



**SRI MANAKULA VINAYAGAR  
ENGINEERING COLLEGE**  
(An Autonomous Institution)  
Puducherry - 605 107

**Department of Electronics and  
Communication Engineering**

## **CURRICULUM & SYLLABI**

**B.Tech - Electronics and  
Communication Engineering**

Regulations  
**2023**

**25**  
years  
1999-2023



**SRI MANAKULA VINAYAGAR**  
**ENGINEERING COLLEGE**  
(An Autonomous Institution)  
Puducherry

**B.TECH.**  
**ELECTRONICS AND COMMUNICATION ENGINEERING**  
(Regulations-2023)

**CURRICULUM & SYLLABI**

Semester	Approval from Statutory Bodies
Semester – I and II	Passed in 6 <sup>th</sup> BoS Meeting held on July 21, 2023 Approved in 6 <sup>th</sup> Academic Council Meeting held on August 22, 2023

## VISION AND MISSION OF THE INSTITUTE

### VISION

To be globally recognized for excellence in quality education, innovation, and research for the transformation of lives to serve the society.

### MISSION

<b>M1: Quality Education</b>	To provide comprehensive academic system that amalgamates the cutting edge-technologies with best practices
<b>M2: Research and Innovation</b>	To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues
<b>M3: Employability and Entrepreneurship</b>	To inculcate the employability and entrepreneurial skills through value and skill-based training
<b>M4: Ethical Values</b>	To instil deep sense of human values by blending societal righteousness with academic professionalism for the growth of society

## VISION AND MISSION OF THE DEPARTMENT

### VISION

Facilitate academic excellence and research among Electronics and Communication Engineers to meet the Global needs with high competence and ethical professionalism

### MISSION

<b>M1: Academic Excellence</b>	To impart learning skills to meet the global challenges in the field of Electronics and Communication Engineering
<b>M2: Research and Innovation</b>	To provide excellence in research and innovation through multidisciplinary specialization
<b>M3: Employability and Entrepreneurship</b>	To enhance inter and intrapersonal skills among students to make them employable and entrepreneurs
<b>M4: Ethics</b>	To inculcate the significance of human values and professional skills to serve the society

## **PROGRAMME OUTCOMES (POs)**

### **PO1: Engineering knowledge:**

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

### **PO2: Problem analysis:**

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

### **PO3: Design/development of solutions:**

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

### **PO4: Conduct investigations of complex problems:**

Use research-based knowledge and research methods 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 diverse teams, and in multidisciplinary settings.

### **PO10: Communication:**

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

### **PO11: Project management and finance:**

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and 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.

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

### **PEO1: Technical Knowledge**

Graduates will be able to develop an insightful combination of modern electronics and communication technology through technical knowledge.

### **PEO2: Research and Development**

Enhance analytical and thinking skills to develop initiatives and innovative ideas for research and development, industry, and societal requirements.

### **PEO3: Leadership**

Inculcate the qualities of teamwork as well as social, interpersonal and leadership skills and adapt to the changing professional environments in the fields of engineering and technology.

### **PEO4: Professional Ethics**

Motivate graduates to become good human beings and responsible citizens for the overall welfare of the society.

## **PROGRAM SPECIFIC OUTCOMES (PSOs)**

### **PSO1: Domain Knowledge**

Ability to understand the concepts in Electronics and Communication Engineering and to apply to different fields, such as Consumer Electronics, Communications, Signal Processing, etc.

### **PSO2: Embedded System Design**

Ability to design a system based on the technical knowledge gained for embedded applications in electronics and communications engineering.

### **PSO3: Professional Competency**

Ability to select cutting-edge engineering hardware and software tools to solve complex problems in Electronics and Communication Engineering

**STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAM**

S.No	Category	Credits
1	Humanities and Social Sciences including Management courses	15
2	Basic Science courses	20
3	Engineering Science courses	28
4	Professional core courses	66
5	Professional Elective courses	18
6	Open Elective Courses	9
7	Project work, seminar, and internship	13
8	Ability Enhancement Courses	
9	Mandatory Courses	
<b>Total Credits</b>		<b>169</b>

**SCHEME OF CREDIT DISTRIBUTION – SUMMARY**

S. No	Category	Credits per Semester								Total credits
		I	II	III	IV	V	VI	VII	VIII	
1	Humanities and Social Sciences including Management courses	3	5	1	1	2			3	15
2	Basic Science courses	7	4	5	4					20
3	Engineering Science courses	8	8	4	4	4				28
4	Professional core courses	4	4	13	11	8	15	11		66
5	Professional Elective courses				3	3	3	3	6	18
6	Open Electives					3	3	3		9
7	Project work and internship					1	1	3	8	13
8	Ability Enhancement Courses*									
9	Mandatory Courses*									
<b>Total Credits</b>		22	21	23	23	21	22	20	17	169

\* AEC and MC are not included for CGPA calculation

**HONOURS DEGREE PROGRAMME:**

The student is permitted to opt for earning an honours degree in the same discipline of engineering in addition to the degree in his/her own discipline. To earn an honours degree the student is required to earn an additional 18 - 20 credits (over and above the total 169 credits prescribed in the curriculum) starting from fourth semester onwards by completing 5 additional courses offered in respective semesters. A student is eligible to exercise this option if he/she has passed all the courses offered up to third semester in the first attempt itself and has earned a CGPA / GPA of not less than 8.0.

The prescribed courses offered for Honours degree are given in Annexure -D

**SEMESTER-I**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23BSTC01	Physical Science for Engineers	BS	3	0	0	3	25	75	100
3	U23ESTC01	Basics of Civil and Mechanical Engineering	ES	3	0	0	3	25	75	100
4	U23EETC01	Electrical Technology	ES	3	0	0	3	25	75	100
5	U23ECT101	Circuits and Networks	PC	3	0	0	3	25	75	100
Theory cum Practical										
6	U23ENBC01	Communicative English - I	HS	2	0	2	3	50	50	100
Practical										
7	U23ESPC02	Design Thinking and Idea Laboratory	ES	0	0	2	1	50	50	100
8	U23EEPC01	Electrical Technology Laboratory	ES	0	0	2	1	50	50	100
9	U23ECP101	Circuits and Networks Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
10	U23AEC1XX	Certification Course – I	AEC	0	0	4	-	100	-	100
Mandatory Course										
11	U23ECM101	Induction Program – (UHV-I)	MC	3Weeks			-	-	-	-
Total							22	425	575	1000

**SEMESTER-II**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC02	Engineering Mathematics-II	BS	3	1	0	4	25	75	100
2	U23ESTC02	Engineering Mechanics	ES	3	0	0	3	25	75	100
3	U23CSTC01	Programming in C	ES	3	0	0	3	25	75	100
4	U23ECT202	Electron Devices	PC	3	0	0	3	25	75	100
5	U23HSTC01	Universal Human Values - II	HS	2	0	0	2	25	75	100
Theory cum Practical										
6	U23ENBC02	Communicative English - II	HS	2	0	2	3	50	50	100
Practical										
7	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
8	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
9	U23ECP202	Electron Devices Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
10	U23ECC2XX	Certification Course – II	AEC	0	0	4	-	100	-	100
Mandatory Course										
11	U23ECM202	Sports and Yoga or NSS/NCC	MC	0	0	2	-	100	-	100
Total							21	525	575	1100

**SEMESTER–III**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC03	Probability and Statistics	BS	3	1	0	4	25	75	100
2	U23ADTC01	Programming in Python	ES	3	0	0	3	25	75	100
3	U23ECT302	Electronic Circuits	PC	3	0	0	3	25	75	100
4	U23ECT304	Sensors and Its Applications	PC	3	0	0	3	25	75	100
5	U23ECT305	Measurement and Instrumentation	PC	3	0	0	3	25	75	100
Theory cum Practical										
6	U23ECB301	Engineering Electromagnetics	PC	3	0	2	3	50	50	100
Practical										
7	U23ENPC01	General Proficiency - I	HS	0	0	2	1	50	50	100
8	U23MAPC01	Engineering Mathematics Laboratory	BS	0	0	2	1	50	50	100
9	U23ADPC01	Programming in Python Laboratory	ES	0	0	2	1	50	50	100
10	U23ECP303	Electronic Circuits Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
11	U23ECC3XX	Certification Course – III	AEC	0	0	4	-	100	-	100
12	U23ECS301	Skill Enhancement Course – I : PCB Design	AEC	0	0	2	-	100	-	100
Mandatory Course										
13	U23ECM303	Climate Change	MC	2	0	0	-	100	-	100
Total							23	675	625	1300

**SEMESTER–IV**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC04	Numerical Methods and Optimization	BS	3	1	0	4	25	75	100
2	U23CSTC03	Data Structures	ES	3	0	0	3	25	75	100
3	U23ECT406	Operational Amplifiers and Applications	PC	3	0	0	3	25	75	100
4	U23ECT407	Digital Circuits	PC	3	0	0	3	25	75	100
5	U23ECE4XX	Professional Elective – I	PE	3	0	0	3	25	75	100
Theory cum Practical										
6	U23ECB402	Signals and Systems	PC	3	0	0	3	50	50	100
Practical										
7	U23ENPC02	General Proficiency -II	HS	0	0	2	1	50	50	100
8	U23CSPC02	Data Structures Laboratory	ES	0	0	2	1	50	50	100
9	U23ECP404	Integrated Circuits Laboratory	PC	0	0	2	1	50	50	100
10	U23ECP405	Digital Circuits Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
11	U23ECC4XX	Certification Course – IV	AEC	0	0	4	-	100	-	100
12	U23ECS302	Skill Enhancement Course- II: Repair and Maintenance of Electronics Equipment's	AEC	0	0	2	-	100	-	100
Mandatory Course										
13	U23ECM404	Right to Information and Good Governance	MC	2	0	-	-	100	-	100
Total							23	675	625	1300



**SEMESTER-V**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23HSTC02	Research Methodology	HS	2	0	0	2	25	75	100
2	U23ITTC03	Programming in JAVA	ES	3	0	0	3	25	75	100
3	U23ECTC01	Microcontrollers and Interfacing	PC	3	0	0	3	25	75	100
4	U23ECT508	Analog and Digital Communication	PC	3	0	0	3	25	75	100
5	U23ECE5XX	Professional Elective – II	PE	3	0	0	3	25	75	100
6	U23ECO5XX	Open Elective - I	OE	3	0	0	3	25	75	100
Practical										
7	U23ITPC03	Programming in JAVA Laboratory	ES	0	0	2	1	50	50	100
8	U23ECP506	Analog and Digital Communication Laboratory	PC	0	0	2	1	50	50	100
9	U23ECPC01	Microcontrollers and Interfacing Laboratory	PC	0	0	2	1	50	50	100
Project Work										
10	U23ECW501	Micro Project	PW	0	0	2	1	100	-	100
Ability Enhancement Course										
11	U23ECC5XX	Certification Course – V	AEC	0	0	4	-	100	-	100
Mandatory Course										
12	U23ECM505	Essence of Indian Traditional Knowledge	MC	2	0	0	-	100	-	100
Total							21	600	600	1200

**SEMESTER-VI**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23ECTC02	Embedded Systems Design	PC	3	0	0	3	25	75	100
2	U23ECT609	Digital Signal Processing	PC	3	0	0	3	25	75	100
3	U23ECT610	Digital VLSI System Design	PC	3	0	0	3	25	75	100
4	U23ECE6XX	Professional Elective - III	PE	3	0	0	3	25	75	100
5	U23ECO6XX	Open Elective - II	OE	3	0	0	3	25	75	100
Theory cum Practical										
6	U23ECB603	Control System Engineering	PC	3	0	0	3	50	50	100
Practical										
7	U23ECPC02	Embedded System Design Laboratory	PC	0	0	2	1	50	50	100
8	U23ECP607	Digital Signal Processing Laboratory	PC	0	0	2	1	50	50	100
9	U23ECP608	Digital VLSI System Design Laboratory	PC	0	0	2	1	50	50	100
Project Work										
10	U23ECW602	Mini Project	PW	0	0	2	1	100	-	100
Ability Enhancement Course										
11	U23ECC6XX	Certification Course – VI	AEC	0	0	4	-	100	-	100
Mandatory Course										
12	U23ECM606	Gender Equality	MC	2	0	-	-	100	-	100
Total							22	625	575	1200

**SEMESTER–VII**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23ECTC03	Internet of Things	PC	3	0	0	3	25	75	100
2	U23ECT711	RF and Microwave Communication	PC	3	0	0	3	25	75	100
3	U23ECT712	Wireless Communication	PC	3	0	0	3	25	75	100
4	U23ECE7XX	Professional Elective - IV	PE	3	0	0	3	25	75	100
5	U23ECO7XX	Open Elective - III	OE	3	0	0	3	25	75	100
Practical										
7	U23ECPC03	Internet of Things Laboratory	PC	0	0	2	1	50	50	100
8	U23ECP709	High Frequency Communication Laboratory	PC	0	0	2	1	50	50	100
Project Work										
10	U23ECW703	Project Phase – I	PW	0	0	4	2	50	50	100
11	U23ECW704	Internship/ Inplant training	PW	0	0	2	1	100	-	100
Total							20	375	525	900

**SEMESTER–VIII**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23HSTC03	Entrepreneurship and Business Management	HS	3	0	0	3	25	75	100
2	U23ECE8XX	Professional Elective - V	PE	3	0	0	3	25	75	100
3	U23ECE8XX	Professional Elective - VI	PE	3	0	0	3	25	75	100
Project Work										
10	U23ECW805	Project Phase – II	PW	0	0	16	8	50	100	150
Total							17	125	325	450

Annexure – A  
**PROFESSIONAL ELECTIVE COURSES**

<b>Professional Elective –I (Offered in Semester IV)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23ECE401	Aircraft Communication and Navigation Systems
2	U23ECE402	Computer Architecture and Interfacing
3	U23ECE403	Data Networks
4	U23ECE404	Electronic Design Automation Tools
5	U23ECE405	System on Chip Design
<b>Professional Elective – II (Offered in Semester V)</b>		
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23BMEC02	Wearable Technology
2	U23ECE506	Cloud Computing
3	U23ECE507	Hardware Description Languages
4	U23ECE508	Mobile Communication
5	U23ECE509	Vehicular Communication
<b>Professional Elective –III (Offered in Semester VI)</b>		
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23ICEC02	Soft Computing Techniques
2	U23ECE6010	Digital Image and Video Processing
3	U23ECE6011	Real Time Operating system
4	U23ECE6012	Network Information Security
5	U23ECE6013	Fog Computing
<b>Professional Elective–IV (Offered in Semester VII)</b>		
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23ICEC03	Intelligence Robotics Systems
2	U23ECEC01	Satellite Communication
3	U23ECE7014	Advanced Wireless Communication Techniques
4	U23ECE7015	Embedded Processors
5	U23ECE7016	Single Board Computer
<b>Professional Elective –V (Offered in Semester VIII)</b>		
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23ITEC05	Augmented Reality and Virtual Reality
2	U23ECE8017	Optical Communication
3	U23ECE8018	Radar Engineering
4	U23ECE8019	Automotive Electronic Systems
5	U23ECE8020	Nano Technology for Energy Sustainability
<b>Professional Elective–VI (Offered in Semester VIII)</b>		
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23ECEC02	Wireless Sensor Networks
2	U23ECEC03	High Speed Networks
3	U23ECE8021	Wireless Broad Band Networks
4	U23ECE8022	Software Defined Radio
5	U23ECE8023	LTE and 5G Communication Systems

Annexure – B  
**OPEN ELECTIVE COURSES**

Open Elective- I (Offered in Semester V/ VI)			
S. No	Course Code	Course Title	Permitted Departments
1	U23ECOC01	Engineering Computation with MATLAB	EEE, ICE, MECH, CIVIL, CCE, BME, AI&DS, Mechatronics
2	U23ECOC02	Consumer Electronics	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, BME, Mechatronics, FT
Open Elective- II (Offered in Semester VII)			
1	U23ECOC03	IoT and its Applications	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, FT
2	U23ECOC04	RFID System Design and Testing	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, BME, Mechatronics

**COMMON COURSE OFFERED BY ECE**

Sl. No.	Course Code	Course Title	Courses Offered
1	U23ECTC01	Microcontrollers and Interfacing	ECE, CCE
2	U23ECPC01	Microcontrollers and Interfacing Laboratory	ECE, CCE
3	U23ECTC02	Embedded Systems Design	ECE, CCE, ICE
4	U23ECPC02	Embedded System Design Laboratory	ECE, CCE, ICE
5	U23ECTC03	Internet of Things	ECE, CCE
6	U23ECPC03	Internet of Things Laboratory	ECE, CCE
7	U23ECEC01	Satellite Communication	ECE, CCE
8	U23ECEC02	Wireless Sensor Networks	ECE, IT
9	U23ECEC03	High Speed Networks	ECE, CCE
10	U23ECEC04	VLSI Systems	EEE, BME

## Annexure-C

**ABILITY ENHANCEMENT COURSES–(A) CERTIFICATION COURSES**

S. No	Course Code	Course Title	Certified By
1	U23ECCX01	Adobe Photoshop	Adobe
2	U23ECCX02	Adobe Animate	Adobe
3	U23ECCX03	Adobe Dreamweaver	Adobe
4	U23ECCX04	Adobe After Effects	Adobe
5	U23ECCX05	Adobe Illustrator	Adobe
6	U23ECCX06	Adobe InDesign	Adobe
7	U23ECCX07	Autodesk AutoCAD -ACU	Autodesk
8	U23ECCX08	Autodesk Inventor - ACU	Autodesk
9	U23ECCX09	Autodesk Revit - ACU	Autodesk
10	U23ECCX10	Autodesk Fusion 360 - ACU	Autodesk
11	U23ECCX11	Autodesk 3ds Max - ACU	Autodesk
12	U23ECCX12	Autodesk Maya - ACU	Autodesk
13	U23ECCX13	Cloud Security Foundations	AWS
14	U23ECCX14	Cloud Computing Architecture	AWS
15	U23ECCX15	Cloud Foundation	AWS
16	U23ECCX16	Cloud Practitioner	AWS
17	U23ECCX17	Cloud Solution Architect	AWS
18	U23ECCX18	Data Engineering	AWS
19	U23ECCX19	Machine Learning Foundation	AWS
20	U23ECCX20	Robotic Process Automation / Medical Robotics	Blue Prism
21	U23ECCX21	Advance Programming Using C	CISCO
22	U23ECCX22	Advance Programming Using C ++	CISCO
23	U23ECCX23	C Programming	CISCO
24	U23ECCX24	C++ Programming	CISCO
25	U23ECCX25	CCNP Enterprise: Advanced Routing	CISCO
26	U23ECCX26	CCNP Enterprise: Core Networking	CISCO
27	U23ECCX27	Cisco Certified Network Associate - Level 2	CISCO
28	U23ECCX28	Cisco Certified Network Associate- Level 1	CISCO
29	U23ECCX29	Cisco Certified Network Associate- Level 3	CISCO
30	U23ECCX30	Fundamentals Of Internet Of Things	CISCO
31	U23ECCX31	Internet Of Things	CISCO
32	U23ECCX32	Java Script Programming	CISCO
33	U23ECCX33	NGD Linux Essentials	CISCO
34	U23ECCX34	NGD Linux I	CISCO
35	U23ECCX35	NGD Linux II	CISCO
36	U23ECCX36	Advance Java Programming	Ethnotech

S. No	Course Code	Course Title	Certified By
37	U23ECCX37	Android Programming / Android Medical App Development	Ethnotech
38	U23ECCX38	Ansys	Ethnotech
39	U23ECCX39	Catia	Ethnotech
40	U23ECCX40	Communication Skills for Business	Ethnotech
41	U23ECCX41	Coral Draw	Ethnotech
42	U23ECCX42	Data Science Using R	Ethnotech
43	U23ECCX43	Digital Marketing	Ethnotech
44	U23ECCX44	Embedded System Using C	Ethnotech
45	U23ECCX45	Embedded System With IOT	Ethnotech
46	U23ECCX46	English For IT	Ethnotech
47	U23ECCX47	Entrepreneurship And Business Plan	Ethnotech
48	U23ECCX48	Estimation And Current Practices	Ethnotech
49	U23ECCX49	Financial Planning, Banking and Investment Management	Ethnotech
50	U23ECCX50	Foundation Of Stock Market Investing	Ethnotech
51	U23ECCX51	Machine Learning / Machine Learning for Medical Diagnosis	Ethnotech
52	U23ECCX52	IOT Using Python	Ethnotech
53	U23ECCX53	Plaxis	Ethnotech
54	U23ECCX54	Soft Skills, Verbal, Aptitude	Ethnotech
55	U23ECCX55	Software Testing	Ethnotech
56	U23ECCX56	Solar And Smart Energy System With IOT	Ethnotech
57	U23ECCX57	Solid Edge	Ethnotech
58	U23ECCX58	Solid works	Ethnotech
59	U23ECCX59	Staad Pro	Ethnotech
60	U23ECCX99	Total Station	Ethnotech
61	U23ECCX60	Hydraulic	Festo
62	U23ECCX61	PLC	Festo
63	U23ECCX62	Numatics	Festo
64	U23ECCX63	Agile Methodologies	IBM
65	U23ECCX64	Block Chain	IBM
66	U23ECCX65	Devops	IBM
67	U23ECCX66	Artificial Intelligence	ITS
68	U23ECCX67	Cloud Computing	ITS
69	U23ECCX68	Computational Thinking	ITS
70	U23ECCX69	Cyber Security	ITS
71	U23ECCX70	Data Analytics	ITS
72	U23ECCX71	Databases	ITS
73	U23ECCX72	Java Programming	ITS
74	U23ECCX73	Networking	ITS
75	U23ECCX74	Python Programming	ITS

S. No	Course Code	Course Title	Certified By
76	U23ECCX75	Web Application Development (HTML, CSS, JS)	ITS
77	U23ECCX76	Network Security	ITS & Palo alto
78	U23ECCX77	MATLAB	MathWorks
79	U23ECCX78	Azure Fundamentals	Microsoft
80	U23ECCX79	Azure AI (AI-900)	Microsoft
81	U23ECCX80	Azure Data (DP -900)	Microsoft
82	U23ECCX81	Microsoft 365 Fundamentals (SS-900)	Microsoft
83	U23ECCX82	Microsoft Security, Compliance and Identity (SC-900)	Microsoft
84	U23ECCX83	Microsoft Power Platform (PI-900)	Microsoft
85	U23ECCX84	Microsoft Dynamics Fundamentals 365 – CRM	Microsoft
86	U23ECCX85	Microsoft Excel	Microsoft
87	U23ECCX86	Microsoft Excel Expert	Microsoft
88	U23ECCX87	Securities Market Foundation	NISM
89	U23ECCX88	Derivatives Equinity	NISM
90	U23ECCX89	Research Analyst	NISM
91	U23ECCX90	Portfolio Management Services	NISM
92	U23ECCX91	Cyber Security	Palo alto
93	U23ECCX92	Cloud Security	Palo alto
94	U23ECCX93	PMI – Ready	PMI
95	U23ECCX94	Tally – GST & TDS	Tally
96	U23ECCX95	Advance Tally	Tally
97	U23ECCX96	Associate Artist	Unity
98	U23ECCX97	Certified Unity Programming	Unity
99	U23ECCX98	VR Development	Unity

Annexure – D  
**HONORS DEGREE**

**Bachelor of Technology (Honors) in Electronics and Communication Engineering With specialization in “Internet of Things”**

COURSE DETAILS											
Sl. No.	Semester	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
					L	T	P		CAM	ESM	Total
Theory											
1	IV	U23ECH401	Sensors and Actuators	PC	3	1	0	4	25	75	100
2	V	U23ECH502	Edge Computing	PC	3	1	0	4	25	75	100
3	VI	U23ECH603	Embedded Device Drivers	PC	3	1	0	4	25	75	100
4	VII	U23ECH704	Privacy and Security in IoT	PC	3	1	0	4	25	75	100
5	VIII	U23ECH805	Industrial IoT	PC	3	1	0	4	25	75	100
	Total							20	125	375	500
Equivalent NPTEL courses <sup>##</sup>											
1	IV-VII	U23ECHN01	Sensors and Actuators					3	12 Weeks Course		
			Foundation of Cloud IoT Edge ML					3			
			Introduction to Industry 4.0					3			
			Industrial Internet of Things					3			
			Introduction to Internet of Things					3			

<sup>##</sup> The student shall be given an option to earn 3 credits through one equivalent 12 weeks NPTEL course instead of any one course listed for honours degree programme that should be completed before the commencement of eighth semester. The equivalent courses are subject to change based on its availability as per NPTEL course list.



## SEMESTER-I

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23BSTC01	Physical Science for Engineers	BS	3	0	0	3	25	75	100
3	U23ESTC01	Basics of Civil and Mechanical Engineering	ES	3	0	0	3	25	75	100
4	U23EETC01	Electrical Technology	ES	3	0	0	3	25	75	100
5	U23ECT101	Circuits and Networks	PC	3	0	0	3	25	75	100
Theory cum Practical										
6	U23ENBC01	Communicative English - I	HS	2	0	2	3	50	50	100
Practical										
7	U23ESPC02	Design Thinking and Idea Lab	ES	0	0	2	1	50	50	100
8	U23EEPC01	Electrical Technology Laboratory	ES	0	0	2	1	50	50	100
9	U23ECP101	Circuits and Networks Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
10	U23AEC1XX	Certification Course – I	AEC	0	0	4	-	100	-	100
Mandatory Course										
11	U23ECM101	Induction Program – (UHV-I)	MC	3Weeks			-	-	-	-
Total							22	425	575	1000

Department	<b>Mathematics</b>			Programme: <b>B.Tech.</b>				
Semester	<b>I</b>			Course Category: <b>BS</b>		*End Semester Exam Type: <b>TE</b>		
Course Code	U23MATC01	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	T
Course Name	<b>ENGINEERING MATHEMATICS – I</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
(Common to All Branches Except CSBS)								
Prerequisite	Basic Mathematics							
Course Outcomes	<b>On completion of the course, the students will be able to</b>						BT Mapping (Highest Level)	
	<b>CO1</b>	Understand the concept of Eigen values and Eigen vectors, Diagonalization of a Matrix						<b>K3</b>
	<b>CO2</b>	Solve higher order differential equations						<b>K3</b>
	<b>CO3</b>	Understand the different types of partial differential equations						<b>K3</b>
	<b>CO4</b>	Know about the Applications of double and triple integrals						<b>K3</b>
	<b>CO5</b>	Gain the knowledge about Vector Calculus and its Applications						<b>K3</b>

<b>UNIT – I</b>	<b>MATRICES</b>	<b>Periods:12</b>
Rank of a Matrix – Systems of Linear Equations – Characteristic equation – Cayley Hamilton Theorem – Eigen values and Eigen vectors of a real Matrix–Diagonalization of Matrices.		<b>CO1</b>
<b>UNIT – II</b>	<b>DIFFERENTIAL EQUATIONS (HIGHER ORDER)</b>	<b>Periods:12</b>
Linear Differential equations of higher order with constant coefficients – Euler's linear equation of higher order with variable coefficients –Method of Variation of parameters.		<b>CO2</b>
<b>UNIT – III</b>	<b>FUNCTIONS OF SEVERAL VARIABLES</b>	<b>Periods:12</b>
Partial derivatives – Total derivatives – Maxima of two variables and Minima of two variables – Lagrange's Method of multipliers.		<b>CO3</b>
<b>UNIT – IV</b>	<b>MULTIPLE INTEGRALS</b>	<b>Periods:12</b>
Multiple Integrals – Change of order of integration (Cartesian form). Applications: Areas as a double integral (Cartesian form) – Volume as a triple integral (Cartesian form)		<b>CO4</b>
<b>UNIT – V</b>	<b>VECTOR CALCULUS</b>	<b>Periods:12</b>
Gradient – Divergence and Curl – Directional derivatives – Irrotational and Solenoidal vector fields – Properties (Statement only) – Gauss Divergence Theorem and Stokes Theorem applications (without proofs).		<b>CO5</b>
<b>Lecture Periods:45</b>		<b>Tutorial Periods:15</b>
<b>Practical Periods: -</b>		<b>Total Periods:60</b>

**Text Books**

1. M.K. Venkataraman, "Engineering Mathematics, The National Publishing Company, Madras, 2016.
2. N. P Bali and Manish Goyal, "A Text Book of Engineering Mathematics", Lakshmi Publications, New Delhi, 9 <sup>th</sup> Edition, 2018.
3. S. Narayanan and T.K. Manicavachagom Pillay, "Differential Equations and Its Applications", Viswanathan.S, Printers & Publishers Pvt Ltd, 2009.

**Reference Books**

1. G. Balaji, "Matrices and Calculus (Engineering Mathematics – I)" Balaji Publications, 9 <sup>th</sup> Edition, 2023
2. Dr. A. Singaravelu, "Engineering Mathematics – I", Meenakshi publications, Tamil Nadu, 2019.
3. Erwin Kreyszig, "Advanced Engineering Mathematics ", Wiley, 10 <sup>th</sup> Edition, 2019.
4. B.V.Ramana, "Higher Engineering Mathematics", Tata McGraw – Hill, New Delhi, 6 <sup>th</sup> Edition, 2018.
5. C W. Evans, "Engineering Mathematics", A Programmed Approach, 3 <sup>rd</sup> Edition, 2019.

**Web References**

1. <http://www.yorku.ca/yaoguo/math1025/slides/chapter/kuttler-linearalgebra-slides-systems-of-equation-handout.pdf>
2. <http://www.math.cum.edu/~wn0g/2ch6a.pdf>
3. <https://nptel.ac.in/courses/122/104/122104017/>
4. <https://nptel.ac.in/courses/111/106/111106051/>
5. <https://nptel.ac.in/courses/111/108/111108081/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	-	2	1	1	-	-	-	-	1	3	-	-
2	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
3	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
4	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
5	2	2	1	-	-	-	1	-	-	-	-	1	3	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Physics and Chemistry			Programme: <b>B.Tech.</b>							
Semester	I			Course Category: <b>BS</b>		*End Semester Exam Type: <b>TE</b>					
Course Code	U23BSTC01			Periods/Week		Credit	Maximum Marks				
				L	T	P	C	CAM	ESE	TM	
Course Name	PHYSICAL SCIENCE FOR ENGINEERS			3	-	-	3	25	75	100	
(Common to all Branches)											
Prerequisite	Physics of 12 <sup>th</sup> standard or equivalent / Chemistry of 12 <sup>th</sup> standard or equivalent.										
Course Outcome	On completion of the course, the students will be able to								BT Mapping (Highest Level)		
	CO1	Understand the basic of properties of magnetic, dielectric and superconductors.								K2	
	CO2	Identify the wave nature of the particles, physical significance of wave functions								K3	
	CO3	Understand the basic principles of laser and fiber optics communication								K2	
	CO4	Understand and familiar with the water treatment.								K2	
	CO5	Understand the electrode potential for its feasibility in electrochemical reactions and uses of various batteries.								K2	
	CO6	Understand the specific operating condition under which corrosion occurs and suggest a method to control corrosion.								K2	

<b>SECTION A – PHYSICS</b>		
<b>UNIT - I</b>	<b>MAGNETIC, DIELECTRIC AND SUPERCONDUCTING MATERIALS</b>	<b>Periods: 8</b>
Introduction to magnetic materials, Ferromagnetism- Domain theory-Types of energy-Hysteresis-Hard and Soft magnetic materials-ferrites-Dielectric materials-Types of polarization – Langevin-Debye equation-Frequency effects on polarization-Dielectric breakdown- Ferroelectric materials-Superconducting materials and their properties.		<b>CO1</b>
<b>UNIT-II</b>	<b>QUANTUM MECHANICS</b>	<b>Periods: 7</b>
Matter Waves - de Broglie Wavelength - Uncertainty Principle –Physical Significance of wave functions - Schrodinger wave Equation - Time Dependent - Time Independent - Application to Particle in a One Dimensional Box - Tunnel Diode.		<b>CO2</b>
<b>UNIT-III</b>	<b>LASER AND FIBER OPTICS</b>	<b>Periods: 7</b>
Lasers - Principles of Laser - Spontaneous and Stimulated Emissions - Einstein's Coefficients - Population Inversion and Laser Action –components of laser - Types of Lasers - NdYAG, CO <sub>2</sub> laser, GaAs Laser Fiber Optics - Principle and Propagation of light in optical fiber - Numerical aperture and acceptance angle - Types of optical fibers (material, refractive index, mode)		<b>CO3</b>

<b>SECTION B – CHEMISTRY</b>		
<b>UNIT-IV</b>	<b>WATER AND ITS TREATMENT</b>	<b>Periods: 8</b>
Water: Sources and impurities, Water quality parameters: Definition and significance of-color, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD. Desalination of brackish water: Reverse osmosis-disadvantages of using hard water in boiler - Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and Calgon conditioning) and External treatment–Ion exchange demineralization and zeolite process.		<b>CO4</b>
<b>UNIT-V</b>	<b>ELECTROCHEMICAL CELLS AND STORAGE DEVICES</b>	<b>Periods: 8</b>
Galvanic cells, single electrode potential, standard electrode potential, electrochemical series. EMF of a cell and its measurement. Nernst equation. Electrolyte concentration cell. Reference electrodes- hydrogen, calomel and Ag/AgCl. Batteries and fuel cells: Types of batteries- alkaline battery-lead storage battery- nickel-cadmium battery- fuel cell H <sub>2</sub> -O <sub>2</sub> fuel cell-applications.		<b>CO5</b>
<b>UNIT-VI</b>	<b>CORROSION</b>	<b>Periods: 7</b>
Corrosion –Introduction - factors – types – chemical, electrochemical corrosion (galvanic, differential aeration), corrosion control – material selection and design aspects – electrochemical protection – sacrificial anode method and impressed current cathodic method. Uses of inhibitors, metallic coating – anodic coating, cathodic coating. Metal cladding, Electroplating of Copper and electroless plating of nickel.		<b>CO6</b>
<b>Lecture Periods: 45</b>		<b>Tutorial Periods:-</b>
<b>Practical Periods:-</b>		<b>Total Periods: 45</b>

**Text Books**

1. V Rajendran, "Engineering Physics", 2<sup>nd</sup> Edition, TMH, New Delhi 2011.
2. S.S Dara – "A text book of Engineering Chemistry" - 15<sup>th</sup> Edition, 2021. S.Chand Publications.
3. C.Jain, Monica Jain, — "Engineering Chemistry" 17<sup>th</sup> Ed. DhanpatRai Pub. Co., NewDelhi, (2015).

**Reference Books**

1. R.Murugesan, "Modern Physics", S. Chand &Co, New Delhi 2006.
2. William D Callister Jr., "Material Science and Engineering", 6<sup>th</sup> Edition, John Wiley and sons, 2009.
3. Jain & Jain "Engineering chemistry", 23<sup>rd</sup> Edition, DhanpatRai Publishing Company. 2022
4. Mars Fontana "Corrosion Engineering", July 2017
5. JinaRedlin, "Handbook of Electrochemistry", March 28, 2005

**Web References**

1. [https://www.sciencedaily.com/terms/materials\\_science.htm](https://www.sciencedaily.com/terms/materials_science.htm).
2. [https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers/materials\\_science.html](https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers/materials_science.html).
3. <https://study.com/academy/lesson/semiconductors-superconductors-definition-properties.html>
4. <https://mechanicalc.com/reference/engineering-materials>
5. [http://ndl.ethernet.edu.et/bitstream/123456789/89589/1/%5BPerez\\_N.%5D\\_Electrochemistry\\_and\\_corrosion%28BookZZ.org%29.pdf](http://ndl.ethernet.edu.et/bitstream/123456789/89589/1/%5BPerez_N.%5D_Electrochemistry_and_corrosion%28BookZZ.org%29.pdf)

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program-Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-
2	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-
3	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-
4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
6	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	<b>Civil / Mechanical</b>	Programme : <b>B.Tech.</b>						
Semester	<b>I</b>	Course Category: <b>ES</b>			End Semester Exam Type: <b>TE</b>			
Course Code	<b>U23ESTC01</b>	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	<b>BASICS OF CIVIL AND MECHANICAL ENGINEERING</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
(Common to EEE, ECE, ICE, MECH, Civil, Mechatronics Branches)								
Prerequisite	Basic Science							
Course Outcomes	<b>On completion of the course, the students will be able to</b>							BT Mapping (Highest Level)
	<b>CO1</b>	Understand the types of buildings and materials.						<b>K2</b>
	<b>CO2</b>	Summarize on the various components of buildings and surveying concepts						<b>K2</b>
	<b>CO3</b>	Identify the various infrastructure facilities						<b>K2</b>
	<b>CO4</b>	To familiarize the working principles of IC engines and automobile systems						<b>K2</b>
	<b>CO5</b>	To understand about the power generation systems and its components						<b>K1</b>
	<b>CO6</b>	To acquire knowledge about the various machining process.						<b>K2</b>

<b>SECTION A - CIVIL ENGINEERING</b>		
<b>UNIT - I</b>	<b>BUILDINGS AND BUILDINGS MATERIALS</b>	<b>Periods: 08</b>
Buildings – Definition – Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart cities - Green building, Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel, Timber - their properties and uses		<b>CO1</b>
<b>UNIT - II</b>	<b>BUILDINGS COMPONENTS AND SURVEYING</b>	<b>Periods: 08</b>
Various Buildings Components and their functions. Foundation: function and types - Brick masonry, Stone Masonry and its types – Floors, Roofs and its types. Surveying: Objects – Classification – Principles – Measurements of Distances and areas – Leveling		<b>CO2</b>
<b>UNIT - III</b>	<b>BASIC INFRASTRUCTURE</b>	<b>Periods: 07</b>
Roads and Bridges – types, components advantage and disadvantages. Railways - Permanent way and its elements. Sources of Water - Quality of Water- Domestic sewage Treatment – Rain Water harvesting – Dams - site selection for dam construction, types of dams.		<b>CO3</b>

SECTION B – MECHANICAL ENGINEERING		
UNIT- IV	INTERNAL AND EXTERNAL COMBUSTION SYSTEMS	Periods: 08
IC engines – Classification – Working principles – Diesel and Petrol Engines: Two stroke and four stroke engines – merits and demerits.		CO4
Steam generators (Boilers) – Classification – Constructional features (of only low-pressure boilers) – Boiler mountings and accessories – Merits and demerits – Applications.		
UNIT- V	POWER GENERATION SYSTEMS, REFRIGERATION AND AIR CONDITIONING SYSTEM	Periods: 07
Power plants: Thermal – Nuclear, Hydraulic, Solar, Wind, Geothermal, Wave, Tidal and Ocean Thermal Energy Conversion systems - Functions, Applications - Schemes and layouts (Description only)		CO5
Refrigeration and Air Conditioning System: Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner.		
UNIT- VI	MANUFACTURING PROCESS	Periods: 07
Lathe - types, Specifications, Operations of a centre lathe. Casting - Pattern making, Allowances, Green sand and dry sand moulding, casting defects. Welding - Arc and Gas welding process, brazing and soldering (process description only).		CO6

<b>Lecture Periods: 45</b>	<b>Tutorial Periods: -</b>	<b>Practical Periods: -</b>	<b>Total Periods: 45</b>
<b>Text Books</b>			
1. Dr. S. Jayakumar, "Basic Civil Engineering", Aagash Nekaa Publications, 2011			
2. G Shanmugam, MS Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018.			
3. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010.			
<b>Reference Books</b>			
1. M.P. Poonia, S.C. Sharma and T.R. Banga, Basic Mechanical Engineering, Khanna Publishing House 2018.			
2. S.S.Bhavikatti, Basic Civil engineering, New Age International Ltd. 2018.			
3. V. Rameshbabu, Basic Civil & Mechanical Engineering, VRB Publishers Private Limited, January 2017.			
4. Serope Kalpakjian, Steven Schmid, Manufacturing Engineering and Technology, 7th Edition, Pearson Publication, 2014.			
5. Gopi Satheesh, Basic Civil engineering, Pearson Publications, 3rd Edition, 2015.			
<b>Web References</b>			
1. <a href="https://nptel.ac.in/courses/112107291/">https://nptel.ac.in/courses/112107291/</a>			
2. <a href="https://nptel.ac.in/courses/112/103/112103262/">https://nptel.ac.in/courses/112/103/112103262/</a>			
3. <a href="https://ocw.mit.edu/courses/mechanical-engineering/2-61-internal-combustion-engines-spring-2017/lecture-notes/">https://ocw.mit.edu/courses/mechanical-engineering/2-61-internal-combustion-engines-spring-2017/lecture-notes/</a>			
4. <a href="https://nptel.ac.in/courses/105102088/">https://nptel.ac.in/courses/105102088/</a>			
5. <a href="https://nptel.ac.in/courses/105104101/">https://nptel.ac.in/courses/105104101/</a>			

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
2	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
3	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
4	3	1	-	-	-	-	-	-	-	-	-	1	-	-	-
5	3	1	-	-	-	-	-	-	-	-	-	1	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	EEE	Programme: <b>B.Tech.</b>						
Semester	I	Course Category: <b>ES</b>			*End Semester Exam Type: <b>TE</b>			
Course Code	U23EETC01	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	AM	ESE	TM
Course Name	<b>ELECTRICAL TECHNOLOGY</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
Prerequisite	Mathematics and Physics							
Course Outcome	<b>On completion of the course, the students will be able to</b>							BT Mapping (Highest Level)
	<b>CO1</b>	Demonstrate the basics of domestic wiring, including the factors that influence the choice of wiring systems in residential buildings.						<b>K3</b>
	<b>CO2</b>	Understand the operation of transformers and their applications.						<b>K2</b>
	<b>CO3</b>	Explain the DC generators and motors, including their construction, principles of operation, and its characteristics.						<b>K2</b>
	<b>CO4</b>	Interpret the construction and working of AC machines for various applications.						<b>K2</b>
	<b>CO5</b>	Describe and compare the operation of special machines.						<b>K2</b>

<b>UNIT-I</b>	<b>BASICS OF ELECTRICAL ENERGY</b>	<b>Periods:09</b>
Introduction, conventional and non- conventional sources of Electrical Energy, Domestic wiring, Factors affecting the choice of wiring system, Types of Wires and cables, Types of Wiring, Typical House Wiring Circuits, Basics of Utility Supply, Knowledge about distribution box, MCB, plug types, fuses, insulators, live wire, neutral wire, Earthing and its types, construction and working of incandescent lamp, CFL and LED lamps.		<b>CO1</b>
<b>UNIT-II</b>	<b>TRANSFORMERS</b>	<b>Periods:09</b>
<b>Single phase transformer:</b> construction, principle of operation, EMF equation, Types, Phasor diagram, Equivalent circuit, Voltage Regulation, losses and efficiency. Load test. <b>Auto transformers:</b> construction, copper saving. Introduction to three phase transformer-Power Measurement using two Wattmeter methods.		<b>CO2</b>
<b>UNIT-III</b>	<b>DC MACHINES</b>	<b>Periods:09</b>
<b>DC Generator:</b> Construction, Principles of operation, Types, EMF equation, OCC and Load characteristics of series and shunt generator. <b>DC motor:</b> Principle of operation, Types, Torque Equation, electrical and mechanical characteristics of series and shunt motor, Speed control methods and applications, Need for starters and its types.		<b>CO3</b>
<b>UNIT-IV</b>	<b>AC MACHINES</b>	<b>Periods:09</b>
<b>Three phase Induction Motor:</b> Construction, principle of operation, Types, torque equation, Slip-torque characteristics. <b>Single Phase Induction Motor:</b> construction, principle of operation and starting methods. <b>Alternator:</b> Construction, Principles of operation, Types, EMF equation, Voltage regulation. <b>Synchronous motor:</b> Construction, Methods of starting, V and inverted V curves.		<b>CO4</b>
<b>UNIT-V</b>	<b>SPECIAL MACHINES</b>	<b>Periods:09</b>
<b>Servo motor:</b> DC and AC servomotors. <b>Stepper motors:</b> variable reluctance and permanent magnet stepper motors. Reluctance motor, Hysteresis motor, Universal motor, Repulsion motor and BLDC motor -Applications		<b>CO5</b>
<b>LecturePeriods:45</b>	<b>TutorialPeriods:-</b>	<b>PracticalPeriods:-</b>
<b>TotalPeriods:45</b>		



**Text Books**

1. B.L. Theraja, "Electrical Technology Vol.- II AC/DC Machines", S. Chand, 2008
2. D. C. Kulshreshtha, "Basic Electrical Engineering", Tata McGraw Hill Education Private Limited, 2<sup>nd</sup> Edition, 2019.
3. D. P. Kothari and I. J. Nagrath, "Electric Machines", Tata McGraw Hill Publishing Company Ltd, 5<sup>th</sup> Edition, 2017.

**Reference Books**

1. V. K. Mehta & Rohit Mehta, "Principle of Electrical Machines", S. Chand Publishers, 2014.
2. D Kothari, I Nagrath, "Basic Electrical Engineering", Tata McGraw Hill Education, 4<sup>th</sup> Edition, 2019.
3. M. S. Sukhija, T. K Nagsarkar, "Basic Electrical Engineering", Oxford University Press, 2011.
4. S. K. Sahdev, "Fundamentals of Electrical Engineering and Electronics", Dhanpat Rai and Co, 2017.
5. E.G. Janardanan, "Special Electrical Machines", Prentice Hall India Learning Private Limited, 2014

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1. <https://www.coursera.org/lecture/linear-circuits-ac-analysis/5-1-transformers-dB0z9>
2. <https://www.elprocus.com/alternating-current-and-direct-current-and-its-applications/>
3. <https://www.electronicshub.org/electrical-systems-and-methods-of-electrical-wiring/>
4. <https://nptel.ac.in/courses/108/105/108105017/>
5. <https://lecturenotes.in/course/all/btech/electrical-engineering>

\* TE – Theory Exam, LE – Lab Exam

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	1	2	-	1	-	-	-	1	1	3	2	-
2	3	3	3	1	2	-	1	-	-	-	1	1	3	2	-
3	3	3	3	1	2	-	1	-	-	-	1	1	3	2	-
4	3	3	3	1	2	-	1	-	-	-	1	1	3	2	-
5	3	3	3	1	2	-	1	-	-	-	1	1	3	2	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	ECE	Programme: <b>B.Tech.</b>						
Semester	I	Course Category: <b>PC</b>			*End Semester Exam Type: <b>TE</b>			
Course Code	<b>U23ECT101</b>	<b>Periods/Week</b>			<b>Credit Maximum Marks</b>			
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CAM</b>	<b>ESE</b>	<b>TM</b>
Course Name	<b>Circuits and Networks</b>	3	-	-	3	25	75	100
Prerequisite	Basics of active and passive components							
<b>Course Outcome</b>	On completion of the course, the students will be able to						BT Mapping (Highest Level)	
	CO1	Infer the fundamental laws and elements of electrical <i>circuits</i> .						K2
	CO2	Apply the knowledge of basic circuital theorems and simplify the network.						K3
	CO3	Evaluate Steady state response and understand alternating current and voltages.						K3
	CO4	Demonstrate the concepts of two port networks and solve different Network Functions and parameters.						K3
	CO5	Design the different passive filters and attenuators for various applications						K3

<b>UNIT-I</b>	<b>CIRCUIT ELEMENTS AND KIRCHHOFF'S LAWS</b>	<b>Periods: 12</b>
Basic definitions: Voltage, Current, Power and Energy -Resistance Parameter, Inductance Parameter, Capacitance Parameter - Independent Energy Sources - Kirchhoff's Voltage Law, Kirchhoff's Current Law - Voltage and current Division rule - Power in Series and parallel Circuits - Star Delta transformation - Source Transformation Technique.		CO1
<b>UNIT-II</b>	<b>CIRCUIT THEOREMS FOR ANALYSING AC &amp; DC CIRCUITS (Independent sources only)</b>	<b>Periods: 12</b>
Introduction- Nodal Analysis, Mesh Analysis - Superposition Theorem - Thevenin's Theorem - Norton's Theorem- Reciprocity Theorem - Compensation Theorem - Maximum Power Transfer Theorem - Duals and Duality - Tellegen's Theorem - Millman's Theorem - Application of theorems to DC and AC circuits		CO2
<b>UNIT-III</b>	<b>ALTERNATING CURRENTS &amp; VOLTAGES AND STEADY-STATE RESPONSE</b>	<b>Periods: 12</b>
The Sine Wave, Angular Relation, The sine wave equation, Voltage and Current Values of a Sine Wave, Phase Relation - Pure Resistor, Pure Inductor, Pure Capacitor; Impedance Diagram, Phasor Diagram, Computation of active, reactive and apparent powers- power triangle, power factor Steady State Response: DC Response of an R-L Circuit, DC Response of an R-C Circuit, DC Response of an R-L-C Circuit		CO3
<b>UNIT-IV</b>	<b>TWO PORT NETWORK FUNCTIONS AND PARAMETERS</b>	<b>Periods: 12</b>
Introduction to two port networks- Driving point impedance and admittance, Transfer impedance and admittance, Voltage and current Transfer ratio, Concept of pole-zeros in network function - Open circuit impedance (Z) parameters - short circuit admittance (Y) parameters - transmission (ABCD) parameters and inverse transmission parameters - Hybrid (h) parameters and inverse hybrid parameters - Conversion between parameters		CO4
<b>UNIT-V</b>	<b>FILTERS AND ATTENUATORS</b>	<b>Periods: 12</b>
Fundamentals of filters, types of filters- low pass, high pass, band pass and band elimination filters, Constant K-filters. Attenuators: Symmetric and asymmetric attenuators- T-attenuators and $\pi$ -attenuators only		CO5
<b>Lecture Periods: 60</b>		<b>Tutorial Periods: -</b>
<b>Practical Periods: -</b>		<b>Total Periods: 60</b>

**Textbooks**

1. A Sudhakar and Shyammohan S. Palli, "Circuits and Networks: Analysis and Synthesis", McGraw Hill Education, Fifth edition July 2017
2. A William Hayt, "Engineering Circuit Analysis" 8th Edition, McGraw-Hill Education, 2016

**Reference Books**

1. Valkenberg V., "Network Analysis", 3rd Ed., Prentice Hall International Edition. 2007.
2. Hayt and Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, New Delhi, 8th Ed, 2013.
3. Kuo F. F., "Network Analysis and Synthesis", 2nd Ed., Wiley India. 2008.
4. PM Chandrashekaraiyah, "Electric Circuit and Network Analysis" First edition, CBS Publishers, 2015.
5. Joseph A. Edminister, Mahmood Maqvi, "Electric Circuits", Schaum's Outline Series, 5th edition, TMH Publishers, 2016

**Web References**

1. [https://www.tutorialspoint.com/network\\_theory/network\\_theory\\_twoport\\_parameter\\_conversions.htm](https://www.tutorialspoint.com/network_theory/network_theory_twoport_parameter_conversions.htm)
2. <https://www.allaboutcircuits.com/textbook/alternating-current/chpt-8/low-pass-filters/>
3. <https://nptel.ac.in/courses/108/105/108105159/>
4. <https://www.newtondesk.com/network-theory-handwritten-study-notes/>
5. <https://lecturenotes.in/subject/25/network-theory-nt>

\* TE - Theory Exam, LE - Lab Exam

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	1	-	-	-	-	-	-	1	3	2	-
2	3	3	3	3	1	-	-	-	-	-	-	1	3	2	-
3	3	3	3	3	1	-	-	-	-	-	-	1	3	2	-
4	3	3	3	3	1	-	-	-	-	-	-	1	3	2	-
5	3	3	3	3	1	-	-	-	-	-	-	1	3	2	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	English		Programme: <b>B.Tech.</b>							
Semester	I		Course Category: <b>HS</b>				End Semester Exam Type: <b>TE</b>			
Course Code	<b>U23ENBC01</b>		Periods/Week			Credit	Maximum Marks			
			L	T	P	C	CAM	ESE	TM	
Course Name	<b>Communicative English - I</b>		<b>2</b>	<b>-</b>	<b>2</b>	<b>3</b>	<b>50</b>	<b>50</b>	<b>100</b>	
(Common to ALL Branches except CSBS)										
Prerequisite	Basics of English Language									
Course Outcomes	<b>On completion of the course, the students will be able to</b>							BT Mapping (Highest Level)		
	<b>CO1</b>	Understand the communication flow in organization and its objectives							<b>K2</b>	
	<b>CO2</b>	Write the technical contents with grammatically precise sentences							<b>K2</b>	
	<b>CO3</b>	Articulate with correct pronunciation and overcome vernacular impact in speaking							<b>K3</b>	
	<b>CO4</b>	Express opinions confidently in formal and informal communicative contexts							<b>K2</b>	
	<b>CO5</b>	Attend interview with assertiveness							<b>K3</b>	

<b>UNIT- I</b>	<b>Workstead Communication</b>	<b>Periods:10</b>
Communication, Definition, Process, Channels, Barriers, Strategies for Effective Communication, Verbal and Nonverbal Communication - Listening, Types, Barriers, Enhancing Listening Skills - Bibliography: Book, Journal and Internet References		<b>CO1</b>

<b>UNIT- II</b>	<b>Common Errors In Writing And Comprehension Strategies</b>	<b>Periods:10</b>
Subject Verb Agreement, Misplaced Modifiers, Squinting Modifiers, Dangling Modifier, Fused Sentence, Comma Splice, Sentence Fragment - Reading Comprehension: Technical passage, Strategies: Skimming, Scanning, Intensive and Extensive Reading, Prediction, and Contextual Meaning		<b>CO2</b>

<b>UNIT- III</b>	<b>Phonetics</b>	<b>Periods:10</b>
Pronunciation Guidelines to consonants and vowels, Sounds Mispronounced, Silent and Non-silent Letters, Intonation, Spelling Rules and Words often misspelled, Mother Tongue Influence (MTI), Various Techniques for Neutralization of Mother Tongue		<b>CO3</b>

<b>UNIT- IV</b>	<b>Communication Practice-I</b>	<b>Periods:15</b>
<b>List of Exercises</b> <b>Listening:</b> Self Introduction videos <b>Speaking:</b> Self-Introduction, Extempore, and Role Play <b>Reading:</b> Non-Technical Comprehension Passage <b>Writing:</b> Common Errors in Writing		<b>CO4</b>

<b>UNIT-V</b>	<b>Interpersonal Communication-I</b>	<b>Periods:15</b>
<b>List of Exercises</b> <b>Listening:</b> Speech Sounds, Interview Videos <b>Speaking:</b> Debate, Structured Group Discussion, and Conversation <b>Reading:</b> Commonly Confused Words <b>Writing:</b> Transcription		<b>CO5</b>
<b>Lecture Periods:30</b>		<b>Tutorial Periods:-</b>
<b>Practical Periods:30</b>		<b>Total Periods:60</b>

<b>Text Books</b>
1. Richa Mishra , Ratna Rao, "A textbook of English Language Communication Skills", Macmillan Publishers India Private Ltd., Revised Edition 2021. 2. Rizvi M. Ashraf, "Effective Technical Communication", New Delhi: Tata-McGraw-Hill Publishing Company Limited, 4th Edition, 2010. 3. Balasubramanian T, "English Phonetics for Indian students workbook", 2nd Edition, Trinity Press, 2016.
<b>Reference Books</b>
1. N.P.Sudharshana, C. Savitha," English for Engineers", Cambridge University Press, 2018.

2. Raman, Meenakshi, and Sharma, Sangeetha, "Technical Communication - Principles and Practice", 3rd Edition, Oxford University Press, 2017.
3. Comfort, Jeremy, Tal., "Speaking Effectively: Developing Speaking Skills for Business English", Cambridge University Press, Cambridge, Reprint 2011.
4. Wren & Martin, "High School English Grammar and Composition", S Chandh & Co. Ltd, 2015.
5. Boove, Courtland L, "Business Communication Today", Pearson Education, New Delhi, 2002.

**Web References**

1. <https://lemongrad.com/subject-verb-agreement-rules/>
2. <https://opentextbc.ca/advancedenglish/chapter/misplaced-and-dangling-modifiers/>
3. <https://www.hitbullseye.com/Reading-Comprehension-Tricks.php>
4. <https://www.softwaretestinghelp.com/how-to-crack-the-gd/>
5. <https://worldscholarshipvault.com/neutralize-mother-tongue-interference/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
2	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
3	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
4	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
5	1	-	-	-	-	-	-	-	1	3	-	1	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Theory						
Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	5	5	5	5	75	60
	20( to be weighted for 10 marks)				(to be weighted for 50 marks)	

Practical					
Continuous Assessment Internal Evaluation			End Semester Internal Evaluation		Total Marks
30(to be weighted for 10 marks)			30 marks		40
Listening (L)*	10		Listening (L)*	10	
Speaking(S)	5		Speaking(S)	5	
Reading(R)*	10		Reading(R)*	10	
Writing(W)*	5		Writing(W)*	5	

LRW components of Practical can be evaluated through Language Lab Software

Department	Mechanical Engineering			Programme : B.Tech.							
Semester	I			Course Category: ES			End Semester Exam Type: LE				
Course Code	U23ESPC02			Periods/Week			Credit	Maximum Marks			
				L	T	P	C	CAM	ESE	TM	
Course Name	Design Thinking and Idea Laboratory			-	-	2	1	50	50	100	
(Common to ALL Branches)											
Prerequisite	Basic Knowledge of Science										
Course Outcomes	On completion of the course, the students will be able to								BT Mapping (Highest Level)		
	CO1	Demonstrate a comprehensive understanding of the tools and inventory associated with the IDEA Lab.								K2	
	CO2	Develop proficiency in ideation techniques to generate creative and innovative solutions for various design challenges and problems								K3	
	CO3	Acquire practical knowledge of mechanical and electronic fabrication processes, including hands-on experience with machinery, tools, and techniques used in the manufacturing and assembly of physical components.								K3	
	CO4	Cultivate the skills necessary for developing innovative and desirable products, including the ability to integrate user needs, market trends, and technological advancements into the design process.								K4	
	CO5	Apply iterative design methodologies to refine and improve solutions based on feedback, user testing, and evaluation of functional, aesthetic, and usability aspects								K4	
<p><b>Design process:</b> Traditional design, Design thinking, Existing sample design projects, Study on designs around us, Compositions/structure of a design, Innovative design: Breaking of patterns, Reframe existing design problems, Principles of creativity Empathy: Customer Needs, Insight-leaving from the lives of others/standing on the shoes of others, Observation</p> <p><b>Design team-Team formation, Conceptualization:</b> Visual thinking, Drawing/sketching, New concept thinking, Patents and Intellectual Property, Concept Generation Methodologies, Concept Selection, Concept Testing, Opportunity identification Prototyping: Principles of prototyping, Prototyping technologies, Prototype using simple things, Wooden model, Clay model, 3D printing; Experimenting/testing.</p> <p>Sustainable product design, Ergonomics, Semantics, Entrepreneurship/business ideas, Product Data Specification, Establishing target specifications, Setting the final specifications. Design projects for teams.</p> <p><b>List of Lab Activities and Experiments</b></p> <ol style="list-style-type: none"><li>1. Schematic and PCB layout design of a suitable circuit, fabrication and testing of the circuit.</li><li>2. Machining of 3D geometry on soft material such as softwood or modelling wax.</li><li>3. 3D scanning of computer mouse geometry surface. 3D printing of scanned geometry using FDM or SLA printer.</li><li>4. 2D profile cutting of press fit box/casing in acrylic (3 or 6 mm thickness)/cardboard, MDF (2 mm) board using laser cutter &amp; engraver.</li><li>5. 2D profile cutting on plywood /MDF (6-12 mm) for press fit designs.</li><li>6. Familiarity and use of welding equipment.</li><li>7. Familiarity and use of normal and wood lathe.</li><li>8. Embedded programming using Arduino and/or Raspberry Pi.</li><li>9. Design and implementation of a capstone project involving embedded hardware, software and machined or 3D printed enclosure.</li><li>10. Discussion and implementation of a mini project.</li><li>11. Documentation of the mini project (Report and video).</li></ol>											
Lecture Periods: -		Tutorial Periods: -		Practical Periods: 30				Total Periods: 30			

**Text Books**

1. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, HarperCollins Publishers Ltd
2. Workshop / Manufacturing Practices (with Lab Manual), Khanna Book Publishing.

**Reference Books**

1. Ulrich and Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004
2. The Big Book of Maker Skills: Tools & Techniques for Building Great Tech Projects. Chris Hackett. Weldon Owen; 2018.
3. The Total Inventors Manual (Popular Science): Transform Your Idea into a Top-Selling Product. Sean Michael Ragan, Weldon Owen; 2017.
4. The Art of Electronics. 3rd edition. Paul Horowitz and Winfield Hill. Cambridge University Press.
5. Practical Electronics for Inventors. 4th edition. Paul Sherz and Simon Monk. McGraw Hill.
6. Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Boards. Simon Monk and Duncan Amos. McGraw Hill Education.
7. Programming Arduino: Getting Started with Sketches. 2nd edition. Simon Monk. McGraw Hill.
8. Venuvinod, PK., MA. W., Rapid Prototyping – Laser Based and Other Technologies, Kluwer
9. Chapman W.A.J, "Workshop Technology", Volume I, II, III, CBS Publishers and Distributors, 5th Edition, 2002.

**Web References**

1. [https://onlinecourses.nptel.ac.in/noc23\\_mg72](https://onlinecourses.nptel.ac.in/noc23_mg72)

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	2	2	-	-	2	-	3	2	-	-	-
2	3	3	3	2	2	2	-	-	2	-	3	2	-	-	-
3	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-
4	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-
5	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100

Department	EEE			Programme: <b>B.Tech.</b>							
Semester	I			Course Category: <b>ES</b>		*End Semester Exam Type: <b>LE</b>					
Course Code	<b>U23EEPC01</b>			Periods/Week		Credit	Maximum Marks				
				L	T	P	C	CAM	ESE	TM	
Course Name	<b>ELECTRICAL TECHNOLOGY LABORATORY</b>			-	-	<b>2</b>	<b>1</b>	<b>50</b>	<b>50</b>	<b>100</b>	
Prerequisite	<b>Mathematics and Physics</b>										
Course Outcome	On completion of the course, the students will be able to								BT Mapping (Highest Level)		
	<b>CO1</b>	Understand the practical aspects of domestic wiring.								<b>K3</b>	
	<b>CO2</b>	Demonstrate the operations of various Transformers.								<b>K3</b>	
	<b>CO3</b>	Illustrate the operational details of the DC machines by conducting various tests.								<b>K3</b>	
	<b>CO4</b>	Compare the various speed control techniques of DC motors.								<b>K3</b>	
	<b>CO5</b>	Infer the performance of AC machines by conducting suitable experiments.								<b>K3</b>	
<b>List of Experiments:</b>											
1. Domestic Wiring Practice (Staircase Wiring, Doctor's Room Wiring, Godown Wiring) 2. Load test on single phase transformer. 3. Load test on 3 phase transformers 4. Measurement of three phase power using two wattmeter method 5. OCC and Load test on DC shunt Generator. 6. Load test on DC shunt motor. 7. Load test on DC series motor 8. Speed control methods of DC motor. 9. Load test on single phase Induction Motor. 10. Load test on 3 phase induction motor.											
<b>Lecture Periods:-</b>			<b>Tutorial Periods:-</b>			<b>Practical Periods: 30</b>		<b>Total Periods: 30</b>			

**Reference Books**

1. B.L. Theraja, "Electrical Technology Vol.- II AC/DC Machines", S. Chand, 2008
2. D. C. Kulshreshtha, "Basic Electrical Engineering", Tata McGraw Hill Education Private Limited, 2<sup>nd</sup> Edition, 2019.
3. D. P. Kothari and I. J. Nagrath, "Electric Machines", Tata McGraw Hill Publishing Company Ltd, 5<sup>th</sup> Edition, 2017.
4. V. K. Mehta & Rohit Mehta, "Principle of Electrical Machines", S. Chand Publishers, 2014.
5. D Kothari, I Nagrath, "Basic Electrical Engineering", Tata McGraw Hill Education, 4<sup>th</sup> Edition, 2019.
6. M. S. Sukhija, T. K Nagsarkar, "Basic Electrical Engineering", Oxford University Press, 2011.

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1. <https://www.electrical4u.com/electric-machines/>
2. <https://www.javatpoint.com/electrical-machines-tutorial>
3. <https://www.coursera.org/lecture/linear-circuits-ac-analysis/5-1-transformers-dB0z9>
4. <https://www.elprocus.com/alternating-current-and-direct-current-and-its-applications/>
5. <https://www.electronicshub.org/electrical-systems-and-methods-of-electrical-wiring/>



**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	-	2	-	-	-	3	-	-	1	3	1	-
2	3	2	1	-	2	-	-	-	3	-	-	1	3	1	-
3	3	2	1	-	2	-	-	-	3	-	-	1	3	1	-
4	3	2	1	-	2	-	-	-	3	-	-	1	3	1	-
5	3	2	1	-	2	-	-	-	3	-	-	1	3	1	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100

Department	<b>ECE</b>	Programme: <b>B.Tech.</b>						
Semester	<b>I</b>	Course Category: <b>PC</b> *End Semester Exam Type: <b>LE</b>						
Course Code	<b>U23ECP101</b>	Periods / Week			Credit	Maximum Marks		
		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CAM</b>	<b>ESE</b>	<b>TM</b>
Course Name	<b>Circuits and Networks Laboratory</b>	0	0	2	1	50	50	100

<b>Prerequisite</b>			
Course Outcome	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	<b>CO1</b>	Familiarize with the fundamentals of basic circuit elements.	K2
	<b>CO2</b>	Perform Analysis and verification of network theorems	K2
	<b>CO3</b>	Develop the application of theoretical concepts on circuits	K3
	<b>CO4</b>	Illustrate various network parameters.	K4
	<b>CO5</b>	Demonstrate the concepts of two port networks and simulation models	K4

**List of Exercises**

1. Study of passive and active components
2. Construction of series and parallel circuits using resistors and verification using KVL and KCL
3. Verification of mesh and nodal analysis
4. Verification of Thevenin's and Norton's Theorem
5. Verification of superposition Theorem
6. Verification of maximum power transfer theorem
7. DC response of RL, RC and RLC circuits
8. Determination of Z and Y parameters of a two-port network.
9. Determination of ABCD and h parameters of a two-port network.
10. Design of LPF and HPF using passive components
11. Simulate an LPF and HPF using PSPICE simulation tool and compare the results

Lecture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30
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**Reference Books**

1. Valkenberg V., "Network Analysis", 3rd Ed., Prentice Hall International Edition. 2007.
2. Hayt and Kemmerly, "Engineering Circuit Analysis," McGraw Hill Education, New Delhi, 8th Ed, 2013.
3. Kuo F. F., "Network Analysis and Synthesis", 2nd Ed., Wiley India, 2008.
4. PM Chandrashekaraiyah, "Electric Circuit and Network Analysis" First edition, CBS Publishers, 2015.
5. Joseph A. Edminister, Mahmood Maqvi, "Electric Circuits," Schaum's Outline Series, 5<sup>th</sup> edition, TMH Publishers, 2016

**Web References**

1. [https://phet.colorado.edu/sims/html/circuit-construction-kit-dc-virtual-lab/latest/circuit-construction-kit-dc-virtual-lab\\_en.html](https://phet.colorado.edu/sims/html/circuit-construction-kit-dc-virtual-lab/latest/circuit-construction-kit-dc-virtual-lab_en.html)
2. <https://www.circuitlab.com/editor/#?id=7pq5wm&from=homepage>
3. <http://vlabs.iitkgp.ac.in/be/#>
4. <http://www.allaboutcircuits.com/technical-articles/an-introduction-to-filters/>
5. [http://www.learnabout-electronics.org/ac\\_theory/filters81.php](http://www.learnabout-electronics.org/ac_theory/filters81.php)

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	-	-	-	-	-	-	-	-	3	2	2
2	3	3	3	3	-	-	-	-	-	-	-	-	3	2	2
3	3	3	3	3	-	-	-	-	-	-	-	-	3	2	2
4	3	3	3	3	-	-	-	-	-	-	-	-	3	2	2
5	3	3	3	3	3	-	-	-	-	-	-	-	3	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 – High

### Evaluation Method

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100

Department	<b>ECE</b>			Programme: <b>B.Tech.</b>				
Semester	<b>I</b>			Course Category : <b>MC</b>		End Semester Exam Type: -		
Course Code	<b>U23ECM101</b>			Periods / Week		Credit	Maximum Marks	
				L	T	P	C	CAM
Course Name	<b>Induction Program - (UHV-I)</b>			-	-	-	Non-Credit	-
Prerequisite	-							
Course Outcomes	<b>On completion of the course, the students will be able to</b>							BT Mapping (Highest Level)
	CO1	Develop holistic attitude and harmony in the individual, family, and Society						<b>K2</b>
	CO2	Acquire grammar skills and capable to write and speak English confidently						<b>K2</b>
	CO3	Understand the basic concepts in Mathematics and Programming						<b>K2</b>
	CO4	Know about the art and culture, language and literature of this vast secular nation						<b>K2</b>
	CO5	Identify the inherent talent and develop it professionally						<b>K3</b>

<b>UNIT-I</b>	<b>Universal Human Values</b>	<b>Periods: 12</b>
Welcome and Introductions - Getting to know each other, Aspirations and Concerns - Individual Academic and Career, Expectations of Family, Peers, Society, Nation, Fixing one's Goals, Self-Management - Self-confidence, Peer Pressure, Time Management, Anger, Stress Personality Development, Self-improvement, Health - Health issues, Healthy diet, Healthy lifestyle, Hostel life, Relationships - Home sickness, Gratitude towards Parents, Teachers and others Ragging and interaction, Competition and Cooperation, Peer Pressure, Society - Participation in Society, Natural Environment - Participation in Nature, Sum Up - Role of Education, Need for a Holistic Perspective, Self-evaluation and Closure - Sharing and feedback.		<b>CO1</b>
<b>UNIT-II</b>	<b>Proficiency in English</b>	<b>Periods: 12</b>
Communication skills - Prognostic test on Grammar - Synonyms, Antonyms, Tenses, Sentence Completion, Idioms and Phrases, One-word Substitution, Homophones, Homonyms, Use of Prepositions, Subject-verb Agreement - Writing - Paragraph writing, Letter writing, Essay writing, Story Development.		<b>CO2</b>
<b>UNIT-III</b>	<b>Bridge Course in Mathematics and C Programming</b>	<b>Periods: 12</b>
<b>Mathematics:</b> Fundamentals of differential and integral calculus: Theory and Practice, Limit of function - Fundamental results on limits - Continuity of a function - Concept of differentiation - Concept of derivative - Slope of a curve - Differentiation Techniques - Derivatives of elementary functions from first principle - Derivatives of inverse functions - Logarithmic differentiation - Method of substitution - Differentiation of parametric functions - Differentiation of implicit functions - Higher order derivatives. Integrals of functions containing linear functions - Method of integration (Decomposition method, method of substitution, integration by parts) - Definite integrals. Simple definite integrals - Properties of Definite integrals - Reduction formulae - Area and volume - Length of curve - surface area of a solid. <b>C Programming:</b> Features of C and its basic Structure - Keywords - constants - variables - operators - Data types - Formatted input and output statements - Control and Looping statement - Arrays - Functions - Strings - writing simple C programs.		<b>CO3</b>
<b>UNIT-IV</b>	<b>Literary Activities</b>	<b>Periods: 12</b>
Team building activities - Quiz - Oral Exercises - Group discussion, Debate, Extempore, Role play, சிறப்பு சொற்பொழிவு - தமிழர் மரபு மற்றும் தமிழர் தொழில்நுட்பம்.		<b>CO4</b>
<b>UNIT-V</b>	<b>Creative Arts</b>	<b>Periods: 12</b>
Introduction to painting and renowned artworks - Documentary and Short films - Music - Vocal, Instrumental - Dance - Classical, Cinematic - Mimicry - Mime.		<b>CO5</b>
<b>Lecture Periods: 60</b>		<b>Tutorial Periods: -</b>
<b>Practical Periods: -</b>		<b>Total Periods: 60</b>

### Reference Books

1. R.R Gaur, R. Asthana, G.P. Bagaria," A Foundation Course in Human Values and Professional Ethics", Excel Books, New Delhi, 2<sup>nd</sup> Revised Edition, 2019.
2. Kumar Mohan R, "English Grammar for all (Functional and Applied Grammar)", Unicare Academy, 2022.
3. Seely, John," Oxford A-Z of Grammar and Punctuation, Oxford Publication, 2013.
4. B.V. Ramana," Higher Engineering Mathematics", Tata McGraw – Hill, New Delhi, 6<sup>th</sup> Edition, 2018.
5. Dr. A. Singaravelu, "Engineering Mathematics - I", Meenakshi publications, Tamil Nadu, 2019.
6. E. Balagurusamy, "PROGRAMMING IN ANSI C", Mc Graw Hill, 8<sup>th</sup> Edition, 2019.
7. Dr.K.K.Pillay,"Social Life of Tamils", A joint publication of TNTB & ESC and RMRL
8. R.Balakrishnan, "Journey of Civilization",Roja muthiah research publishers, 1<sup>st</sup> Edition 2019
9. தமிழக வரலாறு - மக்களும் பண்பாடும், பிள்ளை, கே. கே. , சென்னை : உலகத் தமிழாராய்ச்சி நிறுவனம் , 2002.
10. கணினித்தமிழ் - முனைவர் இல.சுந்தரம், விகடன் பிரசுரம்.
11. கீழடி - வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம், தமிழக தொல்லியல் துறை

### Web References

1. <http://www.newsociety.com/Books/S/Slow-isBeautiful>
2. <https://www.aplustopper.com/formal-letter/>
3. <https://www.javatpoint.com/c-programming-language-tutorial>
4. <http://www.math.cum.edu/~wn0g/2ch6a.pdf>
5. <https://education.nsw.gov.au/teaching-and-learning/curriculum/creative-arts>

## SEMESTER-II

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC02	Engineering Mathematics-II	BS	3	1	0	4	25	75	100
2	U23ESTC02	Engineering Mechanics	ES	3	0	0	3	25	75	100
3	U23CSTC01	Programming in C	ES	3	0	0	3	25	75	100
4	U23ECT202	Electron Devices	PC	3	0	0	3	25	75	100
5	U23HSTC01	Universal Human Values - II	HS	2	0	0	2	25	75	100
Theory cum Practical										
6	U23ENBC02	Communicative English - II	HS	2	0	2	3	50	50	100
Practical										
7	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
8	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
9	U23ECP202	Electron Devices Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
10	U23ECC2XX	Certification Course – II	AEC	0	0	4	-	100	-	100
Mandatory Course										
11	U23ECM202	Sports and Yoga or NSS/NCC	MC	0	0	2	-	100	-	100
Total							21	525	575	1100

Department	<b>Mathematics</b>	Programme : <b>B.Tech.</b>						
Semester	<b>II</b>	Course Category : <b>BS</b>			End Semester Exam Type : <b>TE</b>			
Course Code	<b>U23MATC02</b>	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	<b>ENGINEERING MATHEMATICS – II</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
(Common to ALL Branches Except CSBS, FT)								
Prerequisite	Basic Mathematics							
Course Outcome	On completion of the course, the students will be able to						BT Mapping (Highest Level)	
	<b>CO1</b>	Convert a periodic function into series form.						<b>K2</b>
	<b>CO2</b>	Compute Fourier transforms of various functions.						<b>K3</b>
	<b>CO3</b>	Solve Differential Equations using Laplace transforms.						<b>K3</b>
	<b>CO4</b>	Apply inverse Laplace transform of simple functions.						<b>K3</b>
	<b>CO5</b>	Solve difference equations using Z – transforms.						<b>K3</b>

<b>UNIT – I</b>	<b>FOURIER SERIES</b>	<b>Periods:12</b>
Dirichlet's conditions – General Fourier series – Odd and Even functions – Half-Range sine series and cosine series – Change of intervals – Parseval's Identity.		<b>CO1</b>
<b>UNIT – II</b>	<b>FOURIER TRANSFORMS</b>	<b>Periods:12</b>
Fourier Transforms and its inverse – Properties of Fourier Transform (without proof) – Fourier sine and cosine Transforms and their properties (excluding proof).		<b>CO2</b>
<b>UNIT – III</b>	<b>LAPLACE TRANSFORMS</b>	<b>Periods:12</b>
Laplace transforms of elementary functions and Periodic functions – Basic properties (excluding proof) – Laplace transforms of derivatives and integrals – Initial and final value theorems.		<b>CO3</b>
<b>UNIT – IV</b>	<b>INVERSE LAPLACE TRANSFORMS</b>	<b>Periods:12</b>
Definition of inverse Laplace Transforms – Convolution theorem (excluding proof) – Solutions of Linear Ordinary Differential Equations of second order with constant coefficients.		<b>CO4</b>
<b>UNIT – V</b>	<b>Z – TRANSFORMS</b>	<b>Periods:12</b>
Z-transforms – Elementary Properties – Inverse Z-transforms (using partial fraction and Residues) – Solution of difference equations using Z - transform.		<b>CO5</b>
<b>Lecture Periods: 45</b>	<b>Tutorial Periods: 15</b>	<b>Practical Periods: -</b>
<b>Total Periods: 60</b>		

**Text Books**

1. T. Veerarajan, "Engineering Mathematics", Tata McGraw Hill, New Delhi, 3<sup>rd</sup> Edition, 2011.
2. C. P. Gupta, Shree Ram Singh. M. Kumar, "Engineering Mathematics for semester I & II", Tata McGraw Hill, New Delhi, 2<sup>nd</sup> Edition, 2016.
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand, New Delhi, 22<sup>nd</sup> Edition 2019.

**Reference Books**

1. N.P. Bali and Dr. Manish Goyal, "A TEXTBOOK OF ENGINEERING MATHEMATICS", UNIVERSITY SCIENCE PRESS, India, 8<sup>th</sup> Edition, 2016.
2. P. Sivaramakrishna Das and C. Vijayakumari, "Engineering Mathematics", Pearson India Education services Pvt. Ltd, India 1<sup>st</sup> 2017.
3. Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons, New Delhi, 10<sup>th</sup> Edition, 2019.
4. G. Balaji, "Engineering Mathematics - Transforms and Partial Differential Equations", G. Balaji Publishers, 18<sup>th</sup> Edition, 2022.
5. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill, New Delhi, 2017.

**Web References**

1. <https://nptel.ac.in/courses/111105121/>
2. <https://nptel.ac.in/courses/111105035/>
3. <https://nptel.ac.in/courses/11110711>
4. [https://swayam.gov.in/nd1\\_noc20\\_ma17/preview](https://swayam.gov.in/nd1_noc20_ma17/preview)
5. <https://nptel.ac.in/courses/111/103/111103021/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	-	-	1	-	-	-	-	-	1	1	-	-
2	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-
3	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-
4	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-
5	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus



Department	<b>Mechanical Engineering</b>	Programme : <b>B.Tech.</b>						
Semester	<b>II</b>	Course Category: <b>ES</b>			End Semester Exam Type: <b>TE</b>			
Course Code	<b>U23ESTC02</b>	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	<b>ENGINEERING MECHANICS</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
(Common to EEE, ECE, MECH, CIVIL, Mechatronics Branches)								
Prerequisite	Engineering Physics							
Course Outcomes	<b>On completion of the course, the students will be able to</b>							BT Mapping (Highest Level)
	<b>CO1</b>	Recognize the basics of equilibrium of particles in 2D and 3D						<b>K2</b>
	<b>CO2</b>	Review the requirements of equilibrium of rigid bodies in 2D and 3D.						<b>K2</b>
	<b>CO3</b>	Solve problem related to friction force.						<b>K3</b>
	<b>CO4</b>	Compute the center of mass and moment of inertia of surfaces and solids.						<b>K3</b>
	<b>CO5</b>	Predict displacement, velocity and acceleration of dynamic particles.						<b>K3</b>

<b>UNIT- I</b>	<b>BASICS AND STATICS OF PARTICLES</b>	<b>Periods: 09</b>
Introduction - Units and Dimensions - Vectorial representation of forces and moments – Coplanar Forces - Lami's theorem, Parallelogram and triangular Law of forces -Resolution of forces - Equilibrium of a particle - Principle of transmissibility - Equivalent system of force - Free body diagram		<b>CO1</b>
<b>UNIT- II</b>	<b>EQUILIBRIUM OF RIGID BODIES</b>	<b>Periods: 09</b>
Types of supports and their reactions -requirements of stable equilibrium - Moments and Couples - Moment of a force about a point and about an axis -Vectorial representation of moments and couples - Scalar components of a moment - Varignon's theorem -Equilibrium of Rigid bodies in two dimensions – Forces in space -Equilibrium of a particle in space - Equivalent systems of forces - Equilibrium of Rigid bodies in three dimensions (Descriptive only).		<b>CO2</b>
<b>UNIT - III</b>	<b>STRUCTURAL ANALYSIS OF TRUSSES AND FRICTION</b>	<b>Periods: 09</b>
Trusses - Definition of a truss - Simple Trusses - Analysis of Trusses - Method of joints - Method of sections - Friction force - Laws of sliding friction - equilibrium analysis of simple systems with sliding friction -wedge friction- Rolling resistance.		<b>CO3</b>
<b>UNIT - IV</b>	<b>PROPERTIES OF SURFACES AND SOLIDS</b>	<b>Periods: 09</b>
Determination of centroid of areas, volumes and mass - Pappus and Guldinus theorems - moment of inertia of plane and areas- Parallel axis theorem and perpendicular axis theorem, radius of gyration of area- product of inertia- mass moment of inertia.		<b>CO4</b>
<b>UNIT - V</b>	<b>DYNAMICS OF PARTICLES</b>	<b>Periods: 09</b>
Displacements, Velocity and acceleration, their relationship - Relative motion - Curvilinear motion - Newton's law - Work Energy Equation of particles -Impulse and Momentum -Impact of elastic bodies.		<b>CO5</b>
<b>Lecture Periods: 30</b>	<b>Tutorial Periods: 15</b>	<b>Practical Periods: -</b>
<b>Total Periods: 45</b>		
<b>Text Books</b>		
1. Beer, and Johnston Jr. E.R. "Vector Mechanics for Engineers", McGraw-Hill Education India Pvt Ltd., 11th Edition, 2016.		
2. J.L. Meriam & L.G. Karidge, Engineering Volume I and Engineering Mechanics: Dynamics, 8th edition, Wiley student edition, 2016.		
3. R.C. Hibbeller, "Engineering Mechanics", Prentice hall, 14th edition, 2016.		

**Reference Books**

1. Arthur P. Boresi and Richard J. Schmidt, "Engineering Mechanics: Statics and Dynamics", Thomson Asia
2. Private Limited, Singapore, 2010.
3. D.P.Sharma "Engineering Mechanics", Dorling Kindersley India Pvt. Ltd, New Delhi, 2010
4. S.Rajasekaran, Sankarasubramanian, G., Fundamentals of Engineering Mechanics, Vikas Publishing House Pvt., Ltd., 2012.
5. S.S.Bhavikatti and K.G. Rajashekarappa, Engineering Mechanics, New Age International(P) Ltd, New Delhi, 7th Edition, 2019.

**Web References**

1. <http://nptel.iitm.ac.in/video.php?subjectId=112103108>
2. <http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT-KANPUR/Engineeringmechanics/Table of Contents.html>
3. <https://nptel.ac.in/courses/112/106/112106286/>
4. <https://www.coursera.org/learn/engineering-mechanics-statics>
5. <https://nptel.ac.in/courses/122/104/122104014/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2
2	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2
3	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2
4	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2
5	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	<b>CSE</b>	Programme: <b>B.Tech.</b>						
Semester	<b>Second</b>	Course Category : <b>ES</b>			End Semester Exam Type: <b>TE</b>			
Course Code	<b>U23CSTC01</b>	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	<b>Programming in C</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
(Common to All Branches)								
Prerequisite	NIL							
Course Outcome	<b>On completion of the course, the students will be able to</b>						BT Mapping (Highest Level)	
	<b>CO1</b>	Comprehend the basics of Computers.						<b>K2</b>
	<b>CO2</b>	Illustrate the concepts of control structures and looping.						<b>K2</b>
	<b>CO3</b>	Implement programs using arrays and functions.						<b>K3</b>
	<b>CO4</b>	Demonstrate programs using Structure and Pointers.						<b>K3</b>
	<b>CO5</b>	Build the programs using Union and File management Operations.						<b>K3</b>

<b>UNIT-I</b>	<b>INTRODUCTION</b>	<b>Periods: 09</b>
Generation and Classification of Computers - Block Diagram of a Computer –Categories of Software – Network Structure - Number System – Binary – Decimal – Conversion – Algorithm – Pseudo code – Flow Chart.		<b>CO1</b>
<b>UNIT-II</b>	<b>C PROGRAMMING BASICS</b>	<b>Periods: 09</b>
Introduction to 'C' Programming – Basic structure of a 'C' program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in 'C' – Managing Input and Output operations – Decision Making and Branching – Looping statements.		<b>CO2</b>
<b>UNIT-III</b>	<b>ARRAYS AND FUNCTIONS</b>	<b>Periods: 09</b>
Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays. Simple programs- sorting- searching – matrix operations- Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion		<b>CO3</b>
<b>UNIT-IV</b>	<b>STRUCTURE AND POINTERS</b>	<b>Periods: 09</b>
Structure Introduction – Structure definition – Structure declaration – Structure within a structure –Self Referential Structure. Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays - Pointer to Function –Pointer and Structure- Simple programs.		<b>CO4</b>
<b>UNIT-V</b>	<b>UNIONS AND FILES</b>	<b>Periods: 09</b>
Union Introduction - Programs Using Structures and Unions – Introduction to File - File Operations - File Input and Output Functions - Random Access to Files - File System Functions - Command Line Arguments- Storage Classes - Pre-Processor Directives- Dynamic Memory Functions.		<b>CO5</b>
<b>Lecture Periods: 45</b>	<b>Tutorial Periods:</b>	<b>Practical Periods: -</b>
<b>Total Periods: 45</b>		

**Text Books**

1. Balagurusamy. E, "Programming in ANSI C", Tata McGraw Hill, 8th Edition, 2019.
2. Yashvant Kanetkar, "Let us C", BPB Publications, 16th Edition, 2017
3. Herbert Schildt, "C: The Complete Reference", McGraw Hill, Fourth Edition, 2014

**Reference Books**

1. Vikas B. Agarwal Jyoti P. Mirani, "Computer Fundamentals", Nirali Prakashan Aug-2019,
2. Ashok N Kamthane, "Computer Programming", Pearson education, Second Impression, 2012.
3. Vikas Verma, "A Workbook on C", Cengage Learning, Second Edition, 2012.
4. P. Visu, R. Srinivasan and S. Koteeswaran, "Fundamentals of Computing and Programming", Fourth Edition, Sri Krishna Publications, 2012.
5. Pradip Dev, Manas Ghosh, "Programming in C", Second Edition, Oxford University Press, 2011.

**Web References**

1. <https://www.programiz.com/c-programming>
2. <https://www.geeksforgeeks.org/c-language-set-1-introduction/>
3. <https://www.tutorialspoint.com/cprogramming>
4. <https://www.assignment2do.wordpress.com/.../solution-programming-in-ansi-c>
5. <https://nptel.ac.in/courses/106/104/106104128/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
2	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
3	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
4	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
5	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

**Evaluation Methods**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	ECE		Programme: B.Tech.						
Semester	II		Course Category: PC			*End Semester Exam Type: TE			
Course Code	U23ECT202		Periods/Week			Credit	Maximum Marks		
			L	T	P	C	CAM	ESE	TM
Course Name	Electron Devices		3	-	-	3	25	75	100
Prerequisite	Mathematics and Physics								
Course Outcome	On completion of the course, the students will be able to							BT Mapping (Highest Level)	
	CO1	Explain the basic semiconductor theory concepts about the various diodes with its applications.						K1	
	CO2	Summarize the working principle and characteristics of BJTs and its various configurations.						K2	
	CO3	Interpret the working principle and characteristics of JFET and MOSFETs.						K2	
	CO4	Explain the characteristic of Special Semiconductor devices and other power devices.						K1	
	CO5	Discuss the operation of Rectifiers and Regulators.						K2	

<b>UNIT- I</b>	<b>SEMICONDUCTOR DIODES</b>	<b>Periods: 09</b>
Diode: PN Junction Diode, Resistance Levels, Diode Equivalent Circuits, Transition and Diffusion Capacitance, Reverse Recovery Time, Zener Diodes, Point - Contact Diode. Diode Applications - Series Diode Configurations - Parallel and Series-Parallel Configurations – Clippers – Clampers - Voltage-Multiplier Circuits.		CO1
<b>UNIT- II</b>	<b>BIPOLAR JUNCTION TRANSISTORS</b>	<b>Periods: 09</b>
BJT: Construction and operation of NPN and PNP transistors- Current equations, Types of Configurations - CE, CB, CC - Early Effect. Hybrid Equivalent model, Ebers Moll Model.		CO2
<b>UNIT- III</b>	<b>FIELD EFFECT TRANSISTORS</b>	<b>Periods: 09</b>
FET: JFETs – Construction and Characteristics, - Pinch off voltage MOSFET- Characteristics- Threshold voltage -Channel length modulation, D-MOSFET, E-MOSFET-Characteristics – Comparison of MOSFET with JFET, NMOS, PMOS, CMOS.		CO3
<b>UNIT- IV</b>	<b>SPECIAL SEMICONDUCTOR DEVICES</b>	<b>Periods: 09</b>
Metal-Semiconductor Junction- Schottky barrier diode, Varactor diode, Tunnel diode, Dual-Gate MOSFET, FINFET, MESFET, PINFET, CNTFET, Gallium Arsenide device. Power Devices: Construction, operation and applications of UJT, SCR, DIAC, TRIAC		CO4
<b>UNIT- V</b>	<b>APPLICATIONS OF SEMICONDUCTOR DEVICES</b>	<b>Periods: 09</b>
Rectifiers and Filters: Half wave, Full wave and bridge rectifier, Ripple factor calculation for C, L, LC and CLC filter. Regulators: Voltage regulators, Shunt voltage regulator, Series voltage regulator, short circuit protection circuit, Current limiting circuit, Fold back limiting, switching regulator		CO5
<b>Lecture Periods: 45</b>		<b>Tutorial Periods: -</b>
<b>Practical Periods: -</b>		<b>Total Periods: 45</b>
<b>Textbooks</b>		
1. Salivahanan. S, Suresh Kumar. N, Vallavaraj.A, “Electronic Devices and circuits,” Fifth Edition, Tata McGraw- Hill, 2012 2. Robert L. Boylestad, “Electronic Devices and Circuit Theory,” Pearson, 11 <sup>th</sup> edition 2015 3. David A. Bell, “Electronic devices and circuits,” Oxford University higher education, 5 <sup>th</sup> edition 2008		
<b>Reference Books</b>		
1. Sedra and Smith, “Microelectronic Circuits”, Oxford University Press, 5 <sup>th</sup> Edition, 2005. 2. Donald A Neaman, “Semiconductor Physics and Devices,” 4 <sup>th</sup> edition, McGraw Hill Education India Private Ltd., 2011. 3. Thomas L. Floyd, “Electronic devices” Conventional current version, Pearson prentice hall, 10 <sup>th</sup> Edition, 2017. 4. Balbir Kumar, Shail.B. Jain, “Electronic devices and circuits” PHI learning private limited, 2 <sup>nd</sup> edition, 2014.		

5. J. Millman, C. Halkias and Chetan D. Parikh, "Integrated Electronics" Tata McGraw Hill, 2<sup>nd</sup> edition 2010
6. Muhammed H. Rashid, "Power Electronics", Pearson Education/PHI, 2004.

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1. <https://www.electrical4u.com/diode-working-principle-and-types-of-diode/>
2. <https://www.allaboutcircuits.com/video-tutorials/transistors/>
3. <https://onlinelibrary.wiley.com/doi/full/10.1002/inf2.12016>
4. <https://nptel.ac.in/courses/117/106/117106091/>
5. <https://www.electronics-tutorials.ws/>

\* TE – Theory Exam, LE – Lab Exam

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	2	1	-	-	-	-	-	1	3	1	-
2	3	3	2	3	2	1	-	-	-	-	-	1	3	1	-
3	3	3	2	3	2	2	-	-	-	-	-	1	3	1	-
4	3	2	3	3	2	1	-	-	-	-	-	1	3	1	-
5	3	2	3	2	3	1	-	-	-	-	-	1	3	1	-
6	3	2	3	2	2	1	-	-	-	-	-	1	3	1	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

\* Application-oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	ECE		Programme: B. Tech.							
Semester	Second		Course Category Code: HS				End Semester Exam Type: TE			
Course Code	U23HSTC01		Periods / Week			Credit	Maximum Marks			
			L	T	P	C	CAM	ESE	TM	
Course Name	Universal Human Values - II		2	-	-	2	25	75	100	
(Common to all Branch)										
Prerequisite	UHV - I									
Course Outcomes	On completion of the course, the students will be able to							BT Mapping (Highest Level)		
	CO1	Evaluate the significance of value inputs in formal education and start applying them in their life and profession							K2	
	CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.							K2	
	CO3	Analyze the value of harmonious relationship based on trust and respect in their life and profession							K2	
	CO4	Examine the role of a human being in ensuring harmony in society and nature.							K2	
	CO5	Apply the understanding of ethical conduct to formulate the strategy for ethical life and profession.							K2	

<b>UNIT - I</b>	<b>INTRODUCTION TO VALUE EDUCATION</b>	<b>Periods: 06</b>
Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) - Understanding Value Education - Self-exploration as the Process for Value Education - Basic Human Aspirations - Happiness and Prosperity - Current Scenario- Method to Fulfil the Basic Human Aspirations		<b>CO1</b>
<b>UNIT - II</b>	<b>HARMONY IN THE HUMAN BEING</b>	<b>Periods: 06</b>
Understanding Human being as the Co-existence of the Self and the Body-Distinguishing between the Needs of the Self and the Body-The Body as an Instrument of the Self-Understanding Harmony in the Self-Harmony of the Self with the Body-Programme to ensure self-regulation and Health		<b>CO2</b>
<b>UNIT - III</b>	<b>HARMONY IN THE FAMILY AND SOCIETY</b>	<b>Periods: 06</b>
Harmony in the Family - Basic Unit of Human Interaction- 'trust' - Foundational Value in Relationship - 'Respect' - as the Right Evaluation - Other Feelings, Justice in Human-to-Human Relationship - Understanding Harmony in the Society-Vision for the Universal Human Order.		<b>CO3</b>
<b>UNIT - IV</b>	<b>HARMONY IN THE NATURE / EXISTENCE</b>	<b>Periods: 06</b>
Understanding Harmony in the Nature-Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature - Realizing Existence as Co-existence at All Levels - Holistic Perception of Harmony in Existence		<b>CO4</b>
<b>UNIT - V</b>	<b>IMPLICATIONS OF THE HOLISTIC UNDERSTANDING - A LOOK AT PROFESSIONAL ETHICS</b>	<b>Periods: 06</b>
Natural Acceptance of Human Values - Definitiveness of (Ethical) Human Conduct - Basis for Humanistic Education, Humanistic Constitution and Universal Human Order-Competence in Professional Ethics-Holistic Technologies, Production Systems and Management Models-Typical Case Studies-Strategies for Transition towards Value - based Life and Profession		<b>CO5</b>
<b>Lecture Periods: 30</b>		<b>Tutorial Periods: -</b>
<b>Practical Periods: -</b>		<b>Total Periods: 30</b>

**Text Book**

1. R. R. Gaur, R. Asthana, G. P. Bagaria, "A Foundation Course in Human Values and Professional Ethics", Excel Books, 2<sup>nd</sup> Revised Edition, New Delhi, 2019.

**Reference Books**

1. A Nagraj, Jeevan Vidya Prakashan, Amarkantak, "Jeevan Vidya: EkParichaya", 2013.
2. A.N. Tripathi, "Human Values", New Age International Publishers, New Delhi, 3<sup>rd</sup> Edition, 2019.
3. Annie Leonard, "The Story of Stuff", Free Press, Reprint Edition, 2011.
4. Mohandas Karam chand Gandhi, "The Story of My Experiments with Truth – Mahatma Gandhi Autobiography", Finger print Publisher, 2009.
5. E. F Schumacher, "Small is Beautiful", Vintage Publisher, 1993.

6. Cecile Andrews, "Slow is Beautiful", New Society Publishers, 2006.
7. J C Kumarappa, "Economy of Permanence", Sarva Seva Sangh Prakashan, 2017.
8. Pandit Sunderlal, "Bharat Mein Angreji Raj", Prabhat Prakashan Publisher, 2021.
9. Dharampal, "Rediscovering India", Stosius Inc/Advent Books Division Publisher, 1983.
10. Mohandas K. Gandhi, "Hind Swaraj or Indian Home Rule", Gyan Publishing House, 2023.
11. Maulana Abdul Kalam Azad, "India Wins Freedom", Orient BlackSwan Publisher, 1<sup>st</sup> Edition, 1988.
12. Life of Vivekananda, "Romain Rolland (English)", Advaita Ashrama Publisher, India, 4<sup>th</sup> Edition, 2010.
13. Mahatma Gandhi, "Romain Rolland (English)", Srishti Publishers & Distributors, 2020.

### Web References

1. <https://www.uhv.org.in/uhv-ii>
2. <http://www.storyofstuff.com>
3. [https://www.youtube.com/channel/UCQxWr5QB\\_eZUnwxSwxXEkQw](https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw)
4. [https://fdp-si.aicte-india.org/8dayUHV\\_download.php](https://fdp-si.aicte-india.org/8dayUHV_download.php)
5. <https://www.youtube.com/watch?v=8ovkLRYXlJE>

### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
2	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
3	-	-	-	-	-	3	3	2	2	-	-	3	-	-	-
4	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
5	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

### Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus



Department	English	Programme: <b>B.Tech.</b>						
Semester	Second	Course Category: <b>HS</b>				End Semester Exam Type: <b>TE</b>		
Course Code	U23ENBC02	Periods/Week			Credit	Maximum Marks		
Course Name	Communicative English - II	L	T	P	C	CAM	ESE	TM
		2	-	2	3	50	50	100
(Common to ALL Branches except CSBS)								
Prerequisite	Basics of English Language							
Course Outcomes	<b>On completion of the course, the students will be able to</b>						BT Mapping (Highest Level)	
	CO1	Draft effective written communication in professional environment						<b>K2</b>
	CO2	Apply the mechanics of creative writing with precision and clarity						<b>K3</b>
	CO3	Acquire language skills professionally to groom the overall personality through sensitizing various etiquettes in real time situation						<b>K2</b>
	CO4	Develop language fluency and gain self-confidence						<b>K3</b>
	CO5	Express thoughts and ideas with clarity and focus						<b>K2</b>

<b>UNIT-I</b>	<b>Business Correspondence</b>	<b>Periods:10</b>
Business Writing: Circular, Agenda, Memoranda, Notice, Instruction, Minutes, Email Writing, Report Writing- Official and Demi Official Letters : Applying for Educational / Car / Home Loans / Joining Report, Leave Letter, Industrial Visit, In plant Training, Letter to the Editor, Calling for a quotation, Placing Order, Letter of Complaints, Letter seeking Clarification, Resume', Job Application Letter, Bio-data, CV		<b>CO1</b>
<b>UNIT-II</b>	<b>Functional Writing Skills</b>	<b>Periods:10</b>
Four Modes of Writing, Sentence Structure , Art of condensation: Summary Writing and Note Making, Use of phrase and clause in sentence, Principles of paragraph writing, Techniques of Essay Writing, Jumbled Sentence, Paraphrasing		<b>CO2</b>
<b>UNIT-III</b>	<b>Etiquettes</b>	<b>Periods:10</b>
Etiquette: Meaning, Kinds: Corporate Etiquette, Meeting Etiquette, Telephone Etiquette, Email Etiquette, Social Media Etiquette, Dining Etiquette, Communication Etiquette		<b>CO3</b>
<b>UNIT-IV</b>	<b>Communication Practice-II</b>	<b>Periods:15</b>
<b>List of Exercises</b>		<b>CO4</b>
<b>Listening:</b> Letter writing tips		
<b>Speaking:</b> Just a Minute, Impromptu Speech, Contemporary Issues		
<b>Reading:</b> Variety of examples for Modes of Writing		
<b>Writing:</b> Different types of letters		
<b>UNIT-V</b>	<b>Interpersonal Communication-II</b>	<b>Periods:15</b>
<b>List of Exercises</b>		<b>CO5</b>
<b>Listening:</b> Videos on different types of Etiquettes		
<b>Speaking:</b> Team Presentation, Negotiation Skills		
<b>Reading:</b> Phrases and Clauses		
<b>Writing:</b> Free writing on any given topic, Paraphrasing Practice		
<b>Lecture</b>	<b>Periods:30</b>	
<b>Tutorial</b>	<b>Periods: -</b>	
<b>Practical</b>	<b>Periods:30</b>	
		<b>Total Periods:60</b>

<b>Text Books</b>
1. PC Das, "Letter Writing including Official and Business Letters", New Central Book Agency, 2020.
2. Kumar, Sanjay, Pushpalatha, "Communication Skills". Oxford University Press, 2018.
3. Raman, Meenakshi&Sangeetha Sharma, "Communication Skills", New Delhi: OUP, 2018.

**Reference Books**

1. Sahukar, Nimeran, Bhalla, Prem., "The book of Etiquettes and Manners". PustakMahal Publisher, New Delhi; 1st Edition 2009.
2. Gerson Sharon J, Steven M. Gerson, "Technical Writing Process and Product", Pearson Education Pvt. Ltd. 3<sup>rd</sup> Edition, 2009.
3. Grussendorf, Marion, "English for Presentations". Oxford University Press, Oxford, 2007.
4. Seely John, "The Oxford Guide to Writing and Speaking", Oxford University Press, 2006.
5. R.C. Sharma, Krishna Mohan, "Business Correspondence and Report Writing", Tata McGraw Hill & Co. Ltd., New Delhi, 2001.

**Web References**

1. <https://www.indeed.com/career-advice/finding-a-job/how-to-write-an-application-letter>
2. <https://owlcation.com/humanities/Four-Types-of-Writing>
3. <https://targetstudy.com/languages/english/paragraph-writing.html>
4. <https://www.businessnewsdaily.com/8262-email-etiquette-tips.html>
5. <https://www.youtube.com/watch?v=UOceysteljo>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
2	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
3	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
4	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
5	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Methods**

Theory						
Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	5	5	5	5	75	60
	20( to be weighted for 10 marks)				(to be weighted for 50 marks)	

Practical					
Continuous Assessment Internal Evaluation			End Semester Internal Evaluation		Total Marks
30(to be weighted for 10 marks)			30 marks		40
Listening (L)*	10		Listening (L)*	10	
Speaking(S)	5		Speaking(S)	5	
Reading(R)*	10		Reading(R)*	10	
Writing(W)*	5		Writing(W)*	5	

LRW components of Practical can be evaluated through Language Lab Software

Department	Mechanical			Programme : <b>B.Tech.</b>							
Semester	First / Second			Course Category : <b>ES</b>			End Semester Exam Type: <b>LE</b>				
Course Code	U23ESPC03			Periods/Week			Credit	Maximum Marks			
				L	T	P	C	CAM	ESE	TM	
Course Name	ENGINEERING GRAPHICS USING AUTOCAD			-	-	2	1	50	50	100	
(Common to all Branches)											
Prerequisite	Nil										
Course Outcomes	On completion of the course, the students will be able to								BT Mapping (Highest Level)		
	CO1	Familiarize with the fundamentals and standards of engineering graphics.								K3	
	CO2	Perform drawing of basic geometrical constructions and multiple views of objects.								K2	
	CO3	Visualize the isometric and perspective sections of simple solids.								K3	
	CO4	Connect side view associate on front view.								K4	
	CO5	Correlate sectional views and lateral surface developments of various solids.								K4	

**List of Experiments**

- Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
- Drawing a Title Block with necessary text and projection symbol.
- Drawing 2D sketch by applying modify tools like fillet, mirror, array, etc.,
- Drawing front view and top view of simple solids like prism, pyramid, cylinder, cone, etc., and Dimensioning.
- Drawing front view, top view and side view of objects from the given pictorial views (eg. Simple stool, V-block, Mixie Base).
- Drawing a plan of residential building (Two bed rooms, kitchen, hall, etc.)
- Drawing sectional views of prism, pyramid, cylinder, cone, etc,
- Drawing lateral surface development of prism, pyramid, cylinder, cone, etc,
- Drawing isometric projection of simple objects.
- Creating 3D model of simple object and obtaining 2D multi-view drawings.
- Note: Plotting of drawings must be made for each exercise and attached to the records written by Students.

**Lecture Periods: -****Tutorial Periods: -****Practical Periods: 30****Total Periods: 30****Reference Books**

- James D. Bethune, Engineering Graphics with AutoCAD A Spectrum book 1st Edition, Macromedia Press, Pearson, 2020.
- NS Parthasarathy and Vela Murali, Engineering Drawing, Oxford university press, 2015.
- M.B Shah, Engineering Graphics, ITL Education Solutions Limited, Pearson **Education** Publication, 2011.
- Bhatt N.D and Panchal V.M, Engineering Drawing: Plane and Solid Geometry, Charotar Publishing House, 2017.
- Jeyapooan T, Engineering Drawing and Graphics Using AutoCAD, Vikas Publishing House Pvt Ltd., 7th Edition, New Delhi, 2016.
- C M Agrawal, Basant Agrawal, Engineering Graphics, McGraw Hill, 2012.
- Dhananjay A. Jolhe, Engineering Drawing: With An Introduction To CAD McGraw Hill, 2016.
- James Leach, AutoCAD 2017 Instructor, SDC Publications, 2016.

**Web References**

1. [http://vlabs.iitb.ac.in/vlabs-dev/labs/mit\\_bootcamp/egraphics\\_lab/labs/index.php](http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/egraphics_lab/labs/index.php)
2. <http://www.nptelvideos.in/2012/12/computer-aided-design.html>
3. <https://mech.iitm.ac.in/meiitm/course/cad-in-manufacturing/>
4. <https://autocadtutorials.com>
5. <https://dwgmodels.com>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
2	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
3	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
4	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
5	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100

Department	<b>CSE</b>	Programme: <b>B.Tech.</b>						
Semester	<b>II</b>	Course Category Code: <b>ES</b>			End Semester Exam Type: <b>LE</b>			
Course Code	<b>U23CSPC01</b>	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	AM	SE	M
Course Name	<b>Programming in C Laboratory</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>50</b>	<b>50</b>	<b>100</b>
(Common to All Branches)								
Prerequisite	NIL							
Course Outcome	On completion of the course, the students will be able to						BT Mapping (Highest Level)	
	<b>CO1</b>	Implement logical formulations to solve simple problems leading to specific applications.						<b>K3</b>
	<b>CO2</b>	Execute C programs for simple applications making use of basic constructs, arrays and strings.						<b>K3</b>
	<b>CO3</b>	Experiment C programs involving functions, recursion, pointers, and structures.						<b>K3</b>
	<b>CO4</b>	Demonstrate applications using sequential and random access file processing.						<b>K3</b>
	<b>CO5</b>	Build solutions for online coding challenges.						<b>K3</b>

### List of Exercises

1. Write a C program to find the Area of the triangle.
  2. Develop a C program to read a three digit number and produce output like  
1 hundreds    7 tens    2 units    For an input of 172.
  3. Write a C program to check whether a given character is vowel or not using Switch – Case statement.
  4. Write a C program to Print the numbers from 1 to 10 along with their squares.
  5. Demonstrate do—While loop in C to find the sum of 'n' numbers.
  6. Find the factorial of a given number using Functions in C.
  7. Write a C program to check whether a given string is palindrome or not?
  8. Write a C program to check whether a value is prime or not?
  9. Develop a C program to swap two numbers using call by value and call by reference.
  10. Construct a C program to find the smallest and largest element in an array.
  11. Implement matrix multiplication using C program.
  12. Write a C program to perform various string handling functions like strlen, strcpy, strcat, strcmp.
  13. Develop a C program to remove all characters in a string except alphabets.
  14. Write a C program to find the sum of an integer array using pointers.
  15. Write a C program to find the Maximum element in an integer array using pointers.
  16. Construct a C program to display Employee details using Structures
  17. Write a C program to display the contents of a file on the monitor screen.
  18. Write a File by getting the input from the keyboard and retrieve the contents of the file using file operation commands.
  19. Write a C program to create two files with a set of values. Merge the two file contents to form a single file
- Write a C program to pass the parameter using command line arguments.

**Lecture Periods:** -    **Tutorial Periods:** -    **Practical Periods:** 30    **Total Periods:** 30

**Reference Books**

1. Zed A Shaw, "Learn C the Hard Way: Practical Exercises on the Computational Subjects You Keep Avoiding (Like C)", Addison Wesley, 2016.
2. Anita Goel and Ajay Mittal, "Computer Fundamentals and programming in C", Pearson Education, First edition, 2011.
3. Maureen Sprankle, Jim Hubbard, "Problem Solving and Programming Concepts," Pearson, 9<sup>th</sup> Edition, 2011.
4. Yashwanth Kanethkar, "Let us C", BPB Publications, 13<sup>th</sup> Edition, 2008.
5. B.W. Kernighan and D.M. Ritchie, "The C Programming Language", Pearson Education, 2<sup>nd</sup> Edition, 2006.

**Web References**

1. <https://alison.com/course/introduction-to-c-programming>
2. <https://www.geeksforgeeks.org/c-programming-language/>
3. [http://cad-lab.github.io/cadlab\\_data/files/1993\\_prog\\_in\\_c.pdf](http://cad-lab.github.io/cadlab_data/files/1993_prog_in_c.pdf)
4. <https://www.tenouk.com/clabworksheet/clabworksheet.html>
5. <https://fresh2refresh.com/c-programming/>

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
2	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
3	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
4	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
5	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

**Evaluation Methods**

Evaluation Methods							
Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100

Department	ECE		Programme: <b>B.Tech.</b>						
Semester	II		Course Category : <b>PC</b>			*End Semester Exam Type: <b>LE</b>			
Course Code	<b>U23ECP202</b>		Periods/Week			Credit	Maximum Marks		
			<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CAM</b>	<b>ESE</b>	<b>TM</b>
Course Name	<b>Electron Devices Laboratory</b>		-	-	2	1	50	50	100
Prerequisite	<b>Mathematics and Physics</b>								
Course Outcome	On completion of the course, the students will be able to								<b>BT Level</b>
	CO1	Examine the VI characteristics of various semiconductor diodes							K4
	CO2	Inspect the Input -Output Characteristics of various configurations of BJT							K4
	CO3	Distinguish the characteristics of JFET and MOSFET							K4
	CO4	Illustrate the electrical characteristics SCR and UJT							K4
	CO5	Predict the diodes used for Rectifiers, Voltage regulators, Clippers and Logic Gates verification							K3
<b>List of Experiments:</b>									
List of Lab Activities and Experiments									
1. V-I characteristics of semiconductor diodes									
i) PN Junction diode									
ii) Point contact diode									
iii) Zener diode									
2. Characteristics of BJT in CB configuration									
i) Determination of input and output characteristics									
ii) Determination of voltage gain, current gain, input and output resistances from the characteristics									
3. Characteristics of BJT in CE configuration									
i) Determination of input and output characteristics									
ii) Determination of voltage gain, current gain, input and output resistances from the characteristics									
4. Characteristics of JFET									
i) Determination of output and transfer characteristics									
ii) Determination of pinch-off voltage, $r_d$ , $g_m$ and $\mu$ from the characteristics									
5. Characteristics of MOSFET									
i) Determination of output and transfer characteristics									
ii) Determination of pinch-off voltage, $r_d$ , $g_m$ and $\mu$ from the characteristics									
6. Characteristics of UJT and SCR.									
7. Characteristics of photonic devices									
i) Determination of V-I characteristics of LED									
ii) Determination of V-I and intensity characteristics of phototransistor									
8. Rectifiers and Voltage Regulators									
i) Determination of ripple factor for different types of rectifiers with and without filters.									
ii) Voltage regulation characteristics of the shunt, series and IC regulators									
9. Clipper circuits using diodes: Positive, negative, biased and combinational clippers.									
10. Switching circuit									
i) AND and OR logic gates using diodes.									
ii) NOT gate using transistor									
<b>Reference Books</b>									
1. Sedra and Smith, "Microelectronic Circuits," Oxford University Press, 5 <sup>th</sup> Edition, 2005.									
2. Donald A Neaman, "Semiconductor Physics and Devices," 4 <sup>th</sup> edition, McGraw Hill Education India Private Ltd., 2011.									

3. Thomas L. Floyd, "Electronic devices" Conventional current version, Pearson prentice hall, 10<sup>th</sup> Edition, 2017.
4. Balbir Kumar, Shail.B. Jain, "Electronic devices and circuits" PHI learning private limited, 2<sup>nd</sup> edition, 2014.
5. J. Millman, C. Halkias and Chetan D. Parikh, "Integrated Electronics" Tata McGraw Hill, 2<sup>nd</sup> edition 2010
6. Muhammed H. Rashid, "Power Electronics", Pearson Education/PHI, 2004.

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1. [https://www.industrial-electronics.com/experiments\\_0.html](https://www.industrial-electronics.com/experiments_0.html)
2. <http://www2.ece.ohio-state.edu/ee327/>
3. <http://www.vlab.co.in/broad-area-electronics-and-communications>.
4. <https://www.electrical4u.com/diode-working-principle-and-types-of-diode/>
5. <https://www.allaboutcircuits.com/video-tutorials/transistors/>

\* TE – Theory Exam, LE – Lab Exam

**COs/POs/PSOs Mapping**

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	3	2	2	-	-	-	-	-	-	1	3	1	-
2	3	1	2	2	2	-	-	-	-	-	-	1	3	1	-
3	3	2	3	2	2	-	-	-	-	-	-	1	3	1	-
4	3	2	3	2	2	-	-	-	-	-	-	1	3	1	-
5	3	2	3	2	2	-	-	-	-	-	-	1	3	1	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

**Evaluation Method**

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	Performance in practical classes			Model Practical Examination	Attendance		
	Conduction of practical	Record work	viva				
Marks	15	5	5	15	10	50	100



Department	<b>ECE</b>	Programme: <b>B.Tech.</b>						
Semester	<b>II</b>	Course Category : <b>MC</b>			End Semester Exam Type: -			
Course Code	<b>U23ECM202</b>	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	<b>Sports Yoga or NSS/NCC</b>	0	0	2	Non-Credit	100	-	100
Prerequisite	-							
<b>Course Outcomes</b>	On completion of the course, the students will be able to						BT Mapping (Highest Level)	
	<b>CO1</b>	Practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility and relaxation.						<b>K2</b>
	<b>CO2</b>	Understand basic skills associated with yoga and physical activities including strength and flexibility, balance and coordination.						<b>K2</b>
	<b>CO3</b>	Develop understanding of psychological problems associated with age and lifestyle.						<b>K2</b>
	<b>CO4</b>	Recognize the importance of national service in community development.						<b>K2</b>
	<b>CO5</b>	Convert existing skills into socially relevant life skills.						<b>K2</b>

<b>UNIT-I</b>	<b>INTRODUCTION TO PHYSICAL EDUCATION</b>	<b>Periods: 06</b>
Definition, Aims and Objectives of Physical Education - Changing trends in Physical Education <b>Physical Fitness, Wellness and Lifestyle:</b> Importance of Physical Fitness and Wellness - <b>CO1</b> Components of Physical fitness -Components of Health related fitness - Components of wellness - Preventing Health Threats through Lifestyle Change - Concept of Positive Lifestyle.		
<b>UNIT-II</b>	<b>YOGA AND LIFESTYLE</b>	<b>Periods: 06</b>
Importance of Yoga - Elements of Yoga - Introduction - Asanas, Pranayama, Meditation and Yogic Kriyas - Yoga for concentration and related Asanas (Sukhasana, Tadasana, Padmasana and Shashankasana) - Relaxation Techniques for improving concentration - Yog-nidra. Asanas as preventive measures – Hypertension – Obesity - Back Pain-Diabetes - Asthema. <b>CO2</b>		
<b>UNIT-III</b>	<b>TRAINING AND PLANNING IN SPORTS</b>	<b>Periods: 06</b>
Training - Warming up and limbering down-Skill, Technique and Style - Objectives of Planning – Tournament - Knock-Out, League/Round Robin and Combination. <b>Psychology and Sports</b> - Important of Psychology in Physical Education and Sports - Differentiate Between Growth and Development - Adolescent problems and their Management - Emotion: Concept, Type and Controlling of emotions - Concepts and Types of Aggressions in Sports - Psychological benefits of exercise - Anxiety and Fear and its effects on Sports Performance - Motivation, its type and techniques - Understanding Stress and Coping strategies <b>CO3</b>		
<b>UNIT-IV</b>	<b>INTRODUCTION TO NATIONAL SERVICE SCHEME</b>	<b>Periods: 06</b>
Orientation of NSS volunteers: History, motto, symbol, awards, structure and activities of NSS - Days of National and International Importance - Sensitizing about the thrust areas and awareness activities - Importance of tree plantation and voluntary blood donation - The role of SHGs and NGOs in community development – CSR - Life skills and youth development-extension activities in HEIs - various clubs and schemes like RRC, ELC, YRC, UBA, SBA, etc., <b>CO4</b>		
<b>UNIT-V</b>	<b>COMMUNITY ISSUES AND THE USE OF TECHNOLOGY</b>	<b>Periods: 06</b>
Common Problems of rural India - Technology development and its suitability – Sustainability - Value addition to agricultural products - Service learning and youth volunteering – Shramdaan - Campus cleaning - Field visit to nearby communities - village survey - Initiatives to clean and green environment - preservation of water bodies in adopted villages. <b>CO5</b>		
<b>Lecture Periods: -</b>		<b>Tutorial Periods: -</b>
		<b>Practical Periods: 30</b>
<b>Total Periods: 30</b>		

**Reference Books**

1. Brar Ajmer Singh, Gill Jagtar Singh, Bains Jagdish, "Modern Textbook of Physical Education Health and Sports- I", Kalyani Publishers , 6<sup>th</sup> Edition, 2014
2. B.K.S. Iyengar, "Light on Yoga: The Definitive Guide to Yoga Practice", Thorsons Publishers, Thorsons Classics edition, 2015
3. Joseph, Siby K, Mahodaya, "Bharat Essays on Conflict Resolution", Institute of Gandhian Studies Publishers, 2007
4. Barman Prateeti , Goswami, "Document on Peace Education", Triveni Akansha Publishing House, New Delhi, 2009
5. Prof R.B.S. Verma, "Field Work Practicum in Social Work-Emerging Concerns", Rapid Publisher, Lucknow, 2020
6. Sibereisen, K , Richard M, "Lerner Approaches to Positive Youth Development", Sage Publications, New Delhi, 2007
7. Hoshier Singh, "Administration of Rural Development in India", Sterling Publisher, the University of Michigan, 2009

**Web References**

1. <http://www.thebetterindia.com/140/national-service-scheme-nss>
2. <http://en.wikipedia.org/wiki/national-service-scheme> 19=<http://nss.nic.in/adminstruct>
3. <http://nss.nic.in>
4. <http://socialworknss.org/about.html>
5. Young Journal on Youth published by SAGE: <http://you.sagepub.com>

**Evaluation methods**

Assessment	Continuous Assessment Marks (CAM)			Total Marks
	Attendance	MCQ Test	Presentation / Activity / Assignment	
Marks	10	30	60	100