ANNEXURE – VIII (1)

Appendix 'VII' (9)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SYLLABUS
BACHELOR OF TECHNOLOGY

in

ELECTRONICS ENGINEERING

(VLSI DESIGN & TECHNOLOGY)

[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.

Table of Contents

		Page No.
Chapter 1	**SCHEME OF STUDY (B.TECH UNDER CGPA SCHEME)**	8
Chapter 2	**ECE Subjects offered to first year**	15
Chapter 3	**Major Theory Subjects**	17
Chapter 4	**Major Practical Subjects**	51
Chapter 5	**Program Electives**	69
Chapter 6	**Open Electives**	118
Chapter 7	**Choice based Electives**	173
	Consent of BOS	174

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

Semester	FIRST SEMESTER						SECOND SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
1st Yr	PH101A1	Engineering Physics	3	1	0	4	CH101A1	Engineering Chemistry	3	1	0	4
	MA101A1	Engineering Mathematics–I/II	3	1	0	4	CS101A1	Computer Programming in C	3	1	0	4
	EC101A1	Basic Electronics	3	0	0	3	MA102A1	Engineering Mathematics–I/II	3	1	0	4
	CE101A1	Elements of Civil Engineering	3	0	0	3	EE101A1	Element of Electrical Engineering	3	0	0	3
	ME101A1	Engineering Graphics	2	0	0	2	ME102A1	Element of Mechanical Engineering	3	0	0	3
	ME101A4	Workshop Practice	0	0	1	1	CH102A1	Environmental Science*	1	0	0	1
	BA101A1	Communication Skills*	2	0	0	2	CS101A4	Computer Programming Lab	0	0	1	1
	BP101A1	Constitution of India	1	0	0	1	CH101A4	Engineering Chemistry Lab	0	0	1	1
	PH101A4	Engineering Physics Lab	0	0	1	1		NCC (AU)	0	0	0	0
		NCC (AU)	0	0	0	0						
	Total Contact Hours (L + T + P)					21	Total Contact Hours (L + T + P)					21
	*Mandatory audit course						*Mandatory audit course					

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

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SIKKIM MANIPAL UNIVERSITY ★ 5th Mile Tadong Gangtok

B.TECH. COURSE STRUCTURE – SEMESTER WISE

THIRD SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practica l (P)	Total Hours	
2nd	MA207A1	Engineering Mathematics III	3	1	0	4	4
	VT201A1	Electronic Devices and Components	3	1	0	4	4
	VT202A1	Digital Electronics and System Design	3	1	0	4	4
	VT203A1	Signals and Systems	3	1	0	4	4
	VT2xxA3	Program Elective-I	3	1	0	4	4
	VT2xxA2	Open Elective-I/Minor/NCC	3	1	0	4	4
	VT201A4	Electronic Devices and Components Lab	0	0	1	2	1
	VT202A4	Digital Electronics and System Design Lab	0	0	1	2	1
	VT201A5	Project Based Learning-I	0	0	1	2	1
TOTAL			18	6	3	30	27

FOURTH SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
2nd	MA208A1	Engineering Mathematics IV	3	1	0	4	4
	VT204A1	Analog Electronic Circuits	3	1	0	4	4
	VT205A1	Microprocessor, Microcontroller, and ARM processor	3	1	0	4	4
	VT2xxA2	Open Elective-II/Minor/NCC	3	1	0	4	4
	VT2xxA3	Program Elective-II	3	1	0	4	4
	GN201A1	Universal human values-II: understanding Harmony and ethical human conduct	3	0	0	3	3
	VT203A4	Analog Electronic Circuits Lab	0	0	1	2	1
	VT204A4	Microprocessor and microcontroller LAB	0	0	1	2	1
	VT202A5	Project Based Learning-II	0	0	1	2	1
TOTAL			18	5	3	29	26

Department of Electronics & Communication Engineering ★ SMIT
SIKKIM MANIPAL UNIVERSITY ★ Majitar, Rangpo, Sikkim

FIFTH SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
3rd	VT301A1	Communication Engineering	3	1	0	4	4
	VT302A1	Introduction to Microfabrication	3	1	0	4	4
	VT303A1	VLSI Verification and Testing using EDA tools	3	1	0	4	4
	VT304A1	Embedded System	3	1	0	4	4
	VT3xxA3	Program Elective-III/MOOC	3	3	0	4	3
	VT3xxA2	Open Elective-III/Minor/NCC	3	1	0	4	4
	VT301A4	HDL simulation LAB	0	0	1	2	1
	VT302A4	Python Scripting Lab	0	0	1	2	1
	VT301A5	Project Based Learning-III	0	0	1	2	1
	GN301A1	Quantitative aptitude and logical reasoning	1	0	0	1	1
	VT301A9	Industrial Training-I	0	0	1	-	1
TOTAL			18	6	4	30*	28

SIXTH SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
3rd	BA346A1	Industrial Management	2	0	0	2	2
	VT305A1	Semiconductor Materials Synthesis and Characterization	3	1	0	4	4
	VT306A1	Micro Electronics and VLSI Design)	3	1	0	4	4
	VT3xxA3	Program Elective-IV	3	1	0	4	4
	VT3xxA3	Program Elective-V	3	1	0	4	4
	VT3xxA2	Open Elective-IV/Minor/NCC	3	1	0	4	4
	VT303A4	Communication Lab	0	0	1	2	1
	VT304A4	ARM based SoC Design Lab {Foundry Familiarization workshop / MOOC virtual Lab}	0	0	1	2	1
	GN302A1	Quantitative aptitude and logical reasoning	1	0	0	1	1
	VT302A5	Mini Project	0	0	1	1	1
TOTAL			17	5	4	28	26

*Audit course

SEVENTH SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
4th	VT4xxA2	Open Elective-V/Minor/NCC	3	1	0	4	4
	VT4xxA2	Choice Based Elective (Open Elective)	3	0	0	3	3
	VT401A6	Research based Project / Industrial Project -Phase-I	0	0	7	2	7
	VT401A9	Industrial Training-II	0	0	1	-	1
TOTAL			6	1	1	9*	15

EIGHT SEMESTER							
Year	Course Code	Course Title	Total Number of Contact Hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
4th	VT4xxA2	Open Elective-VI/Minor/NCC	3	1	0	4	4
	VT402A6	Major Project work	0	0	12	-	12
TOTAL			3	1	12	4*	16

Department of Electronics & Communication Engineering SMIT

SIKKIM MANIPAL UNIVERSITY 5th MILE Tadong Gangtok

LIST OF ELECTIVES FOR 3rd. SEMESTER			
PROGRAM ELECTIVE-1			
Year	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
2nd	VT201A3	Electromagnetic Theory	4
	VT202A3	Network Analysis and Synthesis	4
	VT203A3	OOPs with C++	4
	VT204A3	Internet of Things	4
	VT205A3	Computer Organization and Architecture	4

LIST OF ELECTIVES FOR 4TH SEMESTER			
PROGRAM ELECTIVE-2			
Year	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
2nd	VT206A3	Computer Networks	4
	VT207A3	Electronic Instrumention and Measurements	4
	VT208A3	Data Structure	4
	VT209A3	Advanced Electronic Devices	4

LIST OF ELECTIVES FOR 5TH SEMESTER			
PROGRAM ELECTIVE-3			
Year	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
3rd	VT301A3	FPGA Architecture	4
	VT302A3	Digital Signal Processing	4
	VT303A3	VLSI Physical Design	4
	VT304A3	JAVA	4
	VT305A3	Database Management System	4

LIST OF ELECTIVES FOR 6TH SEMESTER			
PROGRAM ELECTIVE-4			
Year	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
3rd	**VT306A3**	Advanced Semiconductor Devices and Flexible Electronics	4
	VT307A3	Linear and Digital Control Systems	4
	VT308A3	Information Theory and Coding	4
	VT309A3	MEMS and NEMS	4
	PROGRAM ELECTIVE-5		
	VT310A3	Advanced VLSI and SoC Design	4
	VT311A3	Semiconductor Device Modelling	4
	VT312A3	Machine Learning	4

OPEN ELECTIVE/MINOR			
SEMESTER	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
3rd	**VT201A2**	Introduction to Complex Variables	4
	VT202A2	Computer Organization and Architecture	4
	VT203A2	Python Programming	4
	VT204A2	Mathematics for Communication Engineering	
4th	**VT205A2**	Signal Processing for Communication	4
	VT206A2	Semiconductor Devices and Circuits	4
	VT207A2	Sensors and Actuators	4
	VT208A2	Advanced Antenna Design	
5th	**VT301A2**	Optimization Technique	4
	VT302A2	Solid State Devices	4
	VT303A2	IOT Gateways and Edge Computing	4
	VT304A2	Advanced Digital Communication	
	VT305A2	Pattern Recognition	4
	VT306A2	Nano Electronic Devices and Materials	4

Department of Electronics & Communication Engineering SMIT
SIKKIM MANIPAL UNIVERSITY Six Mile Tadong Gangtok

6th	**VT307A2**	Communication Pathways between Cloud and IoT	4
	VT308A2	Modern Wireless Communication System	
7th	**VT401A2**	Time Frequency Analysis	4
	VT402A2	Advanced VLSI Design and Applications	4
	VT403A2	Artificial Intelligence and Machine Learning	4
	VT404A2	Coding for MIMO Communication	
8th	**VT405A2**	Advanced Digital Signal Processing	4
	VT406A2	ASIC Design	4
	VT407A2	Data Centre and Cloud Computing	4
	VT408A2	5G Mobile Communication	

CHOICE BASED ELECTIVES/OPEN ELECTIVES			
SEMESTER	**COURSE CODE**	**COURSE TITLE**	**CREDIT**
7th	**VT4xxA2**	Any subjects related to foreign language or Indian language.	3