SHIV NADAR
UNIVERSITY
CHENNAI

SSN School of Engineering

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Bachelor of Technology
Electronics and Communication Engineering
(VLSI Design and Technology)

CURRICULUM

REGULATIONS 2026

VISION AND MISSION OF THE DEPARTMENT

VISION

To be a nationally and globally recognized department in Electronics and Communication Engineering, offering high-quality educational programs at undergraduate, postgraduate, and doctoral levels through research and academic excellence.

MISSION

We will strive towards our Vision by:

- Continued focus on academic and research excellence.
- Empowering students to become reflective professionals through curricular and co-curricular activities that instill a spirit of critical thinking, creativity, innovation, and entrepreneurial skills.
- Building partnerships with leading academic institutions and industries
- Fostering an innovative, and supportive environment that encourages learning, research, and professional growth for students, faculty, and staff.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1	**Core Knowledge Development:** Be competent in applying electronics and communication engineering (VLSI Design and Technology) principles to develop socially and environmentally acceptable engineering solutions.
PEO2	**Professional Development:** Find fulfilling career in electronic and communication engineering (VLSI Design and Technology) or associated industries or higher education and research, or as entrepreneurs.
PEO3	**Attitude towards Lifelong-Learning:** Develop the ability and attitude to adapt to evolving technological and social challenges.

PROGRAM OUTCOMES (POs)

Program outcomes are the skills and knowledge which the students should have acquired at the time of graduation. A program outcome indicates what a student can do from course-wise knowledge acquired during the program. Students who graduate from this program shall exhibit the following:

PO	Graduate Attribute	Programme Outcome
1	Engineering Knowledge	Apply the knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization to develop to the solution of complex Engineering problems (WK 1 to 4).
2	Problem Analysis	Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions with consideration for sustained development (WK 1 to 4).
3	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).
4	Conduct Investigations of Complex Problems	Conduct investigations of complex Engineering problems using research-based knowledge including design of experiments, modelling, analysis and interpretation of data to provide valid conclusions (WK8).
5	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).
6	The Engineer and The World	Analyze and evaluate societal and environmental aspects while solving complex Engineering problems for their impact on sustainability with reference to economy, health, safety, legal framework, culture and environment (WK1, WK5 and WK7).
7	Ethics	Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws (WK9).

8	Individual and Collaborative Teamwork	Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
9	Communication	Communicate effectively and inclusively within the engineering community and the 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.
10	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 multi-disciplinary environments.
11	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).

PROGRAM SPECIFIC OBJECTIVES (PSOs)

PSO1	Design, develop and analyze electronic systems through application of relevant mathematics and engineering principles.
PSO2	Design, develop and analyze VLSI systems through application of fundamentals from materials, devices and digital, analog, mixed-signal and radio frequency circuits.
PSO3	Adapt to emerging electronics and VLSI technologies and develop innovative solutions for existing and newer problems.

PEO - PO/PSO Mapping

PEO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
PEO1	3	3	3	3	3	1	1	1	1	2	1	3	3	1
PEO2	1	1	1	2	1	2	2	3	3	3	3	1	1	2
PEO3	1	2	2	2	1	2	2	3	3	3	3	1	1	3

Mapping Programme Outcomes with Graduate Attributes

Programme Outcomes		NBA's GAs
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 the solution of complex engineering problems.	**GA1**
PO2:	**Problem Analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4).	**GA2**
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).	**GA3**
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).	**GA4**
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).	**GA5**
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).	**GA10**
PO7:	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity, and inclusion; adhere to national & international laws. (WK9).	**GA10**
PO8:	**Individual and Collaborative Teamwork:** Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams	**GA6**
PO9:	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend	**GA8**

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.	**GA7**
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).	**GA9, G11**

Washington Accord Knowledge Levels (WK)	**Attributes**
WK1	Natural sciences and social sciences
WK2	Conceptually based mathematics
WK3	Engineering fundamentals
WK4	Engineering specialist knowledge
WK5	Engineering design and operations
WK6	Engineering Practice (Technology)
WK7	Engineering knowledge in society, public safety and sustainable development
WK8	Research based knowledge
WK9	Professional ethics, inclusive behaviour and conduct

Complex Engineering Problems (WP)	**Attributes**
WP1	Depth of knowledge required
WP2	Range of conflicting requirements
WP3	Depth of analysis required
WP4	Familiarity of issues

WP5	Extent of applicable codes
WP6	Extent of stakeholder involvement and conflicting requirements
WP7	Interdependence

Complex Engineering Activities (EA)	Attributes
EA1	Range of resources
EA2	Level of interactions
EA3	Innovation
EA4	Consequences to the society and environment
EA5	Familiarity

Sustainable Development Goals (SDG)	Details	Sustainable Development Goals (SDG)	Details
SDG 1	No poverty	SDG 10	Reducing inequality
SDG 2	Zero hunger	SDG 11	Sustainable cities and communities
SDG 3	Good health and well-being	SDG 12	Responsible consumption and production
SDG 4	Quality education	SDG 13	Climate action
SDG 5	Gender equality	SDG 14	Life below water
SDG 6	Clean water and sanitation	SDG 15	Life on land
SDG 7	Affordable and clean energy	SDG 16	Peace, justice and strong institutions
SDG 8	Decent work and economic growth	SDG 17	Partnerships for the goals
SDG 9	Industry, innovation and infrastructure		

COURSE SUMMARY

The listed courses in the curriculum are broadly classified as per the recommendations from the UGC.

Sl. No	Broad Category of Course	Minimum Credit Requirement
1	Major Core (MC)	80
2	Minor Stream (MS)	32
3	Multidisciplinary (MD)	09
4	Ability Enhancement Course (AEC)	08
5	Skill Enhancement Course (SEC)	09
6	Value Added Courses (VAC)	08
7	Summer Internship (SI)	02
8	Project Dissertation (PD)	12
	Total	160

The semester wise credit breakup of the Curriculum based on the above credit breakup proposed by the UGC is as follows:

Semester\Category	MC	MS	MD	AEC	SEC	VAC	SI	PD	TOTAL
1	6		9	3	2	2			**22**
2	11			3	2	4			**20**
3	12	6			4				**22**
4	17	2			1	1			**21**
5	14	5				1			**20**
6	13	6						4	**23**
7	7	8		2			2	6	**25**
8		5						2	**7**
Total	**80**	**32**	**9**	**8**	**9**	**8**	**2**	**12**	**160**

Credit Breakup of Proposed Curriculum across Course Categories - Detailed

Semester	MC			MS			MD	AEC	SEC	VAC	SI	PD	TOTAL
	SSNSoE	*Dept Major*	*Program Major*	*SSNSoE*	*Dept Minor*	*Program Minor*	*SSNSoE*	*SSNSoE*	*Dept / Program*	*Dept / Program*	*Dept / Program*	*Dept / Program*	
1		6					9	3	2	2			22
2	3	8						3	2	4			20
3		12		3	3				4				22
4		14	3		2				1	1			21
5			14		5					1			20
6			13			6						4	23
7			7			8		2			2	6	25
8						5						2	7
Total	3	40	37	3	10	19	9	8	9	8	2	12	160

SEMESTER I

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Algebra and Calculus	MD	4	45	15	0	60	120	4
2		Engineering Physics	MD	3	45	0	0	45	90	3
3		Engineering Physics Laboratory	MD	4	0	0	60	60	120	2
4		Communicative English	AEC	4	30	0	30	60	120	3
5		Electron Devices	MC	3	45	0	0	45	90	3
6		Circuit Analysis	MC	3	45	0	0	45	90	3
7		Professional Ethics and Human Values	VAC	2	30	0	0	30	60	2
PRACTICALS										
8		Electronics Engineering Practice	SEC	4	0	0	60	60	120	2
TOTAL				**27**	**240**	**15**	**150**	**405**	**810**	**22**

SEMESTER II

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Complex Functions and Laplace Transforms	MC	3	45	0	0	45	90	3
2		English for Engineers	AEC	4	30	0	30	60	120	3
3		Programming in Python for Data Science	VAC	3	15	0	30	45	90	2
4		Environmental Engineering	VAC	2	30	0	0	30	60	2
5		Digital Electronics	MC	5	45	0	30	75	150	4
6		Analog Electronics	MC	5	45	0	30	75	150	4
PRACTICALS										
7		PCB Design	SEC	4	0	0	60	60	120	2
TOTAL				**26**	**210**	**0**	**180**	**390**	**780**	**20**

SEMESTER III

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Random Signal Analysis	MS	3	45	0	0	45	90	3
2		Linear Integrated Circuits	MC	2	30	0	0	30	60	2
3		Microprocessors and Microcontrollers	MS	4	30	0	30	60	120	3
4		Signals and Systems	MC	3	45	0	0	45	90	3
5		Design Thinking, Innovation, and Entrepreneurship	SEC	4	30	0	30	60	120	3
6		Electromagnetics	MC	3	45	0	0	45	90	3
PRACTICALS										
7		Linear Integrated Circuits Laboratory	MC	4	0	0	60	60	120	2
8		Signals and Systems Laboratory	MC	4	0	0	60	60	120	2
9		PCB Fabrication and Assembly	SEC	2	0	0	30	30	60	1
TOTAL				**29**	**225**	**0**	**210**	**435**	**870**	**22**

SEMESTER IV

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Digital Signal Processing	MC	6	45	0	45	90	180	4.5
2		Transmission Lines and Waveguides	MC	2	30	0	0	30	60	2
3		Principles of Communication Systems	MC	3	45	0	0	45	90	3
4		Digital System Design using HDL	MC	4	30	0	30	60	120	3

5		Control Systems	MS	2	30	0	0	30	60	2
6		Microelectronic Device Modeling	MC	3	45	0	0	45	90	3
PRACTICALS										
7		Communication Engineering Laboratory	MC	3	0	0	45	45	90	1.5
8		EDA Tools for Microelectronic Device Modeling	SEC	2	0	0	30	30	60	1
9		Independent Research / Extra Academic Activity	VAC	2	0	0	30	30	60	1
TOTAL				**27**	**225**	**0**	**180**	**405**	**810**	**21**

SEMESTER V

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Nano Scale Transistors	MC	3	45	0	0	45	90	3
2		Full Custom Digital IC Design	MC	6	30	0	60	90	180	4
3		Full Custom Analog IC Design	MC	6	30	0	60	90	180	4
4		VLSI Interconnects & Modelling	MC	3	45	0	0	45	90	3
5		OOPS and Data Structures	MS	5	45	0	30	75	150	4
6		Principles of Semiconductor Technology	MS	1	15	0	0	15	30	1
PRACTICALS										
7		Independent Research / Extra Academic Activity	VAC	2	0	0	30	30	60	1
TOTAL				**26**	**210**	**0**	**180**	**390**	**780**	**20**

Note: Students Pursuing GPP should register for an additional course on Project Management and Planning (3 credits) under MS category during V semester and this additional credit earned will be adjusted during VIII semester by exempting a minor course of 3 credits.

SEMESTER VI

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		VLSI Design Automation	MC	3	45	0	0	45	90	3
2		Full Custom Mixed Signal IC Design	MC	6	30	0	60	90	180	4
3		Full Custom RF IC Design	MC	6	30	0	60	90	180	4
4		System on Chip Design	MC	2	30	0	0	30	60	2
5		Program Minor 1	MS	4	30	0	30	60	120	3
6		Program Minor 2	MS	4	30	0	30	60	120	3
PRACTICALS										
7		Capstone Project Phase 1	PD	8	0	0	120	120	240	4
TOTAL				**33**	**195**	**0**	**300**	**495**	**990**	**23**

SEMESTER VII

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		VLSI Testing and Verification	MC	6	30	0	60	90	180	4
2		Low Power IC Design	MC	4	30	0	30	60	120	3
3		Program Minor 3	MS	3	45	0	0	45	90	3
4		Program Minor 4	MS	3	45	0	0	45	90	3
5		Program Minor 5	MS	4	0	0	60	60	120	2
6		Ability Enhancement Course	AEC	2	30	0	0	30	60	2
PRACTICALS										
7		Capstone Project Phase 2	PD	12	0	0	180	180	360	6
8		Internship	SI	4	0	0	60	60	120	2
TOTAL				**38**	**180**	**0**	**390**	**570**	**1140**	**25**

SEMESTER VIII

S. No.	COURSE CODE	COURSE TITLE	COURSE CATEGORY	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Program Minor 6	MS	2	30	0	0	30	60	2
2		Program Minor 7	MS	3	45	0	0	45	90	3
PRACTICALS										
3		Capstone Project Phase 3	PD	4	0	0	60	60	120	2
TOTAL				**9**	**75**	**0**	**60**	**135**	**270**	**7**

Major Core Courses
Department Major Core Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Electron Devices	1	3	45	0	0	45	90	3
2		Circuit Analysis	1	3	45	0	0	45	90	3
3		Digital Electronics	2	5	45	0	30	75	150	4
4		Analog Electronics	2	5	45	0	30	75	150	4
5		Linear Integrated Circuits	3	2	30	0	0	30	60	2
6		Signals and Systems	3	3	45	0	0	45	90	3
7		Electromagnetics	3	3	45	0	0	45	90	3
8		Linear Integrated Circuits Laboratory	3	4	0	0	60	60	120	2
9		Signals and Systems Laboratory	3	4	0	0	60	60	120	2
10		Digital Signal Processing	4	6	45	0	45	90	180	4.5
11		Transmission Lines and Waveguides	4	2	30	0	0	30	60	2
12		Principles of Communication Systems	4	3	45	0	0	45	90	3
13		Digital System Design using HDL	4	4	30	0	30	60	120	3
14		Communication Engineering Laboratory	4	3	0	0	45	45	90	1.5

Programme Major Core Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Microelectronic Device Modeling	4	3	45	0	0	45	90	3
2		Nano Scale Transistors	5	3	45	0	0	45	90	3
3		Full Custom Digital IC Design	5	6	30	0	60	90	180	4
4		Full Custom Analog IC Design	5	6	30	0	60	90	180	4
5		VLSI Interconnects & Modelling	5	3	45	0	0	45	90	3
6		VLSI Design Automation	6	3	45	0	0	45	90	3
7		Full Custom Mixed Signal IC Design	6	6	30	0	60	90	180	4
8		Full Custom RF IC Design	6	6	30	0	60	90	180	4
9		System on Chip Design	6	2	30	0	0	30	60	2
10		VLSI Testing and Verification	7	6	30	0	60	90	180	4
11		Low Power IC Design	7	4	30	0	30	60	120	3

Department Minor Stream Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Random Signal Analysis	3	3	45	0	0	45	90	3
2		Microprocessors and Microcontrollers	3	4	30	0	30	60	120	3
3		Control Systems	4	2	30	0	0	30	60	2
4		OOPS and Data Structures	5	5	45	0	30	75	150	4
5		Principles of Semiconductor Technology	5	1	15	0	0	15	30	1

MINOR STREAMS

The Department of Electronics and Communication Engineering (VLSI Design and Technology) offers the following list of Minor Streams.

1. Foundations in VLSI Design
2. Devices and Fabrication
3. Circuits and Systems

Each Minor Stream has twelve courses worth 32 credits. The student must enroll in any one of the above Minor Streams. Minor Streams tagged with Foundations must not be enrolled by students whose Major Core courses overlap with the listed courses in the Minor Stream.

MINOR STREAM 1- Foundations in VLSI Design

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Random Signal Analysis	3	3	45	0	0	45	90	3
2		Electronics Engineering	3	4	30	0	30	60	120	3
3		Analog Electronics	4	4	30	0	30	60	120	3
4		Digital Electronics	5	4	30	0	30	60	120	3
5		Principles of Semiconductor Fabrication	5	1	15	0	0	15	30	1
6		Hardware Description Languages	6	4	30	0	30	60	120	3
7		FPGA Based System Design	6	4	30	0	30	60	120	3
8		Basics of VLSI Design	7	3	45	0	0	45	90	3
9		Full Custom IC Design	7	3	45	0	0	45	90	3
10		Full Custom IC Design Lab	7	4	0	0	60	60	120	2
11		ASIC Design	8	2	30	0	0	30	60	2
12		VLSI Testing and Verification	8	3	45	0	0	45	90	3

MINOR STREAM 2 – Devices and Fabrication

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Digital Subsystem Design	6	4	30	0	30	60	120	3
2		Analog and RF Subsystem Design	6	4	30	0	30	60	120	3
3		VLSI Technology	7	3	45	0	0	45	90	3
4		MINOR STREAM BASKET 1	7	3	45	0	0	45	90	3
5		MINOR STREAM BASKET 2	7	4	0	0	60	60	120	2
6		MINOR STREAM BASKET 3	8	2	30	0	0	30	60	2
7		MINOR STREAM BASKET 4	8	3	45	0	0	45	90	3

The following is the tentative list of courses that may be offered under the ***Minor Stream Baskets***:

Minor Stream Basket 1 (3 Credit courses)	*Minor Stream Basket 2 (2 Credit courses)*	*Minor Stream Basket 3 (2 Credit courses)*	*Minor Stream Basket 4 (3 Credit courses)*
Nano Sensors and Devices	Nano Sensors and Devices Laboratory	Flexible Electronics	VLSI Packaging
Emerging Memory Devices	Emerging Memory Devices Laboratory	Power Electronic Devices	Photonic Devices
Compound Semiconductors and Devices	Compound Semiconductors and Devices Laboratory	Quantum Devices	Solid State Microwave Devices

MINOR STREAM 3 – Circuits and Systems

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Digital Subsystem Design	6	4	30	0	30	60	120	3
2		Analog and RF Subsystem Design	6	4	30	0	30	60	120	3
3		Reconfigurable Architectures	7	3	45	0	0	45	90	3
4		MINOR STREAM BASKET 1	7	3	45	0	0	45	90	3
5		MINOR STREAM BASKET 2	7	4	0	0	60	60	120	2
6		MINOR STREAM BASKET 3	8	2	30	0	0	30	60	2
7		MINOR STREAM BASKET 4	8	3	45	0	0	45	90	3

The following is the tentative list of courses that may be offered under the ***Minor Stream Baskets***:

Minor Stream Basket 1 (3 Credit courses)	*Minor Stream Basket 2 (2 Credit courses)*	*Minor Stream Basket 3 (2 Credit courses)*	*Minor Stream Basket 4 (3 Credit courses)*
Security Solutions in VLSI	Security Solutions in VLSI Laboratory	Multicore Architectures	Energy Harvesting Systems
Embedded and IOT Systems	Embedded and IoT Systems Laboratory	Hardware-Software Codesign	Network On-Chip
VLSI Signal Processing	VLSI Signal Processing Laboratory	Quantum Circuits	AI for VLSI Design

Multi-Disciplinary Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Algebra and Calculus	1	4	45	15	0	60	120	4
2		Engineering Physics	1	3	45	0	0	45	90	3
3		Engineering Physics Laboratory	1	4	0	0	60	60	120	2

Skill Enhancement Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Electronics Engineering Practice	1	4	0	0	60	60	120	2
2		PCB Design	2	4	0	0	60	60	120	2
3		Design Thinking, Innovation, and Entrepreneurship	3	4	30	0	30	60	120	3
4		PCB Fabrication and Assembly	3	2	0	0	30	30	60	1
5		EDA Tools for Microelectronic Device Modeling	4	2	0	0	30	30	60	1

Ability Enhancement Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Communicative English	1	4	30	0	30	60	120	3
2		English for Engineers	2	4	30	0	30	60	120	3
3		Ability Enhancement Course	7	2	30	0	0	30	60	2

Value Added Courses

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW& SL	TH	C
1		Professional Ethics and Human Values	1	2	30	0	0	30	60	2
2		Programming in Python for Data Science	2	3	15	0	30	45	90	2
3		Environmental Engineering	2	2	30	0	0	30	60	2
4		Independent Research / Extra Academic Activity	4	2	0	0	30	30	60	1
5		Independent Research / Extra Academic Activity	5	2	0	0	30	30	60	1

GRAND PROJECT PATHWAY

Semester	Course	Credit
III	Design Thinking, Innovation and Entrepreneurship	3
IV	Independent Research /Extra Academic Activity	1
V	Independent Research /Extra Academic Activity	1
V	Project Management and Planning	3
VI	Capstone Project Phase 1	4
VII	Capstone Project Phase 2	6
VIII	Capstone Project Phase 3	2
	Total Credit for GPP	**20**

L - Lecture, **T** - Tutorial, **P** - Practical, TW & SL – Term Work & Self Learning, TH – Total Hours and **C** – Credits