BTECH ELECTRONICS ENGINEERING (VLSI DESIGN & TECHNOLOGY)

COURSE STRUCTURE

EFFECTIVE 2025-26 ADMISSION BATCH

Approved in Academic Council held on 30 July 2025

Department of Electronics Engineering (VLSI Design & Technology)

PROGRAM OUTCOMES

Engineering Graduates will be able to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Course Structure for B. Tech. Electronics Engineering (VLSIDesign & Technology) - Effective 2025-26

FIRST SEMESTER

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1	BSC	25B11MA113	MATHEMATICS-I	3	1	0	0	4	4
2	BSC	25B11PH111	PHYSICS-I	3	1	0	0	4	4
3	ESC	25B11CI11	SOFTWARE DEVELOPMENT FUNDAMENTALS-I	3	1	0	0	4	4
4	HSC	21B11HS111	ENGLISH	1	0	2	0	3	2
5	BSC	25B17PH171	PHYSICS LAB-I	0	0	2	0	2	1
6	ESC	25B17CI172	SOFTWARE DEVELOPMENT FUNDAMENTALS LAB-I	0	0	2	0	2	1
7	ESC	25B17GE171	WORKSHOP	0	0	3	0	3	1.5
8	ESC	25B11EC111	BASIC ELECTRONICS	3	1	0	0	4	4
9	ESC	25B17EC171	BASIC ELECTRONICS LAB	0	0	2	0	2	1
TOTAL								**28**	**22.5**

SECOND SEMESTER

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1	BSC	25B11MA21	MATHEMATICS-II	3	1	0		4	4
2	BSC	25B11PH211	PHYSICS-II	3	1	0		4	4
3	ESC	25B11CI211	SOFTWARE DEVELOPMENT FUNDAMENTALS -II	3	1	0		4	4
4	BSC	25B17PH271	PHYSICS LAB-II	0	0	2		2	1
5	ESC	25B17CI271	SOFTWARE DEVELOPMENT FUNDAMENTALS LAB- II	0	0	2		2	1
6	HSC	25B17HS271	LIFE SKILLS & PROFESSIONAL COMMUNICATION LAB	0	0	2		2	QUALIFYING
7	ESC	25B17GE172	ENGINEERING DRAWING & DESIGN	0	0	3		3	1.5
8	HSC	25B11HS211	UNIVERSAL HUMAN VALUES (UHV)	2	1	0		3	3

TOTAL							24	18.5

THIRD SEMESTER

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1			PROBABILITY AND RANDOM PROCESSES	3	1	0		4	4
2			ELECTRONIC DEVICES	3	0	0		3	3
3			ELECTRONIC DEVICES LAB	0	0	2		2	1
4			SIGNALS & SYSTEMS	3	1	0		4	4
5			DIGITAL CIRCUIT DESIGN	3	0	0		3	3
6			DIGITAL CIRCUIT DESIGN LAB	0	0	2		2	1
7			ENVIRONMENTAL STUDIES	3	0	0		3	QUALIFYING
8			MICRO PROJECT 1	0	0	4		4	2
9			NUMERICAL TECHNIQUES	2	0	0		2	2
10			ECONOMICS	2	1	0		3	3
11	PCC		COMPETITIVE PROGRAMMING-I	0	0	2		2	1
TOTAL								32	24

FOURTH SEMESTER

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1			ANALOGUE ELECTRONICS	3	0	0		3	3
2			ANALOGUE ELECTRONICS LAB	0	0	2		2	1
3			DIGITAL SIGNAL PROCESSING	3	0	0		3	3
4			ANALOG AND DIGITAL COMMUNICATION	3	0	0		3	3
5			INTRODUCTION TO MICROFABRICATION TECHNOLOGY	3	0	0		3	3
6			INTRODUCTION TO MICROFABRICATION LAB	0	0	2		2	1
7			INTRODUCTION TO VLSI LIFECYCLE LAB	0	0	2		2	1
8			MICRO PROJECT	0	0	4		4	2

9			HSS ELECTIVE–1	2	1	0		3	3
10			AUDIT COURSE	0	0	0		0	0
11	PCC		COMPETITIVE PROGRAMMING-II	0	0	2		2	1
TOTAL								**27**	**21**

FIFTH SEMESTER

SR. NO.	**COURSE**			**CONTACT HOURS**					**CREDITS**
	CATEGORY	**COURSE CODE**	**COURSE TITLE**	**L**	**T**	**P**	**S**	**TOTAL**	
1			HSS ELECTIVE-2	3	0	0		3	3
2			SEMICONDUCTOR MATERIALS SYNTHESIS AND CHARACTERIZATION	3	0	0		3	3
3			SEMICONDUCTOR EQUIPMENT DESIGN AND TECHNOLOGY	3	0	0		3	3
4			ELECTROMAGNETIC FIELD THEORY LAB	0	0	2		2	1
5			ELECTROMAGNETIC FIELD THEORY	3	1	0		4	4
6			CONTROL SYSTEMS	3	0	0		3	3
7			MICROCONTROLLERS AND COMPUTER ARCHITECTURE	3	0	0		3	3
8			MICROCONTROLLERS AND COMPUTER ARCHITECTURE LAB	0	0	2		2	1
9			MINOR PROJECT – 1	0	0	4		4	2
10			INDIAN CONSTITUTION & TRADITIONAL KNOWLEDGE	3	0	0		3	QUALIFYING
11	PCC		COMPETITIVE PROGRAMMING-III	0	0	2		2	1
12	HSC		LOGICAL AND QUANTITATIVE TECHNIQUES - I	2	0	0		2	2
TOTAL								**34**	**26**

SIXTH SEMESTER

SR. NO.	**COURSE**			**CONTACT HOURS**					**CREDITS**
	CATEGORY	**COURSE CODE**	**COURSE TITLE**	**L**	**T**	**P**	**S**	**TOTAL**	
1			ESSENTIALS OF VLSI TESTING	3	0	0		3	3
2			EMBEDDED SYSTEMS/IOT LAB	0	0	2		2	1
3			FUNDAMENTALS OF EMBEDDED SYSTEMS	3	0	0		3	3
4			VLSI DESIGN	3	0	0		3	3

5			VLSI DESIGN LAB	0	0	2		2	1
6			OPEN ELECTIVE - 1	3	0	0		3	3
7			SELECTED VALUE ADDED COURSE	2	0	0		2	AUDIT
8			VLSI VERIFICATION AND TESTING LAB	0	0	2		2	1
9			MINOR PROJECT - 2	0	0	4		4	2
10			DEPARTMENTAL ELECTIVE	3	0	0		3	3
11	HSC		LOGICAL AND QUANTITATIVE TECHNIQUES - II	2	0	0		2	2
TOTAL								**29**	**22**

SEVENTH SEMESTER

SR. NO.	**COURSE**			**CONTACT HOURS**					**CREDITS**
	CATEGORY	**COURSE CODE**	**COURSE TITLE**	**L**	**T**	**P**	**S**	**TOTAL**	
1			DISCIPLINE ELECTIVE – 2	3	0	0		3	3
2			DISCIPLINE ELECTIVE – 3	3	0	0		3	3
3			OPEN ELECTIVE - 2	3	0	0		3	3
4			OPEN ELECTIVE - 3	3	0	0		3	3
5			MAJOR PROJECT PART-1	0	0	8		8	4
6			SUMMER TRAINING VIVA	0	0	0		0	QUALIFYING
TOTAL								**20**	**16**

EIGHTH SEMESTER

SR. NO.	**COURSE**			**CONTACT HOURS**					**CREDITS**
	CATEGORY	**COURSE CODE**	**COURSE TITLE**	**L**	**T**	**P**	**S**	**TOTAL**	
1			DISCIPLINE ELECTIVE – 7	3	0	0		3	3
2			DISCIPLINE ELECTIVE - 8	3	0	0		3	3
3			OPEN ELECTIVE - 3	3	0	0		3	3
4			MAJOR PROJECT PART-2	0	0	16		16	8
TOTAL								**25**	**17**

Total Credits for B.Tech. **167.0**

NEW DEPARTMENTAL ELECTIVES

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1	DE-1		IOT ARCHITECTURE AND PROTOCOLS	3	0	0		3	3
2	DE-2		5G AND NEXT GENERATION NETWORKS	3	0	0		3	3
3	DE-3		REAL-WORLD INFORMATION PROCESSING	3	0	0		3	3
4	DE-4		INTELLIGENT MEDICAL IMAGE ANALYSIS	3	0	0		3	3
5	DE-6		CMOS DIGITAL VLSI DESIGN	3	0	0		3	3
TOTAL									

NEW OPEN ELECTIVES

SR. NO.	COURSE			CONTACT HOURS					CREDITS
	CATEGORY	COURSE CODE	COURSE TITLE	L	T	P	S	TOTAL	
1	OE-1		INTELLIGENT TRANSPORTATION SYSTEMS	3	0	0		3	3
2	OE-2		DIGITAL SYSTEM DESIGN USING FPGA	3	0	0		3	3
3	OE-2		MOBILE COMMUNICATION	3	0	0		3	3
4	OE-3		INDUSTRIAL INTERNET OF THINGS	3	0	0		3	3
5				3	0	0		3	3
TOTAL									