



Programme Specifications

B. Tech. Programme

Programme:
Electronics and communication
Engineering

Department:
Electronics and communication
Engineering

Faculty of Engineering & Technology
M.S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

www.msruas.ac.in

COURSE SPECIFICATIONS: ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty	Engineering and Technology (FET)
Department	Electronics and Communication Engineering
Course	Electronics and Communication Engineering
Dean of Faculty	
Head of Department	

1	Title of the Award B.Tech. in Electronics and Communication Engineering
2	Modes of Study Full Time
3	Awarding Institution /Body M.S. Ramaiah University of Applied Sciences
4	Joint Award Not Applicable
5	Teaching Institution Faculty of Engineering and Technology, M.S. Ramaiah University of Applied Sciences
6	Date of Course Specifications June 2019
7	Date of Course Approval by the Academic Council of MSRUAS July 2019
8	Next Review Date: May 2023
9	Course Approving Regulating Body and Date of Approval --
10	Course Accredited Body and Date of Accreditation --
11	Grade Awarded by the Accreditation Body --
12	Course Accreditation Validity --
13	Course Benchmark N/A
14	<p>Rationale for the Programme</p> <p>The theoretical developments that occurred in previous centuries in understanding electromagnetic fields and material properties have ushered the growth in the domain of Electronics and Communication during the first half of twentieth century. The second half has seen innovation and novelty in chip technology and telecommunication. Communication technology has resulted in a major societal revolution in developing countries such as India. There is a need for highly trained manpower in the domain of Electronics and Communication engineering. Good outcome-based undergraduate engineering education is critical in developing human resources.</p> <p>The National Association of Software and Services Companies (NASSCOM) study, conducted in 2010 and titled “Global Engineering Research and Development: Accelerating Innovation with Indian Engineering”, underlined the significance for India as the country has posted a revenue growth of about 40% during 2007-2010 and is expected to grow in coming years.</p> <p>The Electronics and Communication Engineering programme at Faculty of Engineering and Technology at MSRUAS has been developed by the members of the faculty based on their</p>

	<p>teaching experience and long-standing interactions with various universities and industries in India and abroad.</p> <p>The outcome-based curriculum helps students to develop critical thinking abilities and imbibe relevant practical skills for a smooth transition from academics to real-life work environments. Opportunities are provided for the students to do their internship in India or abroad depending on their preferences.</p> <p>The Global Innovation 1000, reported in 2012, by management consulting firm Booz & Company has indicated that R & D investment in Computing, Electronics, Tele-communication is about 30% by top innovative companies making this sector a leader. The importance of technological advancements in electronics could also be seen in other categories such as Automobile, Process industries, etc. Expertise needs to be built for the design, analysis, simulation, testing and evaluation of analog, digital, control, instrumentation, and communication systems. In the light of above, knowledge of computer architectures and communication protocols is required. Outcome based undergraduate programme along with modern pedagogy is the need of the hour.</p> <p>The programme provides strong foundation in basic concepts, followed by comprehensive understanding of electrical, electronics, and communication courses. Emphasis is laid on simulation, and larger perspective of systems and sub-systems of electronic products. Students are trained to develop life-long skills to understand, analyse, and develop solutions for challenging technological problems.</p> <p>There is a shortage of quality electronics and communication graduates in spite of many institutions offering undergraduate programmes. The FET at MSRUAS would like to offer Electronics and Communication Engineering programme to produce imaginative, creative and innovative engineers to solve the problems of the society.</p>
15	<p>Programme Mission</p> <p>The purpose of the programme is to create innovative problem solvers in multi-disciplinary settings, entrepreneurs and leaders that apply their knowledge, understanding, cognitive abilities, practical skills and transferable skills gained through systematic, flexible and rigorous learning in the chosen academic domain.</p>
16	<p>Graduate Attributes</p> <ol style="list-style-type: none"> 1. Ability to apply knowledge of mathematics, science, and Engineering fundamentals to solve complex problems in engineering 2. Ability to analyse engineering problems, interpret data and arrive at meaningful conclusions involving mathematical inferences 3. Ability to design an engineering system, component, or process to meet desired needs considering public health and safety, and the cultural, societal, and environmental considerations 4. Ability to understand and solve complex engineering problems by conducting experimental investigations 5. Ability to apply appropriate tools and techniques and understand utilization of resources appropriately to complex engineering activities 6. Ability to understand the effect of engineering solutions on legal, cultural, social and public health and safety aspects 7. Ability to develop sustainable solutions and understand their effect on society and environment 8. Ability to apply ethical principles to engineering practices and professional responsibilities

	<ol style="list-style-type: none"> 9. Ability to work as a member of a team, to plan and to integrate knowledge of various engineering disciplines and to lead teams in multidisciplinary settings 10. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means 11. Ability to lead and manage multidisciplinary teams by applying engineering and management principles 12. Ability to adapt to the changes and advancements in technology and engage in independent and life-long learning
17	<p>Programme Goal</p> <p>The programme goal is to produce graduates with critical, analytical and problem-solving skills, and ability to think independently, to pursue a career in Electronic and Communication Engineering.</p>
18	<p>Programme Objectives</p> <p>The Electronic and Communication Engineering programme imparts knowledge in signal processing, network analysis, control systems, electromagnetic fields, communication systems and electronic devices. Students are taught theoretical aspects, problem-solving, analytical modeling, simulation and analysis to study the behavior of electronic circuits and communication systems. Students are trained in practical aspects of analog/digital circuits, instrumentation, electronic devices and programming. In addition, students are trained on personal development and interactive skills with professionals and feel for society.</p> <p>The objectives of the programme are:</p> <ol style="list-style-type: none"> 1. To impart knowledge on electronic and communication systems 2. To enhance the understanding of the underlying principles of electronic and communication systems 3. To develop abilities to design analog and digital system/controllers to meet the required specifications 4. To develop abilities to model, simulate and analyse the characteristics of electronic signals and systems 5. To train on industry standard simulation tools for simulation and analysis of electronic systems 6. To impart training on instrumentation, test and measurement 7. To build and test electronic systems 8. To impart training on professional ethics, history, economics, social sciences and interactive skills relevant to professional practice To educate on professional ethics, economics, social sciences and interpersonal skills relevant to professional practice 9. To provide a general perspective and opportunities for a career in industry, business and commerce
19	<p>Programme Intended Learning Outcomes</p> <p>The intended learning outcomes are listed under four headings:</p> <ol style="list-style-type: none"> 1. Knowledge and Understanding, 2. Cognitive skills 3. Practical skills and 4. Capability / Transferable skills. <p>Knowledge and Understanding</p> <p>After undergoing this programme, a student will be able to-</p> <p>KU1: Identify and describe the various electronic and communication systems</p> <p>KU2: Explain the principles of electromagnetism and circuit theory as applied to electronic and communication systems</p> <p>KU3: Explain the principles of signal processing and control systems</p>

	<p>KU4: Compare the architectures and working principles of various microcontrollers and processors</p> <p>Cognitive Skills After undergoing this programme, a student will be able to-</p> <p>CS1: Design analog and digital electronic circuits CS2: Model, simulate and analyse electronic and communication sub-systems CS3: Apply the principles of electromagnetism to analyse transmission lines and waveguides in microwave communication CS4: Apply software reference models for the development of electronic systems</p> <p>Practical Skills After undergoing this programme, a student will be able to:</p> <p>PS1: Build analog and digital electronic circuits PS2: Test and measure analog and digital signals using measurement devices PS3: Implement algorithms on microprocessors and microcontrollers PS4: Test microwave devices and measure antenna radiation patterns</p> <p>Capability Skills / Transferrable Skills After undergoing the programme, a student will be able to-</p> <p>TS1: Manage information, develop technical reports and make presentations TS2: Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives TS3: Work under various constraints to meet project targets TS4: Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy</p>
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Programme Structure**Semester: 1, Physics Cycle**

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB101A	Engineering Mathematics-1	3	1	0	4	100
2	20PHB102A	Engineering Physics	3	0	0	3	100
3	20MES101A	Elements of Mechanical Engineering	3	0	0	3	100
4	20ECS102A	Elements of Electronics Engineering	3	0	0	3	100
5	20MES103A	Engineering Drawing	1	0	4	3	100
6	20PHL103A	Engineering Physics Laboratory	0	0	2	1	50
7	20ECL104A	Basic Electronics Laboratory	0	0	2	1	50
8	20TSH101A	Constitution, Human Rights and Law	2	0	0	2	50
Total			15	1	8	20	650
Total number of contact hours per week			24 Hours				
Number of credits can be registered			Minimum	16	Maximum		20

Semester: 1, Chemistry Cycle

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB104A	Engineering Mathematics - 1	3	1	0	4	100
2	20PHB105A	Engineering Chemistry	3	0	0	3	100
3	20CES105A	Elements of Mechanical Engineering and Work shop Practice	2	0	2	3	100
4	20EES106A	Elements of Electrical Engineering	3	0	0	3	100
5	20CSS107A	Elements of Computer Science and Engineering	3	0	0	3	100
6	20CHL106A	Engineering Chemistry Laboratory	0	0	2	1	50
7	20CSL108A	Computer Programming Laboratory	0	0	2	1	50
8	20EEL109A	Basic Electrical Engineering Laboratory	0	0	2	1	50
9	20TSH102A	Professional Communication	2	0	0	2	50
Total			16	1	8	21	700
Total number of contact hours per week			25 Hours				
Number of credits can be registered			Minimum		17	Maximum	21

Semester: 2, Physics Cycle

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB104A	Engineering Mathematics - 2	3	1	0	4	100
2	20PHB102A	Engineering Physics	3	0	0	3	100
3	20CES101A	Engineering Mechanics	3	0	0	3	100
4	20ECS102A	Elements of Electronics Engineering	3	0	0	3	100
5	20MES103A	Engineering Drawing	1	0	4	3	100
6	20PHL103A	Engineering Physics Laboratory	0	0	2	1	50
7	20ECL105A	Basic Electronics Laboratory	0	0	2	1	50
8	20TSH101A	Constitution, Human Rights and Law	2	0	0	2	50
Total			15	1	8	20	650
Total number of contact hours per week			24 Hours				
Number of credits can be registered			Minimum	16	Maximum	20	

Semester: 2, Chemistry Cycle

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB104A	Engineering Mathematics - 2	3	1	0	4	100
2	20PHB105A	Engineering Chemistry	3	0	0	3	100
3	20CES105A	Elements of Mechanical Engineering and Workshop Practice	2	0	2	3	100
4	20EES107A	Elements of Electrical Engineering	3	0	0	3	100
5	20CSS108A	Elements of Computer Science and Engineering	3	0	0	3	100
6	20CHL106A	Engineering Chemistry Laboratory	0	0	2	1	50
7	20CSL109A	Computer Programming Laboratory	0	0	2	1	50
8	20EEL110A	Basic Electrical Engineering Laboratory	0	0	2	1	50
9	20TSH102A	Professional Communication	2	0	0	2	50
Total			16	1	8	21	700
Total number of contact hours per week			25 Hours				
Number of credits can be registered			Minimum	17	Maximum	21	

Semester: 3

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB201A	Engineering Mathematics-3	3	1	0	4	100
2	20ECC202A	Signals and Systems	3	1	0	4	100
3	20ECC203A	Electronic Circuits	3	1	0	4	100
4	20ECC204A	Network Analysis and Synthesis	3	1	0	4	100
5	20ECC205A	Digital Logic Design	3	1	0	4	100
6	20ECL206A	Electronic Circuit Design Laboratory	0	0	2	1	50
7	20ECL207A	Digital Logic Design Laboratory	0	0	2	1	50
8	20CEM210A	Environmental Studies	2	0	0	0	Audit
Total			17	5	4	22	600
Total Number of Contact Hours per week			26 Hours				
Number of Credits can be registered			Minimum	18	Maximum	22	

Semester: 4

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20MTB211A	Engineering Mathematics-4	3	1	0	4	100
2	20ECC212A	Linear Integrated Circuits	3	1	0	4	100
3	20ECC213A	Electromagnetic Theory	3	1	0	4	100
4	20ECC214A	Microprocessors and Microcontrollers	3	1	0	4	100
5	20ECC215A	Measurement and Instrumentation	3	0	0	3	100
6	20ECL216A	Linear Integrated Circuit Laboratory	0	0	2	1	50
7	20ECL217A	Microprocessors and Microcontrollers Laboratory	0	0	2	1	50
Total			15	4	4	21	600
Total Number of Contact Hours per week			23 Hours				
Number of Credits can be registered			Minimum	17	Maximum	21	

Semester: 5

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20ECC301A	Analog Communication	3	1	0	4	100
2	20ECC302A	Digital Signal Processing	3	1	0	4	100
3	20ECC303A	Microwave Engineering	3	1	0	4	100
4	20ECC304A	Control Systems	3	1	0	4	100
5	20ECC305A	Engineering Economics and Cost Estimation for Electronic Engineers	2	0	0	2	100
6	20ECL306A	Analog Communication Laboratory	0	0	2	1	50
7	20ECL307A	Digital Signal Processing Laboratory	0	0	2	1	50
Total			14	4	4	20	600
Total Number of Contact Hours per week			22 Hours				
Number of Credits can be registered			Minimum	16	Maximum	20	

Semester: 6

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20ECC308A	Information Theory and Coding	3	1	0	4	100
2	20ECC309A	Digital Communication	3	1	0	4	100
3	20ECC310A	Antenna and Propagation	3	1	0	4	100
4	20ECC311A	Computer Networks	3	0	0	3	100
5	20ECC312A	HDL Programming	3	1	0	4	100
6	20ECL313A	Digital Communication Laboratory	0	0	2	1	50
7	20ECL314A	Antenna and Microwave Laboratory	0	0	2	1	50
Total			15	4	4	21	600
Total Number of Contact Hours per week			23 Hours				
Number of Credits can be registered			Minimum	17	Maximum	21	

Semester: 7

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20ECE41XA	Professional Core Elective-1	3	1	0	4	100
2	20ECE42XA	Professional Core Elective-2	3	1	0	4	100
3	20ECE43XA	Professional Core Elective-3	3	1	0	4	100
4	20ECO40XA	Open Elective-1	3	0	0	3	100
5	20ECP401A	Project Work-1 Or	0	0	8	4	100
6	20ECP402A	Internship					
7	20ECP403A	Seminar	0	1	1	1	50
Total			12	4	9	20	550
Total Number of Contact Hours per week			25 Hours				
Number of Credits can be registered			Minimum	16	Maximum	20	

Note: Internship can be in any Industry, Business, University or Research organization in India or abroad

Semester: 8

Sl. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	20ECE44XA	Professional Core Elective-4	3	1	0	4	100
2	20ECO41XA	Open Elective-2	3	0	0	3	100
3	20ECP404A	Project Work-2	0	0	16	8	100
Total			6	1	16	15	300
Total Number of Contact Hours per week			23 Hours				
Number of credits can be registered			Minimum	11	Maximum	15	

Professional Core Electives (PCE):

Stream ▶		Biomedical Signal and Image Processing	VLSI and Embedded Systems	Communication Theory	Signal and Image Processing	Data Sciences and Analytics	Applied Mathematics
PCE-1 Sem. 7	Course Code	20ECE411A	20ECE412A	20ECE413A	20ECE414A	20MTE401A	20MTE411A
	Course Title	Biomedical Signal Processing	Embedded Systems and IoT	Statistical Signal Processing	Image Processing	Probability and Statistics	Advanced Mathematics
PCE-2 Sem. 7	Course Code	20ECE421A	20ECE422A	20ECE423A	20ECE424A	20CSE421A	20MTE421A
	Course Title	Biomedical Image Processing	Programmable Logic Design using FPGA	Optical Communication	DSP Architecture	Data Sciences and Foundation	Optimization Techniques -1
PCE-3 Sem. 7	Course Code	20ECE431A	20ECE432A	20ECE433A	20ECE434A	20CSE431A	20MTE431A
	Course Title	Principles of Medical Imaging	Electronic Board Design	Wireless Communication	Speech Processing	Data Science Algorithm and Applications	Advanced Numerical Methods
PCE-4 Sem. 8	Course Code	20ECE441A	20ECE442A	20ECE443A OR 20ECE444A	20ECE445A	20CSE441A	20MTE441A
	Course Title	Biomedical Instrumentation	CMOS IC Design	RADAR Systems OR Satellite Communication	Multimedia Processing	Data Analytics	Optimization Techniques -2

Note: Totally student needs to select three professional core elective courses during 7th Semester, one course each from PCE-1, PCE-2 and PCE-3 Groups must be selected.

Note: Totally student needs to select one professional core elective courses during 8th Semester, one course each from PCE-4 Group must be selected.

Open Electives:

A number of electives from faculty of engineering, management and commerce, art and design, hospitality management and catering technology, pharmacy, dental sciences as mentioned in university website. Students can choose the open electives on their own choice.

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Course Delivery

As per the Timetable

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Teaching and Learning Methods

1. Face to Face Lectures using Audio-Visuals
2. Workshops, Group Discussions, Debates, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory work /Field work / Workshop
6. Industry Visit
7. Seminars
8. Group Exercises
9. Project Work
10. Project Exhibitions
11. Technical Festivals

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Assessment and Grading

1. Every course will be assessed for a weight of 100%

2. For the courses having 100% theory
There are two components-Component-1 and Component-2
Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%
Component-1 (CE): 50% weight

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each theory course is indicated in Table below.

ILO No.	Intended Learning Outcome	CE (Weightage: 50 %)				SEE
		Assessment Type	Comp-1a	Comp-1b	Comp-1c	(Weightage: 50 %)
		Comp Weightage (%)	00	00	00	Sem End Exam
1	ILO-1					
2	ILO-2					
3	ILO-3					
4	ILO-4					
5	ILO-5					
6	ILO-6					

CE – can be from any combination of the following:

Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others, if any.

Component - 2 (SEE): 50% weight

A 3-hour duration Semester End Examination will be conducted for a maximum of 100 marks and will be reduced to 50% weight.

A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each theory course.

3. For Laboratory/ Practical courses

Total Marks: 50

Component 1(CE): Laboratory Report: 50% Weight

Component 2(SEE) Semester End Examination: 50% Weight

A 3-hour duration Semester End Examination will be conducted for a maximum of 50 marks.

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each course is indicated in Table below.

A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each laboratory course.

<p>4. For courses with a combination of theory and laboratory</p> <p>There are two components-Component-1 and Component-2</p> <p>Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%.</p> <table><tr><th rowspan="3">ILO No.</th><th rowspan="3">Intended Learning Outcome</th><th></th><th colspan="4">CE (Weightage: 50 %)</th><th>SEE</th></tr><tr><th>Assessment Type</th><th>Conduction of Lab Exercises</th><th>(Viva)</th><th>(Lab Record Submission)</th><th>(La b Test)</th><th>(Weightage: 50 %):</th></tr><tr><th>Comp Weight age (%)</th><td></td><td></td><td></td><td></td><td>SEE</td></tr><tr><td>1</td><td>ILO-1</td><td></td><td></td><td></td><td></td><td></td><td>50</td></tr><tr><td>2</td><td>ILO-2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Component-1 (CE): 50% weight</p> <p>The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.</p> <p>The template for weightage of CE and SEE in percentages for each course is indicated in Table below.</p> <table><tr><th rowspan="3">ILO No.</th><th rowspan="3">Intended Learning Outcome</th><th colspan="4">CE (Weightage: 50 %)</th><th>SEE</th></tr><tr><th>Assessment Type</th><th>Comp-1a</th><th>Comp-1b</th><th>Comp-1c Lab</th><th>(Weightage: 50 %)</th></tr><tr><th>Comp Weightage (%)</th><td>00</td><td>00</td><td>00</td><td>SEE</td></tr><tr><td>1</td><td>ILO-1</td><td></td><td></td><td></td><td></td><td>50</td></tr><tr><td>2</td><td>ILO-2</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td>ILO-3</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td>ILO-4</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td>ILO-5</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td>ILO-6</td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>CE – can be from any combination of the following:</p> <p>Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others,</p> <p>A 3-hour duration Semester End Examination will be conducted for a maximum of 100 marks and will be reduced to 50 marks.</p> <p>A student is required to score a minimum of 40% marks in Semester end examination and 40% marks overall in each theory course.</p> <p>5. Other flexibilities (exceptions) as per the programme regulations.</p>								ILO No.	Intended Learning Outcome		CE (Weightage: 50 %)				SEE	Assessment Type	Conduction of Lab Exercises	(Viva)	(Lab Record Submission)	(La b Test)	(Weightage: 50 %):	Comp Weight age (%)					SEE	1	ILO-1						50	2	ILO-2							ILO No.	Intended Learning Outcome	CE (Weightage: 50 %)				SEE	Assessment Type	Comp-1a	Comp-1b	Comp-1c Lab	(Weightage: 50 %)	Comp Weightage (%)	00	00	00	SEE	1	ILO-1					50	2	ILO-2						3	ILO-3						4	ILO-4						5	ILO-5						6	ILO-6					
ILO No.	Intended Learning Outcome		CE (Weightage: 50 %)				SEE																																																																																															
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24	<p>Attendance</p> <p>As per academic regulations</p>																																																																																																					
25	<p>Award of Class</p> <p>As per the Academic Regulations of B.Tech. Programme</p>																																																																																																					

26	Student Support for Learning <ol style="list-style-type: none">1. Course Notes2. Reference Books in the Library3. Magazines and Journals4. Internet Facility5. Computing Facility6. Laboratory Facility7. Workshop Facility8. Staff Support9. Lounges for Discussions10. Any other support that enhances their learning
27	Quality Control Measures <ol style="list-style-type: none">1. Review of Course Notes2. Review of Question Papers and Assignment Questions3. Student Feedback4. Moderation of Assessed Work5. Opportunities for students to see their assessed work6. Review by external examiners and external examiners reports7. Staff Student Consultative Committee meetings8. Student exit feedback9. Subject Assessment Board (SAB)10. Programme Assessment Board (PAB)

28	<div>Curriculum Map</div> <table><tr><th colspan="17">Intended Learning Outcomes</th></tr><tr><th colspan="5">Course code</th><th colspan="4">Knowledge and Understanding</th><th colspan="4">Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)</th><th colspan="4">Practical skills</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th><th>KU1</th><th>KU2</th><th>KU3</th><th>KU4</th><th>CS1</th><th>CS2</th><th>CS3</th><th>CS4</th><th>PS1</th><th>PS2</th><th>PS3</th><th>PS4</th></tr><tr><td>20TSH110A</td><td>20MHB101A</td><td>20MES103A</td><td>20ECC202A</td><td>20ECE32XA*</td><td>cd</td><td></td><td>cd</td><td></td><td></td><td>bd</td><td></td><td>d</td><td></td><td></td><td></td><td></td></tr><tr><td>20TSH117A</td><td>20MHB110A</td><td>20ECS105A</td><td>20ECC203A</td><td>20ECE41XA*</td><td>bcd</td><td>cd</td><td>c</td><td></td><td>d</td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td>20MTB201A</td><td>20MES106A</td><td>20ECC204A</td><td>20ECE42XA*</td><td></td><td>d</td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>20MTB211A</td><td>20ECL109A</td><td>20ECC205A</td><td>20ECE43XA*</td><td>d</td><td></td><td></td><td></td><td></td><td>bd</td><td></td><td>d</td><td></td><td>d</td><td></td><td></td></tr><tr><td></td><td>20PHB102A</td><td>20EES113A</td><td>20ECL206A</td><td>20ECO40XA*</td><td>d</td><td>d</td><td></td><td></td><td>d</td><td>d</td><td></td><td></td><td>cd</td><td></td><td></td><td></td></tr><tr><td></td><td>20PHL107A</td><td>20CSS114A</td><td>20ECL207A</td><td>20ECO41XA*</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>d</td><td>d</td><td></td><td></td></tr><tr><td></td><td>20CHB111A</td><td>20CSL115A</td><td>20ECC212A</td><td>20ECE44XA*</td><td>c</td><td>c</td><td></td><td></td><td>d</td><td>b</td><td></td><td>d</td><td>d</td><td>d</td><td></td><td></td></tr><tr><td></td><td>20CHL116A</td><td>20EEL108A</td><td>20ECC213A</td><td></td><td>cd</td><td>d</td><td></td><td></td><td>d</td><td>bd</td><td></td><td>d</td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td>20CEM210A</td><td></td><td>20ECC214A</td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC215A</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECL216A</td><td></td><td>d</td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECL217A</td><td></td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td>d</td><td>d</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC301A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td>d</td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC302A</td><td></td><td>d</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC303A</td><td></td><td>d</td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC304A</td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC305A</td><td></td><td>d</td><td>d</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td>d</td></tr><tr><td></td><td></td><td></td><td>20ECL306A</td><td></td><td>d</td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECL307A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC308A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC308A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>d</td><td>d</td><td>d</td><td>d</td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC310A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>d</td><td>d</td><td>d</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC311A</td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECC312A</td><td></td><td>d</td><td></td><td></td><td></td><td></td><td>d</td><td></td><td></td><td>d</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECL313A</td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>20ECL314A</td><td></td><td></td><td>d</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><t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colspan="12">Total 160 credits</td></tr></table> <div>*Depends on elective Course chosen</div>	Intended Learning Outcomes																	Course code					Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)				Practical 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29	Capability / Transferable Skills Map														
	Course Code					S									
	a	b	c	d	e	GK	SL	WC	OC	P	B	IM	PM	L	AO
	20TSH110A	20MHB101A	20MES103A	20ECC202A	20ECE32XA*	abcde	abcde	abcde	a	a	a	abcde	abcde	a	a
	20TSH117A	20MHB110A	20ECS105A	20ECC203A	20ECE41XA*	abcde	abcde	abcde	abcde	a	a	abcde	abcde	a	a
		20MTB201A	20MES106A	20ECC204A	20ECE42XA*	bcde	bcde	bcde				bcde	bcde		
		20MTB211A	20ECL109A	20ECC205A	20ECE43XA*	bcde	bcde	bcde	c			b	bcde		
		20PHB102A	20EES113A	20ECL206A	20ECO40XA*	bcd	bcd	bcd	c			b	bcd		
		20PHL107A	20CSS114A	20ECL207A	20ECO41XA*	bcd	bcd	bcd	b			b	b		
		20CHB111A	20CSL115A	20ECC212A	20ECE44XA*	bcd	bcd	bcd	d			b	b		
		20CHL116A	20EEL108A	20ECC213A		bcd	bcd	bcd				bcd	bcd		
		20CEM210A		20ECC214A		bd	bd	bd				d	d		b
				20ECC215A		d	d	d				d	d		
				20ECL216A		d	d	d				d	d		
				20ECL217A		d	d	d	d			d	d		
				20ECC301A		d	d	d	d			d	d		
				20ECC302A		d	d	d				d	d		
				20ECC303A		d	d	d				d	d		
				20ECC304A		d	d	d				d	d		
				20ECC305A		d	d	d				d	d		
				20ECL306A		d	d	d				d	d		
				20ECL307A		d	d	d				d	d		
				20ECC308A		d	d	d	d			d	d		
				20ECC309A		d	d	d	d			d	d		
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				20ECP318A		d	d	d	d			d	d		
				20ECP401A*		d	d	d	d	d	d	d	d	d	d
				20ECP402A*		d	d	d	d	d	d	d	d	d	d
				20ECP403A		d	d	d	d	d	d	d	d	d	d
	GK: Group Work, SL: Self Learning, WC: Written Communication, OC: Oral Communication, P: Presentation, B: Behavioral, IM: Information Management, PM: Personal Management, L: Leadership, AO: Any Other														
30	Co-curricular Activities Students are encouraged to take part in co-curricular activities like seminars, conferences, symposia, paper writing, attending industry exhibitions, project competitions and related activities for enhancing their knowledge and networking.														
31	Cultural and Literary Activities Annual cultural festivals are held to showcase the creative talents in students. They are involved in planning and organizing the activities.														
32	Sports and Athletics Students are encouraged to take part in sports and athletic events regularly. Annual sports meet will be held to demonstrate sportsmanship and competitive spirit.														

