

**DEPARTMENT OF
ELECTRONICS AND COMMUNICATION
ENGINEERING**



SYLLABUS
Bachelor of Technology in
Electronics and Communication Engineering
with

- I. Minor Specialization in Signal Processing
- II. Minor Specialization in Semiconductor and Nanotechnology
- III. Minor Specialization in 5G and Future Generation Communication
- IV. Minor Specialization in Internet of Things (IoT)

[Effective from Admitted batch 2024 and Admitted batch 2023 (3rd Semester) Onwards]



SMIT SIKKIM
MANIPAL
UNIVERSITY
SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY

Vision, Mission and Objective of the Department

Vision

To achieve eminence in the field of quality techno-logical education and research in Communication, Remote Sensing, VLSI & Embedded System and other Electronics related fields.

Mission

To develop into a department of excellence capable of producing competent techno-managers who can contribute effectively to the advancement of the society.

Objectives

- To prepare students to identify, formulate and solve real life and industrial problems with their knowledge of electronics and communication engineering.
- To develop techno-managerial ability to execute assigned responsibilities.
- To provide the guidance to develop moral and ethical attitudes.
- To provide education to adopt novel technologies towards the betterment of human life and society.



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Consent of BOS		

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FIRST YEAR B. TECH CURRICULUM 2024 Onwards (Common to all branches)

(Applicable to students admitted during 2024 and later)

GROUP B (FIRST SEMESTER)												
CHEMISTRY GROUP												
Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C	
MA101A1	Engineering Mathematics-I	3	1	0	4	MA101A1	Engineering Mathematics-I	3	1	0	4	
CE101A1	Elements of Civil Engineering	3	0	0	3	ME102A1	Element of Mechanical Engineering	3	0	0	3	
PH101A1	Engineering Physics	3	1	0	4	CH101A1	Engineering Chemistry	3	1	0	4	
EC101A1	Basic Electronics	3	0	0	3	EE101A1	Element of Electrical engineering	3	0	0	3	
BA101A1	Communication Skills	2	0	0	2	CS101A1	Computer Programming in C	3	1	0	4	
ME101A1	Engineering Graphics	1	0	2	2	CH102A1	Environmental Science	1	0	0	1	
BP101A1	Constitution of India	1	0	0	1	CS101A4	Computer Programming Lab	0	0	2	1	
ME101A4	Workshop Practice	0	0	2	1	CH101A4	Engineering Chemistry Lab	0	0	2	1	
PH101A4	Engineering Physics Lab	0	0	2	1							
		16	2	6	21			16	3	4	21	
Total Contact Hours (L + T + P)		24			Total Contact Hours (L + T + P)			23				
GROUP B (SECOND SEMESTER)												
MA102A1	Engineering Mathematics-II	3	1	0	4	MA102A1	Engineering Mathematics-II	3	1	0	4	
ME102A1	Element of Mechanical Engineering	3	0	0	3	CE101A1	Elements of Civil Engineering	3	0	0	3	
CH101A1	Engineering Chemistry	3	1	0	4	PH101A1	Engineering Physics	3	1	0	4	
EE101A1	Element of Electrical engineering	3	0	0	3	EC101A1	Basic Electronics	3	0	0	3	
CS101A1	Computer Programming in C	3	1	0	4	BA101A1	Communication Skills	2	0	0	2	
CH102A1	Environmental Science	1	0	0	1	ME101A1	Engineering Graphics	1	0	2	2	
CS101A4	Computer Programming Lab	0	0	2	1	BP101A1	Constitution of India	1	0	0	1	
CH101A4	Engineering Chemistry Lab	0	0	2	1	ME101A4	Workshop Practice	0	0	2	1	
						PH101A4	Engineering Physics Lab	0	0	2	1	
		16	3	4	21			16	2	6	21	
Total Contact Hours (L + T + P)		23			Total Contact Hours (L + T + P)			24				

Note: UHV-I has been introduced under Mandatory Induction Program.



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SECOND YEAR B. TECH ECE CURRICULUM

THIRD SEMESTER						FOURTH SEMESTER					
Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
MA207A1	Engineering Mathematics III	3	1	0	4	MA208A1	Engineering Mathematics IV	3	1	0	4
EC201A1	Electronic Devices and Components	3	1	0	4	EC204A1	Electromagnetic Waves	3	1	0	4
EC202A1	Digital Electronics and System Design	3	1	0	4	EC205A1	Analog Electronic Circuits	3	1	0	4
EC203A1	Signals and Systems	3	1	0	4	EC2xxA3	Program Elective-II	3	1	0	4
EC2xxA3	Program Elective-I	3	1	0	4	EC2xxA2	Open Elective-II/Minor/NCC	3	1	0	4
EC2xxA2	Open Elective-I/Minor/NCC	3	1	0	4	GN201A1	Universal human values-II: understanding Harmony and ethical human conduct	2	1	0	3
EC201A4	Electronic Devices and Components Laboratory	0	0	2	1	EC203A4	Analog Electronic Circuits Laboratory	0	0	2	1
EC202A4	Digital Electronics and System Design Laboratory	0	0	2	1	EC204A4	Microprocessor and Microcontroller Laboratory	0	0	2	1
EC201A5	Project Based Learning-I	0	0	2	1	EC202A5	Project Based Learning- II	0	0	2	1
		18	6	6	27			17	6	6	26
Total Contact Hours (L + T + P)		30				Total Contact Hours (L + T + P)		29			



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THIRD YEAR B. TECH ECE CURRICULUM

FIFTH SEMESTER						SIXTH SEMESTER					
Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
EC301A1	Antenna Theory	3	1	0	4	BA346A1	Industrial Management	2	0	0	2
EC302A1	Analog and Digital Communication	3	1	0	4	EC305A1	Microwave Engineering	3	1	0	4
EC303A1	Digital Signal Processing	3	1	0	4	EC306A1	Microelectronics and VLSI Design	3	1	0	4
EC304A1	Embedded System	3	1	0	4	EC3xxA3	Program Elective-IV	3	1	0	4
EC3xxA3	Program Elective-III	3	1	0	3	EC3xxA3	Program Elective-V	3	1	0	4
EC3xxA2	Open Elective-III/Minor/NCC	3	1	0	4	EC3xxA2	Open Elective-IV/Minor	3	1	0	4
EC301A4	Hardware Descriptive Language (HDL) Laboratory	0	0	2	1	EC303A4	Microwave Engineering Laboratory	0	0	2	1
EC302A4	Digital Signal Processing Laboratory	0	0	2	1	EC304A4	Communication Laboratory	0	0	2	1
EC301A5	Project Based Learning- III	0	0	2	1	EC302A5	Mini Project	0	0	4	1
EC301A9	Industrial Training-I	0	0	2	1	GN302A1	Quantitative Aptitude and Logical Reasoning II	1	0	0	1
GN301A1	Quantitative Aptitude and Logical Reasoning I	0	0	2	1						
Total Contact Hours (L + T + P)		18	6	8	28			18	5	8	26
		32				Total Contact Hours (L + T + P)		31			



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FOURTH YEAR B. TECH ECE CURRICULUM

SEVENTH SEMESTER				EIGHTH SEMESTER			
Sub. Code	Subject Name	L	T P C	Sub. Code	Subject Name	L	T P C
EC4xxA2	Open Elective - V/Minor	3	1 0 4	EC4xxA2	Open Elective - VI/Minor	3	1 0 4
EC4xxA2	Choice Based Elective	3	0 0 3	EC402A6	Major Project – Phase II	0	0 24 12
EC401A6	Major Project – Phase I	0	0 14 7				
EC401A9	Industrial Training-II	0	0 2 1				
Total Contact Hours (L + T + P)		6	1 16 15	Total Contact Hours (L + T + P)		3	1 24 16
		23				28	

Note : A two days workshop to be conducted department wise in sixth semester on "Professional Communication and Technical Writing".

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List of Program Electives

Subject Code	Program Elective-I (3rd Semester)	Subject Code	Program Elective-IV (6th Semester)
EC201A3	Network Analysis and Synthesis	EC306A3	Linear and Digital Control Systems
EC202A3	Sensors and Instrumentation	EC307A3	Information Theory and Coding
EC203A3	OOPs with C++	EC308A3	Wireless Sensor Network
		EC309A3	Speech Processing
		EC310A3	MEMS and NEMS
		EC311A3	Automation and Robotics
	Program Elective-II (4th Semester)		Program Elective-V (6th Semester)
EC204A3	Microprocessor, Microcontroller and ARM processor	EC312A3	Mobile Communication
EC205A3	Data Structure	EC313A3	Advance Computer Networks
EC206A3	Programming in Java	EC314A3	Multimedia Communication
EC207A3	Data Science for Engineers	EC315A3	Detection and Estimation
		EC316A3	Adaptive Signal Processing
	Program Elective-III (5th Semester)	EC317A3	Soft Computing Techniques
EC301A3	Computer Networks		
EC302A3	Power Electronics		
EC303A3	Advanced Electronic Devices		
EC304A3	Digital Image Processing		
EC305A3	Internet of Things		

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List of Minor Specializations/Open Electives

Minor Specialization	Semester	Subject Code	Open Electives
Signal Processing	III	EC201A2	Introduction to Complex variables
	IV	EC205A2	Signal Processing for Communication
	V	EC305A2	Optimization Techniques
	VI	EC309A2	Pattern Recognition
	VII	EC401A2	Time Frequency Analysis
	VIII	EC405A2	Advance Digital Signal Processing
Semiconductor and Nanotechnology	III	EC202A2	Semiconductor Physics
	IV	EC206A2	Semiconductor Devices and Circuits
	V	EC306A2	Solid State Devices
	VI	EC310A2	Nano Electronic Devices and Materials
	VII	EC402A2	Advance VLSI Design and Applications
	VIII	EC406A2	ASIC Design
5G Communication	III	EC203A2	Mathematics for Communication Engineering
	IV	EC207A2	Advanced Antenna Design
	V	EC307A2	Advanced Digital Communication
	VI	EC311A2	Modern Wireless Communication System
	VII	EC403A2	Coding for MIMO Communication
	VIII	EC407A2	5G Mobile Communication
Internet of Things	III	EC204A2	Python Programming
	IV	EC208A2	Sensors and Actuators
	V	EC308A2	IOT Gateways and Edge Computing
	VI	EC312A2	Communication Pathways between Cloud and IOT
	VII	EC404A2	Artificial Intelligence and Machine Learning
	VIII	EC408A2	Data Centre and Cloud Computing

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List of Choice based Electives

Subject Code	Choice based Electives (Seventh Semester)
EC409A2	Foreign Language
EC410A2	Essence of Indian Traditional Knowledge

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