RAJALAKSHMI INSTITUTE OF TECHNOLOGY

BELIEVE IN THE POSSIBILITIES

AN AUTONOMOUS INSTITUTION

B.E. COMPUTER AND COMMUNICATION ENGINEERING

CURRICULUM FOR SEMESTER I TO VIII

REGULATIONS 2023

2025 – 2029 Batch

RAJALAKSHMI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Kuthambakkam, Chennai 600124

RAJALAKSHMI INSTITUTE OF TECHNOLOGY, CHENNAI
An Autonomous Institution, Affiliated to Anna University, Chennai

REGULATIONS 2023
CHOICE BASED CREDIT SYSTEM

B.E. COMPUTER AND COMMUNICATION ENGINEERING

I VISION OF THE DEPARTMENT

To become a preferred destination in global level for solving the real time societal challenges through research and academic excellence by creating highly competent professionals in the broader domain of Computer and Communication Engineering.

II MISSION OF THE DEPARTMENT

- To provide an ambience with updated technology, teaching learning practices and establishes effective industry-institute interaction in the area of Computer and Communication Engineering.
- To inculcate professional norms, practices and social responsibility in the younger minds for promoting research and solving ever growing needs of the industry and society.
- To promote entrepreneurship and leadership among the younger generation for their personality development.

III PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates can

- **PEO1:** To provide a platform by applying advanced techniques and tools for building solutions to complex engineering problems.
- **PEO2:** To Apply design principles and best practices for developing quality products for scientific and business applications.
- **PEO3:** To enable graduates to pursue research, or have a successful career in academia or industries associated with Computer and Communication Engineering, or as entrepreneurs.
- **PEO4:** To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.
- **PEO5:** Promote collaborative learning and spirit of team work through multidisciplinary projects and diverse professional activities.

IV PROGRAM OUTCOMES (POs)

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and Sustainability:** Understand the impact of the professional engineering solutions to societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong Learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

V PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Globally compete with engineering specialists, to solve engineering problems in the field of Computer and communication based on industrial and social requirements.

PSO2: Understand the evolutionary changes in Computer and communication, creating an innovative career path to be an entrepreneur and lifelong learner with moral values and ethics.

PSO3: Apply appropriate technology for the implementation of modern Communication systems.

PSO4: Develop quality software for scientific and business applications by applying software engineering principles and practices.

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CHOICE BASED CREDIT SYSTEM

B.E COMPUTER AND COMMUNICATION ENGINEERING

CURRICULUM FOR SEMESTER I TO VIII
2025 – 2029

SEMESTER I

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
	IP23111	Induction Programme	-	-	-	-	-	0
THEORY COURSES								
1	HS23111	Communicative English	HSMC	3	0	0	3	3
2	CY23111	Engineering Chemistry	BSC	3	0	0	3	3
3	MA23111	Matrices and Calculus	BSC	3	1	0	4	4
4	GE23111	Problem Solving and C Programming	ESC	3	0	0	3	3
5	GE23112	தமிழர் மரபு/Heritage of Tamils	HSMC	1	0	0	1	0
LABORATORY ORIENTED THEORY COURSE								
6	GE23131	Engineering Graphics	ESC	2	0	4	6	4
LABORATORY COURSES								
7	CY23121	Chemistry Laboratory	BSC	0	0	2	2	1
8	GE23121	Problem Solving and C Programming Laboratory	ESC	0	0	2	2	1
TOTAL								**19**

SEMESTER II

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY COURSES								
1	HS23211	Professional English	HSMC	2	0	0	2	2
2	MA23211	Statistics and Numerical Methods	BSC	3	1	0	4	4
3	PH23211	Physics for Information Science	BSC	3	0	0	3	3
4	AD23211	Python for Data Science	ESC	3	0	0	3	3
5	GE23211	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
6	GE23213	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	HSMC	1	0	0	1	0
LABORATORY COURSES								
7	PH23221	Physics Laboratory	BSC	0	0	2	2	1
8	AD23221	Python for Data Science Laboratory	ESC	0	0	2	2	1
9	GE23221	Communication Laboratory / Foreign Language	EEC	0	0	2	2	1
10	GE23224	Design Thinking and IDEA Laboratory	ESC	0	0	2	2	1
NCC/Service Club Credit Course Level 1[#]				2	0	0	2	2[#]
TOTAL								**19**

[#]NCC Credit Course Level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER III

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY COURSES								
1	MA23311	Discrete Mathematics	BSC	3	1	0	4	4
2	CS23312	Object Oriented Programming	PCC	3	0	0	3	3
3	CS23314	Data Structures and Algorithms	PCC	3	0	0	3	3
4	EC23313	Signals and Systems	PCC	3	1	0	4	4
LABORATORY ORIENTED THEORY COURSE								
5	EC23331	Digital Principles and Computer Organization	ESC	3	0	2	5	4
LABORATORY COURSE								
6	CS23322	Object Oriented Programming Laboratory	PCC	0	0	2	2	1
7	CS23324	Data Structures and Algorithms Laboratory	PCC	0	0	2	2	1
INDUSTRY ORIENTED COURSE								
8	CC23IC1	Power BI	EEC	1	-	-	1	1
TOTAL								**21**

SEMESTER IV

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	GE23411	Environmental Science and Sustainability	BSC	2	0	0	2	2
2	AL23311	Artificial Intelligence	PCC	3	0	0	3	3
3	CS23411	Database Management Systems	PCC	3	0	0	3	3
4	CS23412	Operating Systems	PCC	3	0	0	3	3
5	EC23411	Communication Systems	PCC	3	0	0	3	3
LABORATORY ORIENTED THEORY COURSE								
6	EC23431	Digital Signal Processing	PCC	3	0	2	5	4
LABORATORY COURSES								
7	CS23421	Database Management Systems Laboratory	PCC	0	0	2	2	1
8	CS23422	Operating Systems Laboratory	PCC	0	0	2	2	1
9	EC23421	Communication Systems Laboratory	PCC	0	0	2	2	1
INDUSTRY ORIENTED COURSE								
10	CC23IC2	Design Thinking for Engineers	EEC	1	-	-	1	1
NCC/Service Club Credit Course level 2#				3	0	0	3	3#
TOTAL								**22**

#NCC Credit Course Level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER V

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY COURSES								
1	CS23511	Computer Networks	PCC	3	0	0	3	3
2	CS23513	Cryptography and Cyber Security	PCC	3	0	0	3	3
3	CS23514	Cloud Computing Tools and Techniques	PCC	3	0	0	3	3
4		Professional Elective I	PEC	-	-	-	-	3
5		Professional Elective II	PEC	-	-	-	-	3
6		Mandatory Course I [&]	MC	3	0	0	3	0
LABORATORY ORIENTED THEORY COURSE								
7	CC23531	Wireless Communication and Networks	PCC	3	0	2	5	4
LABORATORY COURSES								
8	CS23521	Computer Networks Laboratory	PCC	0	0	2	2	1
9	CS23522	Mobile Application Development Laboratory	PCC	0	0	2	2	1
INDUSTRY ORIENTED COURSE								
10	CC23IC3	Azure for Machine learning	EEC	1	-	-	-	1
TOTAL								**22**

[&] Mandatory Course - I is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-I)

SEMESTER VI

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY COURSES								
1		Professional Elective III	PEC	-	-	-	-	3
2		Professional Elective IV	PEC	-	-	-	-	3
3		Open Elective – I *	OEC	3	0	0	3	3
4		Open Elective – II *	OEC	3	0	0	3	3
5		Mandatory Course - II &	MC	3	0	0	3	0
LABORATORY ORIENTED THEORY COURSE								
6	EC23631	Embedded Systems and IoT	ESC	3	0	2	5	4
7	CS23631	Object Oriented Software Engineering	PCC	3	0	2	5	4
LABORATORY COURSES								
8	CC23621	Mini Project	EEC	0	0	4	4	2
NCC Credit Course Level 3#				3	0	0	3	3#
TOTAL								**22**

*Open Elective – I and II Shall be chosen from the list of open electives offered by other Programmes.

& Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-II)

NCC Credit Course Level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER VII

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY COURSES								
1	GE23711	Human Values and Ethics	HSMC	2	0	0	2	2
2		Elective – Management$	HSMC	3	0	0	3	3
3		Professional Elective V	PEC	-	-	-	-	3
4		Professional Elective VI	PEC	-	-	-	-	3
5	AD23511	Deep Learning	PCC	3	0	0	3	3
6	CB23511	Data and Information Security	PCC	3	0	0	3	3
7	EC23712	5G Fundamentals and Architectures	PCC	3	0	0	3	3
LABORATORY COURSES								
8	CC23721	Internship/Certification Course	EEC	-	-	-	-	2
TOTAL								**22**

$Elective - Management shall be chosen from the list of Elective Management courses.

SEMESTER VIII

S.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1		Open Elective – III *	OEC	3	0	0	3	3
LABORATORY COURSE								
2	CC23821	Project Work	EEC	0	0	20	20	10
TOTAL								**13**

* Open Elective III Shall be chosen from the list of open electives offered by other Programmes.

TOTAL CREDITS: 160

ELECTIVE – MANAGEMENT COURSES

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	GE23712	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	3
2	GE23713	Human Resource Management	HSMC	3	0	0	3	3
3	GE23714	Knowledge Management	HSMC	3	0	0	3	3
4	GE23715	Principles of Management	HSMC	3	0	0	3	3
5	GE23716	Software Project Management	HSMC	3	0	0	3	3
6	GE23717	Total Quality Management	HSMC	3	0	0	3	3
7	GE23718	Management Information Systems	HSMC	3	0	0	3	3

MANDATORY COURSES I

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	MX23511	Disaster Risk Reduction and Management	MC	3	0	0	3	0
2	MX23512	Elements of Literature	MC	3	0	0	3	0
3	MX23513	Film Appreciation	MC	3	0	0	3	0
4	MX23514	Introduction to Women and Gender Studies	MC	3	0	0	3	0

MANDATORY COURSES II

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	MX23611	History of Science and Technology in India	MC	3	0	0	3	0
2	MX23612	Industrial Safety	MC	3	0	0	3	0
3	MX23613	State, Nation Building and Politics in India	MC	3	0	0	3	0
4	MX23614	Well Being with Traditional Practices -Yoga, Ayurveda and Siddha	MC	3	0	0	3	0

PROFESSIONAL ELECTIVE COURSES: VERTICALS

S. No.	Vertical 1	Vertical 2	Vertical 3	Vertical 4	Vertical 5	Vertical 6	Vertical 7
	DATA SCIENCE	**CLOUD COMPUTING**	**COMMUNICATION**	**HIGH SPEED COMMUNICATION**	**FULL STACK DEVELOPMENT**	**SUPPLY CHAIN MANAGEMENT FOR INDUSTRIES**	**CYBER SECURITY AND DATA PRIVACY**
1	AL23V11 Exploratory Data Analysis	CS23V21 Cloud Solution Architecture	CC23V11 Digital Communication	EC23V51 Advanced Wireless Communication Techniques	CS23V51 Agile and DevOps	ME23V61 Industry 5.0	CS23V31 Cryptocurrency and Blockchain Technologies
2	AD23V12 Big Data Analytics	CS23V25 Cloud Services Management	CC23V12 Mobile Communication	EC23V55 Massive MIMO Networks	CS23V25 Cloud Services Management	ME23V62 Planning in Logistics	CS23V71 Digital and Mobile Forensics
3	AD23V13 Data Warehousing and Data Mining	CS23V22 Cloud Configuration Management	CC23V14 Wireless Broad Band Networks	CC23V14 Wireless Broad Band Networks	CS23V52 Mobile App Development	ME23V63 Supply Chain Analytics	CS23V72 Engineering Secure Software Systems
4	AD23V14 Healthcare Analytics	CS23V26 Security and Privacy in Cloud	CC23V13 Telecommunication Switching and Networks	EC23V57 Wireless Sensor Network Design	CS23V53 MLOps	ME23V64 Supply Chain Information System	CS23V26 Security and Privacy in Cloud
5	AD23V15 Image and Video Analytics	CS23V23 Cloud Virtualization	EC23V34 Radar Technologies	CS23V75 Network Security	CS23V54 Software Testing and Automation	ME23V65 Supply Chain Management	CS23V75 Network Security
6	AD23V24 Computer Vision	CS23V24 Cloud Container Orchestration	EC23V37 Satellite Communication	EC23V37 Satellite Communication	CS23V55 UI & UX Design	ME23V66 Supply Chain for Manufacturing	CS23V73 Ethical Hacking
7	AD23V44 Recommender Systems	CS23V27 Cloud Storage Technologies	EC23V56 Optical Communication and Networks	EC23V56 Optical Communication and Networks	CS23V56 Web Application Security	ME23V67 Sustainable Inventory Management	CS23V74 Modern Cryptography
8	AD23V46 Text and Speech Analysis	CS23V28 Software Defined Networks	EC23V58 4G/5G Communication Networks	EC23V58 4G/5G Communication Networks	CS23V57 Web Technologies	ME23V68 Warehouse Automation	CS23V76 Social Network Security

Registration of Professional Elective Courses from Verticals:

A student can choose all the Professional Elective Courses either from one of the verticals or a combination of courses from all verticals in a semester. However, students irrespective of enrolling for additional courses for B.E. / B. Tech. (Hons.) are not permitted to choose more than one course from a row. Students are permitted to enroll more than one elective course from the same vertical in a semester. In the subsequent semesters students are permitted to enroll one more course in a row, provided if he/she has cleared the earlier course of the same row.

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1: DATA SCIENCE

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	AL23V11	Exploratory Data Analysis	PEC	3	0	0	3	3
2	AD23V12	Big Data Analytics	PEC	3	0	0	3	3
3	AD23V13	Data Warehousing and Data Mining	PEC	3	0	0	3	3
4	AD23V14	Healthcare Analytics	PEC	3	0	0	3	3
5	AD23V15	Image and Video Analytics	PEC	3	0	0	3	3
6	AD23V24	Computer Vision	PEC	3	0	0	3	3
7	AD23V44	Recommender Systems	PEC	3	0	0	3	3
8	AD23V46	Text and Speech Analysis	PEC	3	0	0	3	3

VERTICAL 2: CLOUD COMPUTING

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CS23V21	Cloud Solution Architecture	PEC	3	0	0	3	3
2	CS23V25	Cloud Services Management	PEC	3	0	0	3	3
3	CS23V22	Cloud Configuration Management	PEC	3	0	0	3	3
4	CS23V26	Security and Privacy in Cloud	PEC	3	0	0	3	3
5	CS23V23	Cloud Virtualization	PEC	3	0	0	3	3
6	CS23V24	Cloud Container Orchestration	PEC	3	0	0	3	3
7	CS23V27	Cloud Storage Technologies	PEC	3	0	0	3	3
8	CS23V28	Software Defined Networks	PEC	3	0	0	3	3

VERTICAL 3: COMMUNICATION

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CC23V11	Digital Communication	PEC	2	0	2	4	3
2	CC23V12	Mobile Communication	PEC	3	0	0	3	3
3	CC23V14	Wireless Broad Band Networks	PEC	3	0	0	3	3
4	CC23V13	Telecommunication Switching and Networks	PEC	3	0	0	3	3
5	EC23V34	Radar Technologies	PEC	3	0	0	3	3
6	EC23V37	Satellite Communication	PEC	3	0	0	3	3
7	EC23V56	Optical Communication and Networks	PEC	2	0	2	4	3
8	EC23V58	4G/5G Communication Networks	PEC	2	0	2	4	3

VERTICAL 4: HIGH SPEED COMMUNICATION

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	EC23V51	Advanced Wireless Communication Techniques	PEC	2	0	2	4	3
2	EC23V55	Massive MIMO Networks	PEC	2	0	2	4	3
3	CC23V14	Wireless Broad Band Networks	PEC	2	0	2	4	3
4	EC23V57	Wireless Sensor Network Design	PEC	3	0	0	3	3
5	CS23V75	Network Security	PEC	3	0	0	3	3
6	EC23V37	Satellite Communication	PEC	3	0	0	3	3
7	EC23V56	Optical Communication and Networks	PEC	2	0	2	4	3
8	EC23V58	4G/5G Communication Networks	PEC	2	0	2	4	3

VERTICAL 5: FULL STACK DEVELOPMENT

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CS23V51	Agile and DevOps	PEC	3	0	0	3	3
2	CS23V25	Cloud Services Management	PEC	3	0	0	3	3
3	CS23V52	Mobile App Development	PEC	3	0	0	3	3
4	CS23V53	MLOps	PEC	3	0	0	3	3
5	CS23V54	Software Testing and Automation	PEC	3	0	0	3	3
6	CS23V55	UI & UX Design	PEC	3	0	0	3	3
7	CS23V56	Web Application Security	PEC	3	0	0	3	3
8	CS23V57	Web Technologies	PEC	3	0	0	3	3

VERTICAL 6: SUPPLY CHAIN MANAGEMENT FOR INDUSTRIES

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	ME23V61	Industry 5.0	PEC	3	0	0	3	3
2	ME23V62	Planning in Logistics	PEC	3	0	0	3	3
3	ME23V63	Supply Chain Analytics	PEC	3	0	0	3	3
4	ME23V64	Supply Chain Information System	PEC	3	0	0	3	3
5	ME23V65	Supply Chain Management	PEC	3	0	0	3	3
6	ME23V66	Supply Chain for Manufacturing	PEC	3	0	0	3	3
7	ME23V67	Sustainable Inventory Management	PEC	3	0	0	3	3
8	ME23V68	Warehouse Automation	PEC	3	0	0	3	3

VERTICAL 7: CYBER SECURITY AND DATA PRIVACY

S.No	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CS23V31	Cryptocurrency and Blockchain Technologies	PEC	3	0	0	3	3
2	CS23V71	Digital and Mobile Forensics	PEC	3	0	0	3	3
3	CS23V72	Engineering Secure Software Systems	PEC	3	0	0	3	3
4	CS23V26	Security and Privacy in Cloud	PEC	3	0	0	3	3
5	CS23V75	Network Security	PEC	3	0	0	3	3
6	CS23V73	Ethical Hacking	PEC	3	0	0	3	3
7	CS23V74	Modern Cryptography	PEC	3	0	0	3	3
8	CS23V76	Social Network Security	PEC	3	0	0	3	3

OPEN ELECTIVES

(Students shall choose the Open Elective Courses, such that the course contents are not similar to any other course contents/title under other course categories).

OPEN ELECTIVES – I

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	O23AD11	Programming for Data Science	OEC	3	0	0	3	3
2	O23AL11	Fundamentals of AI and ML	OEC	3	0	0	3	3
3	O23BT11	Mushroom Cultivation and Vermicomposting	OEC	3	0	0	3	3
4	O23CB11	Software Testing	OEC	3	0	0	3	3
5	O23CC11	AI for Robotics	OEC	3	0	0	3	3
6	O23CS11	Introduction to Cloud Computing	OEC	3	0	0	3	3
7	O23EC11	Space Engineering	OEC	3	0	0	3	3
8	O23EC12	IT in Agricultural System	OEC	3	0	0	3	3
9	O23EV11	Fundamentals of VLSI	OEC	3	0	0	3	3
10	O23MA11	Probability and Statistics for Data Analytics	OEC	3	0	0	3	3
11	O23ME11	Foundation of Robotics	OEC	3	0	0	3	3

OPEN ELECTIVES – II

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	O23AD21	Data Science Fundamentals	OEC	3	0	0	3	3
2	O23AL21	Fundamentals of Data Analytics	OEC	3	0	0	3	3
3	O23BT21	Biofuels	OEC	3	0	0	3	3
4	O23CB21	Essentials of Digital Marketing	OEC	3	0	0	3	3
5	O23CC21	Space Science	OEC	3	0	0	3	3
6	O23CS21	Introduction to Cyber Security	OEC	3	0	0	3	3
7	O23EC21	Wearable Devices and its Applications	OEC	3	0	0	3	3
8	O23EC22	Introduction to IoT	OEC	3	0	0	3	3
9	O23EV21	Electrical, Electronics and Magnetic Materials	OEC	3	0	0	3	3
10	O23MA21	Optimization Techniques	OEC	3	0	0	3	3
11	O23ME21	Mechanical Foundations of Mechatronic Systems	OEC	3	0	0	3	3

OPEN ELECTIVES – III

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	O23AD31	AI for Industrial Applications	OEC	3	0	0	3	3
2	O23AL31	Information Technology Essentials	OEC	3	0	0	3	3
3	O23BT31	Forensic Technology	OEC	3	0	0	3	3
4	O23CB31	Start-up and Innovations	OEC	3	0	0	3	3
5	O23CC31	Introduction to R Programming	OEC	3	0	0	3	3
6	O23CS31	Introduction to Blockchain	OEC	3	0	0	3	3
7	O23EC31	Batteries and Management Systems	OEC	3	0	0	3	3
8	O23EC32	Basics of Biomedical Instrumentation	OEC	3	0	0	3	3
9	O23EV31	HDL Programming	OEC	3	0	0	3	3
10	O23MA31	Multivariate Data Analysis	OEC	3	0	0	3	3
11	O23ME31	Introduction to 3D Printing Technologies	OEC	3	0	0	3	3

SUMMARY

Name of the Programme : B.E. Computer and Communication Engineering										
Sl.No.	Subject Area	Credits per Semester								Total Credits
		I	II	III	IV	V	VI	VII	VIII	
1	HSMC	3	2					5		10
2	BSC	8	8	4	2					22
3	ESC	8	8	4			4			24
4	PCC			12	19	15	4	9		59
5	PEC					6	6	6		18
6	OEC						6		3	9
7	EEC		1	1	1	1	2	2	10	18
8	Non-Credit/ (Mandatory)		2#		3#					0
Total		19	19	21	22	22	22	22	13	160

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes, Moreover, for minor degree the student can register for courses from any one of the following verticals also.

VERTICALS FOR MINOR DEGREE
(In addition to all the verticals of other programmes)

(Choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

Sl.No.	Vertical 1	Vertical 2	Vertical 3	Vertical 4	Vertical 5
	Fintech and Blockchain	**Entrepreneurship**	**Business Data Analytics**	**Internet of Things**	**Quantum Technologies**
1	**CS23M01** Banking, Financial Services and Insurance	**ME23M01** Foundations of Entrepreneurship	**CB23M01** Data Mining for Business Intelligence	**EC23M01** IoT Architecture	**VL23M01** Mathematical Foundations for Quantum Computing
2	**CS23M02** Principles of Financial Management	**ME23M02** Team Building and Leadership Management for Business	**CB23M02** Financial Analytics	**EC23M02** IoT Device Programming	**VL23M02** Fundamentals of Quantum Computing
3	**CS23M03** Fintech Personal Finance and Payments	**ME23M03** Creativity and Innovation in Entrepreneurship	**CB23M03** Human Resource Analytics	**EC23M03** IoT Foundations	**VL23M03** Quantum Materials
4	**CS23M04** Fundamentals of Investment	**ME23M04** Principles of Marketing Management for Business	**CB23M04** Marketing and Social Media Web Analytics	**EC23M04** Industrial Internet of Things	**VL23M04** Quantum Information Science
5	**CS23M05** Introduction to Blockchain and its Applications	**ME23M05** Human Resource Management for Entrepreneur	**CB23M05** Operation and Supply Chain Analytics	**EC23M05** IoT Protocols	**VL23M05** Quantum Measurement and Control
6	**CS23M06** Introduction to Fintech	**ME23M06** Financing New Business Ventures	**CB23M06** Statistics for Management	**EC23M06** Sensor Technologies and IoT	**VL23M06** Quantum Communication
7					**VL23M07** Quantum Optics
8					**VL23M08** Quantum Cryptography

VERTICAL 1: FINTECH AND BLOCKCHAIN

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CS23M01	Banking, Financial Services and Insurance	PEC	3	0	0	3	3
2	CS23M02	Principles of Financial Management	PEC	3	0	0	3	3
3	CS23M03	Fintech Personal Finance and Payments	PEC	3	0	0	3	3
4	CS23M04	Fundamentals of Investment	PEC	3	0	0	3	3
5	CS23M05	Introduction to Blockchain and its Applications	PEC	3	0	0	3	3
6	CS23M06	Introduction to Fintech	PEC	3	0	0	3	3

VERTICAL 2: ENTREPRENEURSHIP

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	ME23M01	Foundations of Entrepreneurship	PEC	3	0	0	3	3
2	ME23M02	Team Building and Leadership Management for Business	PEC	3	0	0	3	3
3	ME23M03	Creativity and Innovation in Entrepreneurship	PEC	3	0	0	3	3
4	ME23M04	Principles of Marketing Management for Business	PEC	3	0	0	3	3
5	ME23M05	Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3
6	ME23M06	Financing New Business Ventures	PEC	3	0	0	3	3

VERTICAL 3: BUSINESS DATA ANALYTICS

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	CB23M01	Data Mining for Business Intelligence	PEC	3	0	0	3	3
2	CB23M02	Financial Analytics	PEC	3	0	0	3	3
3	CB23M03	Human Resource Analytics	PEC	3	0	0	3	3
4	CB23M04	Marketing and Social Media Web Analytics	PEC	3	0	0	3	3
5	CB23M05	Operation and Supply Chain Analytics	PEC	3	0	0	3	3
6	CB23M06	Statistics for Management	PEC	3	0	0	3	3

VERTICAL 4: Internet of Things

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	EC23M01	IoT Architecture	PEC	3	0	0	3	3
2	EC23M02	IoT Device Programming	PEC	3	0	0	3	3
3	EC23M03	IoT Foundations	PEC	3	0	0	3	3
4	EC23M04	Industrial Internet of Things	PEC	3	0	0	3	3
5	EC23M05	IoT Protocols	PEC	3	0	0	3	3
6	EC23M06	Sensor Technologies and IoT	PEC	3	0	0	3	3

VERTICAL 5: QUANTUM TECHNOLOGIES

Sl.No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	VL23M01	Mathematical Foundations for Quantum Computing	PEC	3	0	0	3	3
2	VL23M02	Fundamentals of Quantum Computing	PEC	3	0	0	3	3
3	VL23M03	Quantum Materials	PEC	3	0	0	3	3
4	VL23M04	Quantum Information Science	PEC	2	0	2	4	3
5	VL23M05	Quantum Measurement and Control	PEC	3	0	0	3	3
6	VL23M06	Quantum Communication	PEC	2	0	2	4	3
7	VL23M07	Quantum Optics	PEC	3	0	0	3	3
8	VL23M08	Quantum Cryptography	PEC	3	0	0	3	3