



SSN School of Engineering

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING**

**Bachelor of Technology
Electrical and Electronics Engineering**

CURRICULUM

REGULATIONS 2026

VISION AND MISSION OF THE DEPARTMENT

VISION

To attain global eminence in Electrical and Electronics Engineering education, research, and innovation by empowering students with technological excellence, professional integrity, entrepreneurial spirit, and social responsibility

MISSION

- To impart advanced technical knowledge and hands-on competence in emerging Electrical and Electronics Engineering domains through innovative teaching, research, and industry-integrated learning.
- To promote research, innovation, and entrepreneurship through strong academia–industry collaboration, addressing global and sustainable technological challenges.
- To develop ethically responsible, career-ready graduates with lifelong learning skills and a commitment to serve society and the global community with integrity.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- **PEO1:** Graduates of the programme will have successful career by their ability to contribute to the electrical and electronics engineering or related professional fields.
- **PEO2:** Graduates of the programme can work in teams with technical competencies, discharging their professional and social responsibilities.
- **PEO3:** Graduates of the programme will exhibit demonstrable attributes in lifelong learning to contribute to their chosen professional field.

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	To apply advanced science and engineering knowledge to analyze and design complex electrical and electronic devices, software and systems containing hardware and software components
PSO2	To design and analyze systems used in advanced power applications, renewable energy, electrical drives for the transportation, manufacturing industries and in allied technical fields

PEO - PO/PSO Mapping

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

PEO3	1	1	1	1	1	1	2	2	2	2	3	1	2
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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.	GA10

(WK9).	
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 and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.	GA8
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) and its Attributes

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
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Complex Engineering Problems (WP) and its Attributes

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) and its Attributes

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 (SDGs)

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	Proposed Credits
1	Major Core (MC)	80	80
2	Minor Stream (MS)	32	32
3	Multidisciplinary (MD)	09	09
4	Ability Enhancement Course (AEC)	08	08
5	Skill Enhancement Course (SEC)	09	09
6	Value Added Courses (VAC)	08	08
7	Summer Internship (SI)	02	2
8	Project Dissertation (PD)	12	12
Total		160	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	1	2			21
2	11			3	2	4			20
3	12	5			5				22
4	17	3			1	1			22
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	1	2			21
2	3	8						3	2	4			20
3		12		3	2				5				22
4		14	3		3				1	1			22
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		Calculus and Complex functions	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	30	30	60	2
4		Communicative English	AEC	4	30	0	30	30	90	3
5		Circuit theory	MC	3	45	0	0	45	90	3
6		Electromagnetic Theory	MC	3	45	0	0	45	90	3
7		Professional Ethics and Human Values	VAC	2	30	0	0	30	60	2
PRACTICALS										
8		Circuits and EMT Laboratory	SEC	2	0	0	30	0	30	1
TOTAL				25	240	15	90	285	630	21

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		Transforms and Partial Differential Equations	MC	3	45	0	0	45	90	3
2		English for Engineers	AEC	4	30	0	30	30	90	3
3		Problem Solving and Python Programming	VAC	3	15	0	30	15	60	2
4		Environmental Engineering	VAC	2	30	0	0	30	60	2
5		Electronic Devices and Circuits	MC	5	45	0	30	45	120	4
6		Digital Logic circuits	MC	5	45	0	30	45	120	4
PRACTICALS										
7		Makers Space Laboratory	SEC	4	0	0	30	30	60	2
TOTAL				26	210	0	150	240	600	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		Numerical Computation and Probability Models	MS	3	45	0	0	45	90	3
2		Electrical Machines - I	MC	3	45	0	0	45	90	3
3		Sensors and Actuators	MS	2	30	0	0	30	60	2
4		Analog Circuits	MC	3	45	0	0	45	90	3
5		Design Thinking, Innovation and Entrepreneurship	SEC	4	30	0	30	30	90	3
6		Electrical Measurement and Instrumentation	MC	3	45	0	0	45	90	3
PRACTICALS										
7		Electrical Machines – I Laboratory	MC	3	0	0	30	15	45	1.5
8		Analog Circuits Laboratory	MC	3	0	0	30	15	45	1.5
9		Engineering Graphics and CAD for EEE	SEC	4	0	0	30	30	60	2
TOTAL				28	240	0	120	300	660	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		Microprocessor and Microcontroller	MC	6	30	0	30	45	105	3.5
2		Power Plant Mechanics	MC	3	45	0	0	45	90	3
3		Electrical Machines – II	MC	3	45	0	0	45	90	3
4		Control Systems	MC	3	45	0	0	45	90	3
5		Electrical Energy Utilization	MS	3	45	0	0	45	90	3
6		Transmission and Distribution	MC	3	45	0	0	45	90	3
PRACTICALS										
7		Electrical Machines – II Laboratory	MC	3	0	0	30	15	45	1.5
8		Practical Aspects of Control Systems and Instrumentation	SEC	2	0	0	30	0	30	1
9		Independent Research / Extra	VAC	2	0	0	30	0	30	1

		Academic Activity								
TOTAL				28	255	0	120	285	660	22

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		Embedded System Design	MC	3	45	0	0	45	90	3
2		Power System Analysis	MC	6	45	0	30	45	120	4
3		Power Electronics	MC	6	45	0	30	45	120	4
4		Digital Signal Processing	MC	3	45	0	0	45	90	3
5		Industrial Automation	MS	3	45	0	0	45	90	3
6		Introduction to Battery Technologies	MS	2	30	0	0	30	60	2
PRACTICALS										
7		Independent Research / Extra Academic Activity	VAC	2	0	0	30	0	30	1
TOTAL				25	255	0	90	255	600	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		Protection and Switchgear	MC	3	45	0	0	45	90	3
2		Power System Operation and Control	MC	6	45	0	30	60	135	4.5
3		Computational Data Structures in Electrical Systems	MC	5	30	0	30	45	105	3.5
4		Electrical Machine Design	MC	2	30	0	0	30	60	2

5		Program Minor 1	MS	3	45	0	0	45	90	3
6		Program Minor 2	MS	3	45	0	0	45	90	3
PRACTICALS										
7		Capstone Project Phase 1	PD	8	0	0	80	40	120	4
TOTAL				30	240	0	140	310	690	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		Modern Electric Drives	MC	6	45	0	30	45	120	4
2		Flexible AC Transmission Systems	MC	3	45	0	0	45	90	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	2	30	0	0	30	40	2
6		Ability Enhancement Course Basket#	AEC	2	30	0	0	30	40	2
PRACTICALS										
7		Capstone Project Phase 2	PD	12	0	0	120	60	180	6
8		Internship	SI	4	0	0	40	20	60	2
TOTAL				35	240	0	190	320	750	25

#The following is a tentative list of courses that may be offered under the Ability Enhancement Course Basket:

1. Writing for Research
2. Creative Writing
3. Psychology and Communication
4. Professional Communication

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	40	20	60	2
TOTAL				9	75	0	40	95	210	7

Major Core Courses

Department 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		Circuit theory	1	3	45	0	0	45	90	3
2		Electromagnetic theory	1	3	45	0	0	45	90	3
3		Transforms and Partial Differential Equations	2	3	45	0	0	45	90	3
4		Electronic Devices and Circuits	2	5	45	0	30	45	120	4
5		Digital logic circuits	2	5	45	0	30	45	120	4
6		Electrical machines - I	3	3	45	0	0	45	90	3
7		Electrical machines - I Laboratory	3	3	0	0	30	15	45	1.5
8		Analog Circuits	3	3	45	0	0	45	90	3
9		Analog Circuits Laboratory	3	3	0	0	30	15	45	1.5

10		Electrical Measurement & Instrumentation	3	3	45	0	0	45	90	3
11		Microprocessor and Microcontroller	4	6	30	0	30	45	105	3.5
12		Power plant mechanics	4	3	45	0	0	45	90	3
13		Electrical Machines – II	4	3	45	0	0	45	90	3
14		Electrical Machines - II Laboratory	4	3	0	0	30	15	45	1.5
15		Control Systems	4	3	45	0	0	45	90	3
TOTAL				52	525	0	180	585	1290	43

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Programme 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		Transmission and Distribution	4	3	45	0	0	45	90	3
2		Embedded System Design	5	3	45	0	0	45	90	3
3		Power System Analysis	5	5	45	0	30	45	120	4
4		Power Electronics	5	5	45	0	30	45	120	4
5		Digital Signal Processing	5	3	45	0	0	45	90	3
6		Protection and Switchgear	6	3	45	0	0	45	90	3
7		Power System Operation and Control	6	6	45	0	30	60	135	4.5

8		Computational Data Structures in Electrical Systems	6	5	30	0	30	45	105	3.5
9		Electrical Machine Design	6	2	30	0	0	30	60	2
10		Modern electric drives	7	6	45	0	30	45	120	4
11		Flexible AC Transmission Systems	7	3	45	0	0	45	90	3
TOTAL				44	465	0	150	495	1110	37

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		Numerical Computation and Probability models	3	3	45	0	0	45	90	3
2		Sensors and Actuators	3	2	30	0	0	30	60	2
3		Electrical energy utilization	4	3	45	0	0	45	90	3
4		Industrial Automation	5	3	45	0	0	45	90	3
5		Introduction to Battery Technologies	5	2	30	0	0	30	60	2
TOTAL				13	195	0	0	195	390	13

MINOR STREAMS

The Department of Electrical and Electronics Engineering offers the following list of Minor Streams.

1. Electrical System*
2. Sustainable Energy Systems##
3. Robotics and Control##
4. Electric Drives and Mobility##
5. Semiconductor Technology and Embedded Computing##

Each minor stream has seven courses worth 19 credits.

* This minor stream serves as a fundamental course in Electrical Engineering and is designed for students from other departments

These minor stream serve as an advanced course in Electrical Engineering and is designed for students from EEE department.



MINOR STREAM 1 – Electrical Systems (Offered to Other Department)

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW&SL	TH	C
1		Electrical Machines	6	3	45	0	0	45	90	3
2		Measurement and Instrumentation	6	3	45	0	0	45	90	3
3		Introduction to Power Electronics	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	2	30	0	0	30	60	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 Basket* in Minor Stream 1 – Electrical Systems:

<i>Minor Stream Basket 1 (3 Credit courses)</i>	<i>Minor Stream Basket 2 (2 Credit courses)</i>	<i>Minor Stream Basket 3 (2 Credit courses)</i>	<i>Minor Stream Basket 4 (3 Credit courses)</i>
Power Plant Engineering	Power System Operation	Power System Protection	Energy Auditing
Special Electrical Machines	Design of Electrical Machine	Introduction to Motor Drive Technology	E - Mobility
Control Engineering	Digital Control System	Intelligent Controllers	Robotics
Solar Energy System	Wind Energy System	Introduction to Hydrogen Energy Systems	Smart Grid Technology

MINOR STREAM 2 – Sustainable Energy Systems

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW&SL	TH	C
1		Power System Transients	6	3	45	0	0	45	90	3
2		Deregulated Power Systems	6	3	45	0	0	45	90	3
3		Computer Relaying and Wide Area Measurement Systems	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	2	30	0	0	30	60	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 Basket* in Minor Stream 2 – Sustainable Energy Systems:

<i>Minor Stream Basket 1 (3 Credit courses)</i>	<i>Minor Stream Basket 2 (2 Credit courses)</i>	<i>Minor Stream Basket 3 (2 Credit courses)</i>	<i>Minor Stream Basket 4 (3 Credit courses)</i>
High Voltage DC Transmission	Wind energy conversion systems	IOT and data analytics for smart energy systems	Power Quality
Power system stability	Power system economics	Energy management and auditing	High Voltage Engineering
Power system optimization	Microgrid and distributed energy resources	Renewable energy integration	Smart grid
Power system reliability	Design of solar energy systems	Cyber security in power systems	Power system dynamics

MINOR STREAM 3 – Robotics and Control

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW&SL	TH	C
1		Introduction to Robotics	6	3	45	0	0	45	90	3
2		Machine Learning Approaches in System Identification	6	3	45	0	0	45	90	3
3		Robot Dynamics and Control	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	2	30	0	0	30	60	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 Basket* in Minor Stream 3 – Robotics and Control.

<i>Minor Stream Basket 1 (3 Credit courses)</i>	<i>Minor Stream Basket 2 (2 Credit courses)</i>	<i>Minor Stream Basket 3 (2 Credit courses)</i>	<i>Minor Stream Basket 4 (3 Credit courses)</i>
Non-linear Control Systems	Drone Robots	Digital Controllers	Computer Vision
Adaptive and Learning Control	Swarm Robotics & Distributed Control	Industrial IoT and Cyber physical systems	Robotics and Artificial Intelligence
Network and Multiagent Control System	Legged Robots	Intelligent Motor Controllers	Robot Operating System
Control Autonomy Planning and Navigation	Under Water Robotics	Fluid Power Automation	Autonomous Mobile Robots

MINOR STREAM 4 – Electric Drives and Mobility

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW&SL	TH	C
1		Electric Vehicle Architecture	6	3	45	0	0	45	90	3
2		Charging Systems for Electric Vehicle	6	3	45	0	0	45	90	3
3		Electric Vehicle Motor Drives	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	2	30	0	0	30	60	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 Basket* in Minor Stream 4 – Electric Drives and Mobility:

<i>Minor Stream Basket 1 (3 Credit courses)</i>	<i>Minor Stream Basket 2 (2 Credit courses)</i>	<i>Minor Stream Basket 3 (2 Credit courses)</i>	<i>Minor Stream Basket 4 (3 Credit courses)</i>
Fundamentals of Electric Vehicle Power Train	Modern Rectifier Technologies	IoT for Smart E-Mobility	Communication and Networking for Electric Vehicle
Grid Integration of Electric Vehicle	Modern Power Converters and Applications	Automotive Electronics	Autonomous and Connected Vehicles
Testing of Electric Vehicle	Modern Inverter Topologies	Artificial Intelligence for e-Mobility	Intelligent Transportation Systems
Energy Storage Systems	Power Semiconductor Devices	Cybersecurity for e-Mobility Systems	Vehicle Diagnostics System

MINOR STREAM 5 – Semiconductor Technology and Embedded Computing

S. No.	COURSE CODE	COURSE TITLE	SEMESTER	CONTACT PERIODS	Teaching and Learning Scheme (per semester)					
					L	T	P	TW&SL	TH	C
1		VLSI Design Techniques	6	3	45	0	0	45	90	3
2		Computer Architecture and Organization	6	3	45	0	0	45	90	3
3		Semiconductor Device Fabrication 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	2	30	0	0	30	60	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 Basket* in Minor Stream 5 – Semiconductor Technology and Embedded Computing:

<i>Minor Stream Basket 1 (3 Credit courses)</i>	<i>Minor Stream Basket 2 (2 Credit courses)</i>	<i>Minor Stream Basket 3 (2 Credit courses)</i>	<i>Minor Stream Basket 4 (3 Credit courses)</i>
Wide Band Gap Devices for Power Electronic Applications	Power Management Integrated Circuits	Semiconductor Microwave Devices	Digital Control in Switched Mode Power Converters and FPGA-based Prototyping
Hardware System Design using Verilog	Low Voltage CMOS Circuit Design	Digital VLSI Design Flow: RTL to GDS	Semiconductor Memory Technologies for AI Applications
Embedded System Design using ARM Cortex-M	Real Time Operating System	Mixed Signal IC Desing	Real Time Embedded Programming
Semiconductor Device Modeling and Simulation	Emerging Semiconductor Devices for Beyond CMOS FETs	Nanoelectronics, Devices and Materials	Analog Integrated Circuit 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		Calculus and Complex functions	1	4	45	15	0	60	120	4
2		Engineering Physics	1	3	45	0	0	45	90	3
3		Engineering Physics Lab	1	4	0	0	30	30	60	2
TOTAL				11	90	15	30	135	270	9

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		Circuits and EMT lab	1	2	0	0	30	0	30	1
2		Makers Space Lab	2	4	0	0	30	30	60	2
3		Design, Thinking, Innovation & Entrepreneurship	3	4	30	0	30	30	90	3
4		Engineering Graphics and CAD for Electrical Engineers	3	4	0	0	30	30	60	2
5		Practical Aspects of Control Systems and Instrumentation	4	2	0	0	30	0	30	1
TOTAL				16	30	0	150	90	270	9

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	30	90	3
2		English for Engineers	2	4	30	0	30	30	90	3

3		Ability Enhancement Course Basket	7	2	30	0	0	30	60	2
TOTAL				10	90	0	60	90	240	8

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		Problem Solving and Python Programming	2	3	15	0	30	15	60	2
3		Environmental Engineering	2	2	30	0	0	30	60	2
4		Independent Research / Extra Academic Activity	4	2	0	0	30	0	30	1
5		Independent Research / Extra Academic Activity	5	2	0	0	30	0	30	1
TOTAL				11	75	0	90	75	240	8

GRAND PROJECT PATHWAY (GPP)

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 C – Credits and TCP- Theory Cum Practical Course