

**BTECH ELECTRONICS ENGINEERING (VLSI
DESIGN & TECHNOLOGY)
COURSE STRUCTURE
EFFECTIVE 2024-25 ADMISSION BATCH**

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 (VLSI Design & Technology) -
Effective 2024-25**

FIRST SEMESTER

SR NO	COURSE			CONTACT HOURS					CRE DITS	
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L		
1	HSMC	21B11HS111	ENGLISH	2	0	0		2	2	
2	HSMC	21B17HS171	ENGLISH LAB	0	0	2		2	1	
3	BSC	24B11MA111	ENGINEERING MATHEMATICS -I	3	1	0		4	4	
4	BSC	18B11PH111	ENGINEERING PHYSICS-I	3	1	0		4	4	
5	BSC	18B17PH171	ENGINEERING PHYSICS LAB-I	0	0	2		2	1	
6	ESC	24B11CI111	PROBLEM SOLVING AND PROGRAMMING	3	0	0		3	3	
7	ESC	24B17CI171	PROBLEM SOLVING AND PROGRAMMING LAB	0	0	2		2	1	
8	ESC	18B17GE171	WORKSHOP PRACTICES OR	0	0	3		3	1.5	
9	ESC	18B17GE173	ENGINEERING GRAPHICS	0	0	3				
10	PR	24B19EC191	PROJECT-I	0	0	2	2	2	1	
11	MNC	18B17GE172	UHV-I MANDATORY INDUCTION PROGRAM	2 WEEKS						0
TOTAL								24	18.5	

SECOND SEMESTER

SR NO	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
1	HSMC	23B11HS211	UHV II: UNDERSTANDING HARMONY	2	1	0		3	3
2	BSC	24B11MA211	ENGINEERING MATHEMATICS -II	3	1	0		4	4
3	BSC	18B11PH211	ENGINEERING PHYSICS-II	3	0	0		3	3
4	BSC	18B17PH271	ENGINEERING PHYSICS LAB - II	0	0	2		2	1
5	ESC	24B11EC211	BASIC ELECTRICAL ENGINEERING	3	1	0		4	4
6	ESC	24B17EC271	BASIC ELECTRICAL ENGINEERING LAB	0	0	2		2	1
7	ESC	24B11CI211	DATA STRUCTURES AND ALGORITHMS	3	0	0		3	3
8	ESC	18B17CI271	DATA STRUCTURES AND ALGORITHMS LAB	0	0	4		4	2

9	ESC	18B17GE171	WORKSHOP PRACTICES OR	0	0	3		3	1.5
10	ESC	18B17GE173	ENGINEERING GRAPHICS	0	0	3			
11	PR	24B19EC291	PROJECT-II	0	0	2	2	2	1
	MNC	23B11HS212	PROFESSIONAL COMMUNICATION PRACTICE (AUDIT)	0	1	0		1	0
TOTAL								31	23.5

THIRD SEMESTER

SR NO	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
1		25B11MA311	PROBABILITY AND RANDOM PROCESSES	3	1	0		4	4
2		25B11EC313	ELECTRONIC DEVICES AND CIRCUITS	3	1	0		4	4
3		25B17EC373	ELECTRONIC DEVICES AND CIRCUITS LAB	0	0	2		2	1
4		25B11EC311	SIGNALS & SYSTEMS	3	1	0		4	4
5		25B11EC312	DIGITAL CIRCUIT DESIGN	3	0	0		3	3
6		25B17EC372	DIGITAL CIRCUIT DESIGN LAB	0	0	2		2	1
7		25B11GE311	ENVIRONMENTAL STUDIES	3	0	0		3	QUA LIFY ING
8		25B19EC392	MICRO PROJECT 1	0	0	4		4	2
9		25B11MA312	NUMERICAL TECHNIQUES	2	0	0		2	2
10		25B11HS311	ECONOMICS	2	1	0		3	3
11	PCC	25B17CI379	COMPETITIVE PROGRAMMING-I	0	0	2		2	1
TOTAL								33	25

FOURTH SEMESTER

SR NO	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
1			ANALOGUE ELECTRONICS	3	0	0		3	3
2		25B17EC472	ANALOGUE ELECTRONICS LAB	0	0	2		2	1
3			DIGITAL SIGNAL PROCESSING	3	0	0		3	3
4		25B11EC417	ANALOG AND DIGITAL COMMUNICATION	3	0	0		3	3
5		25B11EC415	INTRODUCTION TO MICROFABRICATION TECHNOLOGY	3	0	0		3	3

6		25B17EC475	INTRODUCTION TO MICROFABRICATION LAB	0	0	2		2	1
7		25B17EC476	INTRODUCTION TO VLSI LIFECYCLE LAB	0	0	2		2	1
8		25B19EC491	MICRO PROJECT	0	0	4		4	2
9			HSS ELECTIVE-1	2	1	0		3	3
10	PCC	25B17CI476	COMPETITIVE PROGRAMMING-II	0	0	2		2	1
TOTAL								27	21

FIFTH SEMESTER

SR NO	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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	QUA LIFY ING
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					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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	QUA LIFY ING
TOTAL								20	16

EIGHTH SEMESTER

SR · NO ·	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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. :

169.0

NEW DEPARTMENTAL ELECTIVES

SR NO	COURSE			CONTACT HOURS					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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					CRE DITS
	CATEGOR Y	COURSE CODE	COURSE TITLE	L	T	P	S	TOTA L	
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									