SCHEME & SYLLABUS

B. Tech (Electrical Engineering)

Choice Based Credit System

Department of Electrical Engineering
University Institute of Engineering and Technology
Sant Baba Bhag Singh University

2023

1. ABOUT THE DEPARTMENT

The department offers a vibrant environment for education in Electrical Engineering. Our mission is to provide a high-quality education and prepare students ton design and develop products as well as practical solutions to problems in public and private sectors. Currently, the department of Electrical Engineering offers B. Tech. in Electrical Engineering.

Faculty members in the Electrical Engineering department hold B. Tech/ M. Tech/ PhD degrees from prestigious engineering institutions. The key areas of faculty expertise of the department include Instrumentation, Biomedical Signal Processing, Biomedical Image Processing and Biomedical Data Mining, Power systems, Power Electronics, Control systems, antenna designing and optimization, FACTS devices. Furthermore, the faculty members have published significant number of research and review articles in reputed International Journals, proceedings of various International and National Seminars, Conferences, Symposia and Workshops as well as contributed chapters to books published by well-known international publishers.

2. SALIET FEATURES OF THE DEPARTMENT

- The department's faculty is highly qualified and has extensive teaching experience.
- Excellent teaching methodology with a focus on interactive learning through the use of audio- visual aids.
- Well-equipped and upgraded labs to provide students with hands-on learning opportunities.
- IIT Delhi's Virtual Labs platform is being used to provide additional Virtual Lab classes.
- The curriculum is flexible, choice based and well-balanced with a good mix of research and industry-oriented courses. In addition, the department offers a variety of discipline electives to cover modern technologies.
- Students attend regular workshops, seminars, and guest lectures to learn about the latest technology and industry practices.
- Mini-projects and in-plant trainings to provide students with hands-on experience.
- Industrial visits to various renowned companies to expose students to a variety of environments.
- Extension activities are organized for the neighborhood community.
- A dedicated placement cell provides students with numerous career opportunities after the completion of the course.

3. VISION OF THE DEPARTMENT

To impart knowledge, develop skills and prepare graduates in achieving global excellence in Electrical Engineering education, industry and research.

4. MISSION OF THE DEPARTMENT

- To prepare engineering graduates with deep understanding of fundamentals of Electrical Engineering.
- To prepare professionals with good technical abilities, a positive attitude and ethical values.

- To collaborate with industry, research organizations and academia to encourage creativity and innovation.

5. ELIGIBILITY CRITERIA

Programme	Duration	Eligibility
B. Tech in Electrical Engineering	4 years	a. Passed 10+2 examination with Physics/Mathematics/Chemistry/Computer Science/Electronics/Information Technology/ Biology/Informatics Practices/ Biotechnology/ Technical Vocational subject/ Agriculture/ Engineering Graphics/ Business Studies/ Entrepreneurship. b. Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together. OR c. Passed min. 3 years Diploma examination with at least 45% marks (40% marks in case of candidates belonging to reserved category) subject to vacancies in the First Year, in case the vacancies at lateral entry are exhausted.
B. Tech in Electrical Engineering (Lateral Entry to second year)	3 years	a. Passed minimum THREE years (Lateral Entry) Diploma examination with at least 45% marks (40% marks in case of candidates belonging to reserved category) in ANY branch of Engineering and Technology. b. Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks (40% marks in case of candidates belonging to reserved category) and passed 10+2 examination with Mathematics as a subject. c. Passed D. Voc. Stream in the same or allied sector.

6. PROGRAMME OUTCOMES (POs)

PO1: *Engineering knowledge:* Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.

PO2: *Problem analysis*: Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

PO3: *Design/development of solutions*: Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: *Conduct investigations of complex problems:* Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: *Modern tool usage*: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: *The engineer and society:* Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: *Environment and sustainability:* Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: *Ethics:* Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9*: Individual and teamwork:* Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

PO10: *Communication:* Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations and give and receive clear instructions.

PO11: *Project management and finance:* Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

PO12: *Life-long learning*: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

7. PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Graduates will demonstrate their knowledge in the effective implementation during their practice of profession of Electrical Engineering with due regard to environment and social concerns.

PSO2: Graduates will demonstrate their knowledge in analysis, design and laboratory experimentation regarding Electrical Engineering.

PSO3: Graduates will be motivated for continuous self-learning in engineering practice and pursue research in advanced areas of Electrical Engineering in order to offer engineering services to the society, ethically.

8. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To prepare Electrical Engineering students to work for government or private sector companies responsible for the development of the power sector and to demonstrate their abilities in electrical maintenance for the industry.
PEO2: To prepare Electrical Engineering students to contribute to the teaching profession, as well as research and development, by pursuing higher education.
PEO3: To prepare students so that they can work well in multicultural and multidisciplinary groups as part of their profession.

9. CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill-based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. The basic idea is to look into the needs of the students so as to keep up to date with development of higher education in India and abroad. CBCS aims to redefine the curriculum keeping pace with the liberalization and globalization in education. CBCS allows students an easy mode of mobility to various educational institutions spread across the world along with the facility of transfer of credits earned by students.

10. CURRICULUMM STRUCTURE

B.Tech Degree Programme has a curriculum with Syllabi consisting of following type of courses:

S. No.	Definition	Credits
1.	Basic Science courses	23
2.	Engineering Science courses including workshop, Engineering Design, basics of electrical/mechanical/computer etc.	20
3.	Humanities and Social Sciences including Management courses	12
4.	Professional Core courses	85
5.	Professional Elective courses relevant to chosen specialization/branch	18

6.	Open Elective courses – Electives from other technical and /or emerging subjects	9
7.	Mandatory Courses [Induction Training, Physical Training, Environmental Science, Constitution of India]	8 units (Non Credit)
8.	Project work	3
9.	Summer Internship	27
	Total	197

11. NOMENCLATURE

The subjects taught in B.Tech Electrical Engineering are taken from different course types. Following Table shows the abbreviation (Course codes) used for different course types.

Course code	Definitions
BS	Basic Science Courses
ES	Engineering Science Courses
HS	Humanities and Social Sciences including Management courses
PC	Professional core courses
PE	Professional Elective courses
OE	Open Elective courses
MC	Mandatory courses
SI	Summer Industry Internship
PROJ	Project

12. SCHEME FORMAT

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		

13. SYLLABUS FORMAT

Course Code	
Course Title	
Type of Course	
L:T:P	
Credits	
Course Pre-requisites	
Course Objectives	
Course Outcomes (COs)	

SYLLABUS

REFERENCE BOOKS

Course Schemefor B. Tech (Electrical Engineering)

General Course Structure

Course Code and Definition

Course Code	Definition
BS	Basic Science
ES	Engineering Science
HS	Humanities Science
PC	Professional Core
PE	Professional Elective
OE	Open Elective
MC	Mandatory Course
PROJ	Project
SI	Summer Internship

Course Scheme for B. Tech (Electrical Engineering)

SEMESTER I

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	BS	MAT151	Engineering Mathematics-I	3	1	0	3	1	0	4	4
2.	BS	CHM105	Engineering Chemistry	3	1	0	3	1	0	4	4
3.	ES	CSE111	Programming for Problem Solving	3	0	0	3	0	0	3	3
4.	HS	ENG121	Communication Skills-I	2	0	0	2	0	0	2	2

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
5.	ES	ME105	Workshop/ Manufacturing Practices	1	0	4	1	0	2	5	3
6.	ES	CSE113	Programming for Problem Solving Laboratory	0	0	4	0	0	2	4	2
7.	HS	ENG123	Communication Skills-I Laboratory	0	0	2	0	0	1	2	1
8.	BS	CHM107	Engineering Chemistry Laboratory	0	0	3	0	0	1.5	3	1.5
9.	MC	PT101/ PT103/ PT105	Physical Training-I (NSO/NCC/NSS)	0	0	2	NC			2	NC

Total Contact Hours = 29

Total Credit Hours = 20.5

SEMESTER II

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	BS	MAT152	Engineering Mathematics – II	3	1	0	3	1	0	4	4
2.	BS	PHY105	Engineering Physics	3	1	0	3	1	0	4	4
3.	ES	EE102	Basic Electrical Engineering	3	1	0	3	1	0	4	4
4.	ES	ME101	Engineering Graphics and Design	1	0	4	1	0	2	5	3

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
5.	BS	PHY107	Engineering Physics Laboratory	0	0	3	0	0	1.5	3	1.5
6.	ES	EE104	Basic Electrical Engineering Laboratory	0	0	2	0	0	1	2	1
7.	MC	PT102/ PT104/ PT106	Physical Training-II (NSO/NCC/NSS)	0	0	2		NC		2	NC

Total Contact Hours = 24

Total Credit Hours = 17.5

SEMESTER III

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PC	EE215	Electrical Circuit Analysis	3	1	0	3	1	0	4	4
2.	PC	EE217	Analog Electronics Circuits	4	1	0	4	1	0	5	5
3.	PC	EE219	Electrical Machines-I	4	0	0	4	0	0	4	4
4.	PC	EE221	Electromagnetic Fields	4	1	0	4	1	0	5	5
5.	BS	MAT251	Engineering Mathematics -III	3	1	0	3	1	0	4	4
6.	ES	EE227	Basic Electronics Engineering	3	1	0	3	1	0	4	4

II. Practical Subjects

S. No	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
7.	PC	EE223	Analog Electronics Circuits Laboratory	0	0	2	0	0	1	2	1
8.	PC	EE225	Electrical Machines-I Laboratory	0	0	2	0	0	1	2	1
9.	MC	PT201/PT203/PT205	Physical Training-III (NSO/NCC/NSS)	0	0	2		NC		2	NC

Total Contact Hours = 32

Total Credit Hours = 28

SEMESTER IV

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PC	EE216	Digital Electronics	4	0	0	4	0	0	4	4
2.	PC	EE218	Electrical Machines-II	4	0	0	4	0	0	4	4
3.	PC	EE220	Power Electronics	4	0	0	4	0	0	4	4
4.	PC	EE222	Signals and Systems	3	0	0	3	0	0	3	3
5.	HS	SSC007	Universal Human Values: Understanding Harmony	3	0	0	3	0	0	3	3
6.	MC	EVS002	Environmental Sciences	3	0	0	NC			3	NC
7.	PC	EE230	Electrical Safety	3	0	0	3	0	0	3	3
8.	PC	EE232	Estimation and Costing in Electrical Engineering	3	0	0	3	0	0	3	3

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
9.	PC	EE224	Digital Electronics Laboratory	0	0	2	0	1		2	1
10.	PC	EE226	Electrical Machines-II Laboratory	0	0	2	0	1		2	1
11.	PC	EE228	Power Electronics Laboratory	0	0	2	0	1		2	1
12.	MC	PT202/ PT204/ PT206	Physical Training-IV (NSO/NCC/NSS)	0	0	2	NC			2	NC

Total Contact Hours = 35

Total Credit Hours = 27

Note:- After 4th semester, minimum of four weeks in an Industry in the area of Electrical Engineering. The summer internship should give exposure to the practical aspects of the discipline. In addition, the student may also work on a specified task or project, which may be assigned to him/her. The outcome of the internship should be presented in the form of a report.

SEMESTER V

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PC	EE319	Power Systems-I (Apparatus and Modelling)	3	0	0	3	0	0	3	3
2.	PC	EE321	Control Systems	3	0	0	3	0	0	3	3
3.	PC	EE323	Microprocessors	3	0	0	3	0	0	3	3
4.	PE		Professional Elective-I	3	0	0	3	0	0	3	3
5.	OE		Open Elective-I	3	0	0	3	0	0	3	3
6.	MC	LAW005	Constitution of India	3	0	0	NC			3	NC
7.	PC	EE335	Measurements and Instrumentation	2	0	0	2	0	0	2	2
8.	SI	EE339	Summer Internship undertaken after 4th semester								3

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
9.	PC	EE325	Power Systems-I Laboratory	0	0	2	0	0	1	2	1
10.	PC	EE327	Control Systems Laboratory	0	0	2	0	0	1	2	1
11.	PC	EE329	Microprocessors Laboratory	0	0	2	0	0	1	2	1
12.	PC	EE337	Measurements and Instrumentation Laboratory	0	0	2	0	0	1	2	1
13.	MC	PT301/303/ 305	Physical Training-V (NSO/NCC/NSS)	0	0	2	NC			2	NC

III. Professional Elective-I

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE331	Electrical Machine Design	3	0	0	3	0	0	3	3
2.	PE	EE333	Foundation of Artificial Intelligence	3	0	0	3	0	0	3	3

Total Contact Hours = 30

Total Credit Hours = 24

SEMESTER VI

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PC	EE330	Power Systems-II (Operation and Control)	3	0	0	3	0	0	3	3
2.	PC	EE334	Microcontroller	3	0	0	3	0	0	3	3
3.	PE		Professional Elective-II	3	0	0	3	0	0	3	3
4.	PE		Professional Elective-III	3	0	0	3	0	0	3	3
5.	OE		Open Elective-II	3	0	0	3	0	0	3	3
6.	HS	MGT007	Organizational Behaviour	3	0	0	3	0	0	3	3
7.	PC	EE360	Energy Storage System	3	0	0	3	0	0	3	3

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
8.	PC	EE336	Power Systems-II Laboratory	0	0	2	0	0	1	2	1
9.	PC	EE358	Microcontroller Laboratory	0	0	2	0	0	1	2	1
10.	PC	EE340	Electronics Design Laboratory	1	0	4	1	0	2	5	3
11.	MC	PT302/ PT304/ PT306	Physical Training-VI (NSO/NCC/NSS)	0	0	2		NC		2	NC

III. Professional Elective-II

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE342	Control Systems Design	3	0	0	3	0	0	3	3
2.	PE	EE344	Power System Protection	3	0	0	3	0	0	3	3
3.	PE	EE346	Line Commutated and Active Rectifiers	3	0	0	3	0	0	3	3
4.	PE	EE354	Data Acquisition and Telemetry	3	0	0	3	0	0	3	3

IV. Professional Elective-III

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE348	Computer Architecture	3	0	0	3	0	0	3	3
2.	PE	EE350	Computational Electromagnetics	3	0	0	3	0	0	3	3
3.	PE	EE352	Electromagnetic Waves	3	0	0	3	0	0	3	3
4.	PE	EE356	Biomedical Instrumentation	3	0	0	3	0	0	3	3

Total Contact Hours = 32

Total Credit Hours = 26

Note:- After 6th semester, minimum of 4 weeks in an Industry in the area of Electrical Engineering. The summer internship should give exposure to the practical aspects of the discipline. In addition, the student may also work on a specified task or project, which may be assigned to him/her. The outcome of the internship should be presented in the form of a report.

SEMESTER VII

I. Theory Subjects (including Non- Credit Courses)

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE		Professional Elective – IV	3	0	0	3	0	0	3	3
2.	PE		Professional Elective – V	3	0	0	3	0	0	3	3
3.	PC	EE443	Smart Grid	3	0	0	3	0	0	3	3
4.	PC	EE445	Distributed Generation	3	0	0	3	0	0	3	3
5.	HS	ENG2025	Effective Technical Communication Skills	3	0	0	3	0	0	3	3
6.	PE		Professional Elective – VI	3	0	0	3	0	0	3	3
7.	OE		Open Elective – III	3	0	0	3	0	0	3	3
8.	PC	EE447	PLC & SCADA	3	0	0	3	0	0	3	3
9.	PC	EE449	Power Generation and Economics	3	0	0	3	0	0	3	3
10.	SI	EE411	Summer Internship undertaken after 6th semester	NC							4

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
11.	PROJ	EE413	Project Work	0	0	6	0	0	3	6	3

III. Professional Elective-IV

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE415	Wind and Solar Energy Systems	3	0	0	3	0	0	3	3
2.	PE	EE417	HVDC Transmission Systems	3	0	0	3	0	0	3	3
3.	PE	EE419	Power Quality and FACTS	3	0	0	3	0	0	3	3
4.	PE	EE421	High Voltage Engineering	3	0	0	3	0	0	3	3

IV. Professional Elective-V

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE423	Digital Control Systems	3	0	0	3	0	0	3	3
2.	PE	EE425	Electrical Energy Conservation and Auditing	3	0	0	3	0	0	3	3
3.	PE	EE427	Industrial Electrical Systems	3	0	0	3	0	0	3	3
4.	PE	EE429	Electrical Drives	3	0	0	3	0	0	3	3

5.	PE	EE439	Optimization Techniques	3	0	0	3	0	0	3	3

III. Professional Electives-VI

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	PE	EE431	Digital Signal Processing	3	0	0	3	0	0	3	3
2.	PE	EE433	Electrical and Hybrid Vehicles	3	0	0	3	0	0	3	3
3.	PE	EE435	Power System Dynamics and Control	3	0	0	3	0	0	3	3
4.	PE	EE437	Advanced Electric Drives	3	0	0	3	0	0	3	3

Total Contact Hours = 33

Total Credit Hours = 34

SEMESTER VIII

II. Practical Subjects

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	SI	EE416	Six Months Industrial Training	0	0	40	0	0	20	40	20

Total Contact Hours = 40

Total Credit Hours = 20

Total Credits = 197

DETAILS OF B. TECH (EE) COURSES

Course	Credit			Total
	Lecture	Tutorial	Practical	
	(#Subject * Credit)	(#Tutorial * Credit)	(#Practical * Credit)	
I. PC (33 Papers)	6x4=24 14x3=42 1x2=2 1x1=1	3x1=3	11x1=11 1x2=2	85
II. PE (6 Papers)	6x3=18			18
III. ES (7 Papers)	3x3=9 2x1=2	2x1=2	3x2=6 1x1=1	20
IV. BS (7 Papers)	5x3=15	5x1=5	2x1.5=3	23
V. HS (6 Papers)	3x3=9 1x2=2		1x1=1	12
VI. OE (3 Papers)	3x3=9			9
VII. SI (3 Paper)			1x3=3 1x4=4 1x20=20	27
VIII. PROJ (1 Paper)			3	3
Total				**197**

MC- 8 units

SUMMARY OF SCHEME

Sem	L	T	P	Contact hrs/wk	Credits	HS	BS	ES	PC	PE	OE	Project	SI	MC
1	12	2	15	29	20.5	3	9.5	8						1unit
2	10	3	11	24	17.5	-	9.5	8						1unit
3	21	5	6	32	28	-	4	4	20					1unit
4	27	-	8	35	27	3	-		24					2units
5	24	1	8	33	24	3			15	3	3		3	2units
6	22	-	10	32	26	3			14	6	3			1unit
7	27	-	6	33	34	3			12	9	3	3	4	
8	-	-	40	40	20								20	
Total	**143**	**11**	**104**	**258**	**197**	**15**	**23**	**20**	**85**	**18**	**9**	**3**	**27**	**8units**

List of Open Electives

Open Elective-I

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	OE	CSE381	Basics of Computer Networks	3	0	0	3	0	0	3	3
2.	OE	CSE383	Introduction to Big Data Analytics	3	0	0	3	0	0	3	3
3.	OE	CE338	Ground Water	3	0	0	3	0	0	3	3
4.	OE	CE340	Construction Practice	3	0	0	3	0	0	3	3
5.	OE	EE343	Electrical Materials	3	0	0	3	0	0	3	3
6.	OE	EE345	Electric Power Utilization	3	0	0	3	0	0	3	3
7.	OE	ME371	Total Quality Management	3	0	0	3	0	0	3	3
8.	OE	ME373	Industrial Engineering Management	3	0	0	3	0	0	3	3
9.	OE	ME375	Material Management	3	0	0	3	0	0	3	3

Open Elective-II

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	OE	CSE382	Cyber Security	3	0	0	3	0	0	3	3
2.	OE	CSE384	Ad-Hoc Networks	3	0	0	3	0	0	3	3
3.	OE	ME372	Environmental Pollution and Abatement	3	0	0	3	0	0	3	3
4.	OE	ME374	Management Information System	3	0	0	3	0	0	3	3
5.	OE	ME376	Maintenance and Reliability Engineering	3	0	0	3	0	0	3	3

6.	OE	EE364	Wavelet Theory and Applications	3	0	0	3	0	0	3	3
7.	OE	EE366	Industrial Automation	3	0	0	3	0	0	3	3
8.	OE	CE421	Metro Systems & Engineering	3	0	0	3	0	0	3	3
9.	OE	CE423	Environmental Systems	3	0	0	3	0	0	3	3
10.	OE	SSC008	Gender Culture and Development	3	0	0	3	0	0	3	3

Open Elective-III

S. No.	Type	Subject Code	Subject Name	Contact Hours			Credits			Total Contact Hours	Total Credit Hours
				L	T	P	L	T	P		
1.	OE	CSE481	Basics of Database Design	3	0	0	3	0	0	3	3
2.	OE	CSE483	Fuzzy Logic	3	0	0	3	0	0	3	3
3.	OE	ME471	Operations Management	3	0	0	3	0	0	3	3
4.	OE	ME473	Production Planning and Control	3	0	0	3	0	0	3	3
5.	OE	ME475	Smart Materials and Devices	3	0	0	3	0	0	3	3
6.	OE	EE439	Electronic Devices	3	0	0	3	0	0	3	3
7.	OE	EE441	Instrumentation in Power System	3	0	0	3	0	0	3	3
8.	OE	CE420	Environmental Laws and Policy	3	0	0	3	0	0	3	3
9.	OE	CE422	Ecological Engineering	3	0	0	3	0	0	3	3