PROVISIONS IN THE CHOICE AND CREDIT BASED SYSTEM ADOPTED BY THE UNIVERSITY FROM TIME TO TIME.

FOR THE AWARD OF M.Sc. DEGREE IN INDUSTRIAL FISHERIES STUDENT SHALL ACQUIRE MINIMUM OF 72 CREDITS.

- Students are free to select the Elective Courses offered by the School in a semester depending on their choices and the advice of the Student advisor
- Students from other Departments/Schools of the University are also free to take the Elective Courses offered in the School

M.FSC. (SEAFOOD SAFETY AND TRADE)

SEMESTER I

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous evaluation	End Sem. Exam.	Total
20-386-0102	Managerial Economics	C	3	50	50	100
20-386-0103	Food Chemistry and Fish Biochemistry	C	3	50	50	100
20-386-0104	Principles of Fish Business Management	C	3	50	50	100
20-386-0107	Fish Harvest Technologies and Onboard Facilities	C	2	50	50	100
20-386-0109	Food chemistry and Fish Biochemistry (Practical)	C	1	100		100

ELECTIVE I

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous evaluation	End Sem. Exam.	Total
20-386-0101	Taxonomy and Life History Traits of Commercially Important Fin Fishes and Shell Fishes	E	3	50	50	100
20-386-0105	Market Research for Seafood Business	E	3	50	50	100
20-386-0106	Research Methodology and Quantitative Techniques	E	2	50	50	100
20-386-0108	Taxonomy and Life History Traits of Commercially Important Fin Fishes and Shell Fishes (Practical)	E	1	100		100

Maximum Total Credit Offered in 1st Semester: 21 (12 credits for Core and 09 credits for Elective Courses)

SEMESTER II

Course Code	Course	Core/ Elective	Credits	Marks		
				Continu- ous assess- ment	End Sem. Exam.	Total
20-386-0201	Freezing, Canning and Packaging Technology	C	3	50	50	100
20-386-0203	Economics of Seafood Production and Marketing	C	3	50	50	100
20-386-0204	Supply Chain Management in Seafood Industry	C	3	50	50	100
20-386-0207	Freezing, Canning and Packaging Technology (Practical)	C	1	50	50	100
20-386-0209	Economics of Seafood Production and Marketing (Practical)	C	1	100		100

ELECTIVE II

Course Code	Course	Core/ Elective	Credits	Marks		
				Continu- ous assess- ment	End Sem. Exam.	Total
20-386-0202	Fundamentals of Food Microbiology	E	2			100
20-386-0205	International Trade and Development	E	3			100
20-386-0206	Food Science and Nutrition	E	3			100
20-386-0208	Fundamentals of Food Microbiology (Practical)	E	1			100
20-386-0210	Entrepreneurship Development	E	2			100
Maximum Total Credits offered in Second Semester: 22 Credits (11 Credits for Core and 11 Credits for Elective Courses)						

SEMESTER III

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-386-0301	Sustainable Aquaculture for Safe Food Production	C	3	50	50	100
20-386-0302	By products and Value added Products Technology	C	3	50	50	100
20-386-0303	Food Safety	C	3	50	50	100
20-386-0305	International Business Environment and Finance Management	C	3	50	50	100
20-386-0306	International Marketing	C	3	50	50	100
20-386-0307	Food Safety Management Systems	C	3	50	50	100
20-386-0309	Value Added Products technology and Food Safety (Practical)	C	1	50	50	100

ELECTIVE III

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-386-0304	Environmental and Natural Resource Economics	E	3	50	50	100
20-386-0308	Analytical methods for Seafood Quality Assurance	E	2	50	50	100
20-386-0310	Sustainable Aquaculture for Safe Food Production (Practical)	E	1	100		100
20-386-0311	Cold-chain Management in Seafood Business	E	2	50	50	100
Maximum Total Credits offered in Third Semester: 27 Credits (19 Credits for Core and 08 Credits for Elective Courses)						

SEMESTER IV

Course Code	Course	Core/ Elective	Credits	Marks		
				Continu-ous assess-ment	End Sem. Exam.	Total
20-386-0401	Internship in Seafood Industry and Report Evaluation	C	4	100		100
20-386-0403	Dissertation/ Project report Evaluation	C	8	100 100		100 100
20-386-0404	Course Viva-voce	C	1	100		100

ELECTIVE IV

Course Code	Course	Core/ Elective	Credits	Marks		
				Continuous assessment	End Sem. Exam.	Total
20-386-0402	Entrepreneurship/Startups/ Business Incubation Initiatives	E	2	100		100
20-386-0408	Good Aquaculture and Hatchery Practice (Practical)	E	2	100		100

Maximum Total Credit Offered in 4th Semester: 17 (13 credits for Core and 04 credits for Electives)

TOTAL CREDITS OFFERED IN DIFFERENT SEMESTERS

Maxi-mum Offered	Credits	Semester 1	Semester 2	Semester 3	Semester 4	Total Credits
CORE		12	11	19	13	55
ELECTIVE		09	11	08	04	32
TOTAL		21	22	27	17	87

TOTAL CREDITS OF BOTH ELECTIVES AND CORE PAPERS FOR THE AWARD OF THE DEGREE WILL BE ADJUSTED ACCORDING TO THE PROVISIONS IN THE CHOICE AND CREDIT BASED SYSTEM ADOPTED BY THE UNIVERSITY FROM TIME TO TIME. FOR THE AWARD OF MFSc. DEGREE IN SEAFOOD SAFETY AND TRADE STUDENT SHALL ACQUIRE MINIMUM OF 72 CREDITS.

- Students are free to select the Elective Courses offered by the School/other departments in a semester depending on their choices and the advice of the Student advisor
- Students from other Departments/Schools of the University are also free to take the Elective Courses offered in the School

DETAILS OF FACULTY

Sl. No	Name & Designation	Specialization	Communication (Contact No.)	Email id
1	Dr. S. Sabu Associate Professor & Director	Fish Post Harvest Technology	9847233764	directorsif@cusat.ac.in sabuif@cusat.ac.in
2	Dr. M Harikrishnan, Professor	Industrial Fisheries	9447327804	mahadevhari@cusat.ac.in
3	Dr. Mini Sekharan Associate Professor	Fisheries Management	9895070310	minisekharan@cusat.ac.in
4	Dr. Mujeeb Rahiman Associate Professor	Fisheries	9249722109	mujeebrkm@cusat.ac.in
5	Dr. Hareesh N Ramanathan Associate Professor	Fish Business Management	9447476660	hareeshramanathan@cusat.ac.in
6	Dr. Ancy V P Associate Professor	Fisheries Economics	9895040045	ancyvp@cusat.ac.in
7	Dr. Shibu A V Assistant Professor	International Marketing and Trade	8129511388	avshibu@cusat.ac.in
8	Dr. Ginson Joseph Assistant Professor	Fish Processing Technology	8848095895	ginsonjosephif@cusat.ac.in

DEPARTMENT OF ATMOSPHERIC SCIENCES

M.TECH ATMOSPHERIC SCIENCE			
Semester I			
Course Code	Paper	Core/Elective	Credits
20-433-0101	Atmospheric Dynamics	C	4
20-433-0102	General Circulation and Climate Dynamics	C	4
20-433-0103	Physics of Atmosphere and Ocean	C	4
20-433-0104	Weather Analysis and Forecasting Techniques	C	3
20-433-0105	Introduction to Computing (Practical)	C	2
20-433-0106	Semester End Seminar and Viva Voce	C	1
Elective I			
20-433-0107	Applied Statistics	E	4
20-433-0108	Advanced Mathematics	E	4
20-433-0109	Atmospheric Chemistry	E	3
20-433-0110	Monsoon Dynamics	E	2
20-433-0111	Meteorological Analysis (Practical)	E	2
Semester II			
Course Code	Paper	Core/Elective	Credits
20-433-0201	Atmosphere and Ocean Modelling	C	4
20-433-0202	Climate change, Mitigation and Adaptation	C	4
20-433-0203	Modelling Laboratory (Practical)	C	2
20-433-0204	Semester End Seminar and Viva Voce	C	1
Elective II			
20-433-0205	Advanced Atmospheric Dynamics	E	4
20-433-0206	Remote Sensing Applications	E	3
20-433-0207	Aeosol and Climate	E	2
20-433-0208	Air Pollution Meteorology	E	2
20-433-0209	Agricultural Meteorology	E	2
20-433-0210	Hydro Meteorology	E	2
Semester III			
Course Code	Paper	Core/Elective	Credits
20-433-0301	Mid - Term Evaluation of Project	C	16
Semester IV			
Course Code	Paper	Core/Elective	Credits
20-433-0401	Project Dissertation Evaluation	C	16
20-433-0102	Viva Voce	C	4

M.SC. METEOROLOGY			
Semester I			
Course Code	Paper	Core/Elective	Credits
20-302-0101	Geophysical Fluid Dynamics	C	4
20-302-0102	Physical Meteorology	C	4
20-302-0103	Observational Techniques	C	3
20-302-0104	Computing and Programming - I (Practical)	C	3
20-302-0105	Semester End Seminar and Viva-Voce	C	1
Elective I			
20-302-0106	Introductory Physical Oceanography	E	4
20-302-0107	Advanced Mathematics	E	4
20-302-0108	Numerical and Statistical Methods	E	4
20-302-0109	General Meteorology	E	3
Semester II			
Course Code	Paper	Core/Elective	Credits
20-302--0201	Dynamic Meteorology	C	4
20-302--0202	Synoptic Meteorology and Weather Forecasting	C	3
20-302--0203	Tropical Meteorology	C	3
20-302--0204	Computing and Programming II (Practical)	C	2
20-302--0205	Semester End Seminar and Viva - Voce	C	1
Elective II			
20-302--0206	Global Climate and Climate Change	E	4
20-302--0207	Remote Sensing and Satellite Meteorology	E	4
Semester III			
Course Code	Paper	Core/Elective	Credits
20-302--0301	Numerical Weather Prediction	C	4
20-302--0302	Advanced Dynamic Meteorology	C	4
20-302--0303	Meteorological Analysis (Practical)	C	2
20-302--0304	Computational Meteorology (Practical)	C	2
20-302--0305	Semester End Seminar and Viva - Voce	C	1
Elective III			
20-302--0306	Applied Meteorology	E	4
20-302--0307	Cloud Physics and Atmospheric Electricity	E	3
20-302--0308	Air - Sea Interaction	E	3
20-302--0309	Atmospheric Chemistry And Air Pollution	E	3
20-302--0310	Disaster Management	E	3

Semester IV			
Course Code	Paper	Core/Elective	Credits
20-302--0401	Project and Project Presentation	C	15
20-302--0402	Comprehensive Viva	C	3

<u>Details of Faculty</u>			
Sl. No.	Name and Designation	Specialization	Communication (Contact no. & e-mail id)
1	Dr. K. Satheesan (KS) Professor & Head	Remote Sensing, Radar Meteorology	9400810099 04842863817 satheesan.k@gmail.com
2	Baby Chakrapani (BC) Assoc. Professor	Numerical Modelling of Atmospheric and Ocean Processes	0487 2428620/ 04842863803 bcpani@cusat.ac.in
3	Dr. Abhilash S (AS) Assoc. Professor	Tropical Meteorology, Climate Modelling	9561642841, 0484 2863816 abhimets@gmail.com
4	Dr. V. Madhu (VM) Asst. Professor	Middle Atmospheric Dynamics, Tropical Meteorology	9495424310/0484 2863814 madhuv@cusat.ac.in
5	Dr. Lekshmy P R (PRL) Asst. Professor	Isotope Hydrology, Tropical Meteorology, Paleo Climatology	7878320842/0484 2863802 rarylekshmy@gmail.com
6	Dr. Midhun M (MM) Asst. Professor	Climate Dynamics, Paleo Climatology	9662735653, 04842863802 midhun.ndr@gmail.com
7	Dr. Sreekala P P Asst. Professor	Northeast Monsoon	8156937815 srekala86@cusat.ac.in

DEPARTMENT OF CHEMICAL OCEANOGRAPHY

M.Sc. HYDROCHEMISTRY

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-304-0101	Co-ordination Chemistry	C	3	50	50	100
20-304-0102	Marine Environment	C	3	50	50	100
20-304-0103	Quantum Mechanics	C	3	50	50	100
20-304-0104	Stereochemistry, Pericyclic Reactions and Photochemistry	C	3	50	50	100
20-304-0105	Practical I – Analytical Techniques	C	2	100	-	100
20-304-0106	Practical II – Quantitative Chemical Analysis	C	2	100	-	100
Total			16	400	200	600

Elective I

Course Code	Course
20-304-0001	Analytical Chemistry
20-304-0015	Introduction to Hydrochemistry
20-304-0023	Solid State Chemistry

Semester II

<i>Course Code</i>	<i>Course</i>	C/E	Credits	Marks		
				CE	ES	Total
20-304-0201	Chemical Oceanography	C	3	50	50	100
20-304-0202	Group Theory & Spectroscopy	C	3	50	50	100
20-304-0203	Natural Products and Organic Synthesis	C	3	50	50	100
20-304-0204	Thermodynamics & Statistical Mechanics	C	3	50	50	100
20-304-0205	Practical III – Separation and Synthetic Methods	C	2	100	-	100
20-304-0206	Practical IV- Water & Sediment Analysis	C	2	100	-	100
Total			16	400	200	600

Elective II

Course Code	Course
20-304-0002	Applications of Coordination Compounds
20-304-0005	Chemistry of Biomolecules
20-304-0006	Chemistry of Radiations, Surface and Inorganic Materials
20-304-0010	General Chemical Oceanography
20-304-0011	General Chemical Oceanography (Practical)
20-304-0012	Green Chemistry
20-304-0013	Instrumental Techniques
20-304-0016	Marine Biogeochemistry
20-304-0020	Nanomaterials and Supramolecular Chemistry
20-304-0021	Organometallic Chemistry
20-304-0022	Polar Sciences
20-304-0024	Water Management

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-304-0301	Aquatic Chemical Resources	C	2	50	50	100
20-304-0302	Organic Spectroscopy	C	3	50	50	100
20-304-0303	Solution Chemistry	C	3	50	50	100
20-304-0304	Practical V - Instrumental Techniques 1	C	2	100	-	100
20-304-0305	Practical VI- Physicochemical Methods	C	2	100	-	100
Total			12	350	150	500

Elective III

Course Code	Course
20-304-0003	Aquatic Pollution
20-304-0004	Atmospheric Chemistry
20-304-0007	Computational Chemistry
20-304-0008	Environmental Law And EIA
20-304-0009	Estuarine Chemistry
20-304-0014	Instrumental Techniques II- Practical
20-304-0017	Marine Geochemistry

20-304-0018	Marine Natural Products
20-304-0019	Marine Organic Chemistry

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-304-0401	Dissertation (Project work in the Department/Universities/Scientific institutes/Industrial Organizations etc.)*	C	14	50	50	100
20-304-0402	Project Viva-voce*	C	2	-	100	100
Total			16	50	150	200

* The Project dissertation will be assessed by the department examination committee Constituted by the Department Council.

Total number of credits for all the four semesters (Core Courses)	60
Minimum number of credits required for the completion of M.Sc. (Hydrochemistry) programme.	72
Minimum number of credits to be taken as elective courses	12

Audit Courses**

Depends on faculty/ infrastructural facilities.

Course code	Course Name	Credits	Total Teaching Hours	Semester
20-304-0025	Good Laboratory Practice and Safety	0	12	I
20-304-0026	Research Methodology	0	12	III

Elective Courses offered by the Department

Depends on faculty/ infrastructural facilities.

***This course is meant for M.Sc. programmes other than M.Sc. Hydrochemistry.

Course Code**	Course Name	Credits
20-304-0001	Analytical Chemistry	3
20-304-0002	Applications of Coordination Compounds	2
20-304-0003	Aquatic pollution	3
20-304-0004	Atmospheric Chemistry	3

20-304-0005	Chemistry of Biomolecules	2
20-304-0006	Chemistry of Radiation, Surface and Inorganic Materials	3
20-304-0007	Computational Chemistry	3
20-304-0008	Environment Law And EIA	2
20-304-0009	Estuarine Chemistry	3
20-304-0010	General Chemical Oceanography***	3
20-304-0011	General Chemical Oceanography Practical***	2
20-304-0012	Green Chemistry	2
20-304-0013	Instrumental Techniques	3
20-304-0014	Instrumental Techniques II- Practical VII	2
20-304-0015	Introduction to the Hydrochemistry	3
20-304-0016	Marine Biogeochemistry	3
20-304-0017	Marine Geochemistry	3
20-304-0018	Marine Natural Products	3
20-304-0019	Marine Organic Chemistry	3
20-304-0020	Nanomaterials and Supramolecular Chemistry	3
20-304-0021	Organometallic Chemistry	3
20-304-0022	Polar Sciences	2
20-304-0023	Solid State Chemistry	3
20-304-0024	Water Management	3

**Course code of Audit & Elective Courses will change according to the semester (like 0107, 0207, 0307 etc.)

DETAILS OF FACULTY

Permanent Faculty

Sl No	Name & Designation	Specialization	Communication (Contact No & e-mail id)
1	Dr. Shaju S S Assistant Professor & Head of the Department	Bio geo- chemistry, Bio- optics Ocean colour Remote sensing	9895909457 shaju@cusat.ac.in
2	Dr. Habeeb Rahman K Assistant Professor	Chemical Oceanography Isotope Geochemistry	8281256045 habeebcusat@gmail.com
3	Dr. Jorphin Joseph Assistant Professor	Membranes for water Purification, Electrochemical energy storage and conversion.	9495283270 jorphin@cusat.ac.in

Contract Faculty

Sl No	Name & Designation	Specialization	Communication (Contact No & e-mail id)
1	Dr. Asha T M Assistant Professor (on- contract)	Coordination Chemistry Catalysis Biological studies	9746824678 ashatm1989@cusat.ac.in
2	Dr. Arun Gopi Assistant Professor (on- contract)	Organic- Inorganic Hybrid Nanomaterial, Solar cells, Metal and Semiconductor Nanoparticles and Application.	9895575726 arungopiperigala@gmail.com

UGC BSR Faculty

Sl No	Name & Designation	Specialization	Communication (Contact No & e-mail id)
1	Dr. C.H. Sujatha UGC BSR Faculty	Chemical Oceanography, Marine organic chemistry, Pesticides in the aquatic chemistry, Aerosol Chemistry	9995991778 drchsujatha@yahoo.co.in

DEPARTMENT OF MARINE BIOLOGY, MICROBIOLOGY AND BIOCHEMISTRY

M.Sc. MARINE BIOLOGY

Program Outcome (PO)

PO 1	Bridging the knowledge of basic sciences and technologies to understand marine ecosystem
PO 2	Problem analysis: Identify, formulate, research and analyse
PO 3	Develop analytical and computational skills to address challenges in environmental issues

Semester 1

Course code	Course	Hrs/week			Credit	Marks		
		L	T	P		Internal	External	Total
20-315-0101	Marine Biology	3	2	-	3	50	50	100
20-315-0102	2 Cytology and Fish Genetics	3	2	-	3	50	50	100
20-315-0103	Biochemistry	3	2		3	50	50	100
20-315-0104	Marine Biology - Practical	-	-	4	2	100	-	100
20-315-0105	Biochemistry and Instrumentation - Practical	-	-	4	2	100	-	100

Elective 1

Course Code	Course
20-315-0106	Planktonology
20-315-0107	Coral Reef Ecology
20-315-0108	Ornamental Fish culture
20-315-0109	Biological Oceanography

Semester II

Course code	Course	Hrs/week			Credits	Marks		
		L	T	P		Internal	External	Total
20-315-0201	Marine Microbiology	2	2	4	3	50	50	100
20-315-0202	Fish and Fisheries	2	2	4	3	50	50	100
20-315-0203	Marine Pollution	3		1	3	50	50	100
20-315-0204	Marine Biotechnology	2	2	-	3	50	50	100
20-315-0205	Marine Microbiology and Biotechnology – Practical	-	-	4	2	100	-	100
20-315-0206	Fish and Fisheries – Practical	-	-	4	2	100	-	100

Elective

Course Code	Course
20-315-0207	Aquarium plants and culture of live feed organisms
20-315-0208	Marine Conservation Biology
20-315-0209	Ornamental fish culture and live food organisms-Practical

Semester III

Course code	Course	Hrs/week			Credits	Marks		
		L	T	P		Internal	External	Total
20-315-0301	Fish Pathology	3	-	4	3	50	50	100
20-315-0302	Aquaculture	3	2	-	3	50	50	50
20-315-0303	General Animal Physiology	3		-	3	50	50	100
20-315-0304	Marine Ecology	3			3	50	50	50
20-315-0305	Marine Ecology and Aquaculture - Practical	3		4	2	100	-	100
20-315-0306	Fish Physiology and Pathology – Practical	3		4	2	100	-	100

Semester IV

Course Code	Course	C/E	Credits
20-315-0401	Project work and Dissertation	C	18
	MOOC	E	-

DETAILS OF FACULTY

Sl No	Name & Designation	Specialization	Communication (Contact No. & Mail)
1	Dr. A.A. Mohamed Hatha Senior Professor & Head of the Department	Fish Pathology, Fish Nutrition & Fish Genetics	Phone: 0484-2505099; 9446866050 mohamedhatha@cusat.ac.in mohamedhatha@gmail.com
2	Dr. S. Bijoy Nandan Senior Professor & Dean Faculty of Marine Science	Marine Ecology & Marine Pollution	Phone: 9446022880/ 7025150844 bijoynandan@yahoo.com bijoynandan@cusat.ac.in
3	Dr. T P. Sajeevan, Professor	Marine Biology	sajeevantp@gmail.com
4	Dr. S. Venu, Associate Professor	Fisheries Coral Reef Ecology Deep Sea Resources	svenu1974@gmail.com Phone: 7063953206; 9933256866
5	Dr. Punnadath Preetham. E, Associate Professor	Marine Biochemistry	Phone: 9443277157 epreeth@gmail.com
6	Dr. Priyaja P Assistant Professor	Marine Biology with Invertebrata	Phone: 9447444882 Priyaja59@gmail.com
7	Dr. Padmakumar K B Assistant Professor	Algology	Phone: 9847255972 kbpadmakumar@cusat.ac.in kbpadmakumar@gmail.com
8	Dr. Swapna P Antony Assistant Professor	Aquaculture	Phone: 8089131058/ 0484-2863214 swapnapantony@gmail.com swapnapantony@cusat.ac.in
9	Dr.Lathika Cicily Thomas, Assistant Professor	Marine Micro Biology	Phone:9446011630 latikacicily@gmail.com
10	Dr. Chaithanya E R, Assistant Professor	Micro Biology	Phone: 9847667888 erchaithanya@gmail.com

DEPT. OF MARINE GEOLOGY & GEOPHYSICS

M.Sc. MARINE GEOLOGY

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-316-0101	Mineralogy	C	3	50	50	100
20-316-0102	Igneous and Metamorphic Petrology	C	3	50	50	100
20-316-0103	Structural and Engineering Geology	C	4	50	50	100
20-316-0104	Ground Water Geology	C	3	50	50	100
20-316-0105	Mineralogy and Petrology (Practical)	C	1	100	-	100
20-316-0106	Structural Geology (Practical)	C	1	100	-	100
Total			15	400	200	600

Elective I

Course Code	Course
20-316-0107	General Geology
20-316-0108	Physical Geology & Geomorphology

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-316-0201	Geochemistry	C	3	50	50	100
20-316-0202	Sedimentary Geology	C	3	50	50	100
20-316-0203	Indian Stratigraphy	C	3	50	50	100
20-316-0204	Invertebrate and Micro Paleontology	C	3	50	50	100
20-316-0205	Geochemistry (Practical)	C	1	100	-	100
20-316-0206	Sedimentary Geology (Practical)	C	1	100	-	100
20-316-0207	Invertebrate and Micro Paleontology (Practical)	C	1	100	-	100
Total			15	500	200	700

Elective II

Course Code	Course
20-316-0208	Remote Sensing & GIS
20-316-0209	Marine Mineral Resources

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-316-0301	Marine Geology	C	3	50	50	100
20-316-0302	Coastal Process and Evolution	C	3	50	50	100
20-316-0303	Petroleum Geology	C	3	50	50	100
20-316-0304	Geophysics and Offshore Exploration	C	2	50	50	100
20-316-0305	Marine Geology (Practical)	C	1	100	-	100
20-316-0306	Coastal Geology (Practical)	C	1	100	-	100
Total			13	400	200	600

Elective III

Course Code	Course
20-316-0307	Economic Geology
20-316-0308	Environmental Geology and Disaster Management
20-316-0309	Paleoceanography & Climate

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-316-0401	Project Work and Presentation	C	10	70	-	70
20-316-0402	Mid Term Evaluation	C	3	10	-	10
20-316-0403	Comprehensive Viva	C	3	20	-	20
Total			16	100	-	100

M.Sc. MARINE GEOPHYSICS

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-317-0101	Electronics for Instrumentation	C	3	50	50	100
20-317-0102	Physics of the Earth	C	2	50	50	100
20-317-0103	Gravity and Magnetic Prospecting	C	4	50	50	100
20-317-0104	Ground Water Geophysics	C	3	50	50	100
20-317-0105	Computer Programming in Earth Sciences (Practical)	C	2	100	-	100
20-317-0106	Electronics (Practical)	C	1	100	-	100
20-317-0107	Gravity & Magnetic Computations (Practical)	C	1	100	-	100
Total			16	500	200	700

Elective I

Course Code	Course
20-317-0108	Physical Geology and Geomorphology
20-317-0109	General Geology

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-317-0201	Digital Signal Processing	C	3	50	50	100
20-317-0202	Geodynamics	C	3	50	50	100
20-317-0203	Seismology	C	3	50	50	100
20-317-0204	Electrical & Electromagnetic Prospecting	C	3	50	50	100
20-317-0205	Digital Signal Processing (Practical)	C	1	100	-	100
20-317-0206	Seismology (Practical)	C	1	100	-	100
Total			14	400	200	600

Elective II

Course Code	Course
20-317-0207	Remote Sensing & GIS
20-317-0208	Structural Geology and Stratigraphy
20-317-0209	Structural Geology (Practical)
20-317-0210	Engineering Geology

Semester III

Course Code	Course	C/ E	Credits	Marks		
				CE	ES	Total
20-317-0301	Seismic Prospecting	C	3	50	50	100
20-317-0302	Well Logging	C	3	50	50	100
20-317-0303	Offshore Exploration	C	3	50	50	100
20-317-0304	Marine Geology	C	3	50	50	100
20-317-0305	Geophysical Field Work (Practical)	C	1	100	-	100
20-317-0306	Seismic Prospecting (Practical)	C	1	100	-	100
Total			14	400	200	600

Elective III

Course Code	Course
20-317-0307	Petroleum Geology
20-317-0308	Environmental Geology & Disaster Management
20-317-0309	Marine Mineral Resources
20-317-0310	Marine Geology and Offshore (Practical)

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-317-0401	Project Work and Presentation	C	10	70	-	70
20-317-0402	Mid Term Evaluation	C	3	10	-	10
20-317-0403	Comprehensive Viva	C	3	20	-	20
Total			16	100	-	100

Details of Faculty

List of Permanent Faculty

Sl No.	Name & Designation	Specilization	Communication (Contact no. & Email ID)
1.	Dr. Joji V.S. Head & Associate Professor	Hydrogeology, Sedimentology	+91-9446361319 jojivsdeepam@gmail.com
2.	Dr. Sunil P.S., Associate Professor	Seismology and Geodesy	+91-9869801448 sunilps@cusat.ac.in
3.	Dr. P. Ajayakumar, Assistant Professor	Gravity, Electrical Resistivity and Seismology	+91-9495365980 ajaycochin@gmail.com
4.	Dr. N.R. Nisha, Assistant Professor	Marine Geology and Paleoceanography	+91-9846929649 nrnishacusat@gmail.com
5.	Dr. RatheeshKumar R.T, Assistant Professor	Hard-rock Petrology, Computational Geophysics and Tectonics	+91-8592082811 ratheesh.geo@gmail.com
6.	Dr. Amaldev T., Assistant Professor	Metamorphic Petrology and Tectonics	+91-9567870988 amaldev302@gmail.com
7.	Dr. Honey H. Das, Assistant Professor	Metamorphic Petrology and Tectonics	+91-7356087161 honeysouparnika@gmail.com
8.	Mr. Naveen P.U, Assistant Professor	Gravity –Magnetic Prospecting and Geodynamics	+91-9656769939 punaveenpu@gmail.com
9.	Dr. Selvia Kuriakose, Assistant Professor	Electronics-Digital Signal Processing	+91-9847021762 selviakuriakose@cusat.ac.in
10.	Dr. Mohd. Noohu Nazeer Assistant Professor	Marine Micropaleontology and Paleoenvironment	+91-9020515251 geonoohu@gmail.com

DEPARTMENT OF PHYSICAL OCEANOGRAPHY

M.SC. OCEANOGRAPHY

Semester – I (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-319-0101	Introductory Physical Oceanography	-	4	-	4	50	50	100
20-319-0102	Geophysical Fluid Dynamics	-	4	-	4	50	50	100
20-319-0103	Ocean Instrumentation	-	3	-	3	50	50	100
20-319-0104	Ocean Observations (P)	-	-	2	1	100	-	100
20-319-0105	Physical Oceanographic Computations (P)	-	-	4	2	100	-	100
20-319-0106	Oceanographic Application Tools-I (P)	-	-	4	2	100	-	100
Total					C = 16			

Semester – II (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-319-0201	Ocean Dynamics	-	4	-	4	50	50	100
20-319-0202	Air Sea Interaction	-	3	-	3	50	50	100
20-319-0203	Coastal and Estuarine Oceanography	-	3	-	3	50	50	100
20-319-0204	Dynamical Computations (P)	-	-	2	1	100	-	100
20-319-0205	Coastal Oceanography (P)	-	-	4	2	100	-	100
20-319-0206	Air-Sea Interaction (P)	-	-	2	1	100	-	100
Total					C = 14			

Semester – III (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-319-0301	Ocean Remote Sensing	-	4	-	4	50	50	100
20-319-0302	Numerical Ocean Modelling	-	3	-	3	50	50	100
20-319-0303	Ocean and Climate	-	3	-	3	50	50	100
20-319-0304	Ocean Climate Data Analytics (P)	-	-	4	2	100	-	100
20-319-0305	Ocean Modelling (Practical)	-	-	4	2	100	-	100
Total					C=14			

Semester – IV * (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credit	Marks		
		L	T	P		Internal	External	Total
20-319-0401	Project Dissertation**	-	-	-	16	100	-	100
Total					C=16			

List of Electives

Course Code	Course title	Credits	Pre-requisites
20-319-0001	General Oceanography	3	GS
20-319-0002	Marine Hazards and Management	2	GS
20-319-0003	Marine Pollution	3	GS
20-319-0004	Ocean Optics	2	20-319-0101
20-319-0005	Marine Acoustics	4	20-319-0101
20-319-0006	Coastal Zone Management – I	3	GS
20-319-0007	Coastal Zone Management – II	3	20-319-0006
20-319-0008	Beach Dynamics	2	20-319-0101&20-319-0203
20-319-0009	GIS in Oceanography	2	GS
20-319-0010	Advanced Ocean Dynamics	3	20-319-0102&20-319-0201
20-319-0011	Wave Dynamics	3	20-319-0102&20-319-0201

20-319-0012	Marine Biogeochemistry	3	GS
20-319-0013	Ocean Circulation	2	20-319-0102& 20-319-0201
20-319-0014	Remote Sensing (Practical)	2	20-319-0301
20-319-0015	Marine Remote Sensing Applications	3	GS
20-319-0016	Regional Oceanography	3	20-319-0101
20-319-0017	Ocean Engineering	4	20-319-0101& 20-319-0203
20-319-0018	Applied and Computational Mathematics	4	GM/GP
20-319-0019	Ocean Ecosystem Modelling	2	20-319-0101&20-319-0201
20-319-0020	Statistical Methods in Oceanography (Practical)	1	GM/GP
20-319-0021	Polar Oceanography	3	20-319-0101
20-319-0022	Oceanographic Application Tools-II(Practical)	1	GS

GS – Graduate in Science GM – Graduate in Mathematics GM – Graduate in Physics

* A student shall register for a minimum of 56 credits in the first three semesters before he/she registers for the fourth semester.

** The student will devote the fourth semester on dissertation work, related to a relevant area of specialization either in the department or in an industrial/ research/ academic institutions outside the University. They will be sent to outside institution based upon their performance in their previous semesters on the consent of the departmental council. All the students have to submit their project dissertation at the end of the semester.

The award of maximum 100 marks for the project dissertation to student is based on:

- A)** *Continuous assessment by his/her guide based on his/her performance and progress during the course of dissertation work will carry a maximum of 50 marks.*
- B)** *On submission of the project dissertation, an assessment by the Department Examination Committee constituted by the Department Council, based on a presentation and Viva Voce conducted in the parent department will carry a maximum of 50 marks.*

M. TECH. OCEAN TECHNOLOGY

SEMESTER I (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credit	Marks		
		L	T	P		Internal	External	Total
20-439-0101	Ocean Physics	-	3	-	3	60	40	100
20-439-0102	Coastal Engineering	-	4	-	4	60	40	100
20-439-0103	Marine Hydrodynamics	-	3	-	3	60	40	100
20-439-0104	Coastal Oceanography (P)	-	-	2	1	100	-	100
20-439-0105	Computer Programming in Oceanography (Practical)	-	-	4	2	100	-	100
Total					C= 13			

SEMESTER II (CORE COURSES)

Course Code	Course Title	Hrs/Week			Credit	Marks		
		L	T	P		Internal	External	Total
20-439-0201	Advanced Marine Technology	-	4	-	4	60	40	100
20-439-0202	Environmental Ocean Technology	-	3	-	3	60	40	100
20-439-0203	Ocean Modelling	-	3		3	60	40	100
20-439-0204	Ocean Modelling Lab (P)	-	-	2	1	100	-	100
Total					C= 11			

SEMESTER III

20-439-0301	Project Dissertation – Phase-I	C=18
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SEMESTER IV

20-439-0401	Project Dissertation Phase - II	C= 18
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LIST OF ELECTIVES

Course Code	Course Title	Credits	Pre-Requisites
20-439-0001	Boundary Layer Dynamics	4	OT,MM,
20-439-0002	Marine Environmental Pollution	4	OT,MB
20-439-0003	Ocean Resources	4	MO,MGP,MM,GP
20-439-0004	Ocean Instrumentation	4	OT,ME
20-439-0005	Ocean Circulation and Dynamics	4	MO,MP,MM,BT
20-439-0006	Satellite Oceanography	4	OT,MM,ES,BT
20-439-0007	Integrated Coastal Zone Management	4	OT,MB
20-439-0008	Ocean Acoustics	4	OT,MO,MP
20-439-0009	Ocean Material Technology	4	OT,NA,BTM
20-439-0010	Observational Techniques & Instrumentation	4	OT,MO,M-GP,MP,MM,ME
20-439-0011	Deep Sea Submersibles and Exploration Technology	2	OT,NA
20-439-0012	Satellite Image Processing & GIS (P)	2	20-439-0008
20-439-0013	Marine Geotechnical Engineering	4	MO,MGP,BT,BTM,MG
20-439-0014	Dynamics of Ocean Structures	4	MO,MGP,BT,BTM,MG
20-439-0015	Modelling of offshore and coastal processes	3	20-439-0102
20-439-0016	Descriptive Oceanography	3	BT,MP,MO,MM,MG,NA, MB

OT- M.Tech Ocean Technology Students

MM- M.Sc. Meteorology

MO- M.Sc. Oceanography

BTM – B.Tech. Mechanical Engineering Building

MB- M.Tech. Marine Bio Technology Students

MG- M.Sc. Marine Geology

MP- M.Sc. Physics

BT- B.Tech. Civil/ Environmental Science

MGP – M.Sc. Marine Geophysics

NA – B.Tech. Naval Architecture & Ship

ES- M.Sc. Environmental Sciences

Details of Faculty

Sl. No	Name & Designation	Specialization	Communication
1	Dr.R.Sajeev (RS) Associate Professor & Head	Coastal Oceanography	Ph: Off: 0484-2363950 rsajeev@cusat.ac.in
2	Dr.P.K.Saji (PKS) Assistant Professor	Ocean Circulation Ocean Modeling	Ph: Off: 0484-2363950 pkssaji@cusat.ac.in
3	Dr.V.Vijith Assistant Professor	Estuarine Oceanography Ocean Modeling	Ph: Off: 0484-2363950 vijithpod@cusat.ac.in
Contract			
4	Dr K M Santhosh Assistant Professor on contract	Remote Sensing	Ph: Off: 0484-2363950 drsanthoshkm@cusat.ac.in
5	Mr. Lix K John Assistant Professor on contract	Air Sea Interaction	Ph: Off: 0484-2363950 lix@cusat.ac.in
6	Mrs.Thanvi Fathima Rahman Assistant Professor on contract	Ocean Engineering	Ph: Off: 0484-2363950 thanvirahman@cusat.ac.in

FACULTY OF SCIENCE

Dean:

**Dr. S M Sunoj
Professor
Department of Statistics
Cochin University of Science and Technology
Kochi- 682 022**

CENTRE FOR INTEGRATED STUDIES

Integrated MSc in Biological Sciences

SEMESTER I

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
ENG 10101	English – I	C (AEC1)	2-0-0	50	50	100	2
MAL 10101	Malayalam – I*	C (AEC2)	2-0-0	50	50	100	2
HIN 10101	Hindi – I*	C (AEC2)	2-0-0	50	50	100	2
GER 10101	German- I*	C (AEC2)	2-0-0	50	50	100	2
BIO 10101	Fundamentals of Life	C	3-1-0	50	50	100	3
BIO 10102	Fundamentals of Life Lab	C	0-0-4	100	-	100	2
CHE 10101	General Chemistry I	IDC	3-1-0	50	50	100	3
CHE 10102	Quantitative Analysis Lab	IDC	0-0-4	100	-	100	2
PHY 10101	General Physics I	IDC	3-1-0	50	50	100	3
PHY 10102	Physics Lab I (Mechanics)	IDC	0-0-4	100	-	100	2
BIO 10103	General Biology	IDE	3-1-0	50	50	100	3
CSP 10101	Computer Science 1	IDE	3-1-0	50	50	100	3
MAT 10103	Mathematical methods 1	IDE	3-1-0	50	50	100	3
STAT 10101	Statistical methods for data	IDE	3-1-0	50	50	100	3
	Total			550	350	900	22

AEC-Ability enhancement course; MDC- Multidisciplinary Course; VAC- Value Added course; SEC- Skill Enhancement course, IDE- Interdepartmental elective

*Either Malayalam- I, Hindi- I or German- I is to be opted. The students must opt minimum one IDE

C- Core Course, IDC - Interdepartmental Core Course, IDE - Interdepartmental Elective Course, DE- Departmental Elective Course

L- Lecture, T - Tutorial, P - Practical

SEMESTER II

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
ENG 10201	English – II	C (AEC3)	2-0-0	50	50	100	2
MAL 10201	Malayalam – II*	C (AEC4)	2-0-0	50	50	100	2
HIN 10201	Hindi – II*	C (AEC4)	2-0-0	50	50	100	2
GER 10201	German- II*	C (AEC4)	2-0-0	50	50	100	2
BIO 10201	Biochemistry	C	3-1-0	50	50	100	3
BIO 10202	Biochemistry Lab	C	0-0-4	100	-	100	2
CHE 10201	General Chemistry II	IDC	3-1-0	50	50	100	3
CHE 10202	Inorganic Qualitative Analysis Lab	IDC	0-0-4	100	-	100	2
PHY 10201	General Physics II	IDC	3-1-0	50	50	100	3
PHY 10202	Physics Lab II (Waves and Optics)	IDC	0-0-4	100	-	100	2
BIO 10203	Biophysical Chemistry	IDE	3-1-0	50	50	100	3
MAT 10203	Mathematical Methods II	IDE	3-1-0	50	50	100	3
CSP 10201	Computer Science II	IDE	3-1-0	50	50	100	3
STA10201	Probability and Distributions	IDE	3-1-0	50	50	100	3
	Total			550	350	900	22

AEC-Ability enhancement course; MDC- Multidisciplinary Course; VAC- Value Added course; SEC- Skill Enhancement course, IDE- Interdepartmental elective

*Either Malayalam- II, Hindi- II or German- II is to be opted. The students must opt minimum one IDE

C- Core Course, IDC - Interdepartmental Core Course, IDE - Interdepartmental Elective Course, DE- Departmental Elective Course

L- Lecture, T - Tutorial, P - Practical

SEMESTER III

Course Code	Name	C/E	L-T-P	Continuou s evaluation	Marks Distribution		Credit
					End semeste r	Total	
BIO 10301	Genetics and Molecular Biology	C	3-1-0	50	50	100	3
BIO 10302	Genetics and Molecular Biology Lab	C	0-0-4	100	-	100	2
CHE 10301	General Chemistry III	IDC	3-1-0	50	50	100	3
CHE 10302	Organic Qualitative Analysis Lab	IDC	0-0-4	100	-	100	2
PHY10301	General Physics III	IDC	3-1-0	50	50	100	3
PHY 10302	Physics Lab III (Electricity and Magnetism)	IDC	0-0-4	100	-	100	2
YYY 10301	Environmental Science	IDC (VAC1)	4-1-0	50	50	100	4
BIO 10303	Human Disease and Healthcare Management	IDE	3-1-0	50	50	100	3
MAT 10303	Matrix Theory and Graph	ID	3-1-0	50	50	100	3
CSP 10301	Theory Computer Science	E	3-1-0	50	50	100	3
STA10301	III Statistical Inference	ID E ID E	3-1-0	50	50	100	3
	Total			550	250	800	22

AEC-Ability enhancement course; MDC- Multidisciplinary Course; VAC- Value Added course;
SEC- Skill Enhancement course, IDE- Interdepartmental elective

The students must opt minimum one IDE

C- Core Course, IDC - Interdepartmental Core Course, IDE - Interdepartmental Elective Course,
DE- Departmental Elective Course

L- Lecture, T - Tutorial, P - Practical

SEMESTER IV

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10401	Introduction to Biotechnology	C	4-1-0	50	50	100	4
BIO 10402	Basic principles of Metabolism	C	4-0-0	50	50	100	4
BIO 10403	Essential Cell Biology	C	4-0-0	50	50	100	4
BIO 10404	Animal forms and functions	C	4-1-0	50	50	100	4
BIO 10405	Cell Biology & Biochemistry Lab	C	0-0-8	100	-	100	4
Sxxxx	Skill enhancement course [#]	E (SEC1)	0-0-3	100	-	100	3
	Total			400	200	600	23

AEC-Ability enhancement course; MDC- Multidisciplinary Course; VAC- Value Added course; SEC- Skill Enhancement course.

Student shall select the course from a bouquet of courses offered by various departments

SEMESTER V

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10501	Plant Diversity I (Algae/Fungi/Bryophytes/Pteridophytes/Paleobotany)	C	4-1-0	50	50	100	4
BIO 10502	Non-chordates	C	4-1-0	50	50	100	4
BIO 10503	Plant Diversity II (Gymnosperms & Angiosperms)	C	4-1-0	50	50	100	4
BIO 10504	Elective	E	4-1-0	50	50	100	4
BIO 10505	Plant Lab and Animal Lab- I	C	0-0-8	100	-	100	4
Sxxxx	Skill enhancement course [#]	E (SEC2)	0-0-3	100	-	100	3
	Total			400	200	600	23

AEC-Ability enhancement course; MDC- Multidisciplinary Course; VAC- Value Added course; SEC- Skill Enhancement course.

Student shall select the course from a bouquet of courses offered by various departments

SEMESTER VI

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10601	Evolution and developmental Biology	C	4-1-0	50	50	100	4
BIO 10602	Parasitology and Immunology	C	4-1-0	50	50	100	4
BIO 10603	Chordates	C	4-1-0	50	50	100	4
BIO 10604	Parasitology & Immunology Lab	C	0-0-8	100	-	100	4
BIO 10605	Elective	E	4-1-0	50	50	100	4
Sxxxx	Skill enhancement course [#]	E (SEC 3)	0-0-3	100	-	100	3
	Total			400	200	600	23

Student shall select the course from a bouquet of courses offered by various departments

Exit with BSc Biological Sciences – Total Credit required - 135

SEMESTER VII

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10701	Cellular metabolism	C	4-1-0	50	50	100	4
BIO 10702	Cell Biology	C	4-1-0	50	50	100	4
BIO 10703	Advanced Microbiology	C	4-1-0	50	50	100	4
BIO 10704	Molecular Biology	C	4-1-0	50	50	100	4
BIO 10705	Advanced Biology Lab- I	C	0-0-4	100	-	100	2
BIO 10706	Professional and career aspects in Biotechnology	A	2-0-0	-	-	-	0
BIO10707	Elective	E	3-1-0	50	50	100	4
	Total			350	250	600	22

BSc Honours with Research

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10801	Elective	E	4-1-0	50	50	100	4
BIO 10802	Project with report	C	-	-	300	300	16
	Total			50	350	400	20

Exit with B.Sc Biological Sciences Honours (Research)- Total Credit required- 177

SEMESTER VIII

Course Code	Name	C/E	L-T-P	Continuous evaluation	Marks Distribution		
					End semester	Total	Credit
BIO 10801	Enzymology	C	4-1-0	50	50	100	4
BIO 10802	Plant physiology and Biochemistry	C	4-1-0	50	50	100	4
BIO 10803	Human Physiology and Endocrinology	C	4-1-0	50	50	100	4
BIO 10804	Elective	E	4-1-0	50	50	100	4
BIO 10805	Advanced Biology Lab- II	C	0-0-8	100	-	100	4
	Total			300	200	500	20

Exit with B.Sc Biological Sciences Honours – Total Credit required - 177

SEMESTER IX

Course Code	Name	C/E	L-T-P		Marks Distribution		
					End semester	Total	Credit
				Continuous evaluation			
BIO 10901	Immunology	C	4-1-0	50	50	100	4
BIO 10902	Genetic Engineering	C	4-1-0	50	50	100	4
BIO 10903	Research methodology	C	4-1-0	50	50	100	4
BIO 10904	Bioethics, Biosafety and IPR	C	4-1-0	50	50	100	4
BIO 10905	Elective	E	4-1-0	50	50	100	4
BIO 10906	Advanced Biology Lab-III	C	0-0-4	100	-	100	2
	Total			350	250	600	22

SEMESTER X

Course Code	Name	C/E	L-T-P		Marks Distribution		
					End semester	Total	Credit
				Continuous evaluation			
BIO 11001	Project presentation and Viva voce	C	-	-	300	300	16
	Total				300	300	16

Total Credits Required for Integrated M.Sc Biological Sciences- 215

Integrated MSc Chemistry

SEMESTER: 1							
<i>Semester Credit: 22 (Core: 19; Elective: 3) Cumulative Credit: 22</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
ENG10101	English – I	Core (AEC 1)	2	2-0-0	50	50	100
MAL10101 HIN10101 GER10101	Language Malayalam – I Hindi – I German – I	Core (AEC 2)	2	2-0-0	50	50	100
CHE 10101	General Chemistry I	Core* (MDC)	3	3-1-0	50	50	100
CHE 10102	Quantitative Analysis Lab	Core*	2	0-0-4	100	-	100
CHE 10103	Chemistry in Everyday Life	Core	2	2-1-0	50	50	100
MAT 10101	Calculus I	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10101	General Physics I	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10102	Physics Lab I (Mechanics)	Interdepartmental Core	2	0-0-4	100	-	100
BIO 10103	General Biology	MDC**	3	3-1-0	50	50	100
CSP 10101	Computer Science I	MDC**	3	3-1-0	50	50	100
MAT 10103	Mathematical Methods I	MDC*	3	3-1-0	50	50	100
STAT 10101	Statistical Methods for Data	MDC**	3	3-1-0	50	50	100

AEC – Ability enhancement Course; MDC – Multidisciplinary Course; VAC – Value Added Course; SEC – Skill Enhancement Course

- Student shall select any one language- Malayalam/Hindi/German
- * Will also be offered as an interdepartmental core/MDC* Student shall select any one MDC

SEMESTER: 2
Semester Credit: 22 (Core: 19; Elective: 3) Cumulative Credit: 44

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
ENG10201	English – II	Core (AEC 3)	2	2-0-0	50	50	100
MAL10201 HIN10201 GER10201	Language Malayalam – II Hindi – II German – II	Core (AEC 4)	2	2-0-0	50	50	100
CHE10201	General Chemistry II	Core* (MDC)	3	3-1-0	50	50	100
CHE10202	Inorganic Qualitative Analysis Lab	Core*	2	0-0-4	100	-	100
CHE10203	Industrial applications of petrochemicals and petroleum products	Core	2	2-1-0	50	50	100
MAT 10201	Calculus II	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10201	General Physics II	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10202	Physics Lab II (Waves and Optics)	Interdepartmental Core	2	0-0-4	100	-	100
BIO 10203	Biophysical Chemistry	MDC**	3	3-1-0	50	50	100
CSP 10201	Computer Science II	MDC**	3	3-1-0	50	50	100
MAT 10203	Mathematical Methods II	MDC**	3	3-1-0	50	50	100
STA 10201	Probability and Distribution	MDC**	3	3-1-0	50	50	100

- Student shall select any one language- Malayalam/Hindi/German
- * Will also be offered as an interdepartmental core/MDC
- ** Student shall select any one MDC

SEMESTER: 3***Semester Credit: 22 (Core: 19; Elective: 3) Cumulative Credit: 66***

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
CHE10301	General Chemistry III	Core* (MDC)	3	3-1-0	50	50	100
CHE10302	Organic Qualitative Analysis Lab	Core*	2	0-0-4	100	-	100
CHE 10303	Chemical Kinetics and Surface Chemistry	Core	2	2-1-0	50	50	100
PHY 10301	General Physics III	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10302	Physics Lab III (Electricity and Magnetism)	Interdepartmental Core	2	0-0-4	100	-	100
MAT 10301	Calculus III	Interdepartmental Core	3	3-1-0	50	50	100
YYY10301	Environmental Science	Interdepartmental Core(VAC1)	4	4-1-0	50	50	100
BIO 10303	Human Disease and Health Care	MDC**	3	3-1-0	50	50	100
CSP	Computer Science III	MDC**	3	3-1-0	50	50	100
MAT 10303	Matrix Theory and Graph Theory	MDC **	3	3-1-0	50	50	100
STA 10301	Statistical Inference	MDC**	3	3-1-0	50	50	100

- Student shall select any one language- Malayalam/Hindi/German
- * Will also be offered as an interdepartmental core/MDC
- **Student shall select any one MDC

SEMESTER: 4							
<i>Semester Credit: 23 (Core: 20, Elective: 3) Cumulative Credit: 89</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
CHE10401	Inorganic Main Group and Nuclear Chemistry	Core	4	4-1-0	50	50	100
CHE10402	Organic Chemistry I	Core	4	4-1-0	50	50	100
CHE10403	Equilibrium Thermodynamics	Core	4	4-1-0	50	50	100
CHE10404	Theoretical Chemistry I (Introductory Quantum Mechanics)	Core	4	4-1-0	50	50	100
CHE10405	Inorganic Chemistry Lab 1	Core	2	0-0-4	100	-	100
CHE10406	Physical Chemistry Lab 1	Core	2	0-0-4	100	-	100
	Sxxxx	Skill Enhancement Course# (SEC 1)	Elective 3	0-0-3	100	-	100

Student shall select the course from a bouquet of courses offered by various departments

Total Credits in Major (Chemistry) - 41

SEMESTER: 5							
<i>Semester Credit: 23 (Core: 16, Elective: 7), Cumulative Credit: 112</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
CHE10501	Inorganic Chemistry II(Coordination & Bioinorganic Chemistry and Polyhedral Boranes)	Core	4	4-1-0	50	50	100
CHE10502	Organic Chemistry II (Analytical and Spectroscopic Techniques in Organic Chemistry)	Core	4	4-1-0	50	50	100
CHE10503	Physical Chemistry II (Electrochemistry and Solid State Chemistry)	Core		4-1-0	50	50	100
CHE10504	Organic Chemistry Lab 1	Core	2	0-0-4	100	-	100
CHE10505	Inorganic Chemistry Lab 2	Core	2	0-0-4	100	-	100
CHE10506	Elective	Elective	4	4-1-0	50	50	100
Sxxxxxx	Skill Enhancement Course # (SEC 2)	Elective	3	0-0-3	100		100

#Student shall select the course from a bouquet of courses offered by various departments

Total Credits in Major (Chemistry) - 57

SEMESTER: 6							
<i>Semester Credit: 23(Core 16, Elective 7), (Cumulative Credit: 135)</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
CHE10601	Inorganic Chemistry III(Group Theory and Concepts in Inorganic Chemistry)	Core	4	4-1-0	50	50	100
CHE1602	Organic Chemistry III(Organic Chemistry Reactions,Reagents,Photochemistry & Pericyclic Reactions)	Core	4	4-1-0	50	50	100
CHE10603	Physical Chemistry III (Chemical Kinetics,Surface Chemistry and Catalysis)	Core	4	4-1-0	50	50	100
CHE10604	Organic Chemistry Lab 2	Core	2	0-0-4	100	-	100
CHE10605	Physical Chemistry Lab 2	Core	2	0-0-4	100	-	100
CHE10606	Elective	Elective	4	4-1-0	50	50	100
Sxxxxxx	Skill Enhancement Course #(SEC 3)	Elective	3	0-0-3	100	-	100

Exit with B Sc Chemistry-Total Credit required -135

Total Credits in Major (Chemistry) - 73(54%)

SEMESTER: 7
Semester Credit: 22 (Core-18, Elective-4), Cumulative Credit: 157

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
CHE10701	Inorganic Chemistry IV(Reaction Mechanism and Organometallic Chemistry)	Core	4	4-1-0	50	50	100
CHE10702	Organic Chemistry IV(Natural Products,Dyes and Pigments)	Core	4	4-1-0	50	50	100
CHE10703	Theoretical Chemistry II (Approximations and Chemical Bonding)	Core	4	4-1-0	50	50	100
CHE10704	Spectroscopy	Core	4	4-1-0	50	50	100
CHE10705	Industrial Chemistry Lab	Core	2	0-0-4	100	-	100
CHE10706	Professional and Career Development in Chemistry	Audit	0	2-0-0	-	-	-
CHE10707	Elective	Elective	4	4-1-0	50	50	100

Total credits in Major (Chemistry) - 91

SEMESTER: 8

*Semester Credit: 20(Core -16, Elective -4),
Cumulative Credit: 177*

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
CHE 10801	Advanced Analytical and Instrumentation Techniques I	Core	4	4-1-0	50	50	100
CHE 10802	Advanced Physical Chemistry	Core	4	4-1-0	50	50	100
CHE 10803	Advanced Organic Chemistry	Core	4	4-1-0	50	50	100
CHE 10804	Computational Chemistry Lab	Core	2	0-0-4	100	-	100
CHE 10805	Open Ended Lab	Core	2	0-0-4	100	-	100
CHE 10806	Elective	Elective	4	4-1-0	50	50	100

BSc Honors with Research

Total Credits in Major(Chemistry)-107(60%)

Exit with BSc Honors-Total Credit required -177

SEMESTER 9**9 Semester, Credit: 20 (Core - 12, Elective - 8),****Cumulative Credit : 197**

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
CHE 10901	Advanced Analytical and Instrumentation Techniques II	Core	4	4-1-0	50	50	100
CHE 10902	Instrumentation Lab	Core	4	0-0-8	0	100	100
CHE 10903	Mini Project	Core	4	0-0-8		100	100
CHE 10904	Elective -I	Elective	4	4-1-0	50	50	100
CHE 10906	Elective -II	Elective	4	4-1-0	50	50	100

Total Credits in Major (Chemistry)-125

SEMESTER: 10***Semester Credit: 18 (Core: 18; Elective: 0) Cumulative Credit : 215***

Course Code	Course Name	Course Type	Credits	L-T-P	C E	ESE	Total Marks
CHE 11001	Project Dissertation and Viva Voce	Core	1 6	-	-	300	300
CHE 11002	Course viva	Core	2				

Total Credits in Major(Chemistry-141(65%))

Total Credits Required for Integrated M.Sc in Chemistry -215

Detailed Course Structure for Integrated MSc Mathematics

SEMESTER: 1							
<i>Semester Credit: 22 (Core: 19; Elective: 3) Cumulative Credit: 22</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
ENG 10101	English – I	Core (ACE 1)	2	2-0-0	50	50	100
	Language						
MAL 10101 HIN 10101 GER 10101	Malayalam – I* Hindi – I* German – I*	Core (ACE 2)	2	2-0-0	50	50	100
MAT 10101	Calculus 1	Core** (MDC 1)	3	3-1-0	50	50	100
MAT 10102	Basic Analysis 1	Core	4	4-1-0	50	50	100
PHY 10101	General Physics I	Interdepartmental 1 Core	3	3-1-0	50	50	100
PHY 10102	Physics Lab 1 (Mechanics)	Interdepartmental 1 Core	2	0-0-4	100	-	100
STA 10101	Statistical Methods for Data	Interdepartmental 1 Core	3	3-1-0	50	50	100
BIO 10101	General Biology	Interdepartmental 1 Elective***	3	3-1-0	50	50	100
CSP 10101	Computer Science 1	Interdepartmental 1 Elective***	3	3-1-0	50	50	100
CHE 10101	General Chemistry I	Interdepartmental Elective***	3	3-1-0	50	50	100

AEC – Ability enhancement Course; MDC – Multidisciplinary Course; VAC – Value Added Course;
SEC – Skill Enhancement Course

- *Any one language paper is to be chosen
- **Will also be offered as an interdepartmental core/elective
- *** Student shall select any one interdepartmental elective

SEMESTER: 2 <i>Semester Credit: 22 (Core: 19; Elective: 3) Cumulative Credit: 44</i>							
Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
ENG 10201	English – II	Core (ACE 3)	2	2-0-0	50	50	100
	Language						
MAL 10201	Malayalam – II*	Core (ACE 4)	2	2-0-0	50	50	100
HIN 10201	Hindi – II*						
GER 10201	German – II*						
MAT 10201	Calculus II	Core** (MDC 2)	3	3-1-0	50	50	100
MAT 10202	Basic Analysis II	Core	4	4-1-0	50	50	100
PHY 10201	General Physics II	Interdepartmental Core	3	3-1-0	50	50	100
PHY 10202	Physics Lab 2 (Waves and Optics)	Interdepartmental Core	2	0-0-4	100	-	100
STA 10201	Probability and Distributions	Interdepartmental Core	3	3-1-0	50	50	100
BIO 10203	Biophysical Chemistry	Interdepartmental Elective***	3	3-1-0	50	50	100
CSP 10201	Computer Science II	Interdepartmental Elective***	3	3-1-0	50	50	100
CHE 10201	General Chemistry II	Interdepartmental Elective***	3	3-1-0	50	50	100

- *Any one language paper is to be chosen
- **Will also be offered as an interdepartmental core/elective
- *** Student shall select any one interdepartmental elective

SEMESTER: 3

Course Code	Course Name	Course Type	Credits	L-T-P	CE	E S E	Total Marks
MAT 10301	Calculus III	Core* (MDC 3)	3	3-1-0	50	50	100
MAT 10302	Matrix Theory I		4	4-1-0	50	50	100
PHY 10301	General Physics III	Core	3	3-1-0	50	50	100
	Physics Lab 3 (Electricity and	Interdepartme ntal Core					
PHY 10302	Magnetism)		2	0-0-4	100	-	100
		Interdepartme ntal Core					
STA 10301	Statistical Inference		3	3-1-0	50	50	100
STA 10301	Environmental Science	Interdepartme ntal Core	4	4-1-0	50	50	100
	Human Diseases and	Interdepartme ntal Core (VAC 1)					
BIO 10301	Healthcare		3	3-1-0	50	50	100
	Management	Interdepartme ntal Elective**					
CSP 10301	Computer Science III		3	3-1-0	50	50	100
CHE 10301	General Chemistry III	Interdepartme ntal Elective**	3	3-1-0	50	50	100
		Interdepartme ntal Elective**					

- *Will also be offered as an interdepartmental core/elective
- ** Student shall select any one interdepartmental elective

SEMESTER: 4

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
MAT 10401	Basic Group Theory	Core	4	4-1-0	50	50	100
MAT 10402		Core	4	4-1-0	50	50	100
MAT 10403	Matrix Theory II	Core	4	4-1-0	50	50	100
MAT 10404	Elementary Complex Analysis	Core	3	3-1-0	50	50	100
MAT 10405	Basics in Python Programming	Core	2	0-0-4	100	-	100
Sxxxx	Basics in Python Programming Lab	Elective	3	0-0-3	100	-	100
STA 10401	Skill Enhancement Course# (SEC 1) Applied Statistics	Interdepartmental Core	3	3-1-0	50	50	100

Student shall select the course from a bouquet of courses offered by various departments

SEMESTER: 5*Semester Credit: 23 (Core: 16; Elective: 7), Cumulative Credit: 112*

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
MAT 10501	Real Analysis I	Core	4	4-1-0	50	50	100
MAT 10502	Complex Analysis	Core	4	4-1-0	50	50	100
MAT 10503	Group Theory	Core	4	4-1-0	50	50	100
MAT 10504	Linear Algebra and Geometry	Core	4	4-1-0	50	50	100
Sxxxxxx	Skill Enhancement Course# (SEC 2)	Elective	3	0-0-3	100	-	100
MAT 1050x	Elective I	Elective	4	4-1-0	50	50	100

SEMESTER: 6*Semester Credit: 23 (Core: 12; Elective: 7), Cumulative Credit: 135*

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
MAT 10601	Real Analysis II	Core	4	4-1-0	50	50	100
MAT 10602	Ring Theory	Core	4	4-1-0	50	50	100
MAT 10603	Ordinary Differential Equations	Core	4	4-1-0	50	50	100
MAT 106xx	Elective I	Elective	4	4-1-0	50	50	100
MAT 106xx	Elective II	Elective	4	4-1-0	50	50	100
MAT 106xx	Skill Enhancement Course# (SEC 3)	Elective	3	0-0-3	100	-	100
Sxxxxxx							

LIST OF ELECTIVE COURSES OFFERED IN V AND VI SEMESTERS:-

MAT 10505 / MAT 10605: Discrete Mathematics

MAT 10506 / MAT 10606: Linear Programming

MAT 10507 / MAT 10607: Elements of Applied Mathematics

MAT 10508 / MAT 10608: Introduction to Optimization Techniques

MAT 10509 / MAT 10609: Metric Topology

MAT 10510 / MAT 10610: Fuzzy Mathematics

MAT 10511 / MAT 10611: Introduction to Optimization in Machine Learning

MAT 10512 / MAT 10612: Elementary Number Theory

SEMESTER: 7***Semester Credit: 20 (Core: 20, Internship: 2*) Cumulative Credit: 157***

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
MAT 10701	Linear Algebra	Core	4	4-1-0	50	50	100
MAT 10702	Real Analysis	Core	4	4-1-0	50	50	100
MAT 10703	Measure and Integration	Core	4	4-1-0	50	50	100
MAT 10704	Groups and Rings	Core	4	4-1-0	50	50	100
MAT 10705	Topology I	Core	4	4-1-0	50	50	100
MAT 10706	Internship*	Internship	2	--	--	50	50

*Students must do a internship within or outside the institution (online also permitted) during the semester break to attain an additional 2 credits.

SEMESTER: 8***Semester Credit: 20 (Core: 20) Cumulative Credit: 177***

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ES E	Total Marks
MAT 10801	Fields and Modules	Core	4	4-1-0	50	50	100
MAT 10802	Functional Analysis	Core	4	4-1-0	50	50	100
MAT 10803	Complex Analysis	Core	4	4-1-0	50	50	100
	Functions of Several						
MAT 10804	Variables and Geometry	Core	4	4-1-0	50	50	100
	Computational						
MAT 10805	Mathematics Laboratory	Core	4	4-1-0	50	50	100

Students who wish to exit with a BSc Honors with research must do a research project of 12 credits, for additional credits, or can opt out a maximum of 2 core papers offered in 8th semester. The eligibility to opt for research project and the papers that can be omitted shall be decided by the student in consultation with the project supervisor and with the approval of the department council.

SEMESTER 9***Semester Credit: 20 (Core: 12; Elective: 8) Cumulative Credit: 197***

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
MAT 10901	Operator Theory	Core	4	4-1-0	50	50	100
	Ordinary Differential						
MAT 10902	Equations and Integral	Core	4	4-1-0	50	50	100
	Equations						
MAT 10903	Elective I	Elective	4	4-1-0	50	50	100
MAT 109xx	Elective II	Elective	4	4-1-0	50	50	100
XXX 109xx	Elective III	Interdepartmental Elective	4	4-1-0	50	50	100

SEMESTER 10***Semester Credit: 20 (Core: 8; Elective: 12) Cumulative Credit: 217***

Course Code	Course Name	Course Type	Credits	L-T-P	CE	ESE	Total Marks
	Partial Differential						
MAT 11001	Equations and	Core	4	4-1-0	50	50	100
	Variational Problems						
MAT 11002	Probability Theory	Core	4	4-1-0	50	50	100
MAT 110xx	Elective I	Elective	4	4-1-0	50	50	100
MAT 110xx	Elective II	Elective	4	4-1-0	50	50	100
MAT 110xx	Elective III	Elective	4	4-1-0	50	50	100

NB: Hybrid mode, MOOC and/or Project (6 months – 4 credits / 1 year – 8 credits) can be taken instead of elective courses in IX and X semester (For enabling students for 1 year project work in National Labs/Industry/Abroad)

LIST OF ELECTIVE COURSES OFFERED IN IX AND X SEMESTERS:-

- MAT 10905 : Topics in Applied Mathematics (Inter-departmental elective)
- MAT 10906/ MAT 11006 : Advanced Linear Algebra
- MAT 10907/ MAT 11007 : Discrete Framelets
- MAT 10908/ MAT 11008 : Harmonic Analysis
- MAT 10909/ MAT 11009 : Integral Transforms
- MAT 10910/ MAT 11010 : Functions Of Several Variables
- MAT 10911/ MAT 11011 : Advanced Spectral Theory
- MAT 10912/ MAT 11012 : Banach Algebras And Spectral Theory
- MAT 10913/ MAT 11013 : Number Theory
- MAT 10914/ MAT 11014 : Representation Theory Of Finite Groups
- MAT 10915/ MAT 11015 : Algebraic Topology
- MAT 10916/ MAT 11016 : Differential Geometry
- MAT 10917/ MAT 11017: Algebraic Graph Theory
- MAT 10918/ MAT 11018 : Wavelets
- MAT 10919/ MAT 11019 : Advanced Optimization Methods and Machine Learning
- MAT 10920/ MAT 11020 : Commutative Algebra
- MAT 10921/ MAT 11021 : Graph Theory
- MAT 10922/ MAT 11022 : C*-Algebra and Representation Theory
- MAT 10923/ MAT 11023 : Reproducing Kernel Hilbert Spaces
- MAT 10924/ MAT 11024 : Topology II

INTEGRATED MSC PHYSICS

Semester – I

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
ENG 10101	English -I	AEC	2-0-0	50	50	100	2
MAL 10101	Malayalam - I*	AEC	2-0-0	50	50	100	2
HIN 10101	Hindi - I*	AEC	2-0-0	50	50	100	2
GER 10101	German - I*	AEC	2-0-0	50	50	100	2
PHY 10101	General Physics - I	DSC	3-1-0	50	50	100	3
PHY 10102	Physics Lab - I (Mechanics)	DSC	0-0-4	100	–	100	2
PHY 10103	Topics in Quantitative Techniques - I	DSE	2-1-0	50	50	100	2
CHE 10101	General Chemistry - I	DSC	3-1-0	50	50	100	3
CHE 10102	Quantitative Analysis Lab	DSC	0-0-4	100	–	100	2
MAT 10101	Calculus - I	DSC	3-1-0	50	50	100	3
MAT 10103	Mathematical Methods - I	MDC	3-1-0	50	50	100	3
BIO 10103	General Biology	MDC	3-1-0	50	50	100	3
STA 10101	Statistical Methods for Data	MDC	3-1-0	50	50	100	3
CSP 10101	Computer Science - I	MDC	3-1-0	50	50	100	3
Semester Credits	22 (AEC: 4, DSC: 13, DSE: 2, MDC: 3) Cumulative Credits: 22						

*Either Malayalam - I, Hindi - I or German - I is to be opted.

Only one MDC to be opted.

AEC - Ability Enhancement Course, DSC- Discipline Specific Core,

DSE - Discipline Specific Elective, MDC - Multidisciplinary Course

L- Lecture, T - Tutorial, P - Practical

Semester – II

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
ENG 10201	English -II	AEC	2-0-0	50	50	100	2
MAL 10201	Malayalam - II*	AEC	2-0-0	50	50	100	2
HIN 10201	Hindi - II*	AEC	2-0-0	50	50	100	2
GER 10201	German - II*	AEC	2-0-0	50	50	100	2
PHY 10201	General Physics - II	DSC	3-1-0	50	50	100	3
PHY 10202	Physics Lab - II (Waves and Optics)	DSC	0-0-4	100	–	100	2
PHY 10203	Electrostatics and Magnetostatics	DSE	2-1-0	50	50	100	2
CHE 10201	General Chemistry - II	DSC	3-1-0	50	50	100	3
CHE 10202	Inorganic Qualitative Analysis Lab	DSC	0-0-4	100	–	100	2
MAT 10201	Calculus - II	DSC	3-1-0	50	50	100	3
MAT 10203	Mathematical Meth- ods - II	MDC	3-1-0	50	50	100	3
BIO 10203	Biophysical Chemistry	MDC	3-1-0	50	50	100	3
STA 10201	Probability and Distri- butions	MDC	3-1-0	50	50	100	3
CSP 10201	Computer Science - II	MDC	3-1-0	50	50	100	3
Semester Credits	22 (AEC: 4, DSC: 13, DSE: 2, MDC: 3) Cumulative Credits: 44						

*Either Malayalam - II or Hindi - II or German - II is to be opted. Only one MDC to be opted.

Semester – III

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10301	General Physics - III	DSC	3-1-0	50	50	100	3
PHY 10302	Physics Lab - III (Electricity and Magnetism)	DSC	0-0-4	100	–	100	2
PHY 10303	Topics in Quantitative Techniques - II	DSE	2-1-0	50	50	100	2
CHE 10301	General Chemistry - III	DSC	3-1-0	50	50	100	3
CHE 10302	Organic Qualitative Analysis Lab	DSC	0-0-4	100	–	100	2
VAC 10301	Environmental Science and Sustainability	VAC	4-1-0	50	50	100	4
MAT 10301	Calculus - III	DSC	3-1-0	50	50	100	3
MAT 10303	Matrix Theory and Graph Theory	MDC	3-1-0	50	50	100	3
BIO 10303	Human Disease and Healthcare management	MDC	3-1-0	50	50	100	3
STA 10301	Statistical Inference	MDC	3-1-0	50	50	100	3
CSP 10301	Computer Science - III	MDC	3-1-0	50	50	100	3
Semester Credits	22 (DSC: 13, DSE: 2, MDC: 3, VAC: 4) Cumulative Credits:					66	

VAC - Value Added Course Only one MDC to be opted.

Semester – IV

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10401	Classical mechanics and Relativity	DSC	4-1-0	50	50	100	4
PHY 10402	Electricity and Magnetism	DSC	4-1-0	50	50	100	4
PHY 10403	Basic Mathematical Physics	DSC	4-1-0	50	50	100	4
PHY 10404	Basic Electronics	DSC	4-1-0	50	50	100	4
PHY 10405	Physics Lab - IV (Electronics)	DSC	0-0-8	100	–	100	4
SEC 104.xx	Skill Enhancement Course - I	SEC	3-1-0	100	–	100	3
Semester Credits	23 (DSC: 20, SEC: 3) Cumulative Credits: 89						

SEC - Skill Enhancement Course

Semester – V

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10501	Thermal Physics	DSC	4-1-0	50	50	100	4
PHY 10502	Introduction to quantum mechanics	DSC	4-1-0	50	50	100	4
PHY 10503	Optics and spectroscopy	DSC	4-1-0	50	50	100	4
PHY 10504	Numerical and Computational Physics	DSC	4-1-0	50	50	100	4
PHY 10505	Physics Lab - V (Computer Lab)	DSC	0-0-8	100	–	100	4
SEC 105xx	Skill Enhancement Course - II	SEC	3-1-0	100	–	100	3
Semester Credits	23 (DSC: 20, SEC:		3) Cumulative Credits: 112				

Semester – VI

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10601	Basic Solid State Physics	DSC	4-1-0	50	50	100	4
PHY 10602	Basic Nuclear physics and Applications	DSC	4-1-0	50	50	100	4
PHY 106xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 106xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 10605	Physics Lab - VI (Modern Physics)	DSC	0-0-8	100	–	100	4
SEC 106x	Skill Enhancement Course - III	SEC	3-1-0	100	–	100	3
Semester Credits	23 (DSC: 20, SEC:		3) Cumulative Credits: 135				

BSc Exit with 135 Credits Or Merge with MSc

Credit Breakup: Physics – 82 (~ 61%), Chemistry – > 15 (~ 11%), Mathematics – > 9 (> 7%),

SEC – 9 (~ 7%), AEC-8 (~ 6%), MDC – 9 (~ 7%), VAC – 4 (~ 3%)

Semester – VII

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10701	Mathematical Physics	DSC	4-1-0	50	50	100	4
PHY 10702	Classical Mechanics	DSC	4-1-0	50	50	100	4
PHY 10703	Electrodynamics	DSC	4-1-0	50	50	100	4
PHY 10704	Quantum Mechanics	DSC	4-1-0	50	50	100	4
PHY 10705	Advanced Experiments in Physics	DSC	0-0-9	100	–	100	4
	Lab-I						
Semester Credits	20 (DSC: 20) Cumulative Credits: 155						

Semester –VIII: Honours Stream

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10801	Statistical Mechanics	DSC	4-1-0	50	50	100	4
PHY 10802	Atomic and Molecular Spectroscopy	DSC	4-1-0	50	50	100	4
PHY 108xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 108xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 10805	Advanced Experiments in Physics	DSC	0-0-9	100	–	100	4
	Lab-II						
VAC 10806	Student Seminar	VAC	2-0-0	100	–	100	2
Semester Credits	22 (DSC: 12, DSE: 8, VAC:2) Cumulative Credits: 177						

Exit with BSc Honours (177 Credits)

Semester –VIII: Honours with Research Stream

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10801	Statistical Mechanics	DSC	4-1-0	50	50	100	4
PHY 10802	Atomic and Molecular Spectroscopy	DSC	4-1-0	50	50	100	4
PHY 10803	Project	DSC	0-4-0	100	100	200	12
VAC 10806	Student Seminar	VAC	2-0-0	100	–	100	2
Semester Credits	22 (DSC: 8, VAC: 2, Project: 12) Cumulative Credits: 177						

Exit with BSc Honours with Research (177 Credits)

Semester – IX

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 10901	Nuclear and Particle Physics	DSC	4-1-0	50	50	100	4
PHY 10902	Advanced Solid State Physics	DSC	4-1-0	50	50	100	4
PHY 109xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 109xx*	Elective	DSE	4-1-0	50	50	100	4
PHY 10905	Advanced Experiments in Physics Lab-III	DSC	0-0-9	100	–	100	4
Semester Credits	20 (DSC: , Elective: 8) Cumulative Credits: 197						

Semester – X

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
PHY 11001	Major Project [@]	DSC	0-5-0	100	100	200	16
PHY 110xx	Online course **	MDC	2-1-0	–	100	100	2
Semester Credits	18 (DSC: 16, MDC: 2) Cumulative Credits: 215						

Total credit requirement for BSc: 133

Total credit requirement for BSc Honours: 177

Total credit requirement for BSc Honours with Research: 177

Total credit requirement for Integrated MSc: 215

Interdepartmental Core/Elective Courses in Statistics

Semester I

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
STAT 10101	Introductory Statistics	MDC/IDC	3-1-0	50	50	100	3

Semester II

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
STAT 10201	Probability Distributions	MDC/IDC	3-1-0	50	50	100	3

Semester III

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. eval.	End Sem	Total	Credit
STAT 10301	Statistical Methods	MDC/IDC	3-1-0	50	50	100	3

Semester IV

Course Code	Course Name	Course Type	L-T-P	Marks Distribution			
				Cont. Eval.	End Sem	Total	Credit
STAT 10401	Statistica l Inference	MDC/IDC	3-1-0	50	50	100	3

*MDC: Multi Disciplinary Core,

*IDC: Interdepartmental Core

Details of Faculty

Sl.No.	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1	Guest Faculty (Dr. Lalitha Mathew)	ENGLISH	
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M.Sc. FORENSIC SCIENCE (2023 ADMISSION ONWARDS)

FIRST SEMESTER

Code No. & Course	Course type	L-T-P	Credits	ESE Marks	CE Marks	Total Marks
23-358-0101- FUNDAMENTALS OF FORENSIC SCIENCE, CRIMINAL LAWS AND PSYCHOLOGY	Core	4-1-0	4	50	50	100
23-358-0102- CRIME SCENE INVESTIGATION, MANAGEMENT AND RECONSTRUCTION	Core	4-1-0	4	50	50	100
23-358-0103- INSTRUMENTAL TECHNIQUES	Core	4-1-0	4	50	50	100
23-358-0104- LABORATORY QUALITY MANAGEMENT, RESEARCH METHODOLOGY AND STATISTICS	Core	4-1-0	4	50	50	100
23-358-0105 - LABORATORY - FORENSIC SCIENCE AND CRIME SCENE INVESTIGATION	Core	0-0-4	2	50	50	100
23-358-0106- LABORATORY - INSTRUMENTAL TECHNIQUES, RESEARCH METHODOLOGY AND STATISTICS	Core	0-0-4	2	50	50	100
Total for First Semester			20	300	300	600

ESE-End Semester Evaluation, CE- Continuous Evaluation

SECOND SEMESTER

Code No. & Course	Course type	L-T-P	Credits	ESE Marks	CE Marks	Total Marks
23-358-0201- IMPRESSION EVIDENCES AND QUESTIONED DOCUMENTS	Core	4-1-0	4	50	50	100
23-358-0202- FORENSIC PHYSICS AND BALLISTICS	Core	4-1-0	4	50	50	100
23-358-0203- FORENSIC CHEMISTRY	Core	4-1-0	4	50	50	100
23-358-0204- FORENSIC BIOLOGY, SEROLOGY & DNA PROFILING	Core	4-1-0	4	50	50	100
23-358-0205- LABORATORY - QUESTIONED DOCUMENTS AND FORENSIC PHYSICS	Core	0-0-4	2	50	50	100
23-358-0206- LABORATORY - FORENSIC CHEMISTRY AND BIOLOGY	Core	0-0-4	2	50	50	100
Total for Second Semester			20	300	300	600

ESE-End Semester Evaluation, CE- Continuous Evaluation

THIRD SEMESTER

Code No. & Course	Course type	L-T-P	Credits	ESE Marks	CE Marks	Total Marks
23-358-0301- DIGITAL AND CYBER EVIDENCE	Core	4-1-0	4	50	50	100
23-358-0302- LABORATORY - DIGITAL AND CYBER EVIDENCE	Core	0-0-4	2	50	50	100
23-358-0303- FORENSIC MEDICINE AND TOXICOLOGY	Core	4-1-0	4	50	50	100
23-358-0304- LABORATORY - FORENSIC MEDICINE AND TOXICOLOGY	Core	0-0-4	2	50	50	100
23-358-0305- FORENSIC DERMATOGLYPHICS AND GRAPHOLOGY#	Elective	0-0-3	3	50	50	100
23-358-0306- LABORATORY - FORENSIC DERMATOGLYPHICS AND GRAPHOLOGY #	Elective	0-0-4	2	50	50	100
23-358-0307- ADVANCED FORENSIC EXAMINATION OF PHYSICAL EVIDENCE AND BALLISTICS#	Elective	0-0-3	3	50	50	100
23-358-0308- LABORATORY - PHYSICAL EVIDENCE AND BALLISTICS #	Elective	0-0-4	2	50	50	100
23-358-0309- PHARMACOLOGY AND DRUG ANALYSIS#	Elective	0-0-3	3	50	50	100
23-358-0310- LABORATORY - PHARMACOLOGY AND DRUG ANALYSIS #	Elective	0-0-4	2	50	50	100
23-358-0311- ENVIRONMENTAL BIOTECHNOLOGY AND MICROBIAL FORENSICS#	Elective	0-0-3	3	50	50	100
23-358-0312- LABORATORY - ENVIRONMENTAL BIOTECHNOLOGY AND MICROBIAL FORENSICS #	Elective	0-0-4	2	50	50	100
23-358-0313- CYBER SECURITY AND DIGITAL FORENSICS#	Elective	0-0-3	3	50	50	100

23-358-0314- LABORATORY - CYBER SECURITY AND DIGITAL FORENSICS #	Elective	0-0-4	2	50	50	100
23-358-0315- OPEN COURSE - INTER DEPARTMENTAL ELECTIVE	IDE	0-0-3	3	50	50	100
Total for Third Semester			20	400	300	700

ESE-End Semester Evaluation, CE- Continuous Evaluation, # only one Elective Course and its corresponding practical need to be opted by the student.

BASIC ELIGIBILITY FOR SELECTING ELECTIVE COURSES:

23-358-0305	Students from all streams mentioned in the admission criteria of M.Sc. Forensic Science programme.
23-358-0307	Students should have studied Physics as a core/ complementary course for at least 2 semesters in the graduation level.
23-358-0309	Students should have studied Chemistry/ Biochemistry as a core/ complementary course for at least 2 semesters in the graduation level.
22-358-0311	Students should have studied Zoology/ Botany/ Chemistry/ Microbiology/Medical Microbiology/ Biochemistry/ Medical Biochemistry/ Biotechnology/ Genetics as core/ complementary courses for at least 2 semesters in the graduation level.
23-358-0313	Students should have studied Computer Science/ Information Technology as a core/ complementary course for at least 2 semesters in the graduation level.

Students having B.Sc. Degree in Forensic Science/ B.Voc. Forensic Science/ B.Voc. Applied Microbiology & Forensic Science is eligible to select any of the Elective Courses as mentioned above.

FOURTH SEMESTER

Code No. & Course	Course type	L-T-P	Credits	ESE Marks	CE Marks	Total Marks
23-358-0401- PROJECT	Core		16	150	150	300
23-358-0402- FORENSIC ACCOUNTING [#]	Elective	4-1-0	4	50	50	100
23-358-0403- FORENSIC AUDIO VIDEO ANALYSIS [#]	Elective	4-1-0	4	50	50	100
23-358-0404- EXPLOSIVE ANALYSIS AND POST BLAST INVESTIGATION [#]	Elective	4-1-0	4	50	50	100
23-358-0405- WILDLIFE FORENSICS AND ENTOMOLOGY [#]	Elective	4-1-0	4	50	50	100
23-358-0406- ETHICAL HACKING, RECOVERY FORENSIC AND DIGITAL IMAGE PROCESSING [#]	Elective	4-1-0	4	50	50	100
Total for Fourth Semester			20	200	200	400

ESE-End Semester Evaluation, CE- Continuous Evaluation, # only one Elective Course need to be opted by the student in continuation to the 3rd semester elective. The Elective Courses can be given online/ selected from Massive open online course platform

Audit Courses (To be completed within the first two semesters by the students)		Evaluation	Credit
FSC1ACE	Ability Enhancement Course	Internal evaluation only	2
FSC2PCC	Professional Competency Course	Internal evaluation only	2

Details of Faculty

Sl.No.	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1	Awathi A (Asst. Professor on Contract basis)	M.Sc. Forensic Science, Biology	9497893274 & aswathia@cusat.ac.in
2	Binshad M S (Asst. Professor)	M.Sc. Forensic Science	9447374232 Binshadb4s@gmail.com

DEPARTMENT OF APPLIED CHEMISTRY

M.Sc. CHEMISTRY

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
CHE 2101	Inorganic Chemistry - I(Concepts and Developments)	C	3	50	50	100
CHE 2102	Organic Chemistry- I(Reactivity and Mechanisms)	C	4	50	50	100
CHE 2103	Theoretical Chemistry - I(Quantum Chemistry)	C	3	50	50	100
CHE 2104	Theoretical Chemistry - II(Group Theory and Spectroscopy)	C	4	50	50	100
CHE 2105	Advanced Chemical Synthesis and Separation Lab	C	2	100	-	100
CHE 2106	Open Ended Lab-I	C	-	-	-	-
Total			16	300	200	500

Elective I

Course Code	Course
CHE 2107	Equilibrium Thermodynamics
CHE 2108	Environmental Chemistry
CHE 2109	Advanced Stereochemistry

CHE 2110 Professional and Career Development in Chemistry

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
CHE 2201	Inorganic Chemistry-II (Chemistry of d - and f- block Elements)	C	3	50	50	100
CHE 2202	Organic Chemistry II (Reactions, Reagents & Synthesis)	C	4	50	50	100
CHE 2203	Organic Chemistry III (Spectroscopy of Organic Compounds)	C	2	50	50	100
CHE 2204	Physical Chemistry I(Statistical and Non equilibrium Thermodynamics)	C	3	50	50	100
CHE 2205	Theoretical Chemistry III(Chemical Bonding and Computational Chemistry)	C	2	50	50	100
CHE 2206	Advanced Physical Chemistry Lab	C	2	100	-	100
CHE 2207	Open Ended Lab-II	C	-	-	-	-
Total			16	350	250	600

Elective II

Course Code	Course
CHE 2208	Bioanalytical Chemistry
CHE 2209	Polymer Chemistry
CHE 2210	Advanced Photochemistry
CHE 2211	Theory of Orbital Interactions in Chemistry
CHE 2212	Chemical Crystallography

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
CHE 2301	Analytical Chemistry (Advanced Analytical Techniques and Instrumental Methods)	C	4	50	50	100
CHE 2302	Inorganic Chemistry III(Organometallic and Bioinorganic Chemistry)	C	3	50	50	100
CHE 2303	Organic Chemistry IV(Chemistry of Natural Products)	C	3	50	50	100
CHE 2304	Physical Chemistry II(Chemical Kinetics, Reaction Dynamics, Catalysis and Surface Chemistry)	C	3	50	50	100
CHE 2305	Physical Chemistry –III (Advanced Electrochemistry)	C	2	50	50	100
CHE 2306	Open Ended Lab -III	C	2	100	-	100
Total			17	350	250	600

Elective III

Course Code	Course
CHE 2308	Oleochemicals, Nutraceuticals, Surfactant Technology
CHE 2309	Materials Chemistry
CHE 2310	Bonds and Bands in Solids
CHE 2311#	Molecular Modelling in Chemistry
CHE 2312 #	Spectroscopic Techniques
CHE 2313*	Transition Metals: Chemistry and applications in organic Synthesis

* Syllabus of the new elective is under the consideration of the Academic Committee and approval is yet to be obtained.

Interdepartmental elective

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
CHE 2401	Project Dissertation and Viva Voce	C	16	-	300	300
Total			16		300	300

Details of Faculty

Sl. No.	Name & Designation	Specialization	Communication (Contact No, E-mail Id)
1.	Dr. P.M Sabura Begum, Professor & Head	Polymer/ Organic Chemistry	9995071968 pmsabura@cusat.ac.in
2.	Dr. N Manoj Professor	Organic Chemistry	9447712268 manoj.n@cusat.ac.in
3.	Dr. Jayasree E.G Professor	Computation/Theoretic al Chemistry	9746790202 jelambal@cusat.ac.in
4.	Dr. Yoosaf.K Professor	Nanomaterials and Spectroscopy	9495103111 yoosafk@cusat.ac.in
5.	Dr. Suja Haridas Associate Professor	Physical Chemistry	9847436638 sujaharidas@cusat.ac.in
6.	Dr. Manoj.E Associate Professor	Inorganic Chemistry	9447704531 manoje@cusat.ac.in
7.	Dr. Sebastian Nybin Remello Assistant Professor	Inorganic - Physical Chemistry	8921952631 nybinremello@cusat.ac.in
8.	Dr. Kala R , Assistant Professor	Material Chemistry	7373852607 kala@cusat.ac.in
9.	Dr. Leena R Assistant Professor	Analytical Chemistry	9495818133 leelar@cusat.ac.in
10.	Dr. Sindhu Mathai Assistant Professor	Organic Chemistry	9645085624 sindhumathai@cusat.ac.in
11.	Dr. Shandev.P.P Assistant Professor	Organic Chemistry	9544627882 shan@cusat.ac.in
12.	Dr. S.Prathapan Emeritus Professor	Organic Chemistry	9846142512 prathapan@cusat.ac.in

DEPARTMENT OF BIOTECHNOLOGY

M.Sc. BIOTECHNOLOGY

Semester I

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-303-0101	Metabolism and Bioenergetics(C)	3	1	1	4	50	50	100
20-303-0102	Genetics(C)	2	1	0	2	50	50	100
20-303-0103	Molecular Biology(C)	3	1	0	3	50	50	100
20-303-0104	Microbiology(C)	3	1	1	4	50	50	100
20-303-0105	Biostatistics and Principles of Analytical Techniques(C)	3	1	1	4	50	50	100
20-303-0106	Molecular Cell biology(C)	3	1	1	4	50	50	100
Total					21C	300	300	600

Semester-II

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-303-0201	Enzymology(C)	3	1	1	4	50	50	100
20-303-0202	Bioprocess Technology(C)	3	1	1	4	50	50	100
20-303-0203	Biosafety, Bioethics and IPR(C)	2	1	0	2	50	50	100
20-303-0204	Bioinformatics(C)	2	1	1	3	50	50	100
20-303-0205	Project Proposal Preparation and Presentation(C)	1	1	0	1	100	-	100
20-303-0206	Critical Analysis of Classical Papers(C)	0	1	1	1	100	-	100
<u>Elective-II</u>								
20-303-0207	Cancer Biology(E)	3	1	0	3	50	50	100
20-303-0208	Plant Biotechnology(E)	2	1	1	3	50	50	100

20-303-0209	Nano Biotechnology(E)	2	1	1	3	50	50	100
20-303-0210	Neurobiology(E)	2	1	1	3	50	50	100
Total					15 C	400	200	600
					12 E	200	200	400

Semester-III

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-303-0301	Recombinant DNA Technology(C)	3	1	1	4	50	50	100
20-303-0302	Immunology and Immunotechnology(C)	3	1	1	4	50	50	100
20-303-0303	Biopharmaceuticals(C)	2	1	1	3	50	50	100
<u>Elective-III</u>								
20-303-0304	Functional Genomics(E)	1	1	1	2	50	50	100
20-303-0305	Industrial & Environmental Biotechnology(Applications of Biotechnology-I) (E)	3	1	1	4	50	50	100
20-303-0306	Medical & Animal Biotechnology(Applications of Biotechnology-II) (E)	3	1	1	4	50	50	100
20-303-0307	Stem cell biology & Regenerative Medicine (E)	1	1	1	2	50	50	100
20-303-0308	Basic Neuroscience *	3	0	0	3	50	50	100
21-303-0309	RNA Interference and Genome Editing(E)	3	1	1	3	50	50	100
21-303-0310	Next-Generation Sequencing and Data Analysis(E)	3	1	1	3	50	50	100
Total					11 C	150	150	300
					18 E	300	300	600

*IDE offered by Department hence marks and credits not added to the semester.

Semester-IV

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-303-0402	Dissertation(C)				12	200	200	400
	Comprehensive viva voce&Seminar(C)	-	-	-	1	100	100	200

Elective-IV

20-303-0401	Innovation and Entrepreneurship for Biologists(E)	-	-	-	4	100	-	100
Total					13 C 4 E	300 100	300 -	600 100
Compulsory	Swayam/NPTEL Elective(E)				3	100	-	100
GRAND TOTAL FOR M.Sc BIOTECHNOLOGY PROGRAM					60 C 34 E	1200 600	800 500	2000 1100

M.SC MICROBIOLOGY

Semester I

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-340-0101	Bacteriology(C)	3	1	1	4	50	50	100
20-340-0102	Fungi(C)	3	1	1	4	50	50	100
22-340-0103	Microbial Physiology(C)	3	1	1	4	50	50	100
20-340-0104	Microbial biochemistry(C)	3	1	1	4	50	50	100
20-340-0105	Biostatistics and Principles of Analytical Techniques(C)	3	1	1	4	50	50	100
Total					20C	250	250	500

Semester-II

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
22-340-0201	Microbial Genetics (C)	3	1	1	4	50	50	100
20-340-0202	Fermentation technology(C)	3	1	1	4	50	50	100
20-340-0203	Biosafety, Bioethics and IPR(C)	2	1	0	2	50	50	100
20-340-0204	Bioinformatics(C)	3	1	1	3	50	50	100
20-340-0205	Project Proposal Preparation and Presentation(C)	1	1	0	1	100	-	100
20-340-0206	Critical Analysis of Classical Papers(C)	0	1	1	1	100	-	100

Elective-II

20-340-0207	Enzymology(E)	3	1	1	4	50	50	100
20-340-0208	Food Microbiology(E)	3	0	1	3	50	50	100
20-340-0209	Plant microbe interactions(E)	2	1	1	3	50	50	100
20-340-0210	Biofuels and Bioenergy(E)	3	0	0	3	50	50	100
Total					15 C	400	200	600
					13 E	200	200	400

Semester-III

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-340-0301	Recombinant DNA Technology(C)	3	1	1	4	50	50	100
20-340-0302	Immunology and Immunotechnology(C)	3	1	1	4	50	50	100
20-340-0303	Molecular Virology(C)	3	1	1	4	50	50	100

Elective-III

20-340-0304	Industrial microbiology(E)	2	1	1	3	50	50	100
20-340-0305	Functional Genomics(E)	1	1	1	2	50	50	100
20-340-0306	Environmental Microbiology(E)	2	1	1	3	50	50	100
20-340-0307	Diagnostic and Pharmaceutical microbiology(E)	2	1	1	3	50	50	100
20-340-0308	Biodegradation and Solid waste management(E)	2	1	1	2	50	50	100
Total					12 C	150	150	300
					15 E	250	250	500

Semester-IV

Course code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-340-0402	Dissertation(C)				12	200	200	400
	Comprehensive viva voce&Seminar(C)	-	-	-	1	100	100	200

Elective-IV

20-340-0401	Skill development and Entrepreneurship(E)	2	0	2	4	100	-	100
Total					13 C	300	300	600
					4 E	100	-	100

Compulsory	Swayam/NPTEL Elective(E)		3	100	-	100
GRAND TOTAL FOR M.Sc MICROBIOLOGY PROGRAM			60 C 32 E	1100 550	900 550	2000 1100

Details of Faculty

Sl. No	Name & Designation	Specialization	Communication (Contact No. & e-mail id)
1	Dr. Parvathi A Professor & Head	Microbiology, Virology Molecular Biology	9847358540 parubfsc@gmail.com parvathi@cusat.ac.in
2	Dr. Sarita G Bhat Professor	Microbial Genetics, Bacteriophage Therapy	9846033486 saritagbhat@gmail.com sgbhat@cusat.ac.in
3	Dr. Ajith Vengellur, Assistant Professor	Genetics, Cancer Biology Molecular Biology	7558996850 vengellur@gmail.com
4	Dr. Baby Chakrapani P S Assistant Professor	Neurobiology	9495109908 bcps@gmail.com , chakrapani@cusat.ac.in
5	Dr. Bhavya Balan Chandrika Assistant Professor	Cancer Biology Biotechnology	8157025337 bhavyabc@gmail.com bhavya@cusat.ac.in
6	Dr. Rajesh P P Assistant Professor	Bioelectrochemical System	8927962495 rajosone86@gmail.com
7	Dr. Sreekanth P M Assistant Professor	Plant Genetics, Molecular Biology, Conservation biology	9482438168 sreekanthpm@gmail.com
8	Dr. Sneha Yoginran Assistant Professor	Molecular Biology, Plant Biotechnology	9868594069 snehayogindran@cusat.ac.in sneha.yogindran@yahoo.com
9	Dr. Sayuj K P Assistant Professor	Plant Pathology, Bioinformatics	9895921594 sayuj@cusat.ac.in sayujisir@gmail.com
10	Dr. Jomon Sebastian Assistant Professor	Cancer Biology, Biotechnology	9656755299 Jomon.bt@gmail.com

Other Faculties

1	Dr. Sreeja Narayanan Welcome Trust Fellow	Nano biotechnology	8156866922 narayanan.sreeja@gmail.com
2	Dr. Unnikrishnan Sivan, DHR/NRI Faculty	Cancer Biology	8921181551 uks_dbt@cusat.ac.in
3	Dr. Sritha K S, Guest Faculty	Microbiology, Microbial Genetics	9400523745 srithaks@gmail.com

DEPARTMENT OF MATHEMATICS

M.Sc. MATHEMATICS

Semester I

Course Code	Name of the Course	Credits	Marks			Pre-Requisites
			Internal	External	Total	
23-314-0101	Linear Algebra	4	50	50	100	
23-314-0102	Real Analysis	4	50	50	100	
23-314-0103	Measure and Integration	4	50	50	100	
23-314-0104	Groups and Rings	4	50	50	100	
23-314-0105	Topology I	4	50	50	100	
	VIVA VOCE	0				
Total Credits		20				

Elective - Nil

Semester II

Course Code	Name of the Course	Credits	Marks			Pre-Requisites
			Internal	External	Total	
23-314-0201	Fields and Modules	4	50	50	100	23-314-0104
23-314-0202	Functional Analysis	4	50	50	100	23-314-0101 & 23-314-0103
23-314-0203	Complex Analysis	4	50	50	100	23-314-0102
23-314-0204	Functions of Several variables and Geometry	4	50	50	100	23-314-0101 & 23-314-0102
23-314-0205	Computational Mathematical Laboratory	4	50	50	100	-
	VIVA VOCE	0				
Total Credits		20				

Elective - Nil

Semester III

Course Code	Name of the Course	Credits	Marks			Pre-Requisites
			Internal	External	Total	
23-314-0301	Operator Theory	4	50	50	100	23-314-0202
23-314-0302	Ordinary Differential Equations and Integral Equations	4	50	50	100	-
	Elective I	4	50	50	100	-
	Elective II	4	50	50	100	-
23-314-0305	Topics in Applied Mathematics (Inter-Departmental Elective)	3	50	50	100	-
23-314-0338	VIVA VOCE	1	-	100	100	
Total Credits		20				

Semester IV

Course Code	Name of the Course	Credits	Marks			Pre-Requisites
			Internal	External	Total	
23-314-0401	Partial Differential Equations and Variational Calculus	4	50	50	100	23-314-0302
23-314-0402	Probability Theory	4	50	50	100	23-314-0101 & 23-314-0103
	Elective I	4	50	50	100	
	Elective II	4	50	50	100	
	Elective III	4	50	50	100	
23-314-0427	*Project (Optional)	8*	50	50	100	
	VIVA VOCE	0	-	-	-	
Total Minimum Credits		20				
Minimum Credits for Pass		80				

*Project is optional to the students. The students opt for project shall start the work immediately after the second semester. The project is equivalent to two electives in the fourth semester. Students can opt for additional elective courses for extra credits.

Course Code	Name of the Course
23-314-0305	Topics in Applied Mathematics (Inter-Departmental Elective)
23-314-0306/ 23-314-0406	Advanced Linear Algebra
23-314-0307/ 23-314-0407	Discrete Framelets
23-314-0308/ 23-314-0408	Harmonic Analysis
23-314-0309/ 23-314-0409	Integral Transforms
23-314-0310/ 23-314-0410	Functions of Several Variables
23-314-0311/ 23-314-0411	Advanced Spectral Theory
23-314-0312/ 23-314-0412	Banach Algebras and Spectral Theory
23-314-0313/ 23-314-0413	Number Theory
23-314-0314/ 23-314-0414	Representation Theory of Finite Groups
23-314-0315/ 23-314-0415	Algebraic Topology
23-314-0316/ 23-314-0416	Differential Geometry

23-314-0317/ 23-314-0417	Algebraic Graph Theory
23-314-0318/ 23-314-0418	Wavelets
23-314-0319/ 23-314-0419	Advanced Optimization Methods and Machine Learning
23-314-0320/ 23-314-0420	Commutative Algebra
23-314-0321/ 23-314-0421	Graph Theory
23-314-0322/ 23-314-0422	C*-Algebra and Representation Theory
23-314-0323/ 23-314-0423	Reproducing Kernel Hilbert Spaces
23-314-0324/ 23-314-0424	Topology II
23-314-0427	Project
23-314-0338/ 23-314-0438	Viva Voce

List of Elective Courses

TOTAL CREDITS REQUIRED FOR THE SUCCESSFUL COMPLETION OF THE COURSE: 80

TOTAL MARKS: 2100

Details of Faculty

Sl. No.	Name & Designation	Specialisation	Communication (Contact No. & e-mail id)
1	Dr. Sasi Gopalan (SG) Professor and Head	Approximation Theory, Optimization Techniques, Fuzzy Mathematics	9495363385 sgcusat@gmail.com sasigopalan@cusat.ac.in
2	Dr. Shery Fernandez(SF) Associate Professor	Representation Theory, Fuzzy Mathematics	9846762450 sheryfernandez@cusat.ac.in sheryfernandez@yahoo.co.in
3	Dr. Aparna Lakshmanan S (ALS) Associate Professor	Graph Theory, Algebraic Graph Theory	9847742405 aparnaren@gmail.com aparnals@cusat.ac.in
4	Dr. V.B. Kiran Kumar (VBK) Assistant Professor	Functional Analysis	8547496594 kiranbalu36@gmail.com vbk@cusat.ac.in
5	Dr. Ambily A.A. (AAA) Assistant Professor	Algebraic K-theory, Commutative Algebra, Computational Algebra, Non- Commutative Algebras	9048751352 aaambily@gmail.com ambily@cusat.ac.in
6	Dr. Noufal A. (AN) Assistant Professor	Functional Analysis, Framelets, Partial Differential Equations	9447327154 noufalasharaf@gmail.com noufal@cusat.ac.in
7	Dr. Tanushree Pandit (TP) Assistant Professor	Convex Optimization, Variational Inequalities, Equilibrium Problems	8960419388 tanushreepandit91@gmail.com tpandit@cusat.ac.in
8	Dr. Tathagata Banerjee (TB) Assistant Professor	Operator Algebras, Operator Theory and Coarse Geometry	7022518702 tathagatabanerjee85@gmail.com tathagata@cusat.ac.in
9	Dr. Shankar P (SP) Assistant Professor	Functional Analysis, Operator Algebras and Operator Theory	9786698534 shankarsupy@gmail.com shankarsupy@cusat.ac.in
10	Dr. Linu Pinto Assistant Professor	Optimization Techniques in Machine Learning	9446716604 linupinto671@gmail.com
11	Prof. M.N. Narayanan Namboodiri (MNN) Emeritus Professor	Functional Analysis	9446505953 mnnadri@gmail.com
12	Prof. A. Vijayakumar (AV) Emeritus Professor	Discrete Mathematics	9447608851 vambat@gmail.com vijay@cusat.ac.in
13	Prof. P G Romeo (PGR) CSIR Emeritus Scientist	Algebra, Category Theory, Algebraic Topology, Universal Algebras	9447663109 romeo_parackal@yahoo.com romeopg@cusat.ac.in
14	Dr.K P Naveena Chandran (KPN) Adjunct Faculty	Algebra, Topology	9447311751 kpchn@gmail.com kpchn@cusat.ac.in

DEPARTMENT OF PHYSICS

M.Sc. PHYSICS

Semester I

Course code	Course	Hrs /Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-318-0101	Mathematical Physics				4	50	50	100
21-318-0102	Classical Mechanics				4	50	50	100
21-318-0103	Electrodynamics				4	50	50	100
21-318-0104	Quantum Mechanics - I				4	50	50	100
21-318-0104	Advanced Experiments in Physics Lab - I				3	100	-	100
Total					19	500		

Semester II

Course code	Course	Hrs /Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-318-0201	Quantum Mechanics - II				4	50	50	100
21-318-0202	Statistical Mechanics				4	50	50	100
21-318-0203	Atomic and Molecular Spectroscopy				4	50	50	100
21-318-0204	Advanced Electronics				4	50	50	100
21-318-0205	Advanced Experiments in Physics Lab - 11				4	100	-	100
Total					20	500		

Semester III

Course code	Course	Hrs /Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-318-0301	Nuclear and Particle Physics				4	50	50	100
21-318-0302	Advanced Solid State Physics				4	50	50	100
21-318-0303	Elective I				4	50	50	100
21-318-0304	Elective II (Inter-departmental)				4	50	50	100
21-318-0305	Advanced Experiments in Physics Lab - III				4	50	50	100
Total					20	500		

Semester IV

Course code	Course	Hrs /Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-318-0401	Major Project				16	200	200	400
21-318-0402	Online Course				2	50	-	50
21-318-0403	Elective - III (online mode)				4	50	50	100
					22	550		

Electives Courses

Elective courses, from 2021 admission onward, are offered for IIIrd and IVth semester only. Department will offer, in the required semesters, 4 to 5 elective courses from the list below.

Course Code	Course
06	2D Materials
07	Advanced Magnetism and Magnetic Materials
08	Advanced mathematical physics
09	Advanced Raman Spectroscopy
10	Advanced solid state physics-II
11	Applied Vibrational Spectroscopy
12	Astrophysics
13	Biophysics
14	Complex networks
15	Computational Physics
16	Crystal Growth
17	Elementary astronomy
18	Fundamentals of Photovoltaics
19	Gravitation and Cosmology
20	Laser and Nonlinear Optics
21	Light Sources and Detectors
22	Measurements and Optical Instrumentation
23	Modern Optics
24	Molecular physics and laser spectroscopy
25	Nondestructive measurement techniques and applications
26	Non-equilibrium statistical physics
27	Non-linear dynamics and chaos .
28	Non-linear optics
29	Phase transition and critical phenomena
30	Physics of Nanomaterials
31	Principles of Biomedical instruments
32	Quantum field theory
33	Quantum Computation and Information
34	Quantum optics
35	Solar Photovoltaic Technology
36	Sophisticate Material Characterization Techniques
37	Thin film physics
38	Ultrashort Pulse Lasers and Applications .

Details of Faculty

Sl No	Name & Designation	Specialization	Communication (Contact No.& e-mail id)
1	Prof. Titus K Mathew, Professor	Theoretical Physics	9995438460 titus@cusat.ac.in
2	Prof. Junaid Bushiri, Professor	Condensed Matter Physics	9048183372 junaidbushiri@cusat.ac.in
3	Dr. Aldrin Antony, Associate Professor & Head	Condensed Matter Physics	8879007890 aldrin@cusat.ac.in
4	Dr. Riju Issac, Associate Professor	Laser Physics	8943914464 riju@cusat.ac.in
5	Dr. Anoop K K, Assistant Professor	Condensed Matter Physics	8589855747 anoopkk@cusat.ac.in
6	Dr. Seno Thomas, assistant Professor	Condensed Matter Physics	9645826550 senoy.thomas@cusat.ac.in
7	Dr. Prasad V V, Assistant Professor	Theoretical Physics	9036897515 prasad.vv@cusat.ac.in
8	Dr. Charles Jose, Assistant Professor	ASTrophysics	8606434507 charles.jose@cusat.ac.in
9	Dr. Rhine Kumar , Assistant Professor	Nuclear Physics	9447982019 rhinekumar@cusat.ac.in
10	Dr. Asha A S, Assistant Professor	Condensed Matter Physics	9495042275 asa@cusat.ac.in
11	Dr. Sabeena M, Assistant Professor	Condensed Matter Physics	9446996841 sabeena@cusat.ac.in
12	Dr. Sasidevan, Assistant Professor	Theoretical Physics	9004625745 sasidevan@cusat.ac.in
13	Dr. Vineeth Mohanan, Assistant Professor	Condensed Matter Physics	6235459762 vineethmp@cusat.ac.in
14	Dr. Ronald Benjamin, UGC-FRP Assistant Professor	Theoretical Physics	9040000584 benjamin.phys@gmail.com
15	Prof. Ramesh babu. Adjunct Faculty	Particle Physics	9447608852 rbt@cusat.ac.in
16	Dr. N Shaji,, Adjunct Faculty	Quantum Computation and Quantum Information Physics	9447792427 shajin@cusat.ac.in

DEPARTMENT OF STATISTICS

M.Sc STATISTICS (2021 admission onwards)

Semester I

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0101	Mathematical Methods for Statistics	C	4	50	50	100
21-322-0102	Probability Theory I	C	4	50	50	100
21-322-0103	Probability Distributions	C	4	50	50	100
21-322-0104	Sampling Theory & Methods	C	4	50	50	100
Total			16			

Elective I (Choose any one)

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0105	Data Analytics using R	E	3	50	50	100
21-322-0106	Statistical Computing	E	3	50	50	100

Semester II

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0201	Statistical Inference I	C	4	50	50	100
21-322-0202	Probability Theory II	C	4	50	50	100
21-322-0203	Stochastic Processes	C	4	50	50	100
21-322-0204	Practical -I and Viva Voce	C	2	100	-	100
Total			14			

Elective II (Choose any one)

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0205	Statistics for National Development	E	3	50	50	100
21-322-0206	Reliability Modeling and Analysis	E	3	50	50	100

Elective III (Choose any one)

Course Code	Course (Online)	C/E	Credits	Internal	External	Total
21-322-0208	Introduction to Queuing Theory	E	3	50	50	100
21-322-0209	Probabilistic Methods in PDE	E	3	50	50	100
21-322-0210	Probability and Stochastics for Finance	E	2	50	50	100
21-322-0211	Data Analytics with Python	E	3	50	50	100

Semester III

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0301	Statistical Inference II	C	4	50	50	100
21-322-0302	Multivariate Analysis	C	4	50	50	100
21-322-0303	Applied Regression Analysis	C	4	50	50	100
21-322-0304	Practical – II using SPSS/MATLAB	C	2	50(practical + 50 (viva)	-	100
Total			14			

Elective IV (Choose any one of the following)

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0306	Operations Research -II	E	3	50	50	100
21-322-0308	Lifetime Data Analysis	E	3	50	50	100
21-322-0309	Topics in Stochastic Finance	E	3	50	50	100

Elective V (Either an inter-departmental course or an online course)

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0307	Elected course	E	3	50	50	100

Semester IV

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0401	Design and Analysis of Experiments	C	4	50	50	100
21-322-0402	Practical – III using SAS/R, and Viva Voce	C	4	50	50	100
21-322-0403	Project	C	5	100	--	100
Total			13			

Electives – VI, VII, VIII. (Choose any three)

Course Code	Course	C/E	Credits	Internal	External	Total
21-322-0404	Statistical Quality Assurance	E	3	50	50	100
21-322-0405	Time Series Analysis	E	3	50	50	100
21-322-0407	Applied Multivariate Statistical Analysis	E	3	50	50	100
21-322-0408	Statistical Forecasting	E	3	50	50	100
21-322-0409	Inference for Stochastic Processes	E	3	50	50	100
21-322-0410	Online course	E	3	50	50	100
21-322-0411	Statistics for Clinical Research (IQVIA)	E	3	50	50	100

****List of Electives**

1. Actuarial Statistics.
2. Applied Multivariate Statistical Analysis.
3. Life time data analysis.
4. Official Statistics
5. Operations Research.
6. Reliability Modeling and Analysis.
7. Statistical Computing.
8. Statistical Decision Theory.
9. Statistical Forecasting.
10. Statistical Quality Assurance
11. Time Series Analysis.
12. Topics in Stochastic Finance.
13. Data Analytics using R
14. Basic Industrial Statistics using R

M.Tech in Data Science and Analytics

Semester I

Sl.No	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0101	Mathematical Methods for Data Science	C	3	50	50	100
2	22-478-0102	Probability and Statistical Inference	C	4	50	50	100
3	22-478-0103	Data Structures and Algorithms	C	3	50	50	100
4	22-478-0104	Python Programming – Practical I	C	2	50	50	100
5		Elective I	E	3	50	50	100
6		Elective II	E	3	50	50	100
Sl.No.	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0105	Systems and Decision Analytics	E	3	50	50	100
2	22-478-0106	Data Warehousing and Data Mining	E	3	50	50	100
3	22-478-0107	Data Analysis and Visualization using Python	E	3	50	50	100

4	22-478-0108	Operations and Supply Chain Management	E	3	50	50	100
5	22-478-0109	System Reliability and Risk Analysis	E	3	50	50	100

Minimum Credit:18(Core:12, Elective:6)

List of Electives

Semester II

Sl.No.	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0201	Simulation Modelling and Analysis	C	3	50	50	100
2	22-478-0202	Machine Learning	C	4	50	50	100
3	22-478-0203	Multivariate Analysis and Statistical Techniques for Data Mining	C	3	50	50	100
4	22-478-0204	R/R-Studio Programming – Practical II	C	2	50	50	100
5		Elective III	E	3	50	50	100
6		Elective IV	E	3	50	50	100

Minimum Credit:18(Core:12, Elective:6)

List of Electives

Sl.No.	Course Code	Course	E	Credits	Internal	External	Total
1	22-478-0206	Optimization Techniques	E	3	50	50	100
3	22-478-0207	Design of Experiments (Integrated with R)	E	3	50	50	100
3	22-478-0208	Artificial Intelligence and Deep Learning	E	3	50	50	100
4	22-478-0209	Natural Language Processing	E	3	50	50	100
5	22-478-0210	Financial Risk Analytics and Management	E	3	50	50	100
6	22-478-0211	Marketing and HR Analytics	E	3	50	50	100

7	22-478-0212	Bioinformatics	E	3	50	50	100
8	22-478-0213	Big Data Technology	E	3	50	50	100

Semester III

Sl.No.	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0301	Project on Data Analytics in Industry	C	15	150	150	300
2		Elective V	E	3	50	50	100

Minimum Credit:18(Core:15, Elective:3)

List of Electives

Sl.No.	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0302	Statistical Forecasting Methods	E	3	50	50	100
2	22-478-0303	Quality Management and Six Sigma	E	3	50	50	100
3	22-478-0304	Applied Longitudinal Data Analysis	E	3	50	50	100
4	22-478-0305	Lifetime Studies in Data Science (Integrated with R)	E	3	50	50	100
5	22-478-0306	Bayesian Computing & Analysis	E	3	50	50	100
6	22-478-0307	Business Analytics	E	3	50	50	100

Semester IV

Sl.No.	Course Code	Course	C/E	Credits	Internal	External	Total
1	22-478-0401	Project Dissertation Evaluation and Viva	C	18	200	200	400

Minimum Credit:18(Core:18)

***Additional electives from Industry/Institutions can be offered during third and fourth semesters with the approval of Department Council and University**

DETAILS OF FACULTY

Sl.No.	Name & Designation	Specialization	Communication
1	Dr.N.Balakrishna Senior Professor	Stochastic Processes and Inference, Time Series Models, Data Analysis, Chaos and nonlinear time series	0484-2555497(R) 9446605682(M) nb@cusat.ac.in
2	Dr.K.C.James Professor	Industrial Engineering, DE Simulation, Reliability, TQM	0484-2475767(R) 9446605183(M) jamesmech@cusat.ac.in
3	Dr.Asha Gopalakrishnan Senior Professor	Reliability Theory, Survival Analysis	0484-2335390(R) 9447220353(M) asha@cusat.ac.in asha.gopalakrishnan@gmail.com
4	Dr.P.G.Sankaran Senior Professor (Now on Deputation as PVC)	Distribution Theory, Reliability Theory, Data Analysis, Survival Analysis	0484-2741693(R) 9847348528(M) pgsankaran@cusat.ac.in sankaran.p.g@gmail.com
5	Dr.S.M.Sunoj Professor and Head	Distribution Theory, Reliability Theory	0487-2428214(R) 9446627103(M) smsunoj@cusat.ac.in smsunoj@gmail.com
6	Dr.Rajesh G Professor	Distribution Theory, Information Theory	9447280968(M) rajeshgstat@cusat.ac.in rajeshgstat@gmail.com
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8	Dr.Princy T Assistant Professor	Distribution Theory	9446682020(M) princyt@cusat.ac.in princyt.t@gmail.com

9	Ms.Hashmy Hassan Assistant Professor (Contract)	Data Science and Analytics, Information Retrieval, Text Mining	9995867891 hashmyhas123@gmail.com
10	Dr.Ambily Jose Assistant Professor (Contract)	Stochastic Processes	9048080975 drambilystati@gmail.com
11	Rehana P M Guest Faculty	Statistical Quality Assurance	7736336696 rehanamoideen95@gmail.com

**FACULTY
OF
SOCIAL
SCIENCES**

Dean:

**Dr. Sam Thomas
Professor
School of Management Studies
CUSAT, Kochi-22**

CENTRE FOR BUDGET STUDIES (CBS)**M.Sc. Econometrics and Financial Technology****SEMESTER - I**

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours / Week	Continuous evaluation marks	End Semester Marks	Total Marks
23-345-0101	Microeconomics	C	4	4	50	50	100
23-345-0102	Macroeconomics	C	4	4	50	50	100
23-345-0103	Mathematics for Economics and Finance	C	4	4	50	50	100
23-345-0104	Statistics for Economics and Finance	C	4	4	50	50	100
23-345-0105	Financial Economics	C	4	4	50	50	100
23-345-0106	Financial Reporting and Analysis	(Audit course)					
TOTAL CREDITS FOR FIRST SEMESTER			20	23			

SEMESTER – II

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	End Semester Marks	Total Marks
23-345-0201	Advanced Macroeconomics	C	4	4	50	50	100
23-345-0202	Corporate Finance	C	4	4	50	50	100
23-345-0203	Econometrics	C	4	4	50	50	100
23-345-0204	Security Analysis and Portfolio Management	C	4	4	50	50	100
23-345-0205	Behavioral Finance	C	4	4	50	50	100
23-345-0206	Python Lab I	C	1	2	100		
23-345-0207	Capstone Project	C	1	2	100		
TOTAL CREDITS FOR SECOND SEMESTER			22	24			

SEMESTER – III

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
23-345-0301	Applied Econometrics	C	4	4	50	50	100
23-345-0302	Fintech I	C	4	4	50	50	100
23-345-0303	Research Methodology	C	4	4	50	50	100
23-345-0304	Python Lab II	C	1	2	100		
23-354-0305	Internship		1		100		
23-345-0306	Major Issues in Indian Economy with Special Reference to Kerala	Audit course					
	Elective	E	3	3	50	50	100
	Elective	E	3	3	50	50	100
TOTAL CREDITS FOR THIRD SEMESTER			20	20			

SEMESTER - IV

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
23-345-0401	Project Report and Viva Voce	C	3	2	-	100	100
23-345-0402	Python Lab III	C	1	2	50		
23-345-0403	Fintech II	E	4	3	50	50	100
	Elective	E	3	3	50	50	100
	Elective	E	3	3	50	50	100
	MOOC Courses	E	6				
TOTAL CREDITS FOR FOURTH SEMESTER			20	13			

Total Eighty-two credits. PG Regulations of CUSAT is applicable to this programme.

List of Electives

CODE	SEMESTER III
20-372-0411	Financial Derivatives and Risk Management
23-345-0307	Asset Pricing: Theory and Practice
23-345-0308	Artificial Intelligence and Blockchain Technology
23-345-0309	Digital Banking and Payments
23-345-0310	International Finance
23-345-0311	Game Theory
	SEMESTER IV
23-345-0404	Investment Banking Services
23-345-0405	Data Analytics
23-345-0406	Financial Econometrics
23-345-0407	Panel Data Econometrics
23-345-0408	Multivariate Methods
23-345-0409	Budgetary Analysis and Fiscal Management in India
23-345-0410	Fiscal Federalism: Theory and Practice with Special Reference to Kerala
23-345-0411	Public Economics
23-345-0412	Public Choice and Policy
23-345-0413	Insurance Economics
23-345-0414	Fintech Venture Management and Entrepreneurship

Credit Distribution Semester wise

Semester	Credits
1	20
2	22
3	20
4	20
Total credits	82

Details of Faculty

S.No	Name & Designation	Specialization	Communication
1	Dr. Santhosh Kumar P K Director & Associate Professor, Centre for Budget Studies	Econometrics, Finance	director.cbs@cusat.ac.in Mobile: 9620569469 Office: 04842572077
2	Dr. Martin Patrick Hon. Fellow, Centre for Budget Studies	Economic policy, public finance	pmartin47@rediffmail.com 9447664270
3	Dr. S. Muraleedharan Hon. Fellow, Centre for Budget Studies	Industrial Economics, Health Economics	muraleedharanvarsha@yahoo.com
4	Sreeja Sharma Assistant Professor(On Contract)	Finance, Quantitative Techniques	sreejavsharma@gmail.com 9400652312
5	Anjali Haridas Assistant Professor (On Contract)	Macroeconomics , FinTech	anjuhari711@gmail.com 8590867735

DEPARTMENT OF APPLIED ECONOMICS
M.A APPLIED ECONOMICS

SEMESTER – I

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
ECO 2101	Microeconomics I	C	4	5	50	50	100
ECO 2102	Macroeconomics I	C	4	5	50	50	100
ECO 2103	Mathematical Methods for Economics	C	4	5	50	50	100
ECO 2104	Statistics for Economic Analysis	C	4	5	50	50	100
ECO 2105	Indian Economy	C	4	5	50	50	100

SEMESTER – II

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
ECO 2201	Microeconomics II	C	4	5	50	50	100
ECO 2202	Macroeconomics II	C	4	5	50	50	100
ECO 2203	Econometrics	C	4	5	50	50	100
ECO 2204	Development Economics	C	4	5	50	50	100
ECO 2205	International Economics	C	4	5	50	50	100

SEMESTER –III

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours / Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
ECO 2301	Environmental Economics	C	4	4	50	50	100
ECO 2302	Public Economics	C	4	4	50	50	100

ECO 2303	Research Methodology	C	4	4	50	50	100
ECO 2304	Elective	E	3	3	50	50	100
ECO 2305	Elective	E	3	3	50	50	100

SEMESTER -IV

Course Code	Title of Paper	Core/ Elective	Credits	Contact Hours/ Week	Continuous evaluation marks	External Evaluation Marks	Total Marks
ECO 2401	Elective	E	3	4	50	50	100
ECO 2402	Elective	E	3	4	50	50	100
ECO 2403	Elective	E	3	4	50	50	100
ECO 2404	Project Report	C	3	4	50	50	100
ECO 2405	Comprehensive Viva Voce	C	2	4	-	100	100

Total Marks 2000 and Total 72 credits (core 58 credits and optional 14 credits)

Elective Papers (code ECO ELE)

1. Project Planning and Appraisal
2. Kerala Economy
3. Industrial Economics
4. Advanced Econometrics
5. Social Exclusion and Inclusive Policy Studies
6. International Finance
7. Financial Institutions and Markets
8. Financial Economics
9. Gender Studies
10. Economics of labour market
11. Behavioural Economics
12. Agricultural Economics
13. Health Economics
14. Optimisation Techniques
15. Business Finance
16. Economic Theory (Inter Departmental Elective)
17. Environment Management (Inter Departmental Elective)
18. Applied Economics for Insurance, Banking & Risk Management (Inter Departmental Elective)

FACULTY DETAILS

SL. No.	Name & Designation	Specialization	Communication (Contact No.& e-mail id)
1	Dr. P. Arunachalam Professor	International Economics, Quantitative methods, Indian Economy and Statistics	9746770732 8848522390 arunachalam14@yahoo.co.in arunachalam@cusat.ac.in
2	Dr. Manoj P.K Assistant Professor	Business Finance & Econometrics	9447664949 manoj_p_k@cusat.ac.in manoj_p_k2004@yahoo.co.in
3	Dr. P. R. Suresh Assistant Professor	Quantitative Economics, Econometrics and Social Exclusion	9037284525 psuresh@cusat.ac.in
4	Dr. S. Harikumar Adjunct Faculty	Agricultural Economics, Environmental Economics	9446578289 vinvij2003@gmail.com
5	Dr. Aswathy Rachel Varughese Assistant Professor	Development Economics, Applied Econometrics & Data Analytics	9497885522 aswathyrv@cusat.ac.in
6	Dr. Shika Ramesh Assistant Professor	Micro Economics, Environmental Economics	9037873809 shikaramesh@cusat.ac.in

SCHOOL OF MANAGEMENT STUDIES

In order to complete the MBA programme, a student is required to obtain a total of 102 credits consisting of 78 credits for core courses and 24 credits for elective courses. All courses except summer project work and online course (MOOC) carries 3 credits. The summer project work carries 4 credits and Online (MOOC) carries 2 credits. The credits distribution of the programme is given in the following table.

Sl. No.	Courses	CC/EC	No. of Courses	Credit Per Course	Total Credit
1	Core Courses	CC	23	3	69
2	Online Course (MOOC)	CC	1	2	2
3	Summer Project Work	CC	1	4	4
4	Comprehensive Viva-voce	CC	1	3	3
	Total Credit for Core Courses		26		78
3	Elective Courses	EC	8	3	24
	Total Courses		34		102

CC – Core Course

EC – Elective Course

CES – Continuous Evaluation System

ESE – End Semester Examination

Students should start the online MOOC course during the third semester and should complete all formalities before the end of the fourth semester. The grade will be counted as part of the fourth semester.

MBA (FULL-TIME) PROGRAMME

(ALSO FOR RECOGNIZED MBA INSTITUTIONS, CUSAT)

FIRST SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-371-0101	Management Concepts and Organisational Behaviour	CC	3	40	60	100
21-371-0102	Statistics for Managers	CC	3	40	60	100
21-371-0103	Managerial Economics	CC	3	40	60	100
21-371-0104	Business Communication	CC	3	40	60	100
21-371-0105	Financial Accounting	CC	3	40	60	100
21-371-0106	Business Environment	CC	3	40	60	100
21-371-0107	Indian Ethos and Business Ethics	CC	3	40	60	100
21-371-0108	IT for Business and Management	CC	3	40	60	100
21-371-0109	Managerial Skill Development -I	CC	3	100	-	100
		Total	27	-	-	900

SECOND SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-371-0201	Financial Management	CC	3	40	60	100
21-371-0202	Marketing Management	CC	3	40	60	100
21-371-0203	Operations Management	CC	3	40	60	100
21-371-0204	Human Resource Management	CC	3	40	60	100
21-371-0205	Management Accounting	CC	3	40	60	100
21-371-0206	Business Research Methods	CC	3	40	60	100
21-371-0207	Legal Aspects of Business	CC	3	40	60	100
21-371-0208	Innovation and Entrepreneurship	CC	3	40	60	100
21-371-0209	Managerial Skill Development-II	CC	3	100	-	100
		Total	27	-	-	900

THIRD SEMESTER

Course Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-371-0301	Management Science	CC	3	40	60	100
21-371-0302	Organisational Structure, Design and Change	CC	3	40	60	100
21-371-0303	Business Analytics	CC	3	40	60	100
21-371-03XX*	Elective – 1	EC	3	40	60	100
21-371-03XX*	Elective – 2	EC	3	40	60	100
21-371-03XX*	Elective – 3	EC	3	40	60	100
21-371-03XX*	Elective – 4	EC	3	40	60	100
21-371-0304	Summer Project Work**	CC	4	40	60	100
Total			25			800
<p><i>*XX is the unique two digit number of the particular elective course from the list of elective courses</i></p>						

FOURTH SEMESTER

Course Code	Name of Course	CC/EC	Credit	Marks		Total Marks
				CES	ESE	
21-371-0401	Corporate Governance and Strategic Management	CC	3	40	60	100
21-371-0402	Environment Management	CC	3	40	60	100
21-371-04XX*	Elective – 5	EC	3	40	60	100
21-371-04XX*	Elective – 6	EC	3	40	60	100
21-371-04XX*	Elective – 7	EC	3	40	60	100
21-371-04XX*	Elective - 8	EC	3	40	60	100
21-371-0403	Online Course (MOOC)***	CC	2	40	60	100
21-371-0404	Comprehensive Viva-Voce	CC	3	-	100	100
Total			23			800

**XX is the unique two digit number of the particular elective course from the list of elective courses*

*XX is the unique two digit number of the particular elective course from the list of elective courses

**Each student should carry out a summer project work after the completion of second semester for a minimum period of six to eight weeks. The work shall be carried out during the summer break after the second semester examination under the supervision of a guide assigned by the department. The report of the summer project must be submitted at the end of the classes of the third semester by following the guidelines issued by the department.

Evaluation of project work and awarding of pass/fail grade shall be made based on the submission of the final report immediately after the completion of project work, presentation by the candidates followed by viva-voce, and the quality of final report. If a candidate failed in evaluation, he/she has to complete the project work and obtain pass grade along with next batch.

***** Students should start the online MOOC course during the third semester and should complete all formalities before the end of the fourth semester. The grade will be counted as part of the fourth semester.**

MBA (PART-TIME) PROGRAMME
SCHOOL OF MANAGEMENT STUDIES, CUSAT
FIRST SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0101	Management Concepts and Organisational Behaviour	CC	3	50	50	100
21-372-0102	Statistics for Managers	CC	3	50	50	100
21-372-0103	Managerial Economics	CC	3	50	50	100
21-372-0104	Financial Accounting	CC	3	50	50	100
21-372-0105	Indian Ethos and Business Ethics	CC	3	50	50	100
Total			15			500

SECOND SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0201	Financial Management	CC	3	50	50	100
21-372-0202	Marketing Management	CC	3	50	50	100
21-372-0203	Human Resource Management	CC	3	50	50	100
21-372-0204	Management Accounting	CC	3	50	50	100
21-372-0205	Managerial Skill Development -I	CC	3	100	-	100
Total			15			500

Note: *For the Part Time program Managerial Skill Development – II (MSD II) will be conducted through Field works after the completion of the second semester for a minimum duration of 45 hours by covering all the topics included in the MSD-II syllabus. The work shall be carried out during the summer break after the second semester examination under the supervision of the Faculty in-Charge of MSD_ II. Faculty in-Charge of MSD_ II can decide the structure of various components like Assignments, Viva, Field work Report, Quiz, Case studies, Tests etc. and the mode of execution of the same.

Assessment shall be carried out on the basis of the components assigned by the Faculty-in Charge, viz Viva, Quiz, Field work Report, Assignments, Case Studies, Tests etc. 50 marks will be awarded

by the Faculty-in-charge based on the continuous evaluation through the above components during the course and remaining 50 marks will be awarded based on the evaluation of the Final field work report submitted by the students by the Faculty-in-charge. MSD_II mark will be reflected in the third semester mark list.

THIRD SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0301	Business Communication	CC	3	50	50	100
21-372-0302	Management Science	CC	3	50	50	100
21-372-0303	Organisational Structure, Design and Change	CC	3	50	50	100
21-372-0304	IT for Business and Management	CC	3	50	50	100
21-372-0305	Business Environment	CC	3	50	50	100
21-372-0306	*Managerial Skill Development -II	CC	3	100	-	100
Total			18			600

*For the Part Time program Managerial Skill Development – II (MSD II) will be conducted through Field works after the completion of the second semester for a minimum duration of 45 hours by covering all the topics included in the MSD-II syllabus.

FOURTH SEMESTER

Course Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0401	Business Research Methods	CC	3	50	50	100
21-372-0402	Operations Management	CC	3	50	50	100
21-372-0403	Legal Aspects of Business	CC	3	50	50	100
21-372-04XX**	Elective 1	EC	3	50	50	100
21-372-04XX**	Elective2	EC	3	50	50	100
Total			15			500

**XX is the unique two digit number of the particular elective course from the list of elective courses

FIFTH SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0501	Innovation and Entrepreneurship	CC	3	50	50	100
21-372-0502	Business Analytics	CC	3	50	50	100
21-372-05XX**	Elective 3	EC	3	50	50	100
21-372-05XX**	Elective 4	EC	3	50	50	100
21-372-05XX**	Elective 5	EC	3	50	50	100
21-372-0503	Summer Project Work***	CC	4	100	-	100
			Total	19		600
<i>**XX is the unique two digit number of the particular elective course from the list of elective courses</i>						

SIXTH SEMESTER

Code	Name of Course	CC/ EC	Credit	Marks		Total Marks
				CES	ESE	
21-372-0601	Corporate Governance and Strategic Management	CC	3	50	50	100
21-372-0602	Environment Management	CC	3	50	50	100
21-372-06XX**	Elective 6	EC	3	50	50	100
21-372-06XX**	Elective 7	EC	3	50	50	100
21-372-06XX**	Elective 8	EC	3	50	50	100
21-372-0603	Online Course(MOOC)****	CC	2	50	50	100
21-372-0604	Comprehensive Viva-Voce	CC	3	---	100	100
			Total	20		700
<i>**XX is the unique two digit number of the particular elective course from the list of elective courses</i>						

***Each student should carry out a summer project work in a company after the completion of fourth semester for a minimum period of six to eight weeks. The work shall be carried out during the summer break after the second semester examination under the supervision of a guide assigned by the department. The report of the summer project must be submitted at the end of the classes of the third semester by

following the guidelines issues by the department. Summer Project Mark will be reflected in the Fifth Semester Mark list

Evaluation of project work and awarding of pass/fail grade shall be made based on the submission of final report immediately after the completion of project work, presentation by the candidates followed by viva-voce, and the quality of final report. If a candidate failed in evaluation, he/she has to complete the project work and obtain pass grade along with next batch.

******Students should start the online MOOC course during the fifth semester and should complete all formalities before the end of the sixth semester. The grade will be counted as part of the sixth semester.**

9.4 Conduct of Online courses

Students should compulsory take one online course (MOOC) of minimum period of eight weeks as a two credit course and should complete all formalities before the end of the final semester. Students can select online course from Swayam, NTPL, MOOC courses (recognized by UGC), or CUSAT MOOC portal relevant to the MBA programme. Since, there are a wide variety of courses in online platforms which can be used for different programmes, careful evaluation of the course has to be done by the Institute/School so as to understand the suitability, content, number of credits, duration of the course, the method of evaluation and credit transfer.

The recommendations by the Institute/School council must be placed before the Academic Committee for approval. While selecting a course, care is to be given that it will not alter the total credit requirement of the programme and duration of the programme. The Institute/School must ensure that the required infrastructure facilities including laboratory, software etc. are available with the department/university. For selecting a course, prior permission is to be obtained from the Head of the Institute/School as per the decisions of Department Council and it must be obtained by the concerned Institute/school before permitting the students to opt for the same. The course fee/evaluation fee etc. (if required) is to be paid to the host institution by the student and it must be intimated to the parent Institute/School.

The Institute/School must designate one faculty for each course (online course coordinator) and this must be reported to the university before the commencement of the course. The online course coordinator is responsible to guide/supervise the students, keep attendance, conduct Lab sessions if required, conduct continuous evaluation and end semester examination in tune with university regulations.

The online course coordinator has to place the marks obtained by the students in continuous evaluation and for the end semester examination/ or the score received from the host institution before the passing board of the department. He/ she will have to liaison with the host institution, if required, and the head of the online course coordinator must give permission for the same. The communications sent and received must be marked to the HOD/Director.

Those students who are interested to be evaluated by the host institution; they may be permitted for it also. The credit so obtained can be used for finalizing the semester results. This must be intimated to the online course coordinator and the Director/HoD well in advance (at least within one month of the commencement of the course). To begin with the list of electives may be used for enabling students to take appropriate courses offered from the online platforms.

Full Time Students shall be encouraged the students to register for MOOC/ SWAYAM/ NPTEL Courses during the Second/third semester. Students should start the online MOOC course during the third semester and should complete all formalities before the end of the fourth semester. The grade will be counted as part of the fourth semester marks card.

Part Time Students shall be encouraged the students to register for MOOC/ SWAYAM/ NPTEL Courses during the fourth/fifth semester. Students should start the online MOOC course while in the Fifth semester and should complete all formalities before the end of the Sixth semester. The grade will be counted as part of the Sixth semester marks card.

1. SYLLABI OF ELECTIVES COURSES

CODE for the particular Elective Course : 21-37A-0BXX

Where A – stands for whether it offers to FT or PT. ‘1’ for FT and ‘2’ for PT

B – stands for the Semester No. in which it is offered

XX – stands for Unique Two digit No. for a particular elective

12.1 LIST OF ELECTIVE COURSES IN FINANCE AND ACCOUNTING MANAGEMENT

- 21.37A-0B11:** Security Analysis and Portfolio Management
- 21.37A-0B12:** International Finance
- 21.37A-0B13:** Working Capital Management
- 21.37A-0B14:** Management of Financial Services
- 21.37A-0B15:** Financial Derivatives and Risk Management
- 21.37A-0B16:** Corporate Restructuring
- 21.37A-0B17:** Financial Modelling
- 21.37A-0B18:** Analytics for Finance
- 21.37A-0B19:** Behavioural Finance
- 21.37A-0B20:** Project Management
- 21.37A-0B21:** Bank Financial Management
- 21.37A-0B22:** Fundamentals of Insurance

12.2 LIST OF ELECTIVE COURSES IN MARKETING MANAGEMENT

- 21.37A-0B26:** Consumer Behaviour
- 21.37A-0B27:** Integrated Marketing Communication
- 21.37A-0B28:** E-Commerce
- 21.37A-0B29:** Marketing Research
- 21.37A-0B30:** Strategic Marketing
- 21.37A-0B31:** International Marketing
- 21.37A-0B32:** Sales Management
- 21.37A-0B33:** Services Marketing
- 21.37A-0B34:** Brand and Product Management
- 21.37A-0B35:** Retail Management
- 21.37A-0B36:** Digital Marketing
- 21.37A-0B37:** Customer Relationship Management
- 21.37A-0B38:** Marketing Analytics

12.3 LIST OF ELECTIVE COURSES IN OB and HUMAN RESOURCE MANAGEMENT

- 21.37A-0B41:** Strategic Human Resource Management
- 21.37A-0B42:** Management of Industrial Relations
- 21.37A-0B43:** Training and Development
- 21.37A-0B44:** Global Human Resource Management
- 21.37A-0B45:** Compensation Management
- 21.37A-0B46:** Human Resource Planning and Development
- 21.37A-0B47:** Organisational Change and Development
- 21.37A-0B48:** Managing Interpersonal and Group Processes
- 21.37A-0B49:** Performance Management
- 21.37A-0B50:** HR Analytics
- 21.37A-0B51:** Diversity and Inclusion at Workplace
- 21.37A-0B52:** Gender and Leadership at the Workplace

12.4 LIST OF ELECTIVE COURSES IN PRODUCTION AND OPERATIONS MANAGEMENT

- 21.37A-0B20:** Project Management
- 21.37A-0B37:** Customer Relationship Management
- 21.37A-0B56:** Supply Chain Management
- 21.37A-0B57:** Purchasing and Materials Management
- 21.37A-0B58:** Quality Management
- 21.37A-0B59:** International Logistics Management
- 21.37A-0B60:** Service Operations Management
- 21.37A-0B61:** Simulation and Modelling
- 21.37A-0B62:** Enterprise Resource Planning
- 21.37A-0B63:** Supply Chain Analytics

12.5 LIST OF ELECTIVE COURSES IN INFORMATION TECHNOLOGY AND DATA ANALYTICS

- 21-37A-0B17:** Financial Modelling
- 21-37A-0B18:** Analytics for Finance
- 21.37A-0B28:** E-Commerce
- 21.37A-0B36:** Digital Marketing
- 21.37A-0B37:** Customer Relationship Management
- 21-37A-0B38:** Marketing Analytics
- 21-37A-0B50:** HR Analytics
- 21.37A-0B61:** Simulation and Modelling
- 21.37A-0B62:** Enterprise Resource Planning
- 21-37A-0B63:** Supply Chain Analytics
- 21-37A-0B64:** Agile Project Management
- 21.37A-0B69:** Strategic Management of Information Technology
- 21.37A-0B70:** Data Base Management Systems
- 21.37A-0B71:** Business Process Reengineering
- 21.37A-0B72:** System Analysis and Design
- 21.37A-0B73:** Technical Foundation for E-Business
- 21.37A-0B74:** Data Mining for Business Intelligence
- 21.37A-0B75:** Advanced Data Analytics for Business Decisions
- 21.37A-0B76:** Technology Management
- 21-37A-0B91:** Data Science using R and Python
- 21-37A-0B92:** Artificial Intelligence for Business
- 21-37A-0B93:** Data Visualization Techniques
- 21-37A-0B94:** Text Mining and Analytics

12.6 LIST OF ELECTIVES COURSES IN INTERNATIONAL BUSINESS MANAGEMNET

- 21.37A-0B12:** International Finance
- 21.37A-0B31:** International Marketing

21.37A-0B44: Global Human Resource Management

21.37A-0B56: Supply Chain Management

21.37A-0B59: International Logistics Management

21.37A-0B62: Enterprise Resource Planning

21.37A-0B81: Export Import Policies and Procedures

12.7 LIST OF ELECTIVE COURSES IN GENERAL MANAGEMENT AREA

21.37A-0B85: Technology Innovation and Entrepreneurship

21.37A-0B86: Corporate Social Responsibility

21.37A-0B87: Management of NGOs

21.37A-0B88: Management Consulting

DETAILS OF FACULTY

Sl.No.	Name	Designation	Specilisation	Mobile No.	Email ID
1	Dr. Jagathy Raj V. P	Director & Senior Professor	Systems and Operations Management - Logistics, Supply Chain Management, IT Applications in Business and Management, ERP,MIS, Engineering and Technology Management.	9847220016	jagathy@cusat.ac.in
2	Dr. M. Bhasi	Senior Professor	Logistics, Quality, Safety & Crisis Management	9447419863	mbhasi@gmail.com

3	Dr. D. Mavoothu	Professor	HRM and Business Ethics	9400076884	mavoothu@gmail.com
4	Dr. Rajitha Kumar S.	Professor	General Management, Finance Management & Accounting	9400019611	rajithakumar@cusat.ac.in
5	Dr. Zakkariya K. A	Professor	Organisational Behaviour, Marketing, & Sales Management, Managerial Skills Development	9846554444	zakkariya@gmail.com
6	Dr. Sam Thomas	Professor	Systems and operation management , project management , Quantitative Techniques & Finance	9846152127	sam@cusat.ac.in
7	Dr. Santhosh Kumar S	Professor	Finance & Accounting , Production management	9446041325	drsanstpeters@gmail.com
8	Dr. Manoj Edward	Professor	Operations and Service Management	9846280535	manojedw@gmail.com
9	Dr. Renjini D	Associate Professor	Human Resource and Marketing	9895888599	renjinidas@yahoo.com

10	Dr.Devi Soumyaja	Assistant Professor	Organisational behavior & HRM	9972309166	devisoumyaja@gmail.com
11	Dr. Smarty P Mukundan	Associate Professor	Human Resource Management	9249940415	Smarty123@cuat.ac.in
12	Dr. Fezeena Khadir	Associate Professor	Marketing	9847470230	fezeena@cusat.ac.in
13	Dr. Nisa James	Assistant Professor	PGDM Operations Systems & Marketing	9656808654	nisajames@cusat.ac.in
14	Dr. Sangeetha K. Prathap	Associate Professor	Management, Banking, Financial Services, Financial Management	9995775239	sangeethakprathap@gmail.com
15	Dr. Manu Melwin Joy	Assistant Professor	Production Management, Human Resource Management. Gamification	9744551114	manu_melwinjoy@yahoo.com
16	Dr.Remya Ramachandran	Assistant Professor	Capital Marketing, Finance & Accounting	9446035607	remya.rc2323@gmail.com
17	Dr. Rakesh Krishnan M	Associate Professor	General Management, Finance Management & Accounting	9447700081	mrakeshkrishnan@gmail.com
18	Mr.Lithin Thomas	Assistant Professor	Production & Operations Management	9645784323	lithinthomas@cusat.ac.in

19	Dr. Meera Prathapan	Assistant Professor	Marketing Management, Tourism Management	8943284573	meeraprathapan@gmail.com
20	Dr. Daly Paulose Meppurath	Assistant Professor	Marketing Management	9898212897	dalypaulose@cusat.ac.in
21	Dr. Nimitha Aboobaker	Assistant Professor	Information systems and HRM	94977732021	nimis540@gmail.com
22	Dr. Smiju I S	Assistant Professor	IT & Information systems	9495230636	drsmiju@gmail.com

FACULTY OF TECHNOLOGY

Dean:

**Dr. M Kailasnath
Professor
International School of Photonics
CUSAT, Kochi-22**

DEPARTMENT OF COMPUTER APPLICATIONS
M.SC. COMPUTER SCIENCE WITH SPECIALIZATION IN
ARTIFICIAL INTELLIGENCE

Course Structure (2023 admission onwards)

SEMESTER I

Course Code	Course	C/E	Credit	Marks		
				CA	ES	Total
23-344-0101	Mathematics for Artificial Intelligence	C	4	50	50	100
23-344-0102	Python Programming	C	4	50	50	100
23-344-0103	Data Structures and Algorithms	C	4	50	50	100
23-344-0104	Statistics for Artificial Intelligence	C	4	50	50	100
23-344-0105	Advanced Computer Networks	C	4	50	50	100
23-344-0106	Python Programming Lab	C	2	50	50	100
23-344-0107	Data Structure Lab using C	C	2	50	50	100
			24			

SEMESTER II

Course Code	Course	C/E	Credit	Marks		
				CA	ES	Total
23-344-0201	Computing Paradigms	C	4	50	50	100
23-344-0202	Advanced Database Technologies	C	4	50	50	100
23-344-0203	Ethics in Artificial Intelligence	C	4	50	50	100
23-344-0204	Artificial Intelligence and Machine Learning	C	4	50	50	100
	Elective I	E	3	50	50	100
23-344-0206	Data Management Lab	C	2	50	50	100
23-344-0207	Minor Project		2	50		50
			23			

SEMESTER III

Course Code	Course	C/E	Credit	Marks		
				CA	ES	Total
23-344-0301	Deep Learning	C	4	50	50	100
	Elective II / MOOC I	E	3	50	50	100
	Elective III / MOOC II	E	3	50	50	100
	Elective IV / MOOC III	E	3	50	50	100
	Elective V(IE)	E	3	50	50	100
23-344-0306	Seminar	C	2	50		50
23-344-0307	Minor Project	C	2	50		50
	Total		20			

SEMESTER IV

Course Code	Course	C/E	Credit	Marks		
				CA	ES	Total
23-344-0401	Internship/Project Work and Course Viva	C	16	50	50	100
	Total		16			

List of Electives

Elective I

- 23-344-0211 Fuzzy and Nature Inspired Computation
- 23-344-0212 Internet of Things
- 23-344-0213 Digital Image Processing
- 23-344-0214 Big Data Analytics
- 23-344-0215 Information Security
- 23-344-0216 Linux and Shell Programming

Elective II

- 23-344-0311 Reinforcement Learning
- 23-344-0312 Blockchain Technology
- 23-344-0313 Computer Vision
- 23-344-0314 Medical Image Analysis
- 23-344-0315 Social Network Analysis
- 23-344-0316 Computer Forensics
- 23-344-0317 Design Thinking

Elective III

- 23-344-0318 Explainable Artificial Intelligence
- 23-344-0319 Quantum Computing
- 23-344-0320 Human Computer Interaction
- 23-344-0321 Natural Language Processing
- 23-344-0322 Pattern Recognition
- 23-344-0323 Data Analytics for Healthcare
- 23-344-0324 Ethical Hacking
- 23-344-0325 Software Quality Assurance

Elective IV

- 23-344-0326 Affective Computing
- 23-344-0327 Cyber Physical Systems
- 23-344-0328 Bioinformatics
- 23-344-0329 Speech Processing
- 23-344-0330 Virtual Reality and Augmented Reality
- 23-344-0331 Mobile Application Development

MOOC

- 23-344-0332 MOOC I
- 23-344-0333 MOOC II
- 23-344-0334 MOOC III

M.SC. COMPUTER SCIENCE WITH SPECIALIZATION IN DATA SCIENCE

Course Structure (2022 admission onwards)

SEMESTER I

Course Code	Paper	C/E	C	Marks		
				Sessional	Final	
22-359-0101	Statistical Foundations for Data Science	C	4	50	50	100
22-359-0102	Operating System Concepts	C	4	50	50	100
22-359-0103	Data Structures and Algorithms	C	4	50	50	100
22-359-0104	Python for Data Analytics	C	4	50	50	100
22-359-0105	Mathematics for Machine Learning	C	4	50	50	100
22-359-0106	Python Programming LAB	C	2	50		50
22-359-0107	Data Structure and Algorithms LAB	C	2	50		50
			24			

SEMESTER II

Course Code	Paper	C/E	Credit	Marks		Total
				Sessional	Final	
22-359-0201	Networks and Data Communications	C	4	50	50	100
22-359-0202	Database Management Systems	C	4	50	50	100
22-359-0203	R for Data Analytics	C	4	50	50	100
22-359-0204	Machine Learning	C	4	50	50	100
	Elective I	E	4	50	50	100
22-359-0206	Data Analytics LAB (ML and R)	C	2	50		50
22-359-0207	Mini Project	C	2	50		50
			24			

SEMESTER III

Course Code	Paper	C/E	Credit	Marks		
				Sessional	Final	Total
22-359-0301	Deep Learning	C	4	50	50	100
	Elective II	E	4	50	50	100
	Elective III	E	4	50	50	100
	Elective IV	E	4	50	50	100
	Elective V (IE*)	E	3	50	50	100
22-359-306	Seminar	C	1	50		50
22-359-307	Mini Project	C	2	50		50
			22			

***IE - Interdisciplinary Elective**

SEMESTER IV

Course Code	Paper	C/E	Credit	Marks		
				Sessional	Final	Total
22-359-0401	Internship/Project Work	C	16	200	200	400

LIST OF ELECTIVES

Elective I

- 22-359-0211 Block chain Technology
- 22-359-0212 Digital Image Processing
- 22-359-0213 Natural Language Processing (MOOC)
- 22-359-0214 Cryptography and Network Security

Elective II

- 22-359-0311 Explainable Artificial Intelligence
- 22-359-0312 Software Project Management
- 22-359-0313 Network Security Essentials
- 22-359-0314 Cloud Computing (MOOC)

Elective III

22-359-0321 Big Data Analytics

22-359-0322 Cyber Forensics

22-359-0323 Computer Vision

22-359-0324 Social Network Analysis (MOOC)

Elective IV

22-359-0331 Internet of Things

22-359-0332 Android Application Programming

22-359-0333 Virtualization and Containers

22-359-0334 Software Testing (MOOC)

MASTER OF COMPUTER APPLICATIONS
Course Structure (2022 admission onwards)

SEMESTER I	Subject	C/E	Credit	Sessio nal	Final	Total
22-382-0101	Mathematical Foundations for Computing	C	4	50	50	100
22-382-0102	Data Structures and Algorithm using C	C	4	50	50	100
22-382-0103	Digital Fundamentals and Computer Architecture	C	4	50	50	100
22-382-0104	Software Engineering	C	4	50	50	100
22-382-0105	Python Programming	C	4	50	50	100
22-382-0106	Data Structures Lab	C	2	50	50	100
22-382-0107	Python Programming Lab	C	2	50	50	100
	TOTAL		24			

SEMESTER II	Subject		Credit			
22-382-0201	Computer Networks	C	4	50	50	100
22-382-0202	Operating Systems	C	4	50	50	100
22-382-0203	Machine Learning	C	4	50	50	100
22-382-0204	Object Oriented Programming	C	4	50	50	100
22-382-0205	Database Management Systems	C	4	50	50	100
22-382-0206	Java Lab (OOPS)	C	2	50	50	100
22-382-0207	Database Management Systems Lab	C	2	50	50	100
	TOTAL		24			
SEMESTER III	Subject		Credit			
22-382-0301	Web Technologies and Programming	C	4	50	50	100
22-382-0302	Cryptography and Network Security	C	4	50	50	100
	Elective 1(Online course/interdisciplinary elective course/Industry based course)	E	4	50	50	100
	Elective 2	E	4	50	50	100
	Elective 3	E	4	50	50	100
22-382-0303	Mini Project	C	4	50		50
	TOTAL		24			

SEMESTER IV	Subject		Credit			
22-382-0401	Internship/Project	C	16	200	200	400

ELECTIVES:

Subject Code	Subject
	Elective 1
22-382-0311	Network Security Essentials
22-382-0312	Digital Image Processing
22-382-0313	Cloud Computing (MOOC)
22-382-0314	Theory Of Computation (MOOC)
22-382-0315	Software Project Management
22-382-0316	Soft Computing Techniques
	Elective 2
22-382-0321	Cyber Forensic
22-382-0322	Android Application Programming
22-382-0323	Deep Learning
22-382-0324	Big Data Analytics
22-382-0326	Semantic web
22-382-0327	Computer Vision
22-382-0328	Software Testing (MOOC)
	Elective 3
22-382-0331	Natural Language Processing (MOOC)
22-382-0332	Internet of Things
22-382-0333	Explainable AI
22-382-0334	Bioinformatics (MOOC)
22-382-0335	Blockchain Technology

22-382-0336	Social Network Analysis (MOOC)
22-382-0337	Malware Analysis
22-382-0338	Design Thinking

Details of Faculty

Sl. No.	Name & Designation	Specialisation	Communication
1	Dr. M. V. Judy Professor & Head	Big Data Analytics Data mining	0484-2576253 (O) 9048991368 (M) <i>judy.nair@gmail.com</i> <i>judy_nair@yahoo.com</i>
2	Dr. Sabu M. K. Professor	Artificial Intelligence Data Mining Soft Computing	0484-2576253/2577602 (O) 0484- 2947861 (R) 9446128197 (M) <i>sabumk@cusat.ac.in</i> <i>sabu.mes@gmail.com</i>
3	Dr. Vinod P. Professor	Information Security Malware Analysis Deep Learning	0484-2576253 (O) 9497179735(M) <i>vinod.p@cusat.ac.in</i>
4	Dr. Vishnukumar S. Associate Professor	Image Processing Machine Learning Deep Learning	0484-2862826 (O) 9497359253(M) <i>vks@cusat.ac.in</i>
5	Dr. Malathi S. Assistant Professor	Software Engineering	0484-2576253 (O) 9495968765 (M) <i>malathi_s@cusat.ac.in</i>
6	Dr. Rafidha Rehiman K. A. Assistant Professor	Cryptography Network Security	0484-2576253 (O) 9947142132(M) <i>rafidharehimanka@gmail.com</i>
7	Dr. Deepika M. P. Assistant Professor	Data Security Number Theory Software Engineering	0484-2576253 (O) 9400874404(M) <i>deepika.mp@cusat.ac.in</i>
8	Dr. Arun K. S. Assistant Professor	Image Processing Computer Vision	0484-2576253 (O) 9400874404(M) <i>arunks@cusat.ac.in</i>

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME STRUCTURE AND SYLLABUS (2021 ADMISSIONS)							
M.SC. (FIVE YEAR INTEGRATED) IN COMPUTER SCIENCE (ARTIFICIAL INTELLIGENCE & DATA SCIENCE)							
Semester - I							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0101	Mathematics for Data Science	C	4	4	1	100
2	21-805-0102	Communicative English	C	3	3	1	100
3	21-805-0103	Object Oriented Programming	C	4	4	0	100
4	21-805-0104	Computational Thinking for Problem Solving	C	4	4	1	100
5	21-805-0105	Environmental Studies	C	3	3	1	100
6	21-805-0106	Lab 1 - Python Programming Lab	C	1	0	4	100
7	21-805-0107	Lab 2 - C++ Programming Lab	C	1	0	4	100
Total for Semester I				20	18	12	700
Semester - II							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0201	Linear Algebra	C	4	4	1	100
2	21-805-0202	Data Structures	C	4	4	1	100
3	21-805-0203	Introduction to Artificial Intelligence	C	4	4	1	100
4	21-805-0204	Operating Systems	C	3	3	1	100
5	21-805-0205	Java Programming	C	3	3	0	100

6	21-805-0206	Lab 3 - Data Structures Lab	C	1	0	4	100
7	21-805-0207	Lab 4 - Java Programming Lab	C	1	0	4	100
Total for Semester II				20	18	12	700
Semester - III							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0301	Design & Analysis of Algorithms	C	4	4	1	100
2	21-805-0302	Probability and Statistics for Data Science	C	4	4	1	100
3	21-805-0303	Mathematics for Machine Learning	C	4	4	1	100
4	21-805-0304	Database Systems	C	3	3	0	100
5	21-805-0305	Theory of Computation	C	3	3	1	100
6	21-805-0306	Lab 5 - Algorithms Lab	C	1	0	4	100
7	21-805-0307	Lab 6 - Database Systems Lab	C	1	0	4	100
Total for Semester III				20	18	12	700
Semester - IV							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0401	Foundations of Data Science	C	4	4	1	100
2	21-805-0402	Numerical Methods	C	4	4	1	100
3	21-805-0403	Digital Signal Processing	C	4	4	0	100
4	21-805-0404	Agile Software Engineering	C	3	3	1	100

5	21-805-0405	Optimization Techniques	C	3	3	1	100
6	21-805-0406	Lab 7 - Numerical Methods Lab	C	1	0	4	100
7	21-805-0407	Lab 8 - Optimization Techniques Lab	C	1	0	4	100
Total for Semester IV				20	18	12	700
Semester - V							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0501	Regression Analysis	C	4	4	1	100
2	21-805-0502	Big Data Analytics	C	4	4	1	100
3	21-805-0503	Cloud Computing	C	4	4	1	100
4	21-805-0504	R for Data Science	C	3	3	0	100
5	21-805-0505	Number Theory and Cryptography	C	3	3	1	100
6	21-805-0506	Lab 9 - R for Data Science Lab	C	1	0	4	100
7	21-805-0507	Lab 10 - Data Analytics Lab	C	1	0	4	100
Total for Semester V				20	18	12	700
Semester - VI							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0601	Inferential Statistics	C	4	4	0	100
2	21-805-0602	Machine Learning Algorithms	C	4	4	0	100
3	21-805-0603	Feature Engineering	C	4	4	1	100
4	21-805-0604	Soft Computing Techniques	C	3	3	1	100

5	21-805-0605	Parallel Computing	C	3	3	0	100
6	21-805-0606	Lab 11 - Machine Learning and Parallel Computing Lab	C	1	0	4	100
7	21-805-0607	Project	C	1	0	6	100
Total for Semester VI				20	18	12	700
Semester - VII							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0701	Computational Linguistics	C	4	4	1	100
2	21-805-0702	Digital Image and Video Processing	C	4	4	1	100
3	21-805-0703	Deep Learning	C	4	4	2	100
4	21-805-0704	Lab 12 - Computational Linguistics Lab	C	1	0	4	100
5	21-805-0705	Lab 13 - Image and Video Processing Lab	C	1	0	4	100
6		Elective - I	E	3	3	0	100
7		Elective - II	E	3	3	0	100
Total for Semester VII				20	18	12	700
Electives							
21-805-0706: Reinforcement Learning							
21-805-0707: Algorithmic Game Theory							
21-805-0708: Virtualized Systems							
21-805-0709: Advanced Optimization Techniques							
21-805-0710: Bioinformatics							
21-805-0711: Algorithms for Modern Data Models							
21-805-0712: Complex Network Analysis							
Semester - VIII							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0801	Computer Vision	C	4	4	1	100
2	21-805-0802	Probabilistic Graphical Models	C	4	4	1	100

3	21-805-0803	Algorithms for Massive Datasets	C	4	4	1	100
4	21-805-0804	Professional Communication	C	1	2	1	100
5	21-805-0805	Project	C	1	0	6	100
6		Elective - III	E	3	3	0	100
7		Elective - IV	E	3	3	0	100
Total for Semester VIII				20	20	10	700
Electives							
21-805-0806: Deep Learning for Computer Vision							
21-805-0807: Natural Language Processing with Deep Learning							
21-805-0808: Image and Video Coding							
21-805-0809: Functional Programming							
21-805-0810: Information Retrieval and Web Search							
21-805-0811: Human Computer Interaction							
21-805-0812: Cyber Physical Systems							
Semester - IX							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-0901	Research Methodology	C	2	3	0	100
2	21-805-0902	Project & Viva Voce	C	12	0	16	300
3	21-805-0903	Elective - V*	E	2	3	2	100
Total for Semester IX				16	6	18	500
* Students can choose any of the MOOC courses approved by the Department Council. The approved MOOC courses will be numbered as 21-805-0903-M1, 21-805-0903-M2, etc.							
Semester - X							
Sl. No.	Course code	Course Title	C/E	Cr	Lr	L/T	M
1	21-805-1001	Project & Viva Voce	C	16	0	20	500
Total for Semester X				16	0	20	500
Total credits for Degree: 192				Total Marks			6600

**M. TECH. COMPUTER SCIENCE & ENGINEERING WITH
SPECIALIZATION IN DATA SCIENCE & ARTIFICIAL
INTELLIGENCE**

Semester - I

Sl. No.	Course code	Course Title	Core	Credits	Lec	Lab/ Tutoria 1	Marks
			/Elective				
1	21-479-0101	Mathematical Concepts for Computer Science	C	4	4	2	100
2	21-479-0102	Machine Learning Algorithms	C	4	4	3	100
3	21-479-0103	Design and Analysis of Algorithms	C	4	4	3	100
4	-	Elective I	E	3	4	1	100
5	-	Elective II	E	3	4	1	100
Total for Semester I				18	20	10	500

- Electives
- 21-479-0104: Virtualized Systems
 - 21-479-0105: Computational Linguistics
 - 21-479-0106: Advanced Optimization Techniques
 - 21-479-0107: Algorithms for Modern Data Models
 - 21-479-0108: Digital Image and Video Processing
 - 21-479-0109: Mathematics for Machine Learning
 - 21-479-0110: Number Theory and Cryptography

Semester - II

1	21-479-0201	Algorithms for Massive Datasets	C	4	4	2	100
2	21-479-0202	Probabilistic Graphical Models	C	4	4	2	100
3	21-479-0203	Seminar	C	1		3	50
4	-	Elective III	E	3	4	1	100
5	-	Elective IV	E	3	4	1	100
6	-	Elective V	E	3	4	1	100
Total for Semester II				18	20	10	550

- Electives
- 21-479-0204: Bioinformatics
 - 21-479-0205: Programming Massively Parallel Processors
 - 21-479-0206: Deep Learning
 - 21-479-0207: Modelling Cyber Physical Systems
 - 21-479-0208: Algorithmic Game Theory
 - 21-479-0209: Deep Learning for Computer Vision

21-479-0210: Image and Video Coding							
21-479-0211: Reinforcement Learning							
21-479-0212: Natural Language Processing with Deep Learning							
Semester - III							
1	21-479-0301	Elective - VI	E	2	0	10	50
2	21-479-0302	Project & Viva Voce	C	16	0	20	350
Total for Semester II				18	0	30	400
Semester - IV							
1	21-479-0401	Project & Viva Voce	C	18	0	30	500
Total credits for Degree: 72							

M. TECH. COMPUTER SCIENCE AND ENGINEERING ARTIFICIAL INTELLIGENCE AND SOFTWARE ENGINEERING							
Semester - I							
Sl. No.	Course code	Course Title	Core/ Elective	Credits	Lec.	Lab/ Tutorial	Marks
1	21-480-0101	Mathematical Concepts for Computer Science	C	4	4	2	100
2	21-480-0102	Machine Learning Algorithms	C	4	4	3	100
3	21-480-0103	Design and Analysis of Algorithms	C	4	4	3	100
5	-	Elective I	E	3	4	1	100
6	-	Elective II	E	3	4	1	100
Total for Semester I				18	20	10	500
Electives							
21-480-0104: Artificial Intelligence							
21-480-0105: Human Computer Interaction							
21-480-0106: Information Retrieval and Web search							
21-480-0107: Functional Programming							
21-480-0108: Software Quality Management							
21-480-0109: Design and security of Internet of Things							
21-480-0110: Quantum Computing							

Semester - II							
Sl. No.	Course code	Course Title	Core/ Elective	Credits	Lec.	Lab/ Tutorial	Marks
1	21-480-0201	Big Data Analytics	C	4	4	2	100
2	21-480-0202	Agile Software Engineering	C	4	4	2	100
3	21-480-0203	Seminar	C	1	0	3	50
4	-	Elective III	E	3	4	1	100
5	-	Elective IV	E	3	4	1	100
6	-	Elective V	E	3	4	1	100
Total for Semester II				18	20	10	550
Electives							
21-480-0204: Software Architecture							
21-480-0205: Software Agent Systems							
21-480-0206: Enterprise Application Integration and Business Process Management							
21-480-0207: Advanced Data Mining							
21-480-0208: Fuzzy Set Theory: Foundations and Applications							
21-480-0209: Complex Networks: Theory and Applications							
21-480-0210: Advances in Databases							
21-480-0211: Blockchain Technology							
Semester - III							
1	21-480-0301	Elective VI	E	2	0	10	50
2	21-480-0302	Project & Viva Voce	C	16	0	20	350
Total for Semester III				18	0	30	400
Semester - IV							
1	21-480-0401	Project & Viva Voce	C	18	0	30	500
Total credits for Degree: 72							

Details of Faculty

Sl No	Name&Designation	Specialization	Communication (Contact Number&e-mail id)
1	Dr Philip Samuel, Professor	Object Oriented Modelling/Artificial Intelligence/Big Data	9495467252,philipcusat@gmail.com
2	Dr Santhosh Kumar G, Professor	Cyber Physical Systems/Computer Vision/NLP	9447305879,san@cusat.ac.in
3	Dr Madhu S Nair, Professor &HOD	Computer Vision/Image Processing/Machine Learning/Pattern Recognition	9447364158, mns@cusat.ac.in
4	Dr Bijoy Antony Jose, Associate Professor	Embedded Software, Cyber Physical Systems, Internet of Things.	9900634422,bijoyjose@cusat.ac.in
5	Mr K B Muralidharan, Asst Professor	Information Management, Software Engineering	9447708473, kbmuralidharan@gmail.com
6	Dr Jereesh A S , Asst Professor	Bioinformatics/Data mining/Image Processing	9495576665, jereesh@cusat.ac.in
7	Dr Shailesh S Assistant Professor	Artificial Intelligence & Machine Learning ,Computer Vision, Data Science, Quantum Computing	8907230664,shaileshsivan@cusat.ac.in
8	Dr. Jeena Kleenankandy	Artificial Intelligence, Deep learning, Natural Language Processing	9495995060, jeenakk@cusat.ac.in
9	Dr. Ajees A P	Artificial Intelligence, Machine Learning, Deep learning, Natural Language Processing	9061859697, ajeesap@cusat.ac.in

DEPARTMENT OF ELECTRONICS
M.TECH IN ELECTRONICS & COMMUNICATION ENGINEERING

Semester 1

Course code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-437-0101	Embedded Architecture and Interfacing	C	3	50	50	100
20-437-0102	Advanced Digital Communication	C	3	50	50	100
20-437-0103	Advanced Digital Signal Processing	C	3	50	50	100
20-437-0104	Embedded Systems Laboratory	C	1	100	0	100
	Elective-I(Specialization)	E	3	50	50	100
	Elective-Lab (Specialization)	E	1	100	0	100
	Elective-11(General)	E	3	50	50	100
	Elective-Lab(General)	E	1	100	0	100
Total			18			

Elective 1

Course Code	Course
VLSI and Embedded Systems	
20-437-0105	VLSI Technology and Design
20-437-0106	VLSI Laboratory
Microwave and Radar Engineering	
20-437-0107	Microwave Devices & Circuits Design
20-437-0108	Microwave Circuits Lab
Robotics and Inteligent Systems	
20-437-0109	Robotics and Automation
20-437-0110	Robotics Lab
General Electives	
20-437-0111	FPGA Based System Design
20-437-0112	FPGA Based System Design Lab
20-437-0113	Antenna Theory
20-437-0114	Antenna Design Lab
20-437-0115	Neural Networks
20-437-0116	Neural Networks Lab

Semester 11

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-437-0201	Seminar	C	1	100	0	100
20-437-0202	Image and Video Processing	C	3	50	50	100
20-437-0203	Wireless Communication Techniques	C	3	50	50	100
20-437-0204	Communications Laboratory	C	1	100	0	100
	Elective-III (Specialization)	E	3	50	50	100
	Elective-IV (Specialization)	E	3	50	50	100
	Elective-Lab (Specialization)	E	1	100	0	100
	Elective-V (General)	E	3	50	50	100
Total			18			

Elective 11

Course Code	Course
VLSI and Embedded Systems	
20-437-0205	Design Verification and Testing
20-437-0206	Design Verification Lab
20-437-0207	Real Time Operating Systems
20-437-0208	Real Time Operating Systems Lab
Microwave and Radar Engineering	
20-437-0209	Electromagnetic Interference and Compatibility
20-437-0210	EMI/EMC Lab
20-437-0211	Radar Systems
Robotics and Intelligent Systems	
20-437-0212	Mobile Robotics
20-437-0213	Mobile Robotics Lab
20-437-0214	Deep Neural Network Signal Processing
20-437-0215	Deep Neural Network Signal Processing Lab
General Electives	
20-437-0216	Machine Learning
20-437-0217	Analog Integrated Circuits
20-437-0218	Adaptive Signal Processing
20-437-0219	RFIC Design
20-437-0220	Signal Integrity for High-Speed Digital

	Design
20-437-0221	Advanced Electromagnetic Engineering
20-437-0222	Computational Electromagnetics
20-437-0223	Software Defined Radios

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-437-0301	Project Part 1	C	15	100	200	300
20-437-0302	NPTEL(minimum 8 weeks duration)/MOOC Course(with pre approval of Department)	E	3	0	100	100

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-437-0401	Project Part 2	C	18	100	200	300

Total credits for the course =18+18+18+18 = 72

M.Sc. (ELECTRONICS SCIENCE)

Semester 1

Course code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-305-0101	Electronic Circuits	C	4	50	50	100
20-305-0102	Signals & Systems	C	4	50	50	100
20-305-0103	Digital System Design	C	4	50	50	100
20-305-0104	RF & Microwave Technology	C	4	50	50	100
20-305-0105	Programming for Embedded Systems (Lab oriented)	C	4	100	0	100
20-305-0106	Electronic Circuits Lab	C	1	100	0	100
20-05-0107	Signals & Systems Lab	C	1	100	0	100
Total			22			

Semester 11

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-305-0201	Embedded System Design	C	4	50	50	100
20-305-0202	Control Systems	C	4	50	50	100
20-305-0203	Digital Signal Processing	C	4	50	50	100
20-305-0204	Seminar	C	1	100	0	100
20-305-0205	Embedded System Design Lab	C	1	100	0	100
20-305-0206	Control Systems Lab	C	1	100	0	100
	Elective I		3			
	Total credits		18			

Semester III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-305-0302	Project Part 1		0	0	100	100
20-305-0302	Communication Systems		4	50	50	100
20-305-0303	VLSI System Design	C	4	50	50	100
20-305-0304	Communications System	C	1	100	0	100
	Elective II		3	50	50	100
	Elective III		3	50	50	100
	Elective Lab		1	100	0	100
	Total credits		16			

Semester IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-305-0401	Project Part 2	C	13	100	200	300
	Elective IV		3	50	50	100
	Total Credits		16			

List of Electives

Course Code	Course
20-305-0X07	Machine Learning
20-305-0X08	Robotics Technology
20-305-0X09	Microwave Integrated Circuits
20-305-0X10	Data Structures
20-305-0X11	Computer Organisation
20-305-0X12	Wireless Communication
20-305-0X13	Computational Techniques
20-305-0X14	Microprocessors and Microcontrollers
20-305-0X15	Image Processing
20-305-0X16	Robotics and Intelligent Systems
20-305-0X17	Radar and Satallite Communication
20-305-0X18	Embedded Software and Real Time Systems

20-305-0X19	Antennas
20-305-0X20	Computer Architecture
20-305-0X21	Neural Networks
20-305-0X22	Machine Learning Lab
20-305-0X23	Robotics Technology Lab
20-305-0X24	Microwave Circuits Lab
20-305-0X25	Data Structures Lab
20-305-0X26	Image Processing Lab
20-305-0X27	Robotics and Intelligent Systems Lab
20-305-0X28	EM Radiation Lab
20-305-0X29	Embedded Software Lab
20-305-0X30	VLSI System Design Lab
20-305-0X31	MOOC/NPTEL Course

*Electives offered will be subject to availability of expertise in the field

X-Semester

Total credits - 72

Details of Faculty

Sl No.	Name & designation	Specialization	Communication (Contact No. & e-mail id)
1	Dr. Deepti Das Krishna (Assoc.Professor & Head in Charge)	Microwave communication, Communication systems Antennas and High frequency design	2971445 9846420928 (deeptidas@cusat.ac.in)
2	Dr. Supriya M H (Professor)	Signal processing, Network Analysis, Digital Electronics , Microprocessors, Embedded Systems, Data structures	2575471 9947379396 (supriyadoe@cusat.ac.in)
3	Arun A Balakrishnan (Asst.Professor)	Signal Processing	9496346370 (arunab@cusat.ac.in)
4	Mithun Haridas T P (Asst.Professor)	Embedded Systems	944709688 (mithuntp@cusat.ac.in)
5	Dr. Nalesh S (Asst. Professor)	VLSI, AI on Edge, Neuromorphic Computing, Reconfigurable Computing	9945673354 (nalesh@cusat.ac.in)
6	Dr. Tripti S Warriar (Asst. Professor)	VLSI, Computer Architecture,FPGA, VLSI Testing	9495585383 (tripti@cusat.ac.in)
7	Kumary V Y Vidhu (Asst. Professor)	Microwave & Television Engineering	0476 – 2851653 9645735550 (vyvidhu@cusat.ac.in)
8	Tessy Ninan (Asst.Professor)	VLSI & Embedded Systems	9496395375 (tessyninan@cusat.ac.in)

DEPARTMENT OF INSTRUMENTATION

M.Tech. INSTRUMENTATION TECHNOLOGY

SEMESTER I

Sl. No.	Course Code	Name of the Course	C/E	Credits	Marks		
					CA	ES	Total
1	21-473-0101	Intelligent Techniques in Instrumentation	C	3	50	50	100
2	21-473-0102	Advanced Sensor Technology	C	3	50	50	100
3	21-473-0103	Adaptive and Robust Control	C	4	50	50	100
4	21-473-0104	Sensor Technology Lab	C	1	50	-	50
5	21-473-0105	Control System and Computing Lab	C	1	50	-	50
6		Elective 1	E	3	50	50	100
7		Elective 2	E	3	50	50	100
				Total	18		600

List of Electives

Course Code	Course
21-473-0106	Advanced Digital Signal Processing
21-473-0107	Process Dynamics and Control
21-473-0108	Advanced Analytical Instruments
21-473-0109	Optimization Techniques
21-473-0110	Robotics and Automation
21-473-0111	Non Linear Control Systems
21-473-0112	Advanced Biomedical Instruments

SEMESTER II

Sl. No.	Course Code	Name of the Course	C/E	Credits	Marks		
					CA	ES	Total
1	21-473-0201	Multi Sensor Data Fusion	C	3	50	50	100
2	21-473-0202	Wireless Sensor Networks	C	3	50	50	100
3	21-473-0203	Seminar	C	1	50		50
4	21-473-0204	Soft Computing Lab	C	1	50		50
5	21-473-0205	Advanced Process Control Lab	C	1	50		50

6		Elective III	E	3	50	50	100
7		Elective IV	E	3	50	50	100
8		Elective V	E	3	50	50	100
Total				18			650

List of Electives

Course Code	Course
21-473-0206	Digital Image Processing
21-473-0207	Mechatronics
21-473-0208	MEMS and Microsystems
21-473-0209	Optoelectronics and Instrumentation
21-473-0210	Non Destructive Testing and Analysis
21-473-0211	Navigation Guidance and Control
21-473-0212	Embedded System Design
21-473-0213	Remote Sensing and Geographical Information Systems
21-473-0214	Internet of Things

SEMESTER III

Sl. No.	Course Code	Name of the Course	C/E	Credits	Marks		
					CA	ES	Total
1	21-473-0301	Open Elective I*	E	2	-	100	100
2	21-473-0302	Project Progress Evaluation	C	16	-	400	400
Total				18		500	500

SEMESTER IV

Sl. No.	Course Code	Name of the Course	C/E	Credits	Marks		
					CA	ES	Total
1	21-473-0401	Open Elective II*	E	2		100	100
2	21-473-0402	Project Dissertation Evaluation	C	16		400	400
Total				18		500	500

Total credits for the course = 18+18+18+18 = 72

B.Tech. INSTRUMENTATION AND CONTROL ENGINEERING

Semester I

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0101	Calculus	3	1	0	3	50	50	100
20-219-0102	Engineering Physics	3	1	0	3	50	50	100
20-219-0103	Basic Electronics	3	1	0	3	50	50	100
20-219-0104	Electrical Engineering – I	3	1	0	3	50	50	100
20-219-0105	Mechanical Engineering	3	1	0	3	50	50	100
20-219-0106	Soft Skill Development	1	1	0	1	100		100
	Practicals							
20-219-0107	Language Lab	0	0	1	1	50		50
20-219-0108	Engineering Graphics	1	0	3	2	100		100
20-219-0109	Electrical and Mechanical Workshop	0	0	3	1	50		50
	Total				20			800

Semester II

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0201	Linear Algebra and Transforms	3	1	0	3	50	50	100
20-219-0202	Engineering Chemistry	3	1	0	3	50	50	100
20-219-0203	Analog Electronics	3	1	0	3	50	50	100
20-219-0204	Electrical Engineering II	3	1	0	3	50	50	100
20-219-0205	Engineering Mechanics	3	1	0	3	50	50	100
20-219-0206	Materials Science	3	1	0	3	50	50	100
	Practicals							
20-219-0207	Computer Programming	1	1	1	2	100		100
20-219-0208	Basic Electronics Lab	0	0	3	1	100		100
	Total				21			800

Semester III

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0301	Complex Analysis and Partial differential Equations	3	1	0	3	50	50	100
20-219-0302	Electrical measurements and Instrumentation	3	1	0	3	50	50	100

20-219-0303	Digital electronics	3	1	0	3	50	50	100
20-219-0304	Linear Integrated Circuits	3	1	0	3	50	50	100
20-219-0305	Transducers - I	3	1	0	3	50	50	100
20-219-0306	Principles of measurements and Instrumentation	3	1	0	3	50	50	100
	Practicals							
20-219-0307	Analog Electronics Lab	0	0	3	1	100		100
20-219-0308	Electrical Machines Lab	0	0	3	1	100		100
	Total				20			800

Semester IV

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0401	Numerical and Statistical Methods	3	1	0	3	50	50	100
20-219-0402	Transducers – II	3	1	0	3	50	50	100
20-219-0403	Control Engineering – I	3	1	0	3	50	50	100
20-219-0404	Power Electronics	3	1	0	3	50	50	100
20-219-0405	Pneumatic and Hydraulic System	3	1	0	3	50	50	100
20-219-0406	Signals and Systems	3	1	0	3	50	50	100
	Practicals							
20-219-0407	Digital Electronics Lab	0	0	3	1	100		100
20-219-0408	Material Science Lab	0	0	3	1	100		100
	Total				20			800

Semester V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0501	Control Engineering II	3	1	0	3	50	50	100
20-219-0502	Digital Signal Processing	3	1	0	3	50	50	100
20-219-0503	Microprocessors & microcontrollers	3	1	0	3	50	50	100
20-219-0504	Analytical Instruments	3	1	0	3	50	50	100
20-219-0505	Engineering Management	3	1	0	3	50	50	100
20-219-05**	Elective – I	0	0	3	1	50	50	100
	Practicals							
20-219-0506	Control System Lab	3	1	0	3	100		100
20-219-0507	Transducers and Industrial Instrumentation Lab	0	0	3	1	100		100
	Total				20			800

Semester VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0601	Vacuum and Cryogenic Instrumentation	3	1	0	3	50	50	100
20-219-0602	Embedded Systems	3	1	0	3	50	50	100
20-219-0603	Process Control	3	1	0	3	50	50	100
20-219-0604	Optoelectronic Instrumentation	3	1	0	3	50	50	100
20-219-06**	Elective – II	3	1	0	3	50	50	100
20-219-06**	Industry Elective	2	1	0	2	50	50	100
	Practicals							
20-219-0605	Microprocessor and Microcontroller Lab	0	0	3	1	100		100
20-219-0606	Virtual Instrumentation Lab.	0	0	3	1	100		100
20-219-0607	Seminar	1	0	0	1	50		50
	Total				20			850

Semester VII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0701	Biomedical Instrumentation	3	1	0	3	50	50	100
20-219-0702	Advanced Process control	3	1	0	3	50	50	100
20-219-0703	Power Plant & Industrial Instrumentation	3	1	0	3	50	50	100
20-219-0704	Communication Systems and Telemetry	3	1	0	3	50	50	100
20-219-0705	Robotics and automation	3	1	0	3	50	50	100
20-219-07**	Elective – III	3	1	0	3	50	50	100
	Practicals							
20-219-0706	Process Control Lab	0	0	3	1	100		100
20-219-0707	Digital Signal Processing Lab	0	0	3	1	100		100
20-219-0708	Mini project	0	0	0	1	50		50
	Total				21			850

Semester VIII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-219-0801	Project Work	-	-	-	10	300		300
20-219-0802	Viva-Voce	-	-	-	2	100		100
20-219-08**	Open Course 1	-	-	-	2			100
20-219-08**	Open Course 2	-	-	-	2			100
20-219-08**	Open Course 3	-	-	-	2			100
	Total				18			700

DETAILS OF FACULTY

Sl. No.	Name & Designation	Specialization	Communication
1.	Dr. Reju V.G Associate Professor (LWA)	Digital Signal Processing	reju@cusat.ac.in 7558065958
2.	Dr. PankajSagar Assistant Professor & Head	Cryogenic Instrumentation	<u>pankajs@cusat.ac.in</u> 9611366896
3.	Sri. Ratheesh P.M, Assistant Professor	Signal/Image Processing	ratheeshpm@cusat.ac.in <u>9447634188</u>
4	Dr.Suraj Assistant Professor	Robotics & Control	surajdamodaran@cusat.ac.in 9447418668
5	Sri.Anurath M. S Assistant Professor	Electronics Hardware Design	anurathms@cusat.ac.in 8281348453
6.	Dr. Johney Isaac, Adjunct Professor	Control Systems	johney@cusat.ac.in 8281535741
7.	Smt. Soni P Assistant Professor (on contract)	Applied Electronics and Embedded Systems	<u>sonip@cusat.ac.in</u> 9446869524
8.	Dr. Nimmy John T Assistant Professor (on contract)	Electronics and Instrumentation	<u>nimmyjohnt@cusat.ac.in</u> 9495565981
9	Dr. Anju Sunny Assistant Professor (on contract)	Process Simulation & Control	anjusunny@cusat.ac.in 8547919496
10	Sri. Kiran Babu Assistant Professor (on contract)	Signal Processing	kiran@cusat.ac.in 9946445040

DEPARTMENT OF POLYMER SCIENCE AND RUBBER TECHNOLOGY**B.TECH. POLYMER SCIENCE AND ENGINEERING****SEMESTER I**

Course Code	Subject	L	T	P	Credits	Marks		
						Internal	External	Total
20-214-0101	Engineering Mathematics I	2	1	0	3	50	50	100
20-214-0102	Engineering Physics	2	1	0	3	50	50	100
20-214-0103	Engineering Chemistry	2	1	0	3	50	50	100
20-214-0104	Engineering Graphics	1	2	0	3	50	50	100
20-214-0105	Basic Electrical Engineering and Electronics	2	1	0	3	50	50	100
20-214-0106	Soft Skill Development	2	0	0	2	50	50	100
20-214-0111	Introduction to Industrial Chemical Analysis	0	0	2	1	50	0	50
20-214-0112	Basic Electrical Engineering and Electronics	0	0	2	1	50	0	50
20-214-0113	Language Lab	0	0	2	1	50	0	50
20-214-0131	Semiar (Non-Credit)	0	0	3	-			
20-214-0135	Library (Non-Credit)	0	0	4	-			

Elective I – Nil

SEMESTER II

Course Code	Subject	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0201	Engineering Mathematics II	2	1	0	3	50	50	100
20-214-0202	Engineering Mechanics	2	1	0	3	50	50	100
20-214-0203	Environmental Studies	3	0	0	3	50	50	100
20-214-0204	Mechanical Engineering	2	1	0	3	50	50	100

20-214-205	Introduction to Macromolecular Science and Engineering	3	0	0	3	50	50	100
20-214-206	Fluid Mechanics	2	1	0	3	50	50	100
20-214-0211	Mechanical Engineering Workshop	0	0	3	1	50	0	50
20-214-0212	Polymer Synthesis	0	0	2	1	50	0	50
20-214-0231	Seminar (Non-Credit)	0	0	3	-			
20-214-0235	Library(Non-Credit)	0	0	4	-			

Elective II - Nil

SEMESTER III

Course Code	Subject	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0301	Engineering Mathematics III	2	1	0	3	50	50	100
20-214-0302	Natural Rubber Production and Technology	3	0	0	3	50	50	100
20-214-0303	Strength of Materials	2	1	0	3	50	50	100
20-214-0304	Heat and Mass Transfer	2	1	0	3	50	50	100
20-214-0305	Organic Chemistry	3	0	0	3	50	50	100
20-214-0311	Computer Programming	2	0	3	3	100		100
20-214-0312	Identification of Polymers	0	0	2	1	50	0	50
20-214-0313	Chemical Engineering Lab	0	0	2	1	50	0	50
20-214-0331	Seminar(Non-Credit)	0	0	3				
20-214-0335	Library(Non-Credit)	0	0	3				

Elective III - Nil

SEMESTER IV

Course Code	Subject	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0401	Applied Statistics	2	1	0	3	50	50	100
20-214-0402	Quality Management Systems and Safety	3	0	0	3	50	50	100
20-214-0403	Polymer Synthesis and Manufacture	3	0	0	3	50	50	100

20-214-0404	Science and Engineering of Rubbers	3	0	0	3	50	50	100
20-214-0405	Plastic Materials	3	0	0	3	50	50	100
20-214-0406	Universal Human Values	3	0	0	3	50	0	50
20-214-0406	Review Seminar	0	4	0	1	100	0	100
20-214-0411	Polymer Synthesis, Modification and characterization	0	0	4	2	50	0	50
20-214-0432	Seminar	0	0	3	1	30		30
20-214-0435	Library (Non-Credit)	0	0	4	-			

Elective IV - Nil

SEMESTER V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0501	Plastics Processing	3	0	0	3	50	50	100
20-214-0502	Polymer Physics	3	0	0	3	50	50	100
20-214-0503	Rubber Processing and Products Manufacture	3	0	0	3	50	50	100
20-214-0504	Fiber Science and Technology	3	0	0	3	50	50	100
20-214-0521-23	Elective I	3	0	0	3	50	50	100
20-214-0524-26	Elective ii	3	0	0	3	50	50	100
20-214-0511	Polymer Characterization and Properties	0	0	2	1	50	50	50
20-214-0512	Polymer Processing Lab	0	0	3	1	50	50	50
20-214-0531	Seminar	0	0	3	1	30	0	30
20-214-0535	Library(Non-Credit)	0	0	4	-			

SEMESTER VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0601	Latex Technology	3	0	0	3	50	50	100
20-214-0602	Characterisation and Testing Methods	3	0	0	3	50	50	100
20-214-0603	Polymer Products Design	3	0	0	3	50	50	100

20-214-0604	Polymer Rheology	3	0	0	3	50	50	100
20-214-0621-23	Elective iii	3	0	0	3	50	50	100
20-214-0624-26	Elective iv	3	0	0	3	50	50	100
20-214-0605	Minor Project	0	0	3	1	100	0	100
20-214-0611	Latex Technology Practical	0	0	2	1	100	0	100
20-214-0631	Seminar	0	0	3	1	30		30
20-214-0635	Library(Non-Credit)	0	0	4	-			

SEMESTER VII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0701	Polymer Composites and Blends	3	0	0	3	50	50	100
20-214-0702	Introduction to Mould and Design	3	0	0	3	50	50	100
20-214-0703	Failure Analysis of Polymers	3	0	0	3	50	50	100
20-214-0704	Industrial Management	3	0	0	3	50	50	100
20-214-0721-23	Elective V	3	0	0	3	50	50	100
20-214-0724-26	Elective Vi	3	0	0	3	50	50	100
20-214-0711	Polymer Products Testing	0	0	2	1	50	0	50
20-214-0731	Review paper based on Elective	0	0	4	1	60	0	60
20-214-0732	Soft Skill/start up workshop (Non-Credit)			3				
20-214-0735	Library (Non-Credit)			3				

SEMESTER VIII

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
20-214-0841	Project Work Report and Viva Voce	0	0	22	12	200	200	400
20-214-0842	Industrial Training	0	0	4	3	50	50	100
20-214-0861	Open Elective I	2	0	0	2		50	50
20-214-0862	Open Elective ii	2	0	0	2		50	50

Electives

Elective I	20-214-0521 Adhesives Technology
	20-214-0522 Surface Coatings
	20-214-0523 Disaster Management
Elective ii	20-214-0524 Biodegradable Polymers
	20-214-0525 Polymers and Environment
	20-214-0526 Polymers for Packaging
Elective iii	20-214-0621 Polymers for Electrical & Electronics Applicatons
	20-214-0622 Footwear Technology
	20-214-0623 Polymer Recycling
Elective IV	20-214-0624 Specialty Polymers
	20-214-0625 Materials Science
	20-214-0626 Introduction to Biomaterials and Medical Devices
Elective V	20-214-0721 Tyre Technology
	20-214-0722 Polymer process modelling and simulation
	20-214-0723 Smart and intelligent polymers
Elective Vi	20-214-0724 Polymers in space
	20-214 – 0725 Polymer Nanocomposites
	20-214-0726- Professional Ethics in Engineering

M. TECH POLYMER TECHNOLOGY

SEMESTER I

Course Code	Course	C/E	Scheme of study per week			Credit	Marks		
			L	T	P		3	CE	EE
20-440-0101	Advanced Polymer Science	C	3	0	0	3	50	50	100
20-440-0102	Polymer Materials	C	3	0	0	3	50	50	100
20-440-0103	Advanced Polymer Product Design	C					50	50	100
20-440-012*	Prog.Elective I	E	3	0	0	3	50	50	100
20-440-0104	Research Methodology and IPR	C	2	0	0	2	50	50	100
20-440-013*	Audit Course	A	2	0	0	0	-	100	100
20-440-011*	Lab 1 (Prog.Core based)	C	0	0	4	2	100	-	100
20-440-011*	Lab 2 (Elective based)	E	0	0	4	1	100	-	100
	Total					17	450	350	800

SEMESTER II

Course Code	Course	C/E	Scheme of study per week			Credit	CE	EE	Total
			L	T	P				
20-440-0201	Advanced Plastic Processing	C	3	0	0	3	50	50	100
20-440-0202	Rubber Processing and Product Manufacturing	C	3	0	0	3	50	50	100
20-440-0203	Advanced Tyre Technology	C	3		0	3	50	50	100
20-440-022*	Prog.Elective II	E	3	0	0	3	50	50	100
20-440-022*	Prog.Elective III	E	3	0	0	3	50	50	100
20-440-021*	Lab 3	C	0	0	4	2	100	-	100
20-440-021*	Lab 4	E	0	0	4	1	100	-	100
20-440-0251	Minor Project with Seminar	C	0	0	2	2	100	-	100
	Total					20	550	250	800

SEMESTER III

Course Code	Course	C/E	Scheme of study per week			Credit	CE	EE	Total
			L	T	P				
20-440-032*	Prog.Elective IV	E	3	0	0	3	50	50	100
20-440-036*	Open Elective	E	3	0	0	3	-	100	100
20-440-0341	Dissertation I	C	0	0	20	10	-	100	100
	Total					16	50	250	300

SEMESTER IV

Course Code	Course	C/E	Scheme of study per week			Credit	CE	EE	Total
			L	T	P				
20-440-0441	Dissertation II	C	0	0	35	17	-	300	300
	Total					17	-	300	300

Programme Elective I

20-440-0121	Polymers for Packaging
20-440-0122	Advanced Polymer Rheology
20-440-0123	Characterisation and Testing Methods

Programme Elective II

20-440-0221	Specialty Polymers (I.E.)
20-440-0223	Advanced Polymer Nanocomposites (I.E.)

Programme Elective III

20-440-0224	Mould and Die Design
20-440-0225	Polymers for Advanced Electrical and Electronics Application
20-440-0226	Materials in Space Applications

Programme Elective IV

20-440-0321	Adhesives and Surface Coatings
20-440-0322	Advanced Biomaterials for Medical Applications (I.E.)
20-440-0323	Modelling and Simulation

Lab 1: Labs-Core based (Sem I)

20-440-0111	Advanced Polymer Science
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Lab 2: Labs – Elective based (Sem I)

20-440-0112	Polymers for Packaging
20-440-0113	Advanced Polymer Rheology
20-440-0114	Characterisation and Testing Methods

Lab 3: Labs – Core based (Sem II)

20-440-0211	Plastics and Rubber Processing
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Lab 4 : Labs Elective based (Sem II)

20-440-0212	Specialty Polymers
20-440-0213	Advanced Polymer Nanocomposites
20-440-0214	Mould and Die Design
20-440-215	Polymers for Advanced Electrical and Electronics Applications
20-440-0216	Materials in Space Applications

Audit Courses

20-440-0131	Constitution of India and environmental governance : administrative and adjudicatory process
20-440-0132	Principles of management
20-440-0133	Technical English for Engineers

20-440-0134	Entrepreneurship and IP strategy
20-440-0135	Exploring Human Values : Visions of Happiness and Perfect Society
20-440-0136	Speaking Effectively
20-440-0137	Enhancing Soft Skill and Personality
20-440-0138	Plastic Waste Management
20-440-0139	Scanning Electron / Ion / Probe Microscopy in Materials Characterization
20-440-0140	Chemical Process Control
20-440-0141	Introduction to programming
20-440-0142	Managing Intellectual Property in Universities
20-440-0143	Patent drafting for beginners
20-440-0144	Development Research Methods
20-440-0145	Entrepreneurs
20-440-0146	Polymer Assisted Abrasive Finishing Processes
20-440-0147	Science and Technology of Weft and Warp Knitting
20-440-0148	Characterisation of Polymers, Elastomers and Composites.
20-440-0149	English Language for Competitive Exams
20-440-0150	Nature and Properties of Materials
20-440-0151	Non-Conventional Energy Sources.

Open Elective Courses

20-440-0361	Properties of Materials
20-440-0362	Biomedical Nanotechnology
20-440-0363	Technologies for Clean and Renewable Energy Production
20-440-0364	Environmental Quality modelling and analysis
20-440-0365	Membrane Technology
20-440-0366	Chemical Process Safety
20-440-0367	Chemical Reaction Engineering
20-440-0368	Soft Nanotechnology

20-440-0369	Waste to Energy Conversion
20-440-0370	Environmental Degradation of Materials
20-440-0371	Rheology of Complex Materials
20-440-0372	Environmental Engineering
20-440-0373	Municipal Solid Waste Management
20-440-0374	Fundamentals of combustion for propulsion
20-440-0375	Medical Biomaterials
20-440-0376	Biomass conversion and Biorefinary
20-440-0377	Materials Science and Engineering
20-440-0378	Organometallic Chemistry
20-440-0379	Polymer Reaction Engineering
20-440-0380	Pericyclic Reactions and Organic Photochemistry
20-440-0381	Physical and Electrochemical Characterizations in Chemical Engineering
20-440-0382	Nature and Properties of Materials
20-440-0383	Fundamentals of Materials Processing – Part 2.

DETAILS OF FACULTY

Sl.No.	Name & Designation	Specialization	Communication
1.	Dr.Prasanth R. Professor & Head	Polymer Science/ Technology	7907533273 prasanthr@gmail.com
2	Dr. Honey John Professor	Polymer Science/ Technology	9446372997 honey@cusat.ac.in
3.	Dr.Sailaja G.S. Professor	Polymer Science/ Technology	0471-2595136, 9744799643 sailajags@gmail.com
4	Dr.Jayalatha Gopalakrishnan G Professor	Polymer Science/ Technology	9847672916 gjayalatha@gmail.com
5	Dr.Jinu Jacob George Assistant Professor	Polymer Science/ Technology	0481-2598155, 9497792092 jinujac@gmail.com

6	Dr.Abhitha K. Assistant Professor	Polymer Science/ Technology	9847654544 abhithak80@gmail.com/ abhithak80@cusat.ac.in
7	Dr.Sari P.S. Assistant Professor	Polymer Science/ Technology	89219 70724 sarips1@gmail.com
8	Dr. Sunil K. Narayanankutty Adjunct Faculty	Polymer Science/ Technology	0484-2551922, 9995300093 sncusat@gmail.com
9	Dr.Reghunathan Nair Emeritus Professor	Polymer Science/ Technology	9496020080 cprnair@gmail.com
10	Dr.Thomas Kurian Emeritus Professor	Polymer Science/ Technology	09847872209 drtkurian@gmail.com
11	Dr.Reji John Emeritus Professor	Polymer Science/ Technology	9895279657 rejijohnpol@yahoo.com
12	Dr.V.Kumar Emeritus Professor	Polymer Science/ Technology	9495634430 vkumar10@yahoo.com

INTERNATIONAL SCHOOL OF PHOTONICS

M.TECH. (OPTO-ELECTRONICS & LASER TECHNOLOGY)

SEMESTER I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
21-441-0101	Modern Optics	C	4	50	50	100
21-441-0102	Laser Technology	C	4	50	50	100
21-441-0103	Opto-electronics	C	4	50	50	100
21-441-0104	Lab Course I	C	3	50	50	100
21-441-010X	Elective I (from Elective Set I)	E	3	50	50	100
	Total for semester I		18	250	250	500

ELECTIVE SET I

Course Code	Course
21-441-0105	Advanced Engineering Physics
21-441-0106	Digital Communication

SEMESTER II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
21-441-0201	Fibre Optics & Applications	C	4	50	50	100
21-441-0202	Lab Course II	C	3	50	50	100
21-441-0203	Mini Project, Seminar	C	2	50	50	100
21-441-020X	Elective I (from Elective Set II)	E	3	50	50	100
21-441-020X	Elective II (from Elective Set II)	E	3	50	50	100
21-441-020X	Elective III (from Elective Set II)	E	3	50	50	100
	Total for semester II		18	300	300	600

ELECTIVE SET II

Course Code	Course
21-441-0204	Laser Applications
21-441-0205	Optical Communication Technology
21-441-0206	Non-Linear Optics, OSP & OC
21-441-0207	Biophotonics
21-441-0208	Laser Spectroscopy
21-441-0209	Science and Technology of Plasma
21-441-0210	Nanophotonics

SEMESTER III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
21-441-0301	Project	C	15	150	150	300
21-441-03XX	Open Elective*	E	3	50	50	100
	Total for semester III		18	200	200	400

*Management for Scientists and Engineers offered by School of Management Studies OR Any interdisciplinary Electives offered in the MOOC platform

SEMESTER IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
21-441-0401	Project	C	18	200	200	400
	Total for semester IV		18	200	200	400
	Total credit for the course		72			1900

MSc (Five-year Integrated) Photonics
Programme Structure (2023 Admission Onwards)

Semester	Major 4 credits	Minor 4 credits	MDC 4 credits	AEC	SEC	VAC 2 credits	Total credits
I	1 Course	1 Course	1 course	1 course (3 cr)	1 course (3 cr)	2 courses	22
II	1 Course	1 Course	1 course	1 course (3 cr)	1 course (3 cr)	2 courses	22
III	2 Courses 1 lab course (3 cr)	1 Course	1 course	1 course (2 cr)	1 course (2 cr)	-	23
IV	3 Courses 1 lab course (3 cr)	1 Course	-	1 course (2 cr)	Internship (2 cr)	-	23
V	4 Courses 1 lab course (3 cr)	1 Course	-	-		-	23
VI	4 Courses 1 lab course (3 cr)	1 IE Course (3 cr)	-	-		-	22
Total credits	72	23	12	10	10	8	135
Exit with BSc in Photonics (Total credits = 135)							
VII	4 Courses 1 lab course (3 cr)	1 Course	-	-	-	-	23
VIII	1 Course (MOOC)	1 Course (MOOC)	-	-	Project (12 credits)	-	20
Total credits	95	31	12	10	22	8	178
Exit with BSc (Honours with Research) in Photonics (Total credits = 178)							
Exit with BSc (Honours) in Photonics (Total credits = 178)							
IX	4 Courses 1 lab course (3 cr)	1 Course	-	-	-	-	23
X	1 Courses	1 Course	-	-	Project (12 credits)	-	20
Total credits	118	39	12	10	34	8	221
Exit with MSc in Photonics (Total credits = 221)							

MDC: Multi-Disciplinary Courses
AEC: Ability Enhancement Courses
SEC: Skill enhancement Courses
VAC: Value Added Courses

Semester 1

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
23-351-0101	Mechanics	Core	3	1		4	50	50
23-351-0102	Optics I: Geometrical and Wave Optics	Core	3	1		4	50	50
23-351-0103	Mathematics & Statistics	MDC	3	1		4	50	50
23-351-0104	Communicative English I	AEC	3			3	50	
23-351-0105	General physics lab	SEC			6	3	100	
23-351-0106	Environmental Science and Sustainable Development	VAC	2			2	50	
23-351-0107	VAC-2	VAC	2			2	50	
	Total		16	3	6	22	400	150

CA: Continuous Assessment
ESE: End Semester Examination

Semester 2

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
23-351-0201	Modern Physics	Core	3	1		4	50	50
23-351-0202	Optics II Applied Optics	Core	3	1		4	50	50
23-351-0203	Mathematics II	MDC	3	1		4	50	50
23-351-0204	Elective I	AEC	3			3	50	
23-351-0205	General Physics lab II	SEC			6	3	100	
23-351-0206	History of Science and Technology	VAC	2			2	50	
23-351-0207	VAC- 4	VAC	2			2	50	
	Total		16	3	6	22	400	150

Elective I

1. Communicative English II
2. Foreign/Indian Languages with similar credit, without repetition.

List of value-added courses (Student can choose any course related to the topics listed below, without repetition, offered by any institution/MOOC for VAC 2 and 4) Personal Finance, Constitution & Law, Data Science & AI, Performing arts, Visual arts, Martial arts, Yoga, Ethics and Values, Gender Justice, Indian Knowledge System.

Semester 3

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0301	Electronics II Analog Electronics	Core	3	1		3	50	50
20-351-0302	Classical Mechanics	Core	3	1		3	50	50
20-351-0303	Optics III- Optical Instrumentation	Core	3	1		3	50	50
20-351-0304	Mathematics III	Core	3	1		3	50	50
20-351-0305	Atomic Spectroscopy	Core	3	1		3	50	50
20-351-0306	Lab+Viva	Core			6	3	100+50	
20-351-0307	Seminar	Core	1			1	50	
	Total		16	5	6	19	450	250

Semester 4

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0401	Electronics III Digital circuits and Microprocessors	Core	3	1		3	50	50
20-351-0402	Statistical Mechanics	Core	3	1		3	50	50
20-351-0403	Quantum Mechanics I	Core	3	1		3	50	50
20-351-0404	Electromagnetic Theory and Relativistic Phenomena	Core	3	1		3	50	50
20-351-0405	Mathematics IV	Core	3	1		3	50	50
20-351-0406	Lab + Viva	Core			6	3	100+50	
20-351-0407	Workshop	Core		0	2	1	100	
20-351-0408	Seminar	Core	1			1	50	
	Total		16	5	8	20	550	250

Semester 5

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0501	Optics IV -Applied Optics	Core	3	1		3	50	50
20-351-0502	Electronics-IV Electronic Instrumentation	Core	3	1		3	50	50
20-351-0503	Quantum Mechanics II	Core	3	1		3	50	50
20-351-0504	Materials Science	Core	3	1		3	50	50
20-351-0505	Molecular Spectroscopy	Core	3	1		3	50	50
20-351-0506	Lab+Viva	Core			6	3	100+50	
20-351-0507	Seminar		1			1	50	
	Total		16	5	6	19	450	250

Semester 6

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0601	Photonics-I Optoelectronics	Core	3	1		3	50	50
20-351-0602	Photonics-II Fiber Optics	Core	3	1		3	50	50
20-351-0603	Photonics-III Laser Physics	Core	3	1		3	50	50
20-351-0604	Mathematical Modeling and Computational Techniques	Core	3	1		3	50	50
20-351-0605	Project & Project Viva	Core			9	3	100+50	
20-351-0606	Computer Lab + Viva	Core			6	3	100+50	
	Total		12	4	15	18	500	200

Semester 7

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0701	Advanced Solid State Theory	Core	4	1		4	50	50
20-351-0702	Laser Systems	Core	4	1		4	50	50
20-351-072X	Elective I	Elective	3	1		3	50	50
20-351-072X	Elective II	Elective	3	1		3	50	50
20-351-0703	Lab I Photonics Lab I	Core			4	2	100	
20-351-0704	Lab II Electronics Lab I	Core			4	2	100	
20-351-0705	Seminar+ Viva		1			1	50+50	
	Total		15	4	8	19	500	200

Elective VII

1. Advanced Quantum Mechanics
2. Advanced Electromagnetic Theory and Computational Methods.
3. Nanophotonics
4. Optical Sensor Technology

Semester 8

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0801	Nonlinear Optics	Core	4	1		4	50	50
20-351-0802	Digital Signal Processing and Optical Signal Processing	Core	4	1		4	50	50
20-351-082X	Elective III	Elective	3	1		3	50	50
20-351-082X	Elective IV	Elective	3	1		3	50	50
20-351-0803	Lab I Photonics Lab II	Core			4	2	100	
20-351-0804	Lab II Electronics Lab II	Core			4	2	100	
20-351-0805	Seminar+ Viva		1			1	50+50	
	Total		15	4	8	19	500	200

Elective VIII

1. Quantum Optics
2. Biophotonics
3. Optomechanical Engineering

Semester 9

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-0901	Optical Communication	Core	4	1		4	50	50
20-351-0902	Lab I Photonics Lab III	Core			4	2	100	
20-351-0903	Lab II Computational Photonics Lab	Core			4	2	100	
20-351-0904	Seminar + Viva	Core	1			1	50+50	
20-351-092X	Elective V	Elective	3	1		3	50	50
20-351-092X	Elective VI	Elective	3	1		3	50	50
20-351-092X	Elective VII	Elective	3	1		3	50	50
	Total		14	4	8	18	500	200

Elective IX

1. Industrial Photonics
2. Photonic Bandgap Structures and Metamaterials
3. Holography and Speckle Metrology
4. Laser Spectroscopy
5. Computational Material Science

Semester 10

Course code	Course title	Type	Hours per week			Credits	Marks	
			L	T	P		CA	ESE
20-351-1001	Project & Project Viva	Core				16	200+100	200+100
	Total					16	300	300

Details of Faculty

Permanent Faculty			
Sl. No	Name and Designation	Specialization	Communication
1	Dr. Saji K.J Associate Professor & Director	Optoelectronic Devices, Nano Materials and Device Physics	9400217723 saji@cusat.ac.in
2	Dr. A. Mujeeb Senior Professor	Laser Speckle Metrology Optical NDT Nano/Biophotonics	9447419505 mujeeb@cusat.ac.in , mujeebpoovar@gmail.com
3	Dr. M. Kailasnath Professor	Fibre Optics & Optical Sensors	9447213863 kailas@cusat.ac.in
4	Dr. Pramod Gopinath Professor	Laser Plasma Spectroscopy, Nonlinear Optics, Nanophotonics and Magnetoplasmonics.	9446069743 pramod@cusat.ac.in
5	Dr. Sheenu Thomas Professor	Experimental Solid State Physics	0484-2577505, 9349405537 st@cusat.ac.in
6.	Dr. Manu Vaishakh Assistant Professor	Non-linear optics, Optical imaging, Fiber optics	9496061610 manu.vaishakh@cusat.ac.i n
7	Mr. Muhammad Rishad K P Assistant Professor	Ultrafast laser-matter interactions, Metamaterials	9400876955 kpmrishad@cusat.ac.in
8	Dr. Priya Rose T Assistant Professor	Photonic bandgap materials, Metamaterials, Ultrafast laser-matter Interactions	8281982228 priyarose@cusat.ac.in
9	Dr. Praveen C S Assistant Professor	Computational Material Science, Density functional theory	8078078087, 7510511129 mnr.praveen@cusat.ac.in
10	Dr. Mohamed Ameen P Assistant Professor	Theoretical Photonics	9123526041 ameenpoyli@cusat.ac.in

DEPARTMENT OF SHIP TECHNOLOGY

M.TECH COMPUTER AIDED STRUCTURAL ANALYSIS & DESIGN

Semester I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-457-0101	Advanced Engineering Mathematics	C	4	50	50	100
20-457-0102	Computer Aided Design in Offshore Engineering	C	4	50	50	100
20-457-0103	Advanced Structural Analysis	C	4	50	50	100
	Elective I	E	4	50	50	100
	Elective II	E	4	50	50	100
	Total		20			500

Elective I & II

Course Code	Course
20-457-0104	Marine Hydrodynamics
20-457-0105	Fracture Mechanics
20-457-0106	Application of Stochastic Process Theory in Ocean Engineering
20-457-0107	Stability of Structures
20-457-0108	Marine Corrosion and Prevention
20-457-0109	Marine Pollution and its effect
20-457-0110	Pollution Control Technique
20-457-0111	Advanced Joining Techniques

Semester II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
20-457-0201	Dynamics of Structures	C	4	50	50	100
20-457-0202	Finite Element Methods Applied to Offshore Engineering	C	4	50	50	100
	Elective III	E	4	50	50	100
	Elective IV	E	4	50	50	100
	Elective V	E	4	50	50	100
	Total		20			500

Electives

Course Code	Course
20-457-0203	Ocean Waves and Effects
20-457-0204	Analysis of Special Structures
20-457-0205	Design of Offshore Structures
20-457-0206	Fatigue Problems in Ships and Marine Structures
20-457-0207	Computer Application in Ship Manoeuvring

Semester III

Course Code	Course	C/E	Credits
20-457-0301	Project Progress Evaluation	C	18

Semester IV

Course Code	Course	C/E	Credits
20-457-0401	Project Dissertation Evaluation and Viva Voce	C	18

B.TECH (NAVAL ARCHITECTURE & SHIP BUILDING)

Semester I

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0101	Technical Communication	2	1	-	3	2	100	100	200
20-215-0102	Mathematics I	3	1	-	4	3	100	100	200
20-215-0103	Applied Physics	3	1	-	4	3	100	100	200
20-215-0104	Applied Chemistry	3	1	-	4	3	100	100	200
20-215-0105	Engineering Mechanics I	4	1	-	5	4	100	100	200
20-215-0106	Engineering Graphics	4	1	-	5	4	100	100	200
20-215-0107	Workshop Practice I	2	-	3	5	1	50		50
	Total	21	6	3	30	20	650	600	1250

Semester II

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0201	Mathematics II	3	1		4	3	100	100	200
20-215-0202	Computer Programming	3		1	4	3	100	100	200
20-215-0203	Professional Ethics	2	1		3	2	100	100	200
20-215-0204	Electrical Engineering	3	1		4	3	100	100	200
20-215-0205	Machine Drawing	4	1		5	4	100	100	200
20-215-0206	Introduction to Naval Architecture	3	1		4	3	100	100	200
20-215-0207	Workshop Practice II	1		2	3	1	50		50
20-215-0208	Electrical Engineering Lab	1		2	3	1	50		50
	Total	20	5	5	30	20	700	600	1300

Semester III

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0301	Mathematics III	3	1		4	3	100	100	200
20-215-0302	Fluid Mechanics I	3	1		4	3	100	100	200
20-215-0303	Mechanics of Solids	3	1		4	3	100	100	200
20-215-0304	Instrumentation	3	1		4	3	100	100	200
20-215-0305	Applied Thermodynamics	3	1		4	3	100	100	200
20-215-0306	Basic Ship Theory	3	1		4	3	100	100	200
20-215-0307	Fluid Mechanics Lab	2		4	6	1	50		50
20-215-0308	Internship					1	50		50
	Total	20	6	4	30	20	700	600	1300

Semester IV

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0401	Mathematics IV	3	1		4	3	100	100	200
20-215-0402	Fluid Mechanics II	3	1		4	3	100	100	200
20-215-0403	Design of Machine Elements	2	2		4	3	100	100	200
20-215-0404	Analysis of Structures	3	1		4	3	100	100	200
20-215-0405	Material Science	3	1		4	3	100	100	200
20-215-0406	Stability of Ships	3	1		4	3	100	100	200
20-215-0407	Language Lab			2	2	1	50		50
20-215-0408	Material Testing Lab			4	4	1	50		50
	Total	17	7	6	30	20	700	600	1300

Semester V

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0501	Resistance of Ships	3	1		4	3	100	100	200
20-215-0502	Propulsion of Ships	3	1		4	3	100	100	200
20-215-0503	Controllability of Ships	3	1		4	3	100	100	200
20-215-0504	Ship Motions in Seaway	3	1		4	3	100	100	200
20-215-0505	Electrical Systems on Ships & Shipyards	3	1		4	3	100	100	200
20-215-0506	Joining Techniques in Ship building Technology	3	1		4	3	100	100	200
20-215-0507	Model Making Techniques Lab	2		4	6	1	50		50
20-215-0508	Internship					1	50		50
	Total	20	6	4	30	20	700	600	1300

Semester VI

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0601	Computer Aided Design & Drafting	3	1		4	3	100	100	200
20-215-0602	Ship Structural Analysis – I	3	1		4	3	100	100	200
20-215-0603	Structural Design of Ships	3	1		4	3	100	100	200
20-215-0604	Ship Design	3	1		4	3	100	100	200
20-215-0605	Ship Production Technology	3	1		4	3	100	100	200
20-215-0606	Marine Engineering	3	1		4	3	100	100	200
20-215-0607	Marine Hydrodynamics Lab	1		2	3	1	50		50
20-215-0608	Marine Engineering Lab	1		2	3	1	50		50
	Total	20	6	4	30	20	700	600	1300

Semester VII

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0701	Ship Production Management	4			4	3	100	100	200
20-215-0702	Ship Structural Analysis – II	3	1		4	3	100	100	200
20-215-0703	Practical Ship Design	3	1	2	6	3	200	-	200
20-215-E7n	Elective I	3	1		4	3	100	100	200
20-215-E7n	Elective II	3	1		4	3	100	100	200
20-215-0704	Project Work	2	2	4	8	4	100	-	100
20-215-0705	Internship					1	50		50
	Total	18	6	6	30	20	750	400	1150

Elective I & II

Course Code	Course
20-215- E701	Marine corrosion and prevention
20-215- E702	Design of Fishing Vessels
20-215- E703	Refrigeration & Air conditioning of Ships
20-215- E704	Offshore Structure Design
20-215- E705	Ship Recycling
20-215- E706	Computer Aided Ship Design
20-215- E707	Experimental Stress Analysis
20-215- E708	Cargo Handling
20-215- E709	Inland Water Transport
20-215- E710	Design of small crafts
20-215- E711	Marine Pollution, Control and Recovery Systems
20-215- E712	Maritime Law and Shipping Management.
20-215- E713	Maritime Engineering Contracts and Commercial Management
20-215- E714	Composite Boat Design
20-215- E715	Computational Fluid Dynamics in Marine Technology

Semester VIII

Course Code	Course	Hrs/Week				Credits	Marks		
		L	T	P	Total		CE	ES	Total
20-215-0801	Special Problem & Seminar		2		2	2	100	-	100
20-215-E8n	Elective III	3	1		4	3	100	100	200
20-215-E8n	Elective IV	3	1		4	3	100	100	200
20-215-0802	Project Work& Viva Voce	12		8	20	12	300	200	500
	Total	18	4	8	30	20	600	400	1000

Elective III & IV

Course Code	Course
20-215- E801	Experimental Techniques on ships and models
20-215- E802	Finite element method
20-215- E803	Ship Repairing and Surveying
20-215- E804	Advanced Computer Techniques
20-215- E805	Computer Application in Shipbuilding Technology
20-215- E806	Design of fishing systems
20-215- E807	Design of Submarines and Deep Submersibles
20-215- E808	Design of High speed crafts
20-215- E809	Quality Assurance and Management in Shipbuilding
20-215- E810	Numerical techniques in Marine Hydrodynamics
20-215- E811	Probabilistic Theory applied to ship in seaway
20-215- E812	Remote sensing Applications in Ocean Wave Data Analysis
20-215- E813	Underwater Explosions and Acoustics
20-215- E814	Design of warships
20-215- E815	Fracture Mechanics
20-215- E816	Marine Pollution Prevention and Management

Details of Faculty

Permanent Faculty

Sl. No.	Name & Designation	Specialisation	Communication
1.	Dr. Satheesh Babu P. K., Associate Professor and Head	Naval Achitecture, Material Science, Marine Hydrodynamics	satheeshbabu@cusat.ac.in 9946063772
2.	Dr. K. Sivaprasad, Professor	Ship Building Technology, Ship Design & Ship Recycling	sivaprasad@cusat.ac.in 9349265677
3.	Dr. A. Mathiazhagan, Professor	Material Science and Corrosion Engineering	alagan@cusat.ac.in 9400336441
4.	Dr. Rajesh P. Nair, Assistant Professor	Finite Element Method and Impact Analysis	rajeshpnair@cusat.ac.in 7012779642
5.	Dr. Manoj T. Issac, Assistant Professor	Hydrodynamics of underwater vehicles	m.issac@cusat.ac.in 9495519287
6.	Dr. Favas T. K., Assistant Professor	Fluid Mechanics, Numerical Heat Transfer	favastk@cusat.ac.in 8129367615
7.	Mr. Anoop Chithrasenan, Assistant Professor	Naval Architecture & Ocean Engineering	anoop.c@cusat.ac.in 6238558867
8.	Mr. Aravind K. R., Assistant Professor	Marine Engineering & Naval Architecture	aravind@cusat.ac.in 8089866415
9.	Mr. Mohammed Ashiqu, Assistant Professor	Naval Architecture, Marine Hydrodynamics	ashique@cusat.ac.in 9745225996
10.	Mr. Akram P. A., Assistant Professor	Offshore Structures, Applied Mechanics	akrampa@cusat.ac.in 9447537092

Adjunct Faculty

Sl. No.	Name & Designation	Specialisation	Communication
1.	Dr. D. D. Ebenezer, Adjunct Professor	Marine Acoustics, Acoustics System & Instrumentation	d.d.ebenezer@gmail.com 9446577239
2.	Dr. C. B. Sudheer, Adjunct Professor	Naval Achitecture, Computer Aided Design	sudheer@cusat.ac.in 9895074930

DEEN DAYAL UPADHYAY KAUSHAL KENDRA

M.VOC IN SOFTWARE APPLICATION DEVELOPMENT (FACULTY OF TECHNOLOGY)

SEMESTER I

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-493-0101	Communication Skills Development (G-T)	C	3	50	50	100
23-493-0102	Fundamentals of Management (G-T)	C	3	50	50	100
23-493-0103	Object Oriented Programming and Web Technologies (G-P)	C	4	50	50	100
23-493-0104	Product Engineering (D-T)	C	4	50	50	100
23-493-0105	Algorithm and Data Structures (D-P)	C	4	50	50	100
23-493-0106	Database and Backend Technologies (D-P)	C	4	50	50	100
23-493-0107	Full stack Development (MERN Stack) (D-P)	C	4	50	50	100
23-493-0108	Software Lab I (Web, Kotlin, Git & Sql) (LAB)	C	4	50	50	100
	Total		30	400	400	800

SEMESTER II

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-493-0201	Project Management (G-T)	C	3	50	50	100
23-493-0202	Android App Development - Kotlin & XML (D-P)	C	4	50	50	100
23-493-0203	Android App Development - JetPack Compose (D-P)	C	4	50	50	100
23-493-0204	Cloud and Advanced Technologies (D-P)	C	3	50	50	100
23-493-0205	Elective – I (G-T/D- T)*	E	3	50	50	100
23-493-0206	Elective – II (D-T)	E	3	50	50	100
23-493-0207	Software Lab II (Android & Cloud) (LAB)	C	2	50	50	100
23-493-0208	Internship – Android/Web App Development	C	8	50	50	100
	Total		30	400	400	800

* Any general interdisciplinary subject may be considered for 23-493-0205 (Elective – I (G-T/D-T)) apart from the list of electives given.

SEMESTER III

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-493-0301	Entrepreneurship and New Venture Planning (G-T)	C	3	50	50	100
23-493-0302	Agile Process Management. (G-T)	C	3	50	50	100
23-493-0303	Programming with Swift (D-P)	C	4	50	50	100
23-493-0304	iOS App Development- SwiftUI Framework (D-P)	C	4	50	50	100
23-493-0305	Applied Technologies in iOS(D-P)	C	4	50	50	100
23-493-0306	Elective – III(G-T/D-T)	E	3	50	50	100
23-493-0307	Elective – IV(D-T)	E	3	50	50	100
23-493-0308	Software Lab III (iOS & Swift) (LAB)	C	3	50	50	100
23-493-0309	Professional Skills Development (Training Programme) (G-T)	C	3	100		100
	Total		30	500	400	900

Any Cross Platform Technology may be considered for Elective – III (G- T/D-T).

SEMESTER IV

Course Code	Course	C/E	Credits	Marks		
				CE	ES	Total
23-493-0401	*Main Internship (90 working days during Semester IV in an IT firm where students contribute to a live iOS/Android/Cross-platform/Web application development) and Viva voce (Continuous Assessment – 100 marks, Final report – 100 marks & Viva-Voce – 100 marks)	C	28	100	200	300
23-493-0402	MOOC courses from the list of courses shortlisted from the list of NPTEL/SWAYAM courses (or MOOC COURSES recognized by UGC), or CUSAT MOOC portal and approved by the academic committee, with a duration of not less than eight weeks.	C	2	50	50	100
	Total		30	150	250	400

GT: General Theory, G-P: General Practical, D-T: Domain Theory, D-P: Domain Practical

LIST OF ELECTIVES

- Wearable Technologies in Android.
- Watch OS Programming
- Cross Platform Development using React Native
- iOS App Development Fundamentals using Storyboard Framework
- Cross Platform Development using Flutter
- Java Middleware using Spring Boot
- Game Development using Unity and C#.
- Programming with Python
- Internet of Things (IoT)
 - Machine Learning for Software application Development.
 - Introduction to Android Auto
 - Augmented Reality for Ios App Development Using ARKit
 - Cyber Security

B.VOC IN BUSINESS PROCESS & DATA ANALYTICS
(FACULTY OF SOCIAL SCIENCES)

SEMESTER I

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0101	English Language Skills	4	1	0	4	50	50	100
21-251-0102	Principles of Management and Organizations	5	0	0	4	50	50	100
21-251-0103	Statistics for Business	5	2	0	5	50	50	100
21-251-0104	Functional Management for Business	5	1	0	5	50	50	100
21-251-0105	Programming Languages for Data Analytics	2	0	6	5	50	50	100
21-251-0106	Mathematics for Data Analytics	4	1	0	5	50	50	100
21-251-0107	Workshop on Business communication skills (5 Days)	30 hrs / Semester			2		50	50
Total					30	300	350	650

SEMESTER II

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0201	Strategic Communication for Workplaces	5	2	0	5	50	50	100
21-251-0202	Information Systems for Business	4	0	2	5	50	50	100
21-251-0203	Operations Research	6	2	0	6	50	50	100
21-251-0204	Fundamentals of Business Process Management	4	1	2	5	50	50	100
21-251-0205	Database Fundamentals	3	0	4	5	50	50	100
21-251-0206	Project I (Organization Study - 15 working days. 50 marks for continuous assessment and 50 for written report after completion of the project)				4		100	100
Total					30	250	350	600

SEMESTER III

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0301	Managerial Skill Development & Design Thinking	3	2	4	5	50	50	100
21-251-0302	Financial Accounting	5	0	0	5	50	50	100
21-251-0303	Business Environment and Ethics	4	0	0	4	50	50	100
21-251-0304	Production and Operations Management	4	1	0	4	50	50	100
21-251-0305	Data Visualization for Analytics	2	0	6	5	50	50	100
21-251-0306	Data Mining Techniques	2	0	6	5	50	50	100
21-251-0307	Workshop on Personal Productivity Improvement (5 Days)	30 hrs/ Semester			2		50	50
Total					30	300	350	650

SEMESTER IV

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0401	Research Methodology	3	0	2	4	50	50	100
21-251-0402	Environmental Management	3	0	2	4	50	50	100
21-251-0403	Modern Project Management Practices	3	0	2	4	50	50	100
21-251-0404	Introduction to Econometric Methods	5	1	0	5	50	50	100
21-251-0405	Predictive Modelling	2	0	6	5	50	50	100
21-251-0406	Elective 1	3	0	2	4	50	50	100
21-251-0407	Project II Business Process Mapping for a duration of 15 working days. (50 Marks for continuous assessment,50 marks for a written report after the completion of the project)				4		100	100
Total					30	300	400	700

SEMESTER V

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0501	Entrepreneurship Development and Management of Startups	4	0	2	4	50	50	100
21-251-0502	Strategic Self Marketing & Personal Branding	5	2	0	4	50	50	100
21-251-0503	Digital Marketing and social media analytics	2	3	4	4	50	50	100
21-251-0504	Big Data Analytics	2	0	4	4	50	50	100
21-251-0505	Text and Web Analytics	3	0	4	5	50	50	100
21-251-0506	Business Model Analysis	5	1	0	5	50	50	100
21-251-0507	Elective 2	3	1	2	4	50	50	100
	Total				30	350	350	700

SEMESTER VI

Course Code	Course	Hrs/Week			Credits	Marks		
		L	T	P		Internal	External	Total
21-251-0601	Project III - Main Project & Viva-Voce (Duration – 80 days) Evaluation scheme will comprises i) Continuous assessment – 100 marks ii) Final report – 100 marks & iii) Viva-Voce – 100 marks) This project intends to provide students with real hands-on experience on data analytics. Students can attach themselves to an organisation or work independently for this project. However, the project requires real business data for analytics.				26	300		300
21-251-0602	Workshop on Career Building (10 Days)				4		100	100
	Total				30	300	100	400

List of Electives

Course Code	Course
E-1	Practical Accounting in Business Organizations
E-2	Computational Finance
E-3	Investment Analysis and Portfolio Management
E-4	HR Analytics
E-5	Introduction to Machine Learning
E-6	Case Development Skills for Analysts

	Credits
Skill Component	109
General Component	71
Total Credit	180

M.VOC IN CONSULTANCY MANAGEMENT
(FACULTY OF SOCIAL SCIENCES)

SEMESTER I

Course Code	Course	C/E	Credit	Marks		
				CE	ES	Total
20-494-0101	Business Communication Skills - I	C	3	50	50	100
20-494-0102	Contemporary Management	C	3	50	50	100
20-494-0103	Introduction to Technology and Management Consulting	C	3	50	50	100
20-494-0104	Economics for Business Decisions	C	3	50	50	100
20-494-0105	Accounting and Financial Management for Consultants	C	3	50	50	100
20-494-0106	Research Skills for Consulting	C	4	50	50	100
20-494-0107	Quantitative Techniques	C	4	50	50	100
20-494-0108	Professional Skills Development (Training Programme)	C	3	100	-	100
Total			26	450	350	800

SEMESTER II

Course Code	Name of the Course	C/E	Credit	Marks		
				CE	ES	Total
20-494-0201	Operations Management	C	4	50	50	100
20-494-0202	Integrated Management Systems	C	3	50	50	100
20-494-0203	Management of Consulting Firms and Developing Consulting Career	C	3	50	50	100
20-494-0204	New Age Marketing for Business Consulting	C	3	50	50	100
20-494-0205	Project Management	C	3	50	50	100
20-494-0206	Business Analytics	C	3	50	50	100
20-494-0207	Business Communication Skills – II	C	3	50	50	100
20-494-0208	Internship : Initial diagnosis of client issues in a consulting project (40 working days duration, 50 marks for continuous assessment & Report; and 50 marks for Viva Voce by a Board of Internal Examiners)	C	12	50	50	100
Total			34	400	400	800

SEMESTER III

Course No.	Name of the Course	C/E	Credit	Marks		
				CE	ES	Total
20-494-0301	Business, Government and Society	C	4	50	50	100
20-494-0302	Business Model Analysis and Strategy	C	4	50	50	100
20-494-0303	Managing Change in Organizations	C	4	50	50	100
20-494-0304	Entrepreneurship and New Venture Planning	C	4	50	50	100
	Elective-I	E	3	50	50	100
	Elective-II	E	3	50	50	100
	Elective-III	E	3	50	50	100
	Elective-IV	E	3	50	50	100
Total			28	400	400	800

SEMESTER IV

Course No.	Name of the Course	C/E	Credit	Marks		
				CE	ES	Total
20-494-0401	*Major Project (Duration – 90 working days during Semester IV in a consulting firm or any other business organization where the student can undertake a consulting project in management or technology.) (Continuous assessment – 100, Final report – 100 marks & Viva-Voce – 100 marks)	C	26	200	100 (Viva Voce)	300
20-494-0402	Case Development Skills for Consultants (Training Programme)	C	4	100	-	100
20-494-0403	MOOC courses from the list of courses shortlisted from the list of NPTEL/SWAYAM courses (or MOOC COURSES recognized by UGC), or CUSAT MOOC portal and approved by the academic committee, with a duration of not less than eight weeks,	C	2	50	50	100
Total			32	150	350	500

List of Electives

1. HR Analytics
2. Corporate Training Consulting
3. Technology Enabled HR
4. HR Strategies for the New World
5. Consulting Expertise in Performance Management
6. Total Reward Management
7. Strategic Branding
8. Consulting in CRM Design and Management
9. Consulting in Marketing Research
10. Strategic Consulting for Service Organizations
11. Strategic Marketing
12. Marketing Communication Consulting
13. Retail Management
14. Technology and Innovation Management
15. Environmental Consulting (Impact Assessment & Certifications)
16. Enterprise Resource Planning
17. Supply Chain Management
18. Investment Banking & Financial Services
19. Financial Risk Management
20. Banking and Financial Services and Insurance
21. Securities Market.
22. Tax Consulting
23. Corporate Governance and Social Responsibility of Business
24. Consulting for Mergers, Acquisitions and Corporate Restructuring
25. Consulting for Public Private Partnership Projects

Details of Faculty (Permanent)

Sl. No	Name & Designation	Specialization	Communication Mobile/email
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Details of Faculty (Contract)

Sl. No	Name & Designation	Specialization	Communication Mobile/email
1	Mr.Vinu Varghese.V.V, Assistant Professor	Android App Development, Data Mining, Network Security	9446655362 vinghese@gmail.com
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3	Dr. Rajeswari.R Assistant Professor	Human Resource Management, Marketing	9846919863 sterlingrajeswari@gmail.com
4	Dr.Vinney Zephaniah Vincent Assistant Professor	General Management, Entrepreneurship,Operation Management	8075301118 vinneyzephaniah@gmail.com
5	Mr.Shajin.P Assistant Professor	Operations Management & Human Resource Management	9995567922 Shasyed62@gmail.com
6	Ms.Sukrutha A.K. Assistant Professor	Computer and Information Science	9495423314 sukruthadevaki@gmail.com
7	Mrs.Suji Jose Assistant Professor	Cyber forensics and information security	9745463039 sujjose007@gmail.com
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**PROF. N. R. MADHAVA MENON INTERDISCIPLINARY CENTRE
FOR RESEARCH ETHICS & PROTOCOLS (ICREP)**

MASTER OF BIOETHICS DEGREE

FACULTY OF LAW

SEMESTER I

Course Code	Course	C/E	Credits
MBE IC-01	Law, Society and Human Rights.	C	4
MBE IC-02	Fundamentals of Bio Ethics	C	4
MBE IC-03	General Microbiology	C	4
MBE IC- 04	Molecular Biology	C	4
MBE – E	E/IE	E/IE	3

SEMESTER II

Course Code	Course	C/E	Credits
MBE IIC-05	Molecular Cell Biology	C	4
MBE IIC- 06	Methodologies In Biosciences Research	C	4
MBE IIC-07	Legal Regulation of Scientific Research	C	4
MBE IIC-08	IPR, Bio Safety and Bio Ethics	C	4
MBE II E	E/IE	E/IE	3

SEMESTER III

Course Code	Course	C/E	Credits
MBE IIIC-09	Health Care Law and Bioethics	C	4
MBE IIIC-10	Clinical Research and Clinical Trials	C	4
MBE IIIE	E/IE	E/IE	3
MBE IIIE-	E/IE	E/IE	3
MBE IIIE	E/IE	E/IE	3
MBE IIIC	Seminar	C	2

SEMESTER IV

Course Code	Course	C/E	Credits
Dissertation IV C	C	C	14
Viva Voce IVC	C	C	4
MBE-IV E	E/IE	E/IE	3

Core Courses

MBE I C- OI	Law , Society and Human Rights	4 Credits
MBE IC-02	Fundamentals of Bioethics	4 Credits
MBEIC-03	General Micro Biology	4 Credits
MBE IC 04	Molecular Biology	4 Credits
MBE IIC-05	Molecular Cell Biology	4 Credits
MBE IIC-06	Methodologies In Biosciences Research	4Credits
MBE IIC-07	Legal Regulation of Scientific Research	4 Credits
MBE IIC-08	IPR, Bio Safety and Bio Ethics	4 Credits
MBEIIC-0 9	Health Care Law and Bioethics	4 Credits
MBEIIC-10	Clinical Research and Clinical Trials	4Credits

Elective Courses

MBE –E1	Philosophy of Human Rights	3 credits
MBE-E2	Public Health Research : Bioethics and Biosafety	3 credits
MBE- E3	Advances in Reproductive Biotechnology	3 credits
MBE-E4	Animal Welfare, Ethics and Jurisprudence	3 credits
MBE- E5	Plant Biotechnology : Biosafety and Bioethics	3 credits
MBE- E6	Philosophy and Religion in Ethics	3 credits
MBE- E7	Law Relating To Science and Technology	3 credits
MBE –E8	Recombinant DNA Technology	3 credits
MBE – E9	Biodiversity, Biosafety and Bioethics	3 credits

REGULATIONS FOR THE B. TECH. DEGREE PROGRAMMES

UNDER FACULTY OF ENGINEERING (except Marine Engineering)

(With effect from 2023 Admissions)

The following regulations are made applicable to all the B.Tech. programmes offered by the University under Faculty of Engineering except Marine Engineering with effect from the academic year 2023-24.

1. B. Tech. Programme

The duration of the B. Tech. programme shall be eight semesters spanning over four academic years. Each semester shall consist of 15 weeks.

1.1 Programmes

- a) Civil Engineering
- b) Computer Science and Engineering
- c) Electrical and Electronics Engineering
- d) Electronics and Communication Engineering
- e) Information Technology
- f) Mechanical Engineering
- g) Safety and Fire Engineering

1.2 Structure of the B.Tech. Programme

1.2.1. The programme of instruction will consist of the following:

- a) General (common) core courses comprising basic sciences, mathematics, and basic engineering.
- b) Engineering core courses introducing the student to the foundations of engineering in the respective programme.
- c) Elective courses enabling the student to opt and undergo a set of courses of interest to him/her.
- d) Professional practice including project, seminar, and industrial training and internship in industry/higher educational institutions of national eminence; and
- e) Humanities courses on soft skills.
- f) Mandatory courses comprising environmental sciences, induction program, Indian Constitution, essence of Indian Knowledge Tradition.

1.2.2. Every B.Tech. programme will have a curriculum and syllabus for the courses approved by the Academic Council.

1.2.3. The B.Tech. programmes offered by the University Departments/Schools/Cochin University College of Engineering, Kuttanad shall follow the credit system.

1.2.4. The curriculum of any B.Tech. programme shall have a total of 170 credits as minimum.

1.3 Course Registration

It is mandatory for the students to register for the course in each semester.

Before registration, the students should

- a) Clear all dues including any fees to be paid and should not have any disciplinary issues pending.
- b) Meet the requirements regarding the minimum number of credits for promotion stipulated in clause 1.10.

The dates for registration will be announced by the School/College in their academic calendar. Late registration will be allowed up to 7 working days from the commencement of the semester with late registration fee.

1.4 Mode of Evaluation

1.4.1. The performance of the students in theory courses will be evaluated based on continuous assessment and semester end examination. In the case of laboratory courses, the evaluation will be based on continuous assessment and semester end assessment carried out internally by the division concerned.

1.4.2. For theory courses, there will be 50% weightage for continuous assessment and 50% weightage for semester end examination. For practical courses, continuous assessment and semester end assessment will carry 50% weightage each.

1.4.3. For theory courses, the assessment pattern will be as follows:

Continuous Assessment:

- | | |
|---------------------------------------|------------------------|
| a) First Periodical Test | :15 marks |
| b) Second Periodical Test | :15marks |
| c) Tutorials/Assignments/Mini project | :15marks |
| d) Attendance Maximum marks | :5marks Total:50 Marks |

Semester End Examination

- a) Exam shall be of 3hours duration.
- b) Maximum marks: 50

1.4.4. For laboratory courses, the assessment pattern will be as follows:

Continuous Assessment:

The marks may be awarded based on the performance of the student in the laboratory sessions. The break-up of marks for continuous assessment of laboratory courses shall be:

- a) Practical records and Outputs : 10marks
- b) Lab work : 10marks
- c) Attendance (Maximum marks) : 5marks Total:25marks

Semester End Examination

The semester end assessment for laboratory courses will consist of an examination carrying 18 marks and a viva voce carrying 7 marks. Maximum marks for semester end examination: 25

1.4.5 The split up of maximum marks for attendance for theory and laboratory courses as given in 1.4.3 (d) and 1.4.4 (c) shall be:

Attendance less than 75%	0 marks
Attendance of 75% and above, but less than 80%	1 mark
Attendance of 80% and above, but less than 85%	2 marks
Attendance of 85% and above, but less than 90%	3 marks
Attendance of 90% and above, but less than 95%	4 marks
Attendance of 95% and above	5 marks

1.4.6. At the end of the semester, semester end examination will be conducted in all the theory courses offered in the semester and they will be of three hours duration unless otherwise specified. The Controller of Examinations will make necessary arrangements for setting the question papers and valuation of answer books for the semester end examination of theory courses.

1.4.7. The semester end assessment for the laboratory courses shall be conducted by the respective department/division with at least two faculty members as examiners.

1.4.8. In the case of project work/internship activities, the project guide/faculty mentor concerned shall make the continuous assessment. A committee consisting of the Project/Internship Coordinator (nominated by the Head of the Department/Division), project guide/faculty mentor, and at least one senior faculty member at the level of Associate Professor or above will carry out the final review.

The weightages for the assessment of project work/internship activities shall be as follows:

Continuous assessment : 40 percent

Project Report/Report of Internship : 20 percent

Final Review : 40 percent

1.4.9. The Viva-voce examination at the end of VIII semester will be conducted by a panel of three examiners consisting of the Head of the Department/Division or his/her nominee and one senior faculty at the level of Associate Professor or above of the Department/Division and preferably, one external expert.

1.4.10. A candidate shall not be allowed to improve the continuous assessment marks in theory/laboratory courses. A candidate who desires to improve his/her marks in the semester end examination in theory courses shall be permitted to do so in the next available chance. This facility will be available only once for a theory course.

1.5 Course Completion and Earning of Credits.

Students registered for a course have to attend the course regularly and meet the attendance rules of the University and appear for all the internal evaluation procedures for the completion of the course. However, credits can be earned only on completion of the semester end examination and on getting a pass grade. Students, who have completed a course, but could not write the semester end examination for valid reasons, are permitted to write the examination at the next available chance and earn the credits without undergoing the course again.

1.6 Eligibility to Appear for the Semester End Examination

1.6.1. A candidate who has fulfilled the following conditions shall be deemed to have satisfied the requirements for the completion of a semester.

A student shall secure not less than 75% of overall attendance in a semester considering the total number of periods in all courses attended by the candidate as against the total number of periods in all courses offered during that particular semester.

1.6.2. The Principal/Head of the School/College shall have the power to condone shortage of attendance up to 5% (between less than 75% and 70%) in a particular semester due to medical reasons (hospitalization/accident/specific illness) duly verified and recommended by the Head of the Division/Department and on production of medical certificate from a registered medical practitioner endorsed by the University Medical Officer and on payment of the required fee. However, such condonation for shortage of attendance shall be given only twice during the entire duration of the B.Tech. Programme.

1.6.3. The Vice Chancellor shall have the power to condone shortage of attendance up to additional 5% (between less than 70% and 65%) in a particular semester due to medical reasons (hospitalization/accident/specific illness) duly verified and recommended by the Principal/Head of the School/College and on production of Medical Certificate from a registered medical practitioner endorsed by the University Medical Officer and on payment of the required fee. However, such condonation for shortage of attendance shall be given only twice during the entire duration of the B.Tech. Programme.

1.6.4. Candidates who secure overall attendance of less than 65% (subject to clauses 1.6.2 and 1.6.3 above) will not be permitted to write the semester end examinations and will not be permitted to go to next/subsequent semester. They are required to repeat the incomplete semester in the next academic year.

1.7 Eligibility to Write the Supplementary Examination

Failed candidates and those who could not write the semester end examination due to health reasons or other contingencies, that are approved by the Head of the School or College, can register for the supplementary examination. Those who wish to improve their performance in the semester end examination can also register for the same, subject to the provisions of clause 1.4.10. Grades awarded in the supplementary examination will be taken as semester grades in these subjects and will be based on the semester examination grading pattern in that subject. In the case of candidates appearing for improvement of marks, the higher marks obtained will be considered for the purpose of grading.

A candidate who fails to obtain a pass in courses having only continuous assessment component (other than laboratory courses) will be permitted to repeat the course along with the junior batches.

1.8 Revaluation

A candidate can apply for revaluation of his/her semester end examination answer paper in a theory course, within 2 weeks from the declaration of results, on payment of a prescribed fee along with prescribed application to the Controller of Examinations through the Head of Department/School/College. The Controller of Examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department/School/College. Revaluation is not permitted for laboratory courses, courses having only continuous assessment, seminar, project work, internships, and Viva voce.

1.9 Pass Requirements

A candidate has to obtain a minimum of 50% marks for continuous assessment and semester end examination put together with a minimum of 40% marks in the semester end examination for a pass in theory and laboratory courses.

In the case of theory/laboratory courses having only continuous assessment, a candidate has to obtain a minimum of 50% marks in continuous assessment for a pass.

1.10 Promotion to Higher Semesters

A student will be given one regular chance and one supplementary chance for the semester end examination of a particular semester in both theory and practical courses to obtain a pass grade before he/she is assessed for promotion to higher semesters.

Promotion to III, V and VII semesters shall be subject to the following conditions:

Promotion to	Minimum number of credits to be earned
III semester	11 credits of Semester I
V semester	32 credits of Semester I to III 11 credits of semester III for Lateral Entry students
VII semester	54 credits of Semester I to V 32 credits of semester III to V for Lateral Entry students

1.11 Grading

1.11.1. Grades shall be awarded to the students in each course based on the total marks obtained in continuous assessment and at the end semester examination and as per the provisions of clause 1.4.1.

The grading pattern shall be as follows:

Range of Marks obtained* (Percentage)	Grade	Grade points (Gi)
90 and above	S (Outstanding)	10
80 – 90*	A (Excellent)	9
70 – 80*	B (Very good)	8
60 – 70*	C (Good)	7
50 – 60*	D (Satisfactory)	6
< 50	F (Fail)	0

(* where X-Y range denotes 'X' inclusive and 'Y' exclusive)

1.11.2 A student is considered to have credited a course or earned credits in respect of a course if he/she secures a grade other than F for that course.

1.11.3 Semester Grade Point Average

The academic performance of a student in a semester is indicated by the mandatory Semester Grade Point Average (SGPA).

$$\text{SGPA} = \frac{G_1C_1 + G_2C_2 + G_3C_3 + \dots + G_nC_n}{C_1 + C_2 + C_3 + \dots + C_n}$$

Where 'Gi' refers to the grade point and 'Ci' refers to the credit value of the ith course undergone by the student in the semester excluding the credits earned by the student for his/her Minor and/or Honours programme.

The Semester Grade Point Average (SGPA) for each semester will be calculated only for those students who have passed all the registered courses of that semester. Similarly, Cumulative Grade Point Average (CGPA) up to any semester will be calculated only for those students who have passed all courses up to that semester.

1.11.4 Grade Card

The Grade Card issued at the end of the semester to each student by the Controller of Examinations will contain the following:

- a) The code, title, number of credits of each course registered in the semester for the B.Tech. programme,
- b) The marks and letter grade obtained,
- c) The total number of credits earned by the student up to the end of that semester,
- d) SGPA for each semester
- e) CGPA obtained by the candidate will be mentioned in the grade card for the VIII semester in addition to the SGPA for that semester.
- f) In the case of Minor and Honours programmes, the title of the courses successfully completed, and the corresponding number of credits earned by the student in a particular semester will be mentioned in the grade card for that semester.
- g) The total number of credits earned by the student for his/her Minor/Honours Programme will be given in the VIII semester grade card only if he/she fulfills all the requirements of the Minor/Honours programme.

1.11.5 Classification

On successful completion of the programme, mandatory CGPA will be calculated as follows:

$$CGPA = \frac{C_1SGP_1 + C_2SGP_2 + C_3SGP_3 + \dots + C_nSGP_n}{C_1 + C_2 + C_3 + \dots + C_n}$$

Where 'SGPj' refers to the Semester Grade Point Average (SGPA) and 'Cj' refers to the total number of credits obtained by a student in the jth semester excluding the credits earned by the student for his/her Minor and/or Honours programme.

The classification based on CGPA is as follows:

CGPA 8 and above : First Class with distinction

CGPA 6.5 and above, but less than 8 : First Class

CGPA 6 and above, but less than 6.5: Second Class

1.11.6. Conversion of SGPA or CGPA to percentage marks

The following formula shall be used to convert the SGPA or CGPA obtained by a student to percentage of marks.

Percentage marks = (SGPA or CGPA - 0.5) × 10

1.12 Electives

1.12.1 The curriculum for each programme consists of a minimum of four Professional Electives and two Open Electives. The student shall select at least one Open Elective from among the courses offered in that semester by a Division/Department other than his/her Division/Department. Every student shall undergo a minimum number of elective course/s under MOOC offered by CUSAT or national agencies like NPTEL/SWAYAM, recommended by the concerned Division and with the approval of the Board of Studies concerned, during the programme (preferably before the final semester), as per the Regulations for MOOC prescribed by the University from time to time. The candidate shall produce the certification issued by the agency conducting the MOOCs in proof of credit attainment. The assessment and certification of the MOOCs shall be as per the prescribed norms of the MOOCs approved by the University.

1.13 B. Tech with Minor

- 1.13.1 A minor is intended for a student to gain expertise in an area outside his/her major B.Tech. discipline. A Department/Division may offer a Minor in a discipline in which it offers a major UG/PG programme.
- 1.13.2 All B.Tech. students shall be eligible to register for Minor Programmes.
- 1.13.3 The registration for Minor programmes shall be along with the registration of the 3rd semester. The selection of candidates for a minor programme shall be based on the SGPA obtained by the candidate in Semester – I.
- 1.13.4 To offer a minor programme in engineering, the number of candidates shall be at least 20% of the

sanctioned strength of the corresponding major program. The number of seats available for the minor programme shall be decided and announced by the Division/Department concerned at the end of the second semester.

- 1.13.5 The student shall earn a minimum of 18 additional credits to be eligible for the award of B.Tech. Degree with Minor.
- 1.13.6 For CGPA calculation of B.Tech. programme as per the provision of 1.11, the credits earned by the student for his/her Minor programme will not be considered.
- 1.13.7 There is no transfer of credits from courses of Minor programme to regular B. Tech. programme and vice versa.
- 1.13.8 The Department/Division offering a Minor programme would enlist a set of courses from its curriculum and prescribe a requirement for Minor taking at least six courses from this set. No major and minor courses can overlap by more than two courses, and this shall be ensured by the corresponding Departments/Divisions concerned while designing and offering a Minor program.
- 1.13.9 Out of the 18 credits, 9 credits shall be earned by undergoing a minimum of two theory courses and a mini project offered by the Department/Division concerned, during the specified period. The remaining 9 credits could be acquired through courses offered by the Department/Division concerned or MOOCs approved by the Board of Studies concerned.
- 1.13.10 The maximum number of additional credits a student can register (course registration) in a semester is limited to 09 credits in excess of the mandatory credits allotted in the curriculum for that semester.
- 1.13.11 The assessment of the courses other than the MOOCs and earning of credits shall be as per the provisions of the clause 1.11. The assessment and certification of the MOOCs shall be as per the prescribed norms of the MOOCs. The candidate shall produce the certification issued by the agency conducting the MOOCs in proof of credit attainment.
- 1.13.12 If a student fails in any course of the minor, he/she shall not be eligible to continue the B. Tech Minor. However, the additional credits and grades thus far earned by the student shall be included in the grade card.
- 1.13.13 The Undergraduate Degree with minor shall be awarded by the University to the students who fulfill all the academic eligibility requirements for the B.Tech. programme with Minor.

1.14 B. Tech (Honours)

- 1.14.1 Honours is an additional credential a student may earn if he/she opts for the extra 18 credits needed for this in his/her own major B. Tech. discipline. B. Tech students with a minimum CGPA of 8.0 and above obtained in the first attempt in the first and second semesters combined are eligible to register for B.Tech. (Honours).

- 1.14.2 The CGPA of the candidate at the end of eighth semester shall be 8.0 or higher to be eligible for the award of B. Tech. (Honours).
- 1.14.3 The B.Tech. (Honours) registration shall be along with the registration of the 4th semester.
- 1.14.4 If a student fails in any course of the B.Tech. programme or the courses chosen for B.Tech. (Honours), he/she shall not be eligible to continue the B.Tech. (Honours). However, the additional credits thus far earned by the student shall be included in the grade card.
- 1.14.5 The student shall earn a minimum of additional 18 credits from the courses chosen for B.Tech. (Honours), to be eligible for the award of B.Tech. (Honours) Degree.
- 1.14.6 For CGPA calculation of B.Tech. programme as per the provision of 1.11, the credits earned by the student for his/her Honours programme will not be considered.
- 1.14.7 There is no transfer of credits from courses of Honours programme to regular B. Tech. programme and vice versa.
- 1.14.8 Out of the 18 credits, 9 credits shall be earned by undergoing minimum three specified B.Tech.(Honours) Elective courses of the respective discipline. Credits for the B.Tech.(Honours) Elective courses are deemed to be earned only on getting at a “C” grade or better as per the provisions of the clause 1.11.1. A student shall not be permitted to select the normal elective courses of the respective B. Tech programmes for attaining the credit requirements of B.Tech. (Honours). The remaining 9 credits could be acquired through courses offered by the Department/Division concerned or MOOCs of the respective disciplines approved by the Board of Studies concerned.
- 1.14.9 The maximum number of additional credits a student can register (course registration) in a semester is limited to 09 credits in excess of the mandatory credits allotted in the curriculum for that semester.
- 1.14.10 The assessment of the courses other than the MOOCs and earning of credits shall be as per the provisions of the clause 1.11. The assessment and certification of the MOOCs shall be as per the prescribed norms of the MOOCs. The candidate shall produce the certification issued by the agency conducting the MOOCs in proof of credit attainment.
- 1.14.11 B.Tech. (Honours) Degree shall be awarded by the University to the students who fulfill all the academic eligibility requirements for the B.Tech. and B.Tech. (Honours) programmes.

1.15 B.Tech. (Honours) with Minor:

A student has the choice to register for, either a Minor programme or an Honours programme or both Minor and Honours programmes, satisfying the clauses 1.13 and 1.14 related to Minor and Honours programmes, respectively. However, the maximum number of credits a student can register for, in a semester, is limited to 09 credits in excess of the mandatory credits allotted in the curriculum for that semester as given in the clause 1.4.10.

1.16 Faculty Advisor

To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a teacher of the Department who shall function as Faculty Advisor for these students throughout their period of study. Such Faculty Advisor shall advise the students and monitor the courses taken by the students, check the attendance and progress of the students attached to him/her and counsel them periodically. If necessary, the Faculty Advisor may also discuss with or inform the parents about the progress/performance of the students concerned.

1.17 Class Committee

A class committee consists of teachers of the class concerned, student representatives and a chairperson who does not handle any subject for the class. It is like the 'Quality Circle' (more commonly used in industries), with the overall goal of improving the teaching learning process. The functions of the class committee include:

- a. Solving problems experience by students in the classroom and in the laboratories in consultation with Head of the Division/Principal/Director.
- b. Clarifying the regulations of the degree programme and the details of rules therein.
- c. Informing the student representatives, the academic schedule including the dates of assessments and the syllabus coverage for each assessment.
- d. Informing the student representatives, the details of regulations regarding weightage used for each assessment.
- e. Discussing in the class committee meeting the breakup of marks for each experiments/exercise/module of work, in case of practical course (laboratory/drawing/project work/seminar/internships etc.) and informing the students.
- f. Analyzing the performance of the students of the class after each test and finding ways and means of improving the performance of the students.
- g. Identifying the students who are low achievers or weak in their subjects if any, and requesting the teachers concerned to provide some additional help or guidance or coaching to such students.

The class committee is normally constituted by the Head of the Division. However, if the students of different programmes are mixed in each class, the class committee is to be constituted by the Principal/Director. The class committee shall be constituted within a week from the date of commencement of a semester. At least 4 student representatives from the respective class (usually 2 boys and 2 girls) shall be included in the class committee. The student representatives shall be nominated based on their academic performance since the first semester of the B. Tech. programme. In the case of first and second semesters, the

rank obtained in the Common Admission Test (CAT) shall be the criterion for nominating the student representatives. The Chairperson of the class committee may invite the Faculty Advisor(s) and the Head of the Division to the meeting of the class committee. The Chairperson of the class committee is required to prepare the minutes of every meeting, submit the same to the Head of the Division within two days of the meeting and arrange to circulate the same to among students concerned and teachers. If there are some points in the minutes requiring action by the University, the same shall be brought to the attention of the Principal/Director and the Registrar.

The first meeting of the class committee shall be held within fifteen days from the date of commencement of the semester. The nature and weightage of internal assessments shall be decided in the first meeting, within the framework of the regulations and the same shall be communicated to the students. Two or three subsequent meetings in a semester may be held at suitable intervals. During these meetings, the student members representing the entire class, shall meaningfully interact and express their opinions and suggestions of the class to improve the effectiveness of the teaching-learning process.

1.18 Course Committee for Common Courses

Each common theory course offered to more than one discipline or group of discipline shall have a “Common Course Committee” comprising all the teachers teaching the common course with one of them nominated as Common Course Coordinator. The nomination of the Course Coordinator shall be made by the Principal/Director in consultation with Heads of Divisions from among the teachers teaching the common courses. The “Common Course Committee” shall meet as often as possible and ensure uniform evaluation of internal assessments after arriving at a common scheme of evaluation for the tests. Wherever feasible, the common course committee shall prepare a common question paper for the test(s).

1.19 Discipline

Every student is required to observe the discipline and decorous behavior both inside and outside the campus and refrain from any activity which may tarnish the image of the University as per the provisions of the Cochin University Students’ (Conduct and Disciplinary) Code -2005. Any act of indiscipline, misbehavior including unfair practice in examinations will be referred to the authorities of the University that will make a detailed enquiry on the matter and decide on the course of action to be taken.

1.20 Amendment to Regulations

Notwithstanding all that has been stated above, the University has the right to modify any of the above regulations from time to time.

REGULATION FOR MASTER OF SCIENCE (FIVE YEAR INTEGRATED) IN PHOTONICS

(2023 Admission onwards)

Vision

To be an Institute of Eminence creating global leaders and innovators in the emerging field of light based technologies to meet the social challenges of today and the future.

Mission

To impart quality education that equip students through rigorous training towards meeting the needs of society and industry.

To provide state-of-the-art facilities to undertake research activities relevant to light based industries and promote entrepreneurship.

To collaborate with premier academic and research institutes around the globe to fortify the education and research environment.

Program Educational Objectives (PEOs)

PEO1: Inculcate advanced knowledge in photonics and apply theories and principles of general physics and optics in the domain of photonics.

PEO2: Acquire essential laboratory skills in general physics, electronics and advanced optics by designing experiments, carrying out measurements and analyzing acquired data.

PEO3: Provide professional consultancy and research support to photonics and optoelectronics industry and research organizations.

PEO4: Equip for inter-disciplinary & multi-disciplinary research and to be a life-long learner.

PEO5: Inculcate, socially responsible, value based and ethical leadership qualities in the professional and personal life.

Program Outcomes (POs)

PO1 : Gain sufficient knowledge in the areas of mechanics, mathematics, electronics, electrodynamics, quantum mechanics, statistical mechanics, optics, and laser technology.

PO2: Explain the advances in optical technology.

PO3: Expertise in communication, science writing skills and scientific presentations.

PO4: Develop proficiency in experimental skills, data acquisition and interpretation in the advanced topics of physics and optics.

PO5: Gain knowledge in computer simulation of photonic structures and numerical modelling.

PO6: Acquire sufficient skills in experimental designs and problem solving by carrying out minor and major projects in the advanced topics of photonics.

PO7: Familiarise the usage of modern and complex tools used in photonics research.

PO8: Address the societal needs through outreach programmes.

2. SCOPE

2.1 These Regulations shall apply to the M.Sc. (Five-year Integrated) Degree in Photonics conducted by International School of Photonics of the Cochin University of Science and Technology.

2.2 The provisions herein supersede all other Regulations unless otherwise provided.

3. DEFINITIONS

3.1 An academic year is divided into two semesters.

3.2 A summer term is for eight weeks during summer vacation. Internship/apprenticeship/work-based vocational education and training can be carried out during the summer term.

3.3 Major stream courses are the discipline or subject of main focus and the degree will be awarded in that discipline. Students should secure the prescribed number of credits (minimum 50% of total credits) through core courses in the major discipline. The major would provide the opportunity for a student to pursue in-depth study in Photonics.

3.4 Each course may have only a lecture (L) component or a lecture (L) and tutorial (T) component or a lecture (L) and practicum (P) component or a lecture (L), tutorial (T), and practicum (P) component, or only practicum (P) component.

3.5 Academic Committee means the committee constituted by the Vice-Chancellor under this regulation to monitor the running of the programme.

3.6 Core course means a course that the student admitted to a particular programme must successfully complete to receive the Degree. Core courses cannot be substituted by any other course.

3.7 Elective course means a course, which can be substituted by equivalent courses from the same or other Departments/Schools.

3.8 Audited course will not accrue any credit.

3.9 MOOC course means a Massive Open Online Course offered by UGC/AICTE, CUSAT or any other recognized educational agencies approved by the University.

3.10 Department/School means Departments/Schools instituted in the University as per Statutes and Acts.

3.11 Levels of courses in these Regulations will generally mean: BSc in Photonics: (Semester I to Semester VI)

BSc (Honours with Research)/ BSc (Honours) in Photonics: Semester I to Semester VIII

MSc (Five-year integrated) in Photonics: Semester I to Semester X

3.12 Outcome Based Education (OBE) with Choice Based Credit System (CBCS) shall be followed.

4. ELIGIBILITY FOR ADMISSION

As per the Regulations prescribed by the University from time to time.

5. ADMISSIONS

5.1 Minimum of 60% marks or a CGPA of 6.5 for qualifying examination is required. However, a relaxation of marks/CGPA can be given to the students belonging to reservation categories as per rules.

5.2 After closing the admissions, each student will be assigned a unique registration number by the department which will be valid throughout his/her programme in the University.

5.3 Lateral entry to the 7th semester shall be permitted for students who have successfully completed BSc Photonics subject to the availability of seats, as per the rules and regulations of the University.

6. COURSE REGISTRATION

6.1 The School shall have Faculty Members as Student Advisors. Each student at the time of seeking admission will be assigned to an Advisor by the Department Council. She/he will advise the student about the academic programme and counsel on the choice of courses, depending on the student's academic background and objective. The student will then register for the courses he/she plans to take for the semester before the classes begin.

The Department shall prescribe the maximum number of students that can be admitted taking into consideration the facilities available. Preference shall be given to those students for whom the course is a core-course, if the demand for registration is beyond the maximum prescribed. The student has to complete the prescribed prerequisites for the course before registration and register before the last date prescribed by the university. The student can drop/re-register any elective/audit courses(s) within 15 working days after the commencement of the classes.

6.2 The University shall make available to all students a Bulletin listing all the courses offered in every semester specifying the credits, prerequisites, list of topics the course intends to cover, the instructor who is giving the courses, the time and place of the classes for the courses and examination schedule. Each course shall have a nine-digit code consisting of first two digits denoting the year of implementation of the scheme, next three digits denoting the code of the programme and last four digits, of which first two digits indicating the Semester and third and fourth digits the serial number of the course.

7. COURSE STRUCTURE

- 7.1 The programme consists of a combination of major stream courses (core and electives), Multi-Disciplinary Courses (MDC), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), and Value Added Courses (VAC). Core courses will be offered only by the concerned department. Normally no course shall have more than four credits except in cases where only project/dissertation including seminars are involved in which cases, the minimum credit shall be twelve.
- 7.2 Elective course can be substituted by approved equivalent courses from any other Departments/Schools.
- 7.3 The department council is responsible for assessing the eligibility of MOOC/elective courses and granting prior approval.
- 7.4 The minimum credit required for the award of the BSc degree in Photonics is 135, BSc (Honours with Research)/ BSc (Honours) degree in Photonics is 178, and for MSc degree in Photonics is 221.
- 7.5 The Department Council shall make recommendations on the required courses including the detailed syllabus for each programme offered by the Department to the University and approved by the Board of Studies, Faculty and Academic Council.
- 7.6 The Department Council shall have the freedom to design and introduce new electives and/or audited courses, to modify/redesign existing electives and to replace any existing electives with new or modified/redesigned electives to facilitate better exposure and training for the students. Prior approval from the Board of Studies and Academic Council is not required for such modifications in the electives, but shall be done only with the approval of the Academic Committee. Such changes shall be brought to the notice of the concerned bodies in the next meeting for ratification.
- 7.7 The general structure of the programme shall be as given below:

A minimum of 75 % attendance is compulsory for attending end semester examination. Director is authorized to grant 5% condonation of attendance on medical grounds after collecting the required fee. The Vice-Chancellor shall have the power to condone additional 5% shortage of attendance on medical grounds on the recommendations of the Director of the School. However, such condonation for shortage of attendance shall be given only twice during the entire programme duration.

MSc (Five-year Integrated) Photonics	
Programme duration	10 semesters
Accumulated minimum credits required for the successful completion of the programme*	221
Minimum Attendance required**	75%

Note: * One credit shall be given for one hour lecture/tutorial or 2 hours of practical work per week. No regular student shall register less than 16 credits per semester.

**Subject to the amendments implemented by the university from time to time. The minimum accumulated credits required to continue to Semester 9 shall be 150.

8. EVALUATION

8.1 The entire system of evaluation is internal. The evaluation scheme for each semester contains two parts, a Continuous Assessment (CA) and an End Semester Examination (ESE). The CA shall consist a minimum of two tests of twenty marks each and ten marks for assignments/seminars/quizzes, etc. which has to be intimated to the students at the beginning of the semester. Marks obtained in the CA shall be displayed on the notice board and grievances, if any, shall be addressed to the Director. The Department Council shall finalise the marks of the continuous assessment of each course after addressing such grievances.

The ESE shall cover the entire syllabus of the course. Equal weightage shall be given for the continuous assessment and the semester end components. All practical examinations will be internally evaluated as per the procedures laid down by the Department Council.

8.2 Two distinct sets of course outcome (CO) mapped question papers for the ESE are to be set by the concerned teacher in advance, to be scrutinized by the department council to ensure that questions are within the scope of the syllabus and also the entire syllabus of the course is fairly covered in the question paper. Modifications can be suggested by the council if necessary and the incorporation of such suggestions should reflect in the final question paper. Out of the two question papers prepared, one shall be selected by the Director for conducting the ESE.

There shall be only a single internal evaluation for the ESE. Immediately after the examination, the Director shall arrange an internal valuation camp pertaining to all the end semester examinations conducted in the department and the results shall be finalized within 10 working days after the examination. The marks and grades in all the courses obtained by the students have to be displayed in the notice board and the answer scripts can be given back to the students for scrutiny, if necessary.

8.3 For each course there shall be a separate minimum of 45% marks for the end semester examinations.

8.4 The department shall publish the marks obtained by the students, in the continuous assessment and end semester examination. If the student has any grievance, he/she can approach the concerned teacher and submit his/her grievance with supporting documents/arguments within five working days of publication of the results. The teacher and the Director will examine the case and decide on his/her grievance. If the student is not convinced with the decision, he/she can approach the appealing authority- the department council- in writing and the council shall examine the same and take a final decision, which has to be intimated to the student in writing. The decision of the appealing committee shall be final.

- 8.5** The final marks and grades obtained by the students shall be published on the notice board. Those who could not obtain 50% marks (Grade D) in total for a course will be declared as failed in that course. Those who fail in any course shall approach the concerned teacher for an immediate re-examination, if necessary. Within one week of the display of the results on the notice board, the concerned teacher shall conduct an additional end semester examination for such candidates. This re-examination is only to enable the student to pass the examination by completing the course successfully. Even if he/she completes the course successfully making use of this additional chance, he/she will be awarded only a D grade for that course. If he/she cannot make it up, he/she may repeat the end semester examination of that course in the next available chance. Students who wish to improve their end semester examination marks in any course can do it by reappearing for the examination in the next available chance. However, a student can avail only one chance of improvement for a course.
- 8.6** A student can have an additional two years for completing the BSc degree and an additional one year to complete the BSc Honours/ BSc (Honours with Research). The maximum duration for completing the MSc degree programme will be 9 years from the date of commencement of the first semester.
- 8.7** The result of the examinations will be declared by the department council within 30 days of the last examination of the semester and the minutes shall be sent to the Controller of Examinations to issue the mark list of that examination.

9. GRADE CARD

- 9.1** The University under its seal shall issue a Grade Card to the students on completion of each semester.

The Grade card shall contain the following:

- a) Title of the courses (An audit course shall be listed only if the student has secured a pass).
- b) The credits associated with and the grades awarded for each course.
- c) The number of credits earned by the student and the Semester Grade Point Average.
- d) The total credits earned till that semester.

- 9.2** The following grading system will be adopted for all the courses.

Range of marks	Grades	Weightage
90% and above	S - Outstanding	10
80% to 90%	A - Excellent	9
70% to 80%	B - Very good	8
60% to 70%	C - Good	7
50% to 60%	D - Satisfactory	6
Below 50%	F - Failed	0

Here the range of marks X to Y means that X is included and Y is excluded.

The following is the procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA).

2 The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses credited in that semester by a student and the sum of the number of credits of all the courses undergone by a student,

i.e., $SGPA = \frac{\sum(C_i \times G_i)}{\sum C_i}$, where C is the number of credits of the i^{th}

$$\sum C_i$$

course and G_i is the grade point scored by the student in the i^{th} course.

3 The CGPA is also calculated in the same manner taking into account all the courses done by a student over all the semesters of a programme,

i.e., $CGPA = \frac{\sum(C_i \times S_i)}{\sum C_i}$, where S is the SGPA of the i^{th} semester and C is the total $\sum C_i$ number of credits in that semester.

Classification for the Degree will be given as follows:

Classification for the Degree	CGPA
First Class with distinction	8 and above
First Class	6.5 – 8.0*
Second Class	6.0 – 6.5*

(*where X-Y range denotes X inclusive and Y exclusive)

9.3 The Grade Card issued at the end of the final semester shall contain the details of all the courses taken which shall include the titles of the courses, the credits associated with each course, the CGPA and the class. The rank shall be awarded based on CGPA corrected to the 2nd Decimal.

10. MONITORING AND MANAGEMENT OF COURSES

10.1 Every post graduate programme conducted in the Departments shall be monitored by the Department Council subject to these regulations. The Department Council shall design courses, prescribe the mode of conducting the courses and monitor the evaluation of students.

11. ACADEMIC COMMITTEE

11.1 There shall be an Academic Committee constituted by the Vice-Chancellor to monitor and co-ordinate the working of the credit and Semester system.

11.2 The Committee shall consist of:

- a) The Pro-Vice-Chancellor, Chairman
- b) The Registrar, Secretary
- c) The Controller of Examinations
- d) One Teacher from each Department

11.3 A Senior Professor nominated by the Vice-Chancellor from among the members of the Committee shall be the Vice-Chairman of the Committee

11.4 The term of the office of the committee shall be two years, but the committee once constituted shall continue in office until a reconstituted committee assumes office.

12. Exit Option

The MSc (Five-year Integrated) Photonics is a full-time regular programme. Option of exit with a BSc degree/BSc Degree (Honours)/BSc degree (Honours with Research) is introduced for desiring students. The distinguishing features of the exit option are:

12.1 Exit with BSc Degree

- 2 The exit option with BSc Degree will be available at the end of three years (6 semesters) in the case of the MSc (Five-year Integrated) Photonics students.
- 3 Students who seek to opt out after 3 years (six semesters) should have passed all the courses of the first six semesters. For exercising the exit option, the students should have secured a minimum of 135 credits in toto for semesters 1-6.
- 4 Students who exercise exit option at the end of three years of the MSc (Five-year Integrated) Photonics will be awarded a BSc Degree in Photonics.
- 5 The students who exercise the exit option have to surrender the mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the BSc Degree.

• Exit with BSc (Honours) Degree

- The exit option with BSc (Honours) Degree will be available at the end of four years (8 semesters) in the case of the MSc (Five-year Integrated) Photonics students.
- Students who seek to opt out after 4 years (eight semesters) should have passed all the courses of the first eight semesters. For exercising the exit option, the students should have secured a minimum of 178 Credits in toto for semesters 1- 8.
- Students who exercise exit option at the end of four years of the MSc (Five-year Integrated) Photonics will be awarded BSc (Honours) Degree in Photonics.
- The students who exercise the exit option have to surrender the mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the BSc (Honours) Degree.

• Exit with BSc (Honours with Research) Degree

- The exit option with BSc (Honours with Research) Degree will be available at the end of four years in the case of the MSc (Five-year Integrated) Photonics students. The student may opt for BSc (Honours with Research) at the end of seventh semester. The eligibility for a student to pursue BSc (Honours with Research) shall be a minimum CGPA of 8.0 up to sixth semester.
- A Student who opts for BSc (Honours with Research) Degree should have to undertake a research project in the 8th semester. If opportunities are available, the department council may permit the candidate to undertake the research project in other departments of CUSAT or any other National or International

Institutes/Universities to earn a minimum 12 Credits. For exercising the exit option, the student should have secured a minimum of 178 Credits in to for semesters 1-8 including 12 credits for research projects.

- Students who exercise exit option at the end of four years of MSc (Five-year Integrated) Photonics will be awarded BSc (Honours with Research) Degree.
- The students who exercise the exit option have to surrender the mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the BSc (Honours with Research) degree.

13. TRANSITORY PROVISION

Notwithstanding anything contained in these regulations, the Vice-Chancellor shall, for a period of one year from the date of coming into force of these regulations, have the power to provide by order that these regulations shall be applied to any programme with such modifications as may be necessary.

14. REPEAL

The Regulations now in force, in so far as they are applicable to programmes offered in the University Departments and to the extent they are inconsistent with the existing regulations, and the regulations relating to the Credit and Semester System in their application to any course offered in a University Department, the latter shall prevail.

**REGULATION FOR 5-YEAR INTEGRATED M. SC. IN PHYSICS/ 5-YEAR INTEGRATED
M. SC. IN CHEMISTRY / 5-YEAR INTEGRATED M. SC. IN MATHEMATICS/
5-YEAR INTEGRATED M. SC. IN STATISTICS/ 5-YEAR INTEGRATED M. SC.
IN BIOLOGICAL SCIENCES
(2023 Admission onwards)**

PREAMBLE

This Regulations shall be called ‘Regulations for 5-Year Integrated M. Sc. in Physics/ 5-Year Integrated M. Sc. in Chemistry/ 5-Year Integrated M. Sc. in Mathematics/ 5-Year Integrated M. Sc. in Statistics/ 5-Year Integrated M. Sc. in Biological Sciences.

15. Scope

15.1 These regulations shall apply to 5-Year Integrated M. Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5- Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics coordinated by Centre for Integrated Studies (CIS) along with the departments under Faculty of Science of Cochin University of Science and Technology with effect from 2023 admissions.

15.2 The provisions herein supersede all other regulations with respect to 5-Year Integrated M.Sc programme conducted by Centre for Integrated Studies (CIS).

16. Definitions

16.1 **Core course** means a course that the student admitted to a particular programme must successfully complete in order to receive the Degree and which can not be substituted by any other course.

16.2 **Departmental Core Course** means a core course offered by the department which conduct the 5-year integrated programme.

16.3 **Interdepartmental Core Course** means a core course offered by departments other than the department which is offering the 5-year integrated programme.

16.4 **Elective Course** means a course which can be substituted by equivalent course from the same or other departments.

16.5 **Departmental Elective** means an elective course offered by the department which conducts the 5 year integrated programme.

- 16.6 Multidisciplinary course (MDC)** means an elective course offered by departments other than the department which is offering the 5 year integrated programme.
- 16.7 Ability Enhancement Course (AEC)** means a course enabling students to acquire skills in reading, writing, comprehension, communication and developing social skills and responsibility.
- 16.8 Skill Enhancement Course (SEC)** means a course which enables the students to develop and nurture theoretical and practical skills in a chosen area with a special focus to enhance employability.
- 16.9 Value Added Course (VAC)** means a course empowering students to increase employability and to meet professional challenges.
- 16.10 Audit Course** means a course which can be opted by a student but which will not accrue any credit.
- 16.11 MOOC Course** means a Massively Open Online Course offered by UGC, CUSAT or any other recognized educational agencies approved by the University.
- 16.12 Department/School** means Department/School instituted in the University as per Statutes and Act.
- 16.13 CIS** means The Centre for Integrated Studies, an interdepartmental centre to coordinate the 5 Year integrated Programmes. CIS shall manage common classrooms and laboratory facilities.

17. Introduction

In the process of the fulfillment of the set objects of the Cochin University of Science and Technology, a Centre for Integrated Studies (CIS) was established in the year 2018-19 to offer 5 year Integrated M.Sc. (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) for imparting specialized education to the students on completion of their +2 level of education.

18. Courses coordinated by the Centre

The CIS coordinates 5-year integrated M. Sc (Biological Sciences, Chemistry, Mathematics, Physics and Statistics). The nomenclature of the course shall be 5-Year Integrated M.Sc. in Biological Sciences / 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics). These 5-Year Integrated M.Sc. programmes are a non-professional programme. The curriculum is common to all for the first three semesters. The students spend first three semesters of their program at the CIS.

19. Admission

The students are admitted to the departments which offer the programme of their choice. The intake for the 5-Year Integrated M. Sc (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) is **75 (15 in each programme of study)**.

19.1 Eligibility and Entrance Examination

Candidates with **60% marks or 6.5 CGPA** in the plus two examination of the state of Kerala or any other examination accepted as equivalent thereto can apply, satisfying the following conditions.

<i>Programme of Study</i>	<i>Eligibility</i>
5-Year Integrated M.Sc. in Physics	60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects
5-Year Integrated M.Sc. in Chemistry	60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects
5-Year Integrated M.Sc. in Mathematics	60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects
5-Year Integrated M.Sc. in Statistics	60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects
5-Year Integrated M.Sc. in Biological Sciences	60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects

60% marks or 6.5 CGPA in the qualifying examination with Mathematics, Physics and Chemistry as subjects

60% marks or 6.5 CGPA in the qualifying examination with Biology, Physics and Chemistry as subjects

Students shall register their option for the preferred programme of study *i.e.*, 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics at the time of submission of the application.

The rules in force regarding the relaxation in qualifying marks/grade and the reservation in admission shall be applicable to candidates, belonging to the reservation categories.

19.2 Entrance Examination

The admission to 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics will be through the Common Admission Test examination (CAT) of CUSAT conducted by the Directorate of Admissions, CUSAT.

The students applying for 5-Year Integrated M.Sc. in Mathematics, 5-Year Integrated M.Sc. in Statistics, 5-Year Integrated M.Sc. in Chemistry and 5-Year Integrated M.Sc. in Physics shall write the entrance examination with Test code 101. The students applying for 5-Year Integrated M.Sc. in Biological Sciences shall write Test Code 104.

The pattern of Test Codes 101 and 104 are given as follows.

Subject

Test Code 101	Test Code 104
Physics	Physics
Chemistry	Chemistry
Mathematics	Biology

The scheme of the test shall be devised by Directorate of admissions and announced through the admission prospectus.

While preparing the Selection List, if tie arises, the following criteria shall be followed, one after the other, to resolve the ties, when more than one candidate secures the same total marks in the entrance examination:

Rank list for 5-Year Integrated M.Sc. in Mathematics/5-Year Integrated M.Sc. in Statistics

- 4 The rank list for 5-Year Integrated M.Sc. in Mathematics and 5-Year Integrated M.Sc. in Statistics shall be prepared from the test code 101 who opted for the 5-Year Integrated M.Sc. in Mathematics/5-Year Integrated M.Sc. in Statistics programmes. Total marks of Physics, Chemistry, and Mathematics will be ranked in the order. There shall be separate rank list for the Mathematics and Statistics programmes.
- 5 For Tie Breaking in 5– year integrated M.Sc in Mathematics/ 5 – Year Integrated M.Sc in Statistics rank list, marks obtained for mathematics will be considered first with higher mark given preference.
- 6 If the tie continues the number of correct answers scored in Mathematics will be considered next.
- 7 If the tie continues after applying the above two conditions, date of birth of the candidates in the descending order (older to younger) will be considered.
- 8 If the tie continues after applying the above three conditions, the names of the candidates in alphabetical order will be considered.

Rank list for 5-Year Integrated M.Sc. in Physics

- 6 The rank list for 5-Year Integrated M.Sc. in Physics shall be prepared from the test code 101 who opted for the 5-Year Integrated M.Sc. in Physics programme. Total marks of Physics, Chemistry, and Mathematics will be ranked in the order.
- 7 For Tie Breaking in 5– year integrated MSc Physics rank list, marks obtained for Physics will be considered first with higher mark given preference.
- 8 If the tie continues the number of correct answers scored in Physics will be considered next
- 9 If the tie continues after applying the above two conditions, date of birth of the candidates in the descending order (older to younger) will be considered.

- 10 If the tie continues after applying the above three conditions, the names of the candidates in alphabetical order will be considered.

Rank list for 5-Year Integrated M.Sc. in Chemistry

- c) The rank list for 5-Year Integrated M.Sc. in Chemistry shall be prepared from the test code 101 who opted for the 5-Year Integrated M.Sc. in Chemistry programme. Total marks of Physics, Chemistry, and Mathematics will be ranked in the order.
- d) For Tie Breaking in 5 – year integrated MSc Chemistry rank list, marks obtained for Chemistry will be considered first with higher mark given preference.
- e) If the tie continues the number of correct answers scored in Chemistry will be considered next
- f) If the tie continues after applying the above two conditions, date of birth of the candidates in the descending order (older to younger) will be considered.
- g) If the tie continues after applying the above three conditions, the names of the candidates in alphabetical order will be considered.

Rank list for 5-Year Integrated M.Sc. in Biological Sciences

- 2 The rank list for 5-Year Integrated M.Sc. in Biological Sciences shall be prepared from the test code 104 who opted for the 5-Year Integrated M.Sc. in Biological Sciences programme. Total marks of Physics, Chemistry, and Biology will be ranked in the order.
- 3 For Tie Breaking in 5– year integrated M.Sc Biological Sciences rank list, marks obtained for Biology will be considered first
- 4 If the tie continues the number of correct answers scored in Biology will be counted
- 5 If the tie continues after applying the above two conditions, date of birth of the candidates in the descending order (older to younger) will be considered.
- 6 If the tie continues after applying the above three conditions, the names of the candidates in alphabetical order will be considered.

20. Course Structure

- 2 The duration of 5 – Year Integrated M. Sc. in Biological Sciences/ 5 – Year Integrated M. Sc. in Chemistry/ 5 – Year Integrated M. Sc. in Mathematics/ 5 – Year Integrated M. Sc. in Physics/ 5 – Year Integrated M. Sc. in Statistics is 10 semesters.
- 3 The program follow OBE based CBCS system having core, elective and audit courses implemented in the University.
- 4 The curriculum and syllabus framed by the board of studies in Chemical and Bio- logical Sciences and the board of studies in Physical and Mathematical Sciences with inputs from the participating department councils approved by Academic Council is applicable to the 5– Year Integrated M.Sc. in Biological Sciences/ 5– Year Integrated M.Sc. in Chemistry/ 5– Year Integrated M.Sc. in Mathematics/ 5– Year Integrated M.Sc. in Physics/ 5– Year Integrated M.Sc. in Statistics.
- 5 The department councils of the respective departments shall have the freedom to design and introduce new departmental and interdepartmental electives, to mod- ify/redesign existing electives and to replace existing electives with new or mod- ified/redesigned electives. Such changes shall be done with the approval of the academic committee and shall be ratified in the concerned board of studies, Faculty and Academic Council.
- 6 Each semester shall have a minimum of 16 weeks and one credit shall be given for one hour lecture or 2 hours of lab/practical work per week.

20.1 Course/Credits

- a) The subjects for the 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Inte- grated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Inte- grated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics are common in the first three semesters.
- b) The first two semesters will have interdepartmental core courses in English as first language (2 Credits/semester), and German/Malayalam/Hindi/French (2 cred- its/semester) as second language.
- c) The students will have the option of choosing their second language in their first semester.
- d) The students of the 5 -Year Integrated M.Sc. in Biological Sciences, Chemistry, Physics, Mathematics and Statistics will have the option of taking computer science or General Biology as interdepartmental course in the first three semesters.

- e) Students admitted to each branch of study will have a departmental core course for the first three semesters.
- f) In all semesters there shall be core courses (departmental/interdepartmental) and elective courses (departmental/interdepartmental/MOOC) as detailed in the curriculum and syllabus of the respective program.

The minimum number of credits required to successfully complete an individual Semester is as per the respective programme curriculum and syllabus. **The minimum** credit required for successful completion of the 5 Year Integrated M. Sc. in toto is 215.

A student can take courses over and above those stipulated for a semester and can accumulate extra credits in a given semester, not exceeding the maximum of 24 credits per semester.

20.2 Audit Course

A student have the choice of auditing of not more than one course in each semester. Students who desire to audit courses over and above the number of courses prescribed have to choose from amongst the courses offered by different Departments in that semester and inform their department in writing. Courses thus audited should also be indicated in the course Registration forms along with other courses opted for that semester.

21. Course Registration and Attendance

The Integrated M. Sc. Course is conducted under OBE based CBCS. Students have to register for the courses of their choice within 10 days of commencement of a Semester. All students have to register for the core courses. They can choose the elective courses of their choice in consultation with their mentors. The student can drop/re-register any elective/audit course(s) within 15 working days after the commencement of the classes.

21.1 The students can choose MOOC courses from CUSAT, SWAYAM or other platforms as recommended by the Department Council and approved by the University from time to time. The course registration and provision for credit transfer for the credits acquired from the MOOC/SWAYAM platform shall be as per the general rules and regulations for MOOC courses issued by the university from time to time.

21.2 A student shall compulsorily register and complete at least one interdepartmental elective course from other departments/ Schools before registering for the final semester of the programme.

21.3 A minimum of 75% attendance is compulsory for the continuous evaluation and the End semester examination. University may condone the shortage of attendance on valid grounds as per the existing rules.

22. Evaluation

- 2 Evaluation of 5- Year Integrated M.Sc in Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) is done under the Grading System.
- 3 There will be 6 letter grades; S, A, B, C, D and F on a 10-point scale which carries 10, 9, 8, 7, 6, 0 grade points respectively.
- 4 The final result in each course will be determined on the basis of continuous assessment and performance in the end semester examination which will be in the ratio of 50:50 in the case of theory courses.
- 5 For Laboratory Courses (Practical Courses), Open Ended Laboratory Courses, Mini project work and Final semester project work there will be only Continuous Assessment as per procedures laid down by the Department Council of the department offering the programme.
- 6 For the Open Ended Laboratory Courses, Mini project work and Final semester project work at the end of the Semester, the Students will have to submit a report of the work done; they will present the results in a Seminar and should defend the work in a Viva- voce.

22.1 Continuous Assessment (CA)

CUSAT has a scheme of rigorous and continuous internal assessment. The student can get the best out of this system if he/she is well informed about how it works right from the beginning. Schedule and nature of tests/assignments/quizzes that are relevant may be followed. The specific nature of the assignments/tests will be described by the faculty in the class and can vary from course to course. The student shall be given a minimum of two written tests per semester in each course. The faculty concerned can choose the mode of evaluation and compilation of final marks of CA ensuring all modules in the course syllabus covered in the assessment process with the approval of the department council of the participating department. The marks obtained in the continuous assessment shall be displayed on the notice board of CIS/Department and grievances if any may be addressed to the respective Head of the Department. The Department Council which offers the concerned programme shall finalize the marks of the continuous assessment of each course after addressing such grievances.

22.2 End-semester Examination (ESE)

A final examination at the end of the semester in each course will follow the internal assessments during the semester. The semester end examination shall cover the entire syllabus of the course. The question paper for the semester-end examination for each course is to be set by the concerned course teacher in advance, which must be scrutinized by a committee, consisting of one or two faculties, who are competent in the subjects/course regarding, appointed by the Head/department council to ensure that questions are within the scope of the syllabus and also the entire syllabus of the course is fairly covered in the question paper. Modifications suggested by this committee should reflect in the final question paper.

There shall be only a single internal evaluation for the end semester examination. Immediately after the examination is over, course teachers shall complete the evaluations and the results shall be finalized within 10 working days after the last examination is over so as to enable students who have failed to appear for the makeup examination. The marks and grade in all the subjects obtained by the students has to be displayed in the notice board and the answer scripts can be made available to the students for scrutiny if necessary.

The final result in each course is calculated on the basis of continuous assessment and performance in the end-semester examination. For Semester End Examination, the students have to score a minimum of 45 % marks to get a pass. Also, the students should get a total of 50 % marks for each course (Sum of CA and ESE) to get a pass in the course.

Head of the Departments shall publish the marks obtained by the students, in the continuous assessment and semester end examination. If the student has any grievance about the result of a course the student can approach the concerned Head of the Department and submit his/her grievance with supporting documents/arguments. The teacher, and the Head of the Department of the department offering the course will examine the case and decide on his/her grievance. If the student is not convinced with the decision, he/she can approach the appellate authority, which is the department council of the department offering the programme to which the student is admitted. The appellate authority shall examine the grievance and take a final decision which must be intimated to the student in writing. **The decision of the appellate authority shall be final.**

The final marks and grades obtained by the students shall be published in the notice board. Those who could not obtain 45% marks in the End semester examination and 50% marks (Grade D) in total for a course will be declared as failed in that course. Those who fail in any core or elective course shall approach the Head of the Department if necessary for a makeup examination. Within one week of the

display of the results in the notice board, the Head of the Department with the help of the course teacher shall conduct an additional semester end examination for these candidates. This makeup is only to enable the student to pass the examination so by completing the course successfully. If he/she completes the course successfully making use of this additional chance, he/she will be awarded only a D grade for that course. **The student may appear for the supplementary examination next year for improving the marks so obtained.**

Supplementary Examination: 5-Year Integrated M. Sc. in Biological Sciences/ 5-Year Integrated M. Sc. in Chemistry/ 5-Year Integrated M. Sc. in Mathematics/ 5-Year Integrated M. Sc. in Physics/ 5-Year Integrated M. Sc. in Statistics students, who after completion of the prescribed duration of the course, are left with backlogs, are eligible to appear for supplementary exams.

The maximum duration for completing the Integrated MSc degree programme will in any case be 9 years from the date of commencement of first semester (A student will have additional two years to complete the first level (*i.e.*, semester 1 – semester 6) and additional two years for completing the second level (*i.e.*, Semester 7 – Semester 10). Total additional years that can be availed is 4.

The result of the examinations will be finalized and published by the Department council of the department offering the programme within 30 days of the last examination of the semester and the minutes shall be sent to the controller of examinations to issue the mark list of that examination.

22.3 Grade Card

The University under its seal shall issue a Grade Card to the students on completion of each semester. The Grade card shall contain the following:

- 2 Title of the course taken as core, elective and audit. (An audit course shall be listed only if the student has secured a pass)
- 3 The credits associated with and the grades awarded for each course.
- 4 The number of credits (core and elective separately) earned by the student and the Grade point Average.
- 5 The total credits (core and elective) earned till that semester

Computation of SGPA/CGPA: The following grades will be awarded based on the overall performance in each course.

Range of Marks*	Grades	Grade Points (G_i)
90 and above	S - Outstanding	10
80 - 90*	A - Excellent	9
70 - 80*	B - Very Good	8
60 - 70*	C - Good	7
50 - 60*	D - Satisfactory	6
Below 50%	F - Failed	0

(*where $X - Y$ range denotes X inclusive and Y exclusive)

The following is the procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA).

5.13 The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, *i.e.*,

$$SGPA(S_i) = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

5.14 The CGPA is also calculated in the same manner taking into account all the courses done by a student over all the semester of a programme, *i.e.*,

$$CGPA = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.

Classification for the Degree will be given as follows:

Classification for the Degree	CGPA
First Class with distinction	8 and above
First Class	6.5 - 8*
Second Class	6 - 6.5*

(*where $X - Y$ range denotes X inclusive and Y exclusive)

The Grade Card issued at the end of the final semester shall contain the details of all the courses taken which shall include the titles of the courses, the credits associated with each course, the CGPA and the class. The rank shall be awarded based on CGPA corrected to the 2nd Decimal.

23. Backlogs

No student of the 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics shall be allowed to move to 3rd , 5th or 7th semester, if he/she does not satisfy the following conditions.

<i>Promotion to</i>	<i>Minimum number of credits to be earned</i>
III Semester	Half of the total credits of Semester I
V Semester	Half of the total credits of Semesters I, II, & III put together
VII Semester	Pass all the registered courses up to Semesters VI

24. Readmission

24.1 The students who are not eligible for promotion to the next higher semester as per rules will be given opportunities to clear the back logs in the previous semesters by appearing for supplementary examinations.

24.2 Once the student gets eligibility for promotion to the higher semester, he/she will be given re-admission along with the junior regular batch and from then onwards he/she can continue his studies as regular student from the semester where he/she is re-admitted.

24.3 This will be subject to the maximum period available for the completion of the course permitted by this regulations.

24.4 Re-admission under the above provision shall be permitted only once.

25. Exit Option

The 5-Year Integrated M. Sc. in Biological Sciences/ 5-Year Integrated M. Sc. in Chemistry/ 5-Year Integrated M. Sc. in Mathematics/ 5-Year Integrated M. Sc. in Physics/ 5-Year Integrated M. Sc. in Statistics is a full time regular course. Option of Exit with a Bachelor's degree/Bachelors Degree with Honours/Bachelors degree with Honours (Research) is introduced for desiring students. The distinguishing features of the exit option are:

25.1 Exit with B.Sc. Degree

2 The Exit Option with BSc Degree will be available at the end of three years in the case of the 5-Year Integrated M.Sc. (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) students.

3 Students who seek to opt out after 3 years (six semesters) should have passed all the courses of the preceding six semesters. For exercising the Exit Option, the students should have secured a minimum of 135 Credits in toto for semesters 1-6.

4 Students who exercise 'Exit option' at the end of three years of the 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics will be given B.Sc. Degree Certificates. B.Sc. Degree in Chemistry or B.Sc. Degree in Mathematics or B.Sc. Degree in Physics, or the B.Sc. Degree in Statistics or B.Sc. Degree in Biological Sciences on the basis of the subject to which they are admitted.

5 The students who exercise the Exit Option have to surrender the Mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the B.Sc. Degree that will be conferred to them.

25.2 Exit with B.Sc. Honours Degree

- h. The Exit Option with BSc Honours Degree will be available at the end of Four years in the case of the 5-Year Integrated M.Sc. (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) students.
- i. Students who seek to opt out after 4 years (eight semesters) should have passed all the courses of the preceding eight semesters. For exercising the Exit Option, the students should have secured a minimum of 177 Credits in toto for semesters 1-8.
- j. Students who exercise 'Exit option' at the end of four years of the 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M. Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics will be given B.Sc. Degree Honours Certificates. B.Sc. Degree Honours in Chemistry or B.Sc. Degree Honours in Mathematics or B.Sc. Degree Honours in Physics, or the B.Sc. Degree Honours in Statistics or B.Sc. Degree Honours in Biological Sciences on the basis of the subject to which they are admitted.
- k. The students who exercise the Exit Option have to surrender the Mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the B.Sc. Honours Degree that will be conferred to them.

25.3 Exit with B.Sc. Honours (Research) Degree

- (a) The Exit Option with B.Sc. Honours Degree will be available at the end of Four years in the case of the 5-Year Integrated M.Sc. (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) students. The student may opt for BSc Honors with research at the end of seventh semester. The eligibility for a student to pursue BSc Honors with research shall be CGPA 8.0 up to sixth semester. The final selection of students shall be based on the criteria fixed by the respective Department Council.
- (b) A Student who opt for B.Sc. Honours (Research) Degree should have to undertake a research project in the department. If opportunities available, the respective department council may permit the candidate to undertake the research project in other departments for research on interdisciplinary themes/National Laboratories/Institutes of National Importance/ Industrial R & D Laboratories to earn minimum 12 Credits. For exercising the Exit Option, the student should have secured a minimum of 177 Credits in toto for semesters 1-8.

(c) Students who exercise 'Exit option' at the end of four years of the 5-Year Integrated M.Sc. in Biological Sciences/ 5-Year Integrated M.Sc. in Chemistry/ 5-Year Integrated M.Sc. in Mathematics/ 5-Year Integrated M.Sc. in Physics/ 5-Year Integrated M.Sc. in Statistics will be given B.Sc. Degree Honours (Research) Certificates. B.Sc. Degree Honours (Research) in Chemistry or B.Sc. Degree Honours (Research) in Mathematics or B.Sc. Degree Honours (Research) in Physics, or the B.Sc. Degree Honours (Research) in Statistics or B.Sc. Degree Honours (Research) in Biological Sciences on the basis of the subject to which they are admitted.

(d) The students who exercise the Exit Option have to surrender the Mark lists of the previous semesters and pay a cancellation fee as per rules of the University. They will be issued new mark lists in conformity with the B.Sc. Degree Honours (Research) that will be conferred to them.

26. Merger with the 2 Year M.Sc.

In the Fourth Year, students of the 5-Year Integrated M.Sc. (Chemistry/ Mathematics/ Physics/ Statistics) may be integrated with the students admitted for the 2 Year M. Sc. programme offered by the respective Departments to which they are admitted. **After merger i.e., from 7th semester, any provision under this regulation inconsistent with the PG regulations in force for M.Sc. Chemistry/Mathematics/Physics/Statistics) shall not be applicable and the respective provision under PG regulation shall prevail.** The 5-Year Integrated M.Sc. (Biological Sciences) shall be conducted separately by the Department of Biotechnology as there is no regular 2 year M.Sc. programme in Biological Sciences.

27. Mentoring, Tutorial and Remedial classes

A system of mentoring by a teacher for a group of 15 students in the first three semesters will be coordinated by CIS. Mentor shall conduct orientation sessions to plan studies, utilize library and other common university and departmental resources. Mentor shall monitor academic progress of their mentee and identify weak learners in advance and arrange for remedial sessions in association with CIS/Equal opportunity cell/Department as the case may be. Special talents of their mentee may be identified and give guidance to nurture them. From 4th semester onwards a mentor will be assigned to a group of 5 students by the respective departments. Mentor in association with CIS/Department shall coordinate internships/summer research programs/vacation activity during vacation months.

28. Transitory Provisions

Notwithstanding anything contained in these regulations, the Vice – Chancellor shall, for a period of one year from the date of coming into force of these regulations, have the power to provide by order that these regulations shall be applicable to any programme with such modifications as may be necessary

29. Repeal

The regulations now in force, in so far as they are applicable to 5-Year Integrated M.Sc. (Biological Sciences/ Chemistry/ Mathematics/ Physics/ Statistics) conducted by Centre for Integrated Studies (CIS) and to the extent they are inconsistent with the existing regulations, and the regulations relating to the CBCS System in their application to any programme offered in a University Department, the latter shall prevail.

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

Ph.D. REGULATIONS – 2023

Short title, Application and Commencement

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Preamble

These regulations, named as Cochin University of Science and Technology Ph.D. Regulations 2023, are framed in accordance with the University Grants Commission (Minimum Standards and Procedures for the Award of Ph.D. Degree) Regulations, 2022.

Cochin University of Science and Technology is conducting research programmes in various subjects and inter-disciplinary areas in its Schools/Departments/Centres and other Recognized Institutions leading to the award of the Degree of Doctor of Philosophy under the Faculties listed in the Statutes. The Standards and Procedures for registration, research and award of Ph.D. Degree of the University shall be as per this regulation.

1.	Short title, Application and Commencement	
1.1		These Regulations shall be called Cochin University of Science and Technology Ph.D. Regulations, 2023.
1.2		These regulations shall apply to every Academic Unit of Research (Schools/Departments/Centres) of the University and Recognized Research Institutions, where Research programme leading to Ph.D. of Cochin University of Science and Technology is being conducted.
1.3		These regulations shall come into force from 01.07.2023. These regulations shall govern all new Ph.D. Registrations from the date it comes into force. No new registration may be given under the previous Ph.D. Regulations thereafter. The Ph.D. scholars registered under the old regulations shall continue under the same.
2.	Recognized Institutions	
		The University may decide to accord recognition, in specified Faculties, on the recommendation of the Academic Council, to a Research/Educational Institution under the control of Central/State Government as per the provisions of the Cochin University of Science and Technology (CUSAT) Act 1986 and the relevant statutes and ordinances in this regard, provided the University is satisfied that the Institution will be able to provide the required facilities to candidates to pursue their studies in the Institution for the Degree of Doctor of Philosophy (Ph.D.) of the University in the Faculties concerned and to fulfil such other conditions that the Syndicate may stipulate from time to time.
3.	Research Supervisor	
3.1		Permanent faculty members working as Professor/Associate Professor of the University with a Ph.D., and at least five research publications in SCI (Science Citation Index), Scopus Index, SSCI (Social Science Citation Index) or AHCI (Arts & Humanities Citation Index) journals or UGC approved care list of journals and permanent faculty members working as Assistant Professors in the University with a Ph.D., and at least three research publications in SCI (Science Citation Index), Scopus Index, SSCI (Social Science Citation Index) or AHCI (Arts & Humanities Citation Index) journals or UGC approved list of journals shall be recognized as a Research Supervisor. Such recognized Research Supervisors cannot supervise Research Scholars in Institutions, other than CUSAT, where they can only act as Co-Supervisors. The scientists working at recognized Research Centres who hold a position equivalent to Professor/Associate Professor/Assistant Professor can be recognized as Supervisors if they fulfil the above requirements.

	<p>Co-Supervisors from within the same Department or other Departments of the University or other Institutions may be permitted with the approval of the University.</p> <p>Co-Supervisors from Industry having collaboration with the University under MoU shall be permitted with the approval of the University.</p> <p>Adjunct Faculty members shall not act as Research Supervisors and can only act as Co-Supervisors.</p>
3.2	A person who has joined in an Academic Unit of research in the University under INSPIRE faculty scheme/tenure track/faculty recharge scheme etc. for a period not less than five years can also be recognized as Research Supervisor, fulfilling the other conditions of research publications.
3.3	The allocation of Research Supervisor for a selected Research Scholar shall be decided by the Research Committee of the concerned Department/School/Centre, depending on the number of scholars per Research Supervisor, the available specialization among the Supervisors and research interests of the scholars as indicated by them at the time of selection interview. Co-Supervisor can be allowed in inter-disciplinary areas from other Departments of the same Institute or from other recognized Institutions.
3.4	The number of Research Scholars that a Professor, Associate Professor and Assistant Professor/Scientists in equivalent positions in the Recognized Research Centres of the University, shall supervise at any given point of time is 8, 6 and 4 respectively. Each Departments/Schools/Centres/Recognized Research Institutions of CUSAT shall reserve 25% of the seats to admit the Research Students who are qualified for assured fellowship/scholarship in UGC-NET, UGC-CSIR-NET and similar National/State Level Tests in the relevant subject area. The maximum number mandated above also includes the number of Ph.D. Scholars supervised/co-supervised by the Supervisor in any other Universities/Research Institutes. Those who are presently guiding a number more than what is mentioned above are allowed to retain them till their completion of research. A declaration to the above effect shall be submitted by the Supervisor on accepting new doctoral student(s). Persons mentioned under Item 3.2 above, will be treated as equivalent to Assistant Professor for the purpose. This is also applicable to all Recognized Research Centres of CUSAT.
3.5	A Research Supervisor can take two foreign students sponsored under a scholarship scheme by the Government of India/under a MoU with CUSAT, for Ph.D. Programme, over and above the allotted number.
3.6	A Research Supervisor should have at any point of time at least one Research Scholar from reservation category. Preference shall be given to SC/ST candidates.
3.7	A Research Supervisor may be recognized under more than one faculty if the person is eligible for the same. The total number of scholars in all faculties under a Supervisor shall also be limited to the number as per rules.
3.8	A Research Supervisor on retirement may be allowed to continue to guide the scholars already registered under their supervision at the time of retirement. They will not be allowed to register fresh candidates for supervision. However, the UGC-BSR Faculty Fellow Awardees/CSIR-Emeritus Scientist Scheme Awardees are permitted to Guide two/one candidate respectively with assured fellowships.

3.9	If a Research Supervisor leaves the present job and takes up another assignment in an Institution which is not a Recognized Research Centre of the University, the Supervisor may be allowed to continue to guide the scholars already registered under their supervision. They will not be allowed to register fresh candidates for supervision.
3.10	In case of relocation of a female Ph.D. Scholar due to marriage or otherwise, the research data shall be allowed to be transferred to the University to which the scholar intends to relocate, provided all the other conditions in these Regulations are followed, and the research work does not pertain to a project sanctioned to the parent Institution/Supervisor by any funding agency. Such scholar shall, however, give due credit to the parent institution and the supervisor for the part of research already undertaken.
4.	Co-Supervisor
4.1	If the Research Committee feels for valid academic reasons that the service of an additional Supervisor is desirable it may recommend a Co-Supervisor provided both the Supervisors are willing. For reckoning the maximum number of students who may register under a Research Supervisor, the students under co-guidance shall be treated as 0.5 for each Supervisor.
4.2	In the case of interdisciplinary/multidisciplinary subjects, there shall be two Research Supervisors, one in scholar's own PG based subject according to which the candidate is registered in a Research Centre and another in the area of subject in which he combines the core subject. In this case, for reckoning the maximum number of students who may register under a Research Supervisor, the students under co-guidance shall be treated as 0.5 for each Supervisor.
4.3	Scientists/Researchers working in partnering institutions having MoU on specific projects with a Department of the University may be permitted to be a Co-Supervisor for the students working in that project, irrespective of the geographical jurisdiction subject to approval by the University.
5.	Research Committee (RC)
5.1	Every Department/School/Centre of research in the University shall have a Research Committee (RC) with the Head of the Department/School/Centre as Chairman and all the recognized Research Supervisors of the University serving in the Department/School/Centre as members. The Vice-Chancellor shall on the recommendation of the Dean of the Faculty concerned, nominate additional members from other relevant Departments/Schools/Centres/Recognized Research Institutions to the Research Committee. In Departments where interdisciplinary/multidisciplinary research is pursued, the Committee shall consist of the Research Supervisor(s) approved by the University from other subject(s) who has (have) consented to supervise the candidate(s).
5.2	Every Recognized Research Institution shall similarly have a Research Committee with the Head of the Recognized Research Institution or a Research Supervisor working in the Institution nominated by the Chairman as Convener. All the Recognized Research Supervisors working in the Recognized Research Institution, the Deans of the Faculties concerned and the Heads of the Department/School/Centre of the University concerned or their nominees as members.
5.3	The Research Committee in the University Departments/Schools/Centres/

		Recognized Research Institutions shall decide upon the number of Research Students who can be admitted during the next academic year.
5.4		The Research Committee shall meet at least twice in a year to review the progress of research work of the registered Research Students in the Department/School/Centre/Recognized Research Institution and record the minutes of the meeting in a Register kept for the purpose. The Chairman shall submit the minutes of the meetings to the University, if required.
5.5		In case the progress of the Ph.D. Scholar is unsatisfactory, the Research Committee shall record the reasons for the same and suggest corrective measures. If the Ph.D. Scholar fails to implement these corrective measures, the Research Committee may recommend with specific reasons, the cancellation of the registration of the Ph.D. Scholar from the Ph.D. Programme.
5.6		The Research Committee shall make recommendations on matters such as (a) the conversion of registration from Full-Time to Part-Time or vice-versa and (b) cancellation of registration in case of unsatisfactory progress, unethical practices in research committed by the student, after giving a chance to hear the Research Scholar concerned.
6.	Doctoral Committee (DC)	
6.1		There shall be a Doctoral Committee (DC) to monitor the progress of each student registered for research in the University Departments/Schools/Centres/Recognized Research Institutions. The Doctoral Committee shall provide necessary guidance to the Research Student and shall take efforts to ensure that good progress is made by him/her.
6.2		In the case of a University Department/School/Centre, the Head concerned in consultation with the Research Supervisor shall constitute the Doctoral Committee with the Research Supervisor as Convenor, Co-Supervisor (if any) and an approved Research Supervisor from the Department in the same area as members. The Head of the Department/School/Centre shall be the Chairman of the Doctoral Committee.
6.3		In the case of a Recognized Research Institution, the Head of the Institution in consultation with the Research Supervisor shall constitute the Doctoral Committee with the Research Supervisor as Convener, the Co-Supervisor, if any, and an approved Research Supervisor from the same or allied area in the University as members. The Head of the Institution (or his nominee) will be the Chairman of the Doctoral Committee.
6.4		The Doctoral Committee shall be constituted and conduct its first meeting within a month of admission of the candidate. The meetings of the DC should be convened regularly at least once in every semester for the entire duration of research of the candidate.
6.5		The Doctoral Committee shall be in existence during the full period of registration of a candidate and shall be reconstituted on the recommendations of the Supervisor with such changes in membership as may become necessary from time to time in accordance with relevant clauses.

	6.6	All Research Students shall submit progress reports to the respective Research Supervisors every six months. The Doctoral Committees shall review the progress of the Research Student periodically.
	6.7	The Doctoral Committee shall make recommendations on matters such as (a) granting leave of the candidate for short term assignments, training etc. and (b) presentation of synopsis.
	6.8	The Doctoral Committee shall be responsible for the preparation of the confidential panel of adjudicators for evaluation of the thesis with the recommendation of the Dean of the Faculty concerned to the Controller of Examinations for further necessary action.
7.	Notification for Ph.D. Programme	
	7.1	The Notification for Ph.D. admissions shall be issued once in an academic year through public notification in national daily's. The details shall also be available in the University Website.
	7.2	All Academic Units of Research of the University and Recognized Research Institutions that are allowed to conduct Ph.D. Programme shall decide on an annual basis through their Research Committee (RC) the number of Ph.D. Scholars to be admitted as per the norms regarding the Scholar-Supervisor ratio and the facilities available.
	7.3	A candidate who wishes to pursue a programme of study and research leading to the degree of Doctor of Philosophy (Ph.D.) will be required to seek registration to the programme under these regulations as Full-Time or Part-Time Research Student in an Academic Unit of study or in an Institution recognized for this purpose by the University, under an appropriate faculty. In the case of Recognized Research Institutions, Part-Time registration shall be granted only for the permanent employees of the respective Institutions.
	7.4	Application for admission shall be submitted to the Head of the Academic Unit of Research concerned in the prescribed form on payment of the required fees. Candidates intending to do research in Recognized Research Institutions shall submit their applications through the Head of Institution to the Head of the concerned Academic Unit of Research.
8.	Eligibility for admission	
	The following are eligible to seek admission to the Ph.D. Programme:	
	8.1	Candidates who have completed:
	a)	A 1-year/2-semester Master's Degree programme after a 4-year/8-semester Bachelor's Degree programme or a 2-year/4-semester Master's Degree programme after a 3-year Bachelor's Degree programme or qualifications declared equivalent to the Master's Degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed.

		b) Equivalent qualification from a foreign educational institution accredited by an assessment and accreditation agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of the Educational Institution.
		c) Candidates with a 4-year/8-semester Bachelor's Degree (honours with research) having a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed. A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (Non-Creamy Layer)/Differently-Abled/Economically Weaker Section (EWS) and other categories of candidates as per the decision of the University from time to time. This relaxation to the categories mentioned above are permissible based only on the qualifying marks without including the grace mark procedures.
8.2	Duration of the Programme:-	
	a)	Ph.D. Programme shall be for a minimum duration of three (3) years, including course work and a maximum duration of six (6) years from the date of admission to the Ph.D. Programme.
	b)	A maximum of an additional two (2) years can be given through a process of re-registration as per the rules of the University. However, that the total period for completion of a Ph.D. Programme should not exceed eight (8) years from the date of admission to the Ph.D. Programme. Provided further that, female Ph.D. Scholars and Persons with Disabilities (having more than 40% disability) may be allowed an additional relaxation of two (2) years; however, the total period for completion of a Ph.D. Programme in such cases should not exceed ten (10) years from the date of admission to the Ph.D. Programme.
	c)	Female Ph.D. Scholars may be provided Maternity Leave/Child Care Leave for up to 240 days in the entire duration of the Ph.D. Programme.
9.	Procedure for Admission	
9.1	Admission to the Ph.D. Programme shall be made using the following methods:	
	a)	An Academic Department may admit candidates who have been awarded fellowships for pursuing Ph.D. Programme by agencies such as UGC/CSIR/AICTE etc. or any similar agencies of the Government of India or Government of Kerala in the relevant subject area based on an interview. They can join research at any time provided they satisfy other academic conditions.

		b) Candidates who are working in funded research projects in the Department/ Academic Unit of Research with assured fellowship for at least two years and have qualified NET/GATE or other similar examinations conducted by national agencies.
		c) An Academic Department may admit students through an Entrance Test conducted. The syllabus of the Entrance Test will be decided by the respective Department Research Committee. The syllabus of the Entrance Test shall consist of subject/subjects specific to the Academic Unit of Research concerned. The entrance test namely Departmental Admission Test (DAT) will be conducted only once in an academic year before the end of August.
		d) The Departmental Admission Test (DAT) shall have two parts – Written test and Interview. In the case of candidates undertaking interdisciplinary/ multidisciplinary research, the written test can be on a subject offered by the academic unit where the candidate is seeking registration.
		e) Students who have secured 50% marks in the DAT are eligible to be called for the interview.
		f) A relaxation of 5% marks will be allowed in the DAT for the candidates belonging to SC/ST/OBC (Non-Creamy Layer)/Differently-Abled category/ Economically Weaker Section (EWS) and other categories of candidates as per the decision of the UGC/Government of Kerala from time to time.
		g) Those candidates who have secured a total marks of 60% or above only will be ranked. A relaxation of 5% marks will be allowed for ranking the candidates belonging to SC/ST/OBC (Non-Creamy Layer)/Differently-Abled category/ Economically Weaker Section (EWS) and other categories of candidates as per the decision of the UGC/Government of Kerala from time to time.
	9.2	Recognized Research Institutions and Centres which are eligible to conduct Ph.D. Programme, should notify the criteria for admission, the procedure for admission and all other relevant information for the candidates well in advance in the website of the Institution.
10. Exemption from DAT		
	10.1	The following candidates are exempted from the written examination part of the DAT and they shall be ranked separately as per the norms laid down in relevant clauses for the same of these regulations.
	10.1.1	Foreign students who have been sponsored under a scholarship scheme by the Government of India for undergoing Ph.D. Programme in India.

10.1.2	Students from India or abroad coming for Ph.D. Programme based on specific agreements or MoUs of the University.
10.1.3	Candidates who have provisionally qualified for INSPIRE fellowship (Ph.D. Registration thus obtained will be provisional and the confirmation of the same will be subject to the award of the INSPIRE fellowship).
10.1.4	Regular and permanent teachers from University Departments, Government & Aided Colleges within the state with a minimum continuous service of 5 years as permanent Teachers.
10.1.5	Scientists working in Government/Quasi Government R&D Institutions/Public Sector Industries with a minimum continuous service of 5 years as permanent employees.
10.1.6	Candidates working/residing outside India (NRI status) shall not be eligible for registration for Ph.D., except as per Clause 10.1.2.
10.1.7	Foreign students shall not be allowed to do Part-Time research.
10.2	All candidates who have passed the written part of DAT with a minimum of 50% marks as well as those exempted from DAT shall be required to present themselves for an interview with the Research Committee (RC) or with a Sub-committee constituted for the same. In the case of admission for interdisciplinary research the Committee or Sub-committee shall consist of the Research Supervisor(s) from other subject(s) who has (have) consented to co-supervise the candidate.
10.3	Candidates applying for registration as Part-Time Research Scholars shall be considered for registration only in cases where the Research Committee (RC) is convinced that effective supervision can be ensured. The RC shall also check on the regularity and progress of the Ph.D. work being carried out by the scholar.
11.	Preparation of Rank list
11.1	Separate Rank list/Eligibility list shall be prepared with the following criteria/weightage of marks after the admission process (I) Eligibility list for candidates who qualify for fellowship/scholarship in UGC-NET/UGC-CSIR NET and similar National/State Level Tests with fellowship in the relevant subject area (II) Rank list for DAT Qualified Candidates (III) Rank list for DAT Exempted Candidates.

TABLE 01: Weightage of marks for the preparation of Rank List of Candidates to be admitted for Ph.D. Programme in the University.

No.	Category & Criteria	Weightage
I	Candidate who qualified for fellowship/scholarship in UGC-NET/UGC-CSIR-NET and similar National/State Level Tests	
	a. Interview	100%
II	DAT Qualified Candidates	
	a. Written Test	50%
	b. Master's Degree	20%
	c. UGC-NET/UGC-CSIR-NET/similar exams	10%
	d. Interview	20%
III	DAT Exempted Candidates	
	a. Master's Degree	50%
	b. Interview	50%

11.2 a) The interview for the candidates applying under Category **I** may be conducted periodically and list of eligible candidates with respect to Category **I** should be published after every interview process.

b) The admission process of the candidates under Category **II** & **III** will be conducted only once in a year and the final rank list showing admission lists and the waiting list of all eligible candidates shall be displayed on the notice boards of the respective Academic Unit of Research/Recognized Research Institutions and also will be published on the University Website. The rank list shall be valid till 31st December of the year.

c) Category **I** candidates who qualify the fellowship/scholarship in UGC-NET/UGC-CSIR-NET and similar National/State Level Tests in the relevant subject area shall be given preference for admission.
For admission in remaining seats, a ratio of 5:1 may be maintained between Category **II** and Category **III**.

12. Admission and Registration

12.1 A candidate who has been ranked and recommended for provisional admission shall take the admission within fifteen days from the date of issue of memo after paying the required fees and fulfilling such other requirements as per the admission rules.

12.2 The Head of the Academic Unit of Research/Recognized Research Institution shall be empowered to give an extension of time for a further period up to three months to the candidate, if so requested by the candidate and recommended by the Research Supervisor (within the validity period of the rank list).

	12.3	The Head of Department/Recognized Research Institution shall forward to the University a consolidated list of all those who are admitted to the Ph.D. Programme within ten days after the validity of the rank list.
	12.4	The University shall allot registration numbers to students admitted for the Doctoral Programme with effect from the date on which he/she paid the prescribed fees and was admitted to the respective Department/School/Centre/Recognized Research Institution concerned.
	12.5	The time schedule for the admission and registration process will be as decided by the University from time to time and shall be published on its website.
	12.6	Candidates who are exempted from DAT under the Clauses 10.1.1 to 10.1.3 (with assured fellowship) may be admitted at any time during the academic year on submission of applications in the prescribed format with the consent from a recognized Research Supervisor and the recommendations of the Research Committee.
	12.7	The University shall maintain the list of all Ph.D. registered students on its website with the details such as the name of registered candidate, topic of research, name of Supervisor/Co-Supervisor and date of registration. All Academic Units of Research shall provide these details on year-wise basis to the Registrar before 31 st December.
13. Course Work		
	13.1	(a) The Credit requirement for the Ph.D. coursework is a minimum of 18 credits , including “Research and Publication Ethics” and Research Methodology Courses. The Research Committee can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. Programme.
		(b) All Ph.D. Scholars, irrespective of discipline, shall be required to train in teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral period. The Ph.D. Scholars may also be assigned 4-6 hours per week of teaching/research assistantship for conducting tutorial or laboratory work and evaluations.
		(c) A Ph.D. Scholar must obtain a minimum of 55% marks or its equivalent grade in the UGC 10-point scale in the course work will be eligible to continue in the programme and submit his or her thesis.
	13.2	After having been admitted, each Ph.D. student (both Full-Time and Part-Time) shall be required to undertake course work on a full time basis for a minimum period of one semester with a minimum total of 18 credits. The course work should be completed within TWO years from the date of joining for research, by all Research Scholars, failing which they will be deemed to have discontinued the Ph.D. Programme (Part-Time Research Scholars will have to take leave from their regular job and attend the course work for a semester on Full-Time basis). The course work shall be done along with the ongoing semester in the Department.

13.3	<p>The course work shall be treated as Pre-Ph.D. preparation. The structure of the course work shall be as follows with credits marked in the Table.02. Additional course work with clear prescribed credit may be recommended by RC, if committee feels such a requirement is necessary for the successful completion of the research work as decided by the Research Committee.</p> <p>Course I (4 Credits): Shall be covering the Broad area of Research of the Candidate. Syllabus and Title for this course shall be prepared by the DC and approved by RC.</p> <p>Course II (4 Credits): Shall be covering the Specific Topic of Research of the Candidate. Syllabus and Title for this course shall be prepared by the DC and approved by RC.</p> <p>Course III (4 Credits): Shall focus on Research Methodology which covers areas such as quantitative methods, computer applications, research ethics, training, field work, etc. This course shall be designed for each Faculty/Department and shall be approved by the Faculty/RC concerned and may be conducted simultaneously in one or more Academic Unit of Research.</p> <p>Course IV (2 Credits): This course on Research and Publication Ethics (RPE) is to create awareness about publication ethics and publication misconducts. The course structure and syllabus is as prescribed by UGC, and is mandatory in Ph.D. course work.</p> <p>Course V (4 Credits): Shall be devoted to the preparation of a comprehensive report of review of literature relevant to the candidate's research and preparation, submission and defence of the Research Proposal.</p> <p style="text-align: center;">TABLE 02: COURSE WORK CREDIT</p> <table border="1"> <thead> <tr> <th rowspan="2">Course Number</th> <th rowspan="2">Credits</th> <th colspan="2">Marks</th> <th rowspan="2">Total Marks</th> </tr> <tr> <th>Continuous Evaluation</th> <th>End Semester Examination</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>4</td> <td>50</td> <td>50</td> <td>100</td> </tr> <tr> <td>II</td> <td>4</td> <td>50</td> <td>50</td> <td>100</td> </tr> <tr> <td>III</td> <td>4</td> <td>50</td> <td>50</td> <td>100</td> </tr> <tr> <td>IV</td> <td>2</td> <td>50</td> <td>50</td> <td>100</td> </tr> <tr> <td>V</td> <td>4</td> <td>-</td> <td>100</td> <td>100</td> </tr> </tbody> </table>	Course Number	Credits	Marks		Total Marks	Continuous Evaluation	End Semester Examination	I	4	50	50	100	II	4	50	50	100	III	4	50	50	100	IV	2	50	50	100	V	4	-	100	100
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13.4	<p>Ph.D. students with M.Phil. Degree, awarded complying with the UGC Regulations for awarding M.Phil./Ph.D. in the same field of study, may be exempted from registering for Course I and Course III of the course work, if the Research Committee is satisfied that similar courses have been undergone by the students in the M.Phil. Programme.</p>																																
13.5	<p>Candidate may undergo course work in any Academic Unit of Research with the approval of the concerned DC and RC.</p>																																

13.6	Continuous evaluation shall be done by the teachers offering the courses. An end semester examination (except Course V) shall be monitored by the Research Committee. For Course V, at the end of the semester, the student shall submit a report on the scope, relevance and purpose of the research work, its identified objectives, review of literature, research methodologies to be followed and expected outcome of the thesis work. The evaluation of Course V shall be done by the Research Committee or a subcommittee nominated by the Research Committee at the end of the semester, through an open seminar.																								
13.7	<p>Based on the marks obtained in the examinations, the students may be awarded grades as detailed below.</p> <table border="1"> <thead> <tr> <th>Range of Marks</th> <th>Grades</th> <th>Weightage</th> </tr> </thead> <tbody> <tr> <td>90% and above</td> <td>S-Outstanding</td> <td>10</td> </tr> <tr> <td>(80-89)</td> <td>A-Excellent</td> <td>9</td> </tr> <tr> <td>(70-79)</td> <td>B-Very Good</td> <td>8</td> </tr> <tr> <td>(60-69)</td> <td>C-Good</td> <td>7</td> </tr> <tr> <td>(50-59)</td> <td>D-Satisfactory</td> <td>6</td> </tr> <tr> <td>Below 50%</td> <td>F-Failed</td> <td>0</td> </tr> </tbody> </table> <p>Overall Performance of the candidate will be indicated by Grade Point Average (GPA) calculated as follows:</p> <table border="1"> <tr> <td rowspan="2" style="vertical-align: middle;">GPA =</td> <td style="text-align: center;">$G1 \times C1 + G2 \times C2 + G3 \times C3 + G4 \times C4 + G5 \times C5$</td> </tr> <tr> <td style="text-align: center;">$C1 + C2 + C3 + C4 + C5$</td> </tr> </table> <p>where 'G' refers to the Grade Weightage and 'C' refers to the Credit Value of the corresponding course undergone by the student.</p>	Range of Marks	Grades	Weightage	90% and above	S-Outstanding	10	(80-89)	A-Excellent	9	(70-79)	B-Very Good	8	(60-69)	C-Good	7	(50-59)	D-Satisfactory	6	Below 50%	F-Failed	0	GPA =	$G1 \times C1 + G2 \times C2 + G3 \times C3 + G4 \times C4 + G5 \times C5$	$C1 + C2 + C3 + C4 + C5$
Range of Marks	Grades	Weightage																							
90% and above	S-Outstanding	10																							
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(70-79)	B-Very Good	8																							
(60-69)	C-Good	7																							
(50-59)	D-Satisfactory	6																							
Below 50%	F-Failed	0																							
GPA =	$G1 \times C1 + G2 \times C2 + G3 \times C3 + G4 \times C4 + G5 \times C5$																								
	$C1 + C2 + C3 + C4 + C5$																								
13.8	Students who are not able to acquire a minimum grade in each Course shall be given one more chance to complete the course work successfully in the next semester when the course is offered. If he/she cannot acquire the required 18 credits within a period of 24 months from the date of his/her Ph.D. Registration, his/her registration will be cancelled.																								
13.9	The Research Committee will scrutinize the grades awarded to the candidate in each course and finalize the results. On successful completion of the course work by acquiring minimum of 18 credits, the candidate shall be given a certificate of eligibility for continuing doctoral research (both the Grade Cards and Certificate of Eligibility will be issued by the Chairman of Research Committee).																								
14. Attendance																									
14.1	A student registered as Full-Time Research Student will be required to have at least 80% attendance in every semester failing which his/her name shall be removed from the rolls of the University subject to the existing provisions.																								
14.2	Every Research Student shall submit an attendance certificate and a report of the progress of research countersigned by the Supervisor and HOD/Head of the Institution pertaining to the previous semester before the payment of the next semester fees.																								

14.3	The Research Committee shall be empowered to condone the shortage of attendance up to 10% on an application made by the student, duly recommended by the Research Supervisor and endorsed by the Doctoral Committee.
14.4	A Research Student will be eligible to attend conferences/seminars/symposia/specialized training programmes connected with his/her area of research or participate in research cruises or visit other places for collecting data and all such days (including University holidays) when they were away from the Department/School/Centre or Recognized Research Institution, including days of travel, shall count for attendance or for periods of being in residence at the University, if they have been duly authorized to do so by the Research Supervisor with intimation to the Head of the Academic Unit.
14.5	A candidate registered for Full-Time research shall be eligible to avail of leave for thirty days in one calendar year and leave without fellowship for three months on medical grounds or for any other genuine reasons duly recommended by the Research Supervisor.
14.6	A Part-Time Research Scholar shall have a minimum attendance of 60 days each in a calendar year or on a pro-rata basis for part of the year. The days of minimum attendance shall also include days of eligibility of attendance as per relevant clauses.
14.7	Notwithstanding anything contained in these regulations a candidate who comes under the National/State or such other fellowship or scheme/project etc., shall be governed by the respective rules governing the award of such fellowship/scheme/project, regarding attendance, leave etc.
15.	Change of Research Supervisor
15.1	The Research Committee (RC) shall have the power to consider the request of candidate to change his/her Supervisor or to have a Co-Supervisor provided that the request is supported by his/her supervisor and the prospective Co-Supervisor and the request is recommended by the Doctoral Committee. If the Research Committee gives assent to the request, the matter shall be reported to the University.
15.2	However, such request for change of Supervisor or Co-Supervisor shall be made at least one year prior to the candidate's giving notice for submission of the thesis for adjudication by examiners, provided that, this limitation shall not be applicable in the case where the present supervisor is unable to continue supervision due to reasons of health, shifting of place of work/residence to a distant place etc.
16.	Change of Academic Unit of Research
	The Research Committee shall have the power to consider and to give assent to the request of the candidate for change of Academic Unit of Research, provided the request is recommended by the Research Supervisor and the Doctoral Committee and is accompanied by a 'No Objection Certificate' from the Head of the present and newly proposed recognized Academic Unit of Research. Such instances of request for change

	in the Academic Unit of Research shall be submitted to the University, which shall obtain the comments of the Dean of the Faculty concerned on the matter and inform the candidate of its decision.
17.	Change of Area of Research
17.1	A Candidate who has registered for research shall be eligible to apply for the change of the topic or the area of research on payment of the prescribed fee and the Research Committee shall be competent to give assent to the request, which has been duly supported by the Research Supervisor, the Doctoral Committee and the University shall be informed accordingly. The Doctoral Committee shall examine if the change in topic or area is allowable with the course work already completed or if additional course work needs to be prescribed, considering that the topic or area of research has changed. Their explicit comments on the matter of adequacy of course work done shall accompany the topic or area change request/decision. If additional course work is required considering the change in topic or area the coursework done earlier may be cancelled in full or part and the necessary additional coursework completed within one year of the change being provisionally allowed. However, such an application for change of topic/the area of research shall be permitted only once during the period of registration, and further that the application for the same shall be made at least one year prior to the notice for submission of thesis.
17.2	A Research Student shall be eligible to request for approval of the title of his/her thesis and the Doctoral Committee shall be competent to give assent to the request. In case, there is a change in the title of research, the request shall be made at least one month prior to the submission of the synopsis.
18.	Conversion of Registration
18.1	A candidate who has registered for the Ph.D. Programme shall be eligible to apply for conversion of research work from Full-Time to Part-Time and vice-versa. The request shall be duly recommended by the Research Supervisor and endorsed by the Doctoral Committee. The Research Committee shall be empowered to grant the conversion which shall be reported to the University for confirmation.
18.2	Conversion from Part-Time to Full-Time or vice-versa will not be allowed more than three times during the period of registration.
19.	Progress of Research and Publications
19.1	A Ph.D. Scholar shall appear before the Research Committee or its Subcommittee to make a presentation and submit a brief report on the progress of his/her work for half yearly evaluation and a satisfactory report of the Research Committee in such evaluation in the previous semester is necessary for remittance of semester fees in the next semester. A copy of such recommendations shall also be provided to the Ph.D. Scholar.

19.2	<p>A Research Student shall have at least TWO research papers published/accepted in SCI (Science Citation Index), SCOPUS indexed, SSCI (Social Science Citation Index) or AHCI (Arts & Humanities Citation Index) journals or UGC Approved Care List of journals as first author/second author/corresponding author and TWO paper presentations in conferences/seminars before the submission of synopsis. They should produce evidence for the same in the form of reprints/acceptance letters from the journal and presentation certificates in conference/seminars. Certificate from the supervising Teacher stating that the content of the Research Publications is part of the research work should be included. Affiliation to the University has to be ensured in each publications.</p> <p>Out of the two journal papers required, one may be substituted by a patent awarded by the competent authority. The authenticity of the patent claimed by the candidate must be ensured by the supervising guide.</p> <p>Conference papers published as Proceedings in a special volume of a journal is acceptable as journal publication only if the journal is a SCI (Science Citation Index), Scopus Indexed, SSCI (Social Science Citation Index) or AHCI (Arts & Humanities Citation Index) indexed or UGC Approved Care listed journal. The research papers with the same title cannot be listed under both conference and journal publications to meet the minimum requirement for the submission of the Ph.D. Thesis.</p> <p>Publication of journal articles by the student in collaboration with other institutes should be done with the knowledge of the Supervisor and such publications must mention the name of the supervisor and the affiliation of the University.</p>
19.3	<p>While publishing any paper at the Recognized Research Institution under the Ph.D. Programme with CUSAT, the Research Scholar should additionally mention the affiliation with CUSAT, along with their parent institute address. The Doctoral Committee shall submit a certificate to this effect at the time of submission of thesis.</p>
20.	Submission of the Thesis for Award of Ph.D. Degree
20.1	<p>Every candidate of the Degree of Doctor of Philosophy shall be required to submit a thesis embodying the results of his/her research finding to the University for Adjudication by examiners.</p>
20.2	<p>A candidate who is registered for the Ph.D. Degree and has completed the course requirements, shall be eligible to submit his/her thesis for adjudication, on completion of a minimum period of three years of registration for both Full- Time and Part-Time Research Scholars.</p>
20.3	<p>The thesis shall be written in English, except the case of thesis from the Faculty of Humanities where the language of the thesis shall be in the language of study and should conform to the format and standard prescribed by the University from time to time.</p>
20.4	<p>A candidate proposing to submit the thesis shall submit a synopsis of the same at least one month in advance to the University, and such intimation shall be accompanied by a certificate from the Head of Academic Unit of Research that he/she has presented the salient features of the proposed thesis in a pre-synopsis seminar in the Academic Unit of Research with notice to all RC members and the Research Scholars. If the presentation is not found satisfactory and major changes are recommended by the RC members, the candidate shall have to repeat the</p>

		presentation. Recommendations for any changes if made during the pre-synopsis seminar have to be examined by the DC for incorporation at that stage and appropriate decision taken. After successful presentation, the Scholar shall submit the synopsis along with the documents given below:
	a)	5 copies of the synopsis of the thesis not exceeding ten pages, highlighting the literature review, problem selected, objectives, methods used in the research, observations, findings, a brief discussion and conclusion. It shall also have a list of references cited in the synopsis.
	b)	Copy of the Grade cards in respect of the Ph.D. course work.
	c)	Copy of at least two published research paper/letter of acceptance with a copy of the manuscript along with a certificate from the supervising teacher to the effect that the paper is published in a refereed journal as specified in para 19.2, and certificate of at least two conference paper presentations during the period of Ph.D. Registration. The above published papers and conference papers should be related to the work presented in the thesis.
	d)	Attendance certificate from the Head of Academic Unit of Research.
	e)	A certificate from the Research Supervisor to the effect that all the relevant corrections and modifications suggested by the audience during the pre-synopsis Seminar has been incorporated and it shall be recommended by the Head of the Department.
	f)	Recommendation of the Doctoral Committee to the effect that work of the candidate is adequate and complete for the submission of the Ph.D. thesis.
	g)	Evidence of having paid the required fees prescribed by the University.
20.5		The candidate has to submit the synopsis within three months from the date of pre-synopsis seminar. The candidate shall submit the thesis within three months from the date of submission of synopsis. The delay in submitting the thesis beyond three months, but within six months may be condoned by the Research Committee on the recommendation of the Doctoral Committee. The Vice-Chancellor may condone delay for a further period of six months in exceptional cases, provided further that the candidate shall submit the thesis only during the period of his/her registration.
20.6		The candidate shall submit five copies of the thesis prepared in the language proposed to be used in the thesis and conforming to the specification if any prescribed by the University along with a CD/Pen drive containing soft copy of the thesis in PDF format.

20.7	The Thesis submitted shall be accompanied by the following:
	a) A declaration signed by the candidate to the effect that the thesis is the outcome of the original work done by the candidate and that the work did not form part of any dissertation submitted for the award of any degree, diploma, associateship or any other title or recognition from any University/ Institution.
	b) A Certificate by the Research Supervisor(s) to the effect that to the best of his/her/their knowledge the thesis is a bonafide record of research carried out by the candidate under his/her/their supervision and that the work has not been submitted for the award of any other degree/diploma of the same Institution where the work was carried out or to any other Institution.
	c) The University Library shall make available a facility for plagiarism checking and shall on the request of a Supervisor assist in running the plagiarism check and issue the plagiarism report. The Supervisors should ensure that the plagiarism level is less than 10% values for the overall thesis and the Supervisor should issue a certificate in this regard while submitting the thesis for evaluation.
	d) An appendix containing list of research articles published by him/her jointly with the supervising guide and others in the same area of study as evidence of the research work done by the candidate.
21. Procedure for Adjudication of the Thesis	
21.1	The panel of experts prepared by the Doctoral Committee shall be forwarded to the University duly verified by the concerned Dean of the Faculty. In the case of Recognized Research Institutions, panel of experts prepared by the Doctoral Committee shall be submitted to the University by the concerned Head of the Institution which will be forwarded to the Dean of the Faculty concerned for verification. The panel should contain names of at least ten experts not below the rank of an Associate Professor of a University or an equivalent rank in a reputed Research Institution working in the area of research of the thesis. At least seven experts of this panel should be from National Institutions/Institutions outside the State/Country.
21.2	The thesis to be adjudicated shall be forwarded to three external examiners nominated by the Vice-Chancellor from the panel of experts of which at least two shall be from National Institutions/Institutions outside the State/Country.
21.3	Each examiner shall be requested to send a report on adjudication of the thesis, wherein it shall be specifically stated, whether or not the examiner recommends the award of the degree based on the written thesis, with reasons for the recommendation. If the thesis does not meet the standard expected for a Ph.D.

		thesis, the examiner may recommend that the thesis be rejected or resubmitted after doing additional work.
21.4		In the event of the receipt of the evaluation reports from all the examiners, if any two out of the three examiners recommend the thesis for the award of Ph.D. Degree, the University shall make arrangements for the conduct of the Open Defence and Viva-Voce examination.
21.5		In case only one examiner has recommended and the other two have not recommended, then the thesis shall be sent to a fourth examiner whose recommendations shall be binding on the University for accepting or rejecting the thesis.
21.6		But if any of the examiners suggests resubmission of the thesis, the candidate may resubmit the thesis incorporating the changes proposed by the examiner(s) after payment of such fees as may be prescribed by the University.
21.7		On resubmission, the thesis shall again be sent for adjudication to the same examiner who had recommended revision. If the same examiner is not available, another examiner shall be selected from the same panel by the Vice-Chancellor.
21.8		The candidate shall have no further chance for resubmission of the thesis and the decision to accept or reject the thesis at this stage shall be final.
22.	Open Defence and Viva-Voce	
22.1		If the examiners recommend for the award of the Ph.D. Degree, the University shall make arrangements for the conduct of Open Defence and a Viva-Voce examination. If corrections or modifications are suggested by the examiners the candidate shall be required to submit the hard copy of the thesis along with a soft copy in PDF format after incorporating all corrections/suggestions made by the examiners along with a certificate from the supervisor to this effect before scheduling of the Open Defence.
22.2		The Open Defence/Viva-Voce board shall consist of the Dean of the Faculty as Chairman and any one of the examiners (preferably one among the thesis examiners) nominated by the Vice-Chancellor from the panel of adjudicators of the thesis, the Research Supervisor and Co-Supervisor, if any, as members. The Supervisor shall be the convener of the Open Defence.
22.3		Open Defence and Viva-Voce examination shall be held at a place and time decided by the University after making prior announcement of the same in the website and issuing the notice to all the Departments/Schools/Centres/Recognized Research Institutions coming under the Faculty.
22.4		During the Open Defence of the thesis, the candidate has to explain the motivation and relevance of the work, innovation in methodology and salient features of the findings. He/She shall satisfactorily answer the questions put forward by the audience and the examiners.

22.5	The Chairman and the External Expert shall necessarily be present at the Open Defence/Viva-Voce examination.
22.6	If, in the opinion of the Board of Examiners, the candidate is successful in defending the thesis satisfactorily, a consolidated report is prepared and presented to the University recommending the award of the Degree.
22.7	If, in the opinion of the board, the candidate is not successful in defending the thesis, he/she shall be given an additional opportunity after one month, after payment of the prescribed fee, and the decision of the board at this examination shall be final.
22.8	The award of Ph.D. Degree will be with effect from the date of successful completion of Viva-Voce examination as noted by the consolidated report of the Board of Examiners. On successful completion of the Viva-Voce examination, a notification shall be issued which shall contain the Name of the Candidate, Name(s) of the Supervisor(s), Title of Thesis, Subject and Faculty under which the Degree is awarded.
22.9	The University shall issue a provisional certificate to the candidate to the effect that he/she has successfully fulfilled the entire requirement including course work for the award of the Degree of Doctor of Philosophy in accordance with the UGC guidelines. The regular Ph.D. Degree certificate shall be issued thereafter.
22.10	The University shall complete the entire process of evaluating a Ph.D. thesis, including the declaration of the Viva-Voce result, within a period of six (6) months from the date of submission of the thesis.
23.	Publication of the Thesis
23.1	Following the successful completion of the evaluation process and bennouncement of the award of the Ph.D. degree to the candidate, the Ph.D. thesis shall be uploaded to the National Repository INFLIBNET for hosting the same so as to make it accessible to all Institutions.
23.2	A candidate who has been awarded the Degree of Doctor of Philosophy shall be free to publish his/her thesis with a proper acknowledgment to the University. A copy of the thesis so published shall be given by the candidate to the University.
24.	Payment of Fees
a)	Every Research Student shall be required to pay, in time, the fees prescribed by the University every semester. The registration of the Research Student will be cancelled, if he/she fails to pay the fee in the stipulated time (December 31 st for odd semester and June 30 th for even semester). The University shall fix the fees to be paid by the student for applying for various permissions and relaxations provided for in these regulations, such as condonation of attendance shortage, conversion of registration from Full-Time to Part-Time, or any other matter. Any modifications in this regard will be binding on all Research Scholars on the rolls at that time.
b)	The candidate shall cease to be on the rolls of the University as a Research Student on submission of the thesis or from the date on which his/her registration is cancelled or lapsed for any reason.