

(ii) B. Tech. – M. Tech. Dual Degree in Communication System and Signal Processing (CSSP)

<p>Program Learning Objectives:</p> <ol style="list-style-type: none"> 1. Develop a solid foundation in electronics and communication engineering principles, including circuit analysis, electronic devices, signal processing, microprocessor/microcontroller systems, analog communication systems, digital communication, and RF circuits etc. 2. Develop electronics and communication project management skills, including the ability to plan, execute, and complete within specified timelines and budgets. 3. Work collaboratively in multidisciplinary teams, demonstrating effective teamwork and communication to solve complex engineering problems. 4. Recognize the importance of ongoing professional development, engaging in activities such as certifications, workshops, and conferences to stay updated of industry trends. 	<p>Program Learning Outcomes:</p> <p>The graduates of this program will have</p> <ol style="list-style-type: none"> 1. a successful career in an Academia/Industry/Entrepreneur. 2. strong fundamentals in electronics and communications engineering. 3. ability to design prototypes for real world problems related to electronics, communications and interdisciplinary fields. 4. ability to develop soft skills such as effective communications in both verbal and written forms, body language, time management, problem-solving, leadership, work in both team as well as individual in a professional manner.
<p>Program Goal 1: Academic excellence by providing a curriculum that aligns with industry standards and encourages critical thinking in the field of electronics and communication engineering.</p>	<p>Program Learning Outcome 1a: Highly skilled market ready man power to serve the emerging electronic sectors</p> <p>Program Learning Outcome 1b: Skilled Human resource to cater the needs of next generation communication sectors</p>
<p>Program Goal 2: A culture of research and innovation by promoting faculty and student involvement in cutting-edge projects in electronic and communication technologies.</p>	<p>Program Learning Outcome 2a: Trained researchers for implementing research projects in line with national priorities such as CPS, Semiconductors, Clean Energy, Green Technologies</p> <p>Program Learning Outcome 2b: Design and develop innovative smart electronics products as per the societal need</p>
<p>Program Goal 3: To design dynamic and flexible course structures for UG and PG programs as per the changing requirement of the industries</p>	<p>Program Learning Outcome 3a: Industry relevant UG, PG, and research programs</p> <p>Program Learning Outcome 3b: Trained manpower as per the industry requirement</p>

<p>Program Goal 4: To promote entrepreneurship among the students in the field of electronics and communication engineering</p>	<p>Program Learning Outcome 4a: Realization of working prototype towards product development</p> <p>Program Learning Outcome 4b: Promotion of in house technology based ventures catering societal needs</p>
<p>Program Goal 5: Equip students with strong communication skills, enabling them to articulate technical concepts clearly and effectively in both written and oral forms.</p>	<p>Program Learning Outcome 5a: Man power with enhanced soft skills to support the vision of developed India</p> <p>Program Learning Outcome 5b: Responsible citizen for the holistic growth of the country</p>
<p>Program Goal 6: To equip students with technical skills necessary for the design, analysis, and implementation of communication system technologies and networks.</p>	<p>Program Learning Outcome 6a: Demonstrate proficiency in one or more specialized areas within communication system engineering, such as wireless communication, optical communication, microwave and millimeter wave technologies, digital signal processing, or network engineering.</p> <p>Program Learning Outcome 6b: Demonstrate advanced knowledge and understanding of communication engineering principles, theories, and concepts.</p>
<p>Program Goal 7: To foster research and development skills, enabling students to contribute to the advancement of communication technologies through innovation and problem-solving.</p>	<p>Program Learning Outcome 7: Conduct independent research, including literature review, experimentation, data analysis, and interpretation, to address communication engineering challenges and contribute to knowledge advancement in the field.</p>
<p>Program Goal 8: To prepare students for professional practice in communication engineering roles in industry, academia, research institutions, or government agencies.</p>	<p>Program Learning Outcome 8: Design, simulate, and implement communication systems and networks using appropriate tools, techniques, and methodologies.</p>

Sl. No.	Subject Code	SEMESTER III	L	T	P	C
1.	EE2101	Measurements and Instrumentation	3	0	2	4
2.	EE2102	Network Analysis and Synthesis	3	0	0	3
3.	EC2101	Analog Circuits	3	0	2	4
4.	EC2102	Signals and Systems	3	1	0	4
5.	EC2103	Semiconductor Devices	3	0	2	4
6.	HS21PQ	HSS Elective - I	3	0	0	3
TOTAL			18	1	6	22

Sl. No.	Subject Code	SEMESTER IV	L	T	P	C
1.	EC2201	Digital Electronics	3	0	2	4
2.	EC2202	Microprocessor	2	0	2	3
3.	EE2201	Control Systems	3	0	2	4
4.	EC2203	Computer Organization and Architecture	3	0	0	3
5.	EC2204	Internet of Things	3	0	0	3
6.	XX22PQ	IDE - I	3	0	0	3
TOTAL			17	0	6	20

Sl. No.	Subject Code	SEMESTER V	L	T	P	C
1.	EC3101	Microcontroller and Embedded System	3	0	2	4
2.	EE3102	VLSI Design	3	0	2	4
3.	EC3103	Analog Communication	3	0	2	4
4.	EC3104	Engineering Electromagnetics	3	0	0	3
5.	EC3105	Random Signals and Stochastic Processes	3	0	0	3
6.	XX31PQ	IDE - II	3	0	0	3
TOTAL			18	0	6	21

Sl. No.	Subject Code	SEMESTER VI	L	T	P	C
1.	EC3201	Digital Communication	3	0	2	4
2.	EC3202	Digital Signal Processing	3	0	2	4
3.	EC3203	Introduction to AI/ML	3	0	0	3
4.	EC3204	Low Power MOSFETs Design and Modeling	3	0	0	3
5.	EC3205	Introduction to Wireless Communications	3	0	0	3
6.	EC3206	RF Systems	3	0	0	3
TOTAL			18	0	4	20

Sl. No.	Subject Code	SEMESTER VII	L	T	P	C
1.	EC41XX	B. Tech. Elective - I	3	0	0	3
2.	EC41XX	B. Tech. Elective - II	3	0	0	3
3.	XX41PQ	IDE - III	3	0	0	3
4.	HS41PQ	HSS Elective - II	3	0	0	3
5.	EC4196	Summer Internship*	0	0	12	3
6.	EC4197	Project – I	0	0	12	6
7.	EC5101	Information Theory and Coding	3	1	0	4
TOTAL			15	1	24	25

Sl. No.	Subject Code	SEMESTER VIII	L	T	P	C
1.	RM6201	Research Methodology	3	1	0	4
2.	EC5201	Wireless Communication	3	0	2	4
3.	EC5202	Advanced Communication Systems	3	0	2	4
4.	XX52PQ/XX62 PQ	M. Tech. Elective - I	3	0	0	3
5.	EC4297	Project - II	0	0	12	6
TOTAL			12	1	16	21

Sem IX:

Sl. No.	Subject Code	SEMESTER IX	L	T	P	C
1.	XX52PQ/XX62 PQ	M. Tech. Elective - II	3	0	0	3
2.	XX52PQ/XX62 PQ	M Tech Elective - III	3	0	0	3
3.	XX52PQ/XX62 PQ	M Tech Elective - IV	3	0	0	3
4.	EC5197	Project III	0	0	16	8
TOTAL			9	0	8	17

Sem X:

Sl. No.	Subject Code	SEMESTER X	L	T	P	C
1.	EC5297	Project IV	0	0	36	18
TOTAL			0	0	36	18
Grand TOTAL (Semester I to X)			210			

Elective Courses:

Semester VII

B. Tech. Elective - I	B. Tech. Elective - II
EC4101 Introduction to Quantum Computing	EC4104 Introduction to Information Theory
EC4102 Deep Learning for Video Surveillance Systems	EC4105 Digital Image Processing
EC4103 FPGA based System Design	EC4106 Graph Signal Processing

Semester VIII

M. Tech. Elective - I	
EC5250	Patterns Recognition and Machine Learning
EC5203	Communication Networks
EC5204	Multimedia Communication
EC6209	Adaptive filtering: From theory to practice
EC5206	Advanced Biomedical Signal Processing
EC6208	RF and Microwave Measurement Techniques
EE6215	Random Signals and Systems
EC6212	Optimization Theory and Techniques for Electrical Engineering
EC6210	Smart Antenna: From Theory to Practice
EC6211	Antenna Design and Characterization
EC5216	Silicon Photonics
EC5205	Optical Communication
EC6213	Statistical Signal Processing
EC6207	Microwave and Millimetre Wave Integrated Circuits (MMIC)
EC6271	Generative AI for Video Surveillance System

Semester IX

M. Tech. Elective - II	M. Tech. Elective - III	M. Tech. Elective - IV
EC5108 RF and Microwave Active Circuits	EC6154 Computer Vision	EC6155 Emerging Technologies for Beyond 5G
EC5109 Internet of Things (IoT) Networks	EC6114 Radio Frequency Design and Technology	EE5112 Energy Storage Systems
EC6116 Advance Antenna and Microwave Devices	EC5111 VLSI Architectural Design and Implementation	EE6112 V2G and G2V Technology
EC5113 Radio Frequency Integrated Circuits	EC5159 Bio Sensors and Circuits	
	EC5104 Quantum Computing	
	EC6157 VLSI Signal Processing	