KSR IET

Where future begins.

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

(Approved by AICTE, New Delhi & Affiliated to Anna University)

K.S.R. Kalvi Nagar, Tiruchengode – 637 215, Namakkal Dist., Tamil Nadu, India.

B.E - COMPUTER SCIENCE AND ENGNEERING (CYBERSECURITY)

CURRICULUM FOR SEMESTERS I to VIII
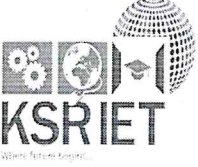
&

SYLLABUS FOR SEMESTERS I AND II

REGULATION - 2023

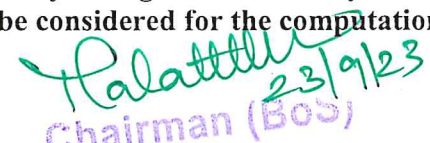## CHOICE BASED CREDIT SYSTEM

(Academic Year 2023 - 2024 Onwards)

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
	An Autonomous Institution	UG
	Approved by AICTE and Affiliated to Anna University, Chennai	R - 2023
	Accredited by NAAC ('A+' Grade) & NBA	

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER I

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
Induction Programme			-	-	-	-	-	-	-	-	-
THEORY COURSES											
1.	23HS1131	Professional Communication	HSMC	3	0	0	3	3	40	60	100
2.	23GE1131	Fundamentals of Computer Programming	ESC	2	1	0	3	3	40	60	100
3.	23GE1132	Heritage of Tamils	HSMC	1	0	0	1	1	40	60	100
4.	23GE1132	Engineering Graphics	ESC	2	0	4	6	4	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
5.	23MA1141	Matrices and Calculus	BSC	2	1	2	5	4	50	50	100
6.	23CY1141	Engineering Chemistry	BSC	3	0	2	5	4	50	50	100
LABORATORY COURSES											
7.	23GE1151	Programming in C Lab	ESC	0	0	3	3	1.5	60	40	100
MANDATORY COURSES											
8.	23MC1131	Yoga for Stress Management	HSMC	1	0	0	1	0	-	-	-
TOTAL				14	2	11	27	20.5	700		
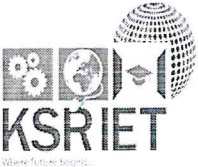
Chairman (BoS)
23/9/23

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
An Autonomous Institution	UG
Approved by AICTE and Affiliated to Anna University, Chennai	R - 2023
Accredited by NAAC ('A+' Grade) & NBA	

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER II

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1.	23GE1231	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3	40	60	100
2.	23CS1231	Python Programming	PCC	2	1	0	3	3	40	60	100
3.	23GE1232	Tamils and Technology	HSMC	1	0	0	1	1	40	60	100
4.		NCC Credit course level 1#	-	2	0	0	2	2#			
THEORY COURSES WITH LABORATORY COMPONENT											
5.	23EC1241	Digital Principles and System Design	ESC	2	1	2	5	4	50	50	100
6.	23MA1241	Probability and Statistics	BSC	2	1	2	5	4	50	50	100
7.	23PH1141	Engineering Physics	BSC	3	0	2	5	4	50	50	100
LABORATORY COURSES											
8.	23CS1251	Python Programming Lab	PCC	0	0	3	3	1.5	60	40	100
9.	23GE1251	Communication Laboratory	HSMC	0	0	3	3	1.5	60	40	100
10.	23GE1252	Engineering Experience Lab	ESC	0	0	3	3	1.5	60	40	100
			TOTAL	14	3	13	30	23.5		900	

NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

23/9/23

Chairman (BoS)

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
An Autonomous Institution	UG
Approved by AICTE and Affiliated to Anna University, Chennai	R - 2023
Accredited by NAAC ('A+' Grade) & NBA	

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER III

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1.	23MA1331	Discrete Mathematics	BSC	3	1	0	4	4	40	60	100
2.	23IT1331	Computer Architecture and Organization	PCC	3	0	0	3	3	40	60	100
3.	23GE1331	Universal Human Values	HSMC	3	0	0	3	3	40	60	100
4.	23IT1332	Data Structures and Algorithms	PCC	3	0	0	3	3	40	60	100
5.	23CB1301	Database Management Systems and security	PCC	3	0	0	3	3	40	60	100
THEORY COURSES WITH PROJECT COMPONENT											
6.	23CS1341	Java Programming	PCC	3	0	2	5	4	50	50	100
LABORATORY COURSES											
7.	23IT1351	Data Structures and Algorithms Lab	PCC	0	0	3	3	1.5	60	40	100
8.	23CB1321	Database Management Systems and security Lab	PCC	0	0	3	3	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES											
9.	23SS1351	Aptitude and Coding Skills - I	EEC	0	0	2	2	1	100	-	100
			TOTAL	18	1	10	29	24		1000	

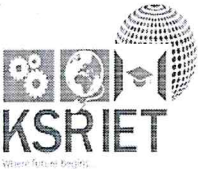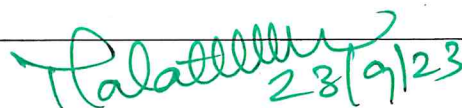23/9/23

Chairman (BoS)

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY An Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A+' Grade) & NBA	Curriculum UG R - 2023

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER IV

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1.	23CB1401	Principles of Compiler Design	PCC	3	0	0	3	3	40	60	100
2.	23CB1402	Operating Systems and security	PCC	3	0	0	3	3	40	60	100
3.	23IT1431	Computer Networks	PCC	3	0	0	3	3	40	60	100
4.	23CB1403	Cryptography and Cyber Security	PCC	3	0	0	3	3	40	60	100
5.	23CB1404	Principles of Digital Forensics	PCC	3	0	0	3	3	40	60	100
6.		NCC Credit course level 2#	-	3	0	0	3	3#			
THEORY COURSES WITH PROJECT COMPONENT											
7.	23IT1441	Embedded Systems and IoT	PCC	3	0	2	5	4	50	50	100
LABORATORY COURSES											
8.	23CB1421	Operating Systems and security Lab	PCC	0	0	3	3	1.5	60	40	100
9.	23IT1451	Networks Lab	PCC	0	0	3	3	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES											
10	23SS1451	Aptitude and Coding Skills-II	EEC	0	0	2	2	1	100	-	100
11.	23CB1421	Internship *	EEC	0	0	0	0	1	-	-	-
			TOTAL	18	0	10	28	24		900	

* Duration - Minimum 2 weeks internship in industry.

Grade – Completed / Not Completed

 # NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

Chairman (BOS) 23/9/23

4

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
KSRIET	An Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A+' Grade) & NBA	UG R - 2023

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER V

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1.		Open Elective - I	OEC	3	0	0	3	3	40	60	100
2.	23CB1501	Software Vulnerability Testing	PCC	3	0	0	3	3	40	60	100
3.	23IT1532	Web Technology	PCC	3	0	0	3	3	40	60	100
4.	23CB1502	Cyber Crimes and Laws	PCC	3	0	0	3	3	40	60	100
5.		Professional Elective - I	PEC	3	0	0	3	3	40	60	100
6.		Professional Elective - II	PEC	3	0	0	3	3	40	60	100
LABORATORY COURSES											
7.	23CB1521	Software Vulnerability Testing Lab	PCC	0	0	3	3	1.5	60	40	100
8.	23IT1551	Web Technology Lab	PCC	0	0	3	3	1.5	60	40	100
MANDATORY COURSE											
9.		Mandatory Course - I	MC	2	0	0	2	0	100	-	100
EMPLOYABILITY ENHANCEMENT COURSES											
10.	23SS1551	Advanced Aptitude and Coding Skills-I	EEC	0	0	2	2	1	100	-	100
			TOTAL	20	0	8	28	22		1000	

23/9/23

Chairman (BoS)

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
KSRIET	**An Autonomous Institution** **Approved by AICTE and Affiliated to Anna University, Chennai** **Accredited by NAAC ('A+' Grade) & NBA**	UG R - 2023

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER VI

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1.		Open Elective-II	OEC	3	0	0	3	3	40	60	100
2.	23CB1601	Fundamentals of Ethical Hacking	PCC	3	0	0	3	3	40	60	100
3.	23CB1602	Engineering Secure Software Systems	PCC	3	0	0	3	3	40	60	100
4.		Professional Elective- III	PEC	3	0	0	3	3	40	60	100
5.		Professional Elective -IV	PEC	3	0	0	3	3	40	60	100
6.		NCC Credit course level 3[#]	-	3	0	0	3	3[#]			
LABORATORY COURSES											
7.	23CB1621	Fundamentals of Ethical Hacking Lab	PCC	0	0	3	3	1.5	60	40	100
8.	23CB1622	Engineering Secure Software Systems Lab	PCC	0	0	3	3	1.5	60	40	100
MANDATORY COURSES											
9.		Mandatory Course - II	MC	2	0	0	2	0	100	-	100
EMPLOYABILITY ENHANCEMENT COURSES											
10.	23SS1651	Advanced Aptitude and Coding Skills - II	EEC	0	0	2	2	1	100	-	100
11.	23CB1621	Internship and Innovation Project	EEC	0	0	0	0	2	-	-	-
			TOTAL	17	0	8	25	21		900	

* Duration - Minimum 2 weeks internship in industry. Grade – Completed / Not Completed

NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.
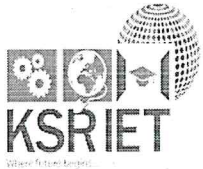
28/9/23

Chairman (BoS)
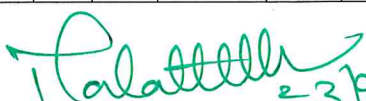
6

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY	Curriculum
	An Autonomous Institution	UG
	Approved by AICTE and Affiliated to Anna University, Chennai	R - 2023
	Accredited by NAAC ('A+' Grade) & NBA	

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER VII

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	23GE1731	Professional Ethics	HSMC	3	0	0	3	3	40	60	100
2		Management Elective	HSMC	3	0	0	3	3	40	60	100
3		Open Elective - III	OEC	3	0	0	3	3	40	60	100
4		Open Elective - IV	OEC	3	0	0	3	3	40	60	100
5		Professional Elective - V	PEC	3	0	0	3	3	40	60	100
6		Professional Elective - VI	PEC	3	0	0	3	3	40	60	100
EMPLOYABILITY ENHANCEMENT COURSES											
7	23CB1721	Project Work - Phase I	EEC	0	0	4	4	2	40	60	100
			TOTAL	18	0	4	22	20		700	

23/9/23

Chairman (BoS)

	K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY		Curriculum
KSRIET	An Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A+' Grade) & NBA		UG R - 2023

Department	Computer Science and Engineering(Cyber Security)
Programme	B.E.

SEMESTER VIII

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
EMPLOYABILITY ENHANCEMENT COURSES											
1	23CB1821	Project Work - Phase II	EEC	0	0	16	16	**8**	40	60	100
			TOTAL	0	0	16	16	**8**	100		
			TOTAL CREDITS					163			

TOTAL NUMBER OF CREDITS TO BE EARNED FOR
AWARD OF THE DEGREE = 160

Note: HSMC- Humanities and Social Sciences including Management Courses, BSC- Basic Science Courses, ESC-Engineering Science Courses, PCC-Professional Core Courses, PEC-Professional Elective Courses, OEC- Open Elective Courses, EEC-Employability Enhancement Courses & MC- Mandatory Courses

Chairman (BoS)

HUMANITIES, SCOCIAL SCIENCE AND MANAGEMENT COURSES (HSMC)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1.	23HS1141	Professional Communication	HSMC	3	0	0	3	3	40	60	100
2.	23GE1131	Heritage of Tamils	HSMC	1	0	0	1	1	40	60	100
3.	23MC1131	Yoga for Stress Management	HSMC	1	0	0	1	0	-	-	-
4.	23GE1231	Tamils and Technology	HSMC	1	0	0	1	1	40	60	100
5.	23GE1251	Communication Laboratory	HSMC	0	0	3	3	1.5	60	40	100
6.	23GE1331	Universal Human Values	HSMC	3	0	0	3	3	40	60	100
7.	23GE1731	Professional Ethics	HSMC	3	0	0	3	3	40	60	100
8.	23GE173#	Management Elective	HSMC	3	0	0	3	3	40	60	100
			TOTAL	15	0	3	18	15.5			

BASIC SCIENCE COURSES(BSC)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1.	23MA1141	Matrices and Calculus	BSC	2	1	2	5	4	50	50	100
2.	23PH1141	Engineering Physics	BSC	3	0	2	5	4	50	50	100
3.	23CY1141	Engineering Chemistry	BSC	3	0	2	5	4	50	50	100
4.	23MA1241	Probability and Statistics	BSC	2	1	2	5	4	50	50	100
5.	23MA1341	Discrete Mathematics	BSC	3	1	0	4	4	40	60	100
			TOTAL	13	3	8	24	20			

ENGINEERING SCIENCES COURSES (ESC)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1.	23GE1131	Fundamentals of Computer Programming	ESC	2	1	0	3	3	40	60	100
2.	23GE1151	Programming in C Lab	ESC	0	0	3	3	1.5	60	40	100

Chairman (BoS)   9

3.	23GE1132	Engineering Graphics	ESC	2	0	4	6	4	40	60	100
4.	23GE1232	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3	40	60	100
5.	23EC1241	Digital Principles and System Design	ESC	2	1	2	5	4	50	50	100
6.	23GE1252	Engineering Experience Laboratory	ESC	0	0	3	3	1.5	60	40	100
			TOTAL	9	2	12	23	17			

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

| S. No. | Course Code | Course Title | Category | Periods / Week | | | | Credit | Max. Marks | | |
				L	T	P	Tot		CA	ES	Tot
1.	23SS1351	Aptitude and Coding Skills - I	EEC	0	0	2	2	1	100	-	100
2.	23CB1421	Internship	EEC	0	0	0	0	1	-	-	-
3.	23SS1451	Aptitude and Coding Skills -II	EEC	0	0	2	2	1	100	-	100
4.	23CB1621	Internship and Innovation Project	EEC	0	0	0	0	2	-	-	-
5.	23SS1551	Advanced Aptitude and Coding Skills -I	EEC	0	0	2	2	1	100	-	100
6.	23SS1651	Advanced Aptitude and Coding Skills -II	EEC	0	0	2	2	1	100	-	100
7.	23CB1721	Project Work - Phase I	EEC	0	0	4	4	2	40	60	100
8.	23CB1821	Project Work - Phase II	EEC	0	0	16	16	8	40	60	100
			TOTAL	0	0	28	28	17			

23/9/23

Chairman (BoS)

PROFESSIONAL CORE COURSES (PCC)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1.	23CS1231	Python Programming	PCC	2	1	0	3	3	40	60	100
2.	23CS1251	Python Programming Lab	PCC	0	0	3	3	1.5	60	40	100
3.	23IT1331	Computer Architecture and Organization	PCC	3	0	0	3	3	40	60	100
4.	23IT1332	Data Structures and Algorithms	PCC	3	0	0	3	3	40	60	100
5.	23CB1301	Database Management Systems and security	PCC	3	0	0	3	3	40	60	100
6.	23CS1341	Java Programming	PCC	3	0	2	5	4	50	50	100
7.	23IT1351	Data Structures and Algorithms Lab	PCC	0	0	3	3	1.5	60	40	100
8.	23CB1321	Database Management Systems and security Lab	PCC	0	0	3	3	1.5	60	40	100
9.	23CB1401	Principles of Compiler Design	PCC	3	0	0	3	3	40	60	100
10.	23CB1402	Operating Systems and security	PCC	3	0	0	3	3	40	60	100
11.	23IT1431	Computer Networks	PCC	3	0	0	3	3	40	60	100
12.	23CB1403	Cryptography and Cyber Security	PCC	3	0	0	3	3	40	60	100
13.	23CB1404	Principles of Digital Forensics	PCC	3	0	0	3	3	40	60	100
14.	23IT1441	Embedded Systems and IoT	PCC	3	0	2	5	4	50	50	100
15.	23CB1421	Operating Systems and security Lab	PCC	0	0	3	3	1.5	60	40	100
16.	23IT1451	Networks Lab	PCC	0	0	3	3	1.5	60	40	100
17.	23CB1501	Software Vulnerability Testing	PCC	3	0	0	3	3	40	60	100
18.	23IT1532	Web Technology	PCC	3	0	0	3	3	40	60	100
19.	23CB1502	Cyber Crimes and Laws	PCC	3	0	0	3	3	40	60	100
20.	23CB1521	Software Vulnerability Testing Lab	PCC	0	0	3	3	1.5	60	40	100

Malattttt 23/9/23
Chairman (BoS)

21.	23IT1551	Web Technology Lab	PCC	0	0	3	3	1.5	60	40	100
22.	23CB1601	Fundamentals of Ethical Hacking	PCC	3	0	0	3	3	40	60	100
23.	23CB1602	Engineering Secure Software Systems	PCC	3	0	0	3	3	40	60	100
24.	23CB1621	Fundamentals of Ethical Hacking Lab	PCC	0	0	3	3	1.5	60	40	100
25.	23CB1622	Engineering Secure Software Systems Lab	PCC	0	0	3	3	1.5	60	40	100
			TOTAL	47	1	31	79	63.5			

Chairman (BoS)

23/9/23

VERTICAL 1 ETHICAL HACKING	VERTICAL 2 VULNERABILITY ASSESSMENT AND PENETRATION TESTING	VERTICAL 3 DIGITAL FORENSICS	VERTICAL 4 DEVSECOPS	VERTICAL 5 EMERGING TECHNOLOGIES	VERTICAL 6 FULL STACK DEVELOPMENT
Network scanning concepts	Cloud computing	Introduction to Cyber Forensics	DevOps	Machine Learning Techniques	App development
SQL injection	Enumeration	Cyber attacks and counter measures	Dockers and Kubernetes	Computer Vision	UI and UX Design
Evading IDS and Firewalls	Vulnerability Analysis	Computer Forensics	Continuous Integration and deployment	Artificial Intelligence	Software Testing and Automation
Social Engineering	Malware Threats	Database Forensics	Secure Development Life Cycle	Audio and Video processing	Principles of Programming Language
System Hacking	Threat Analysis	Memory Forensics	Infrastructure as code Security	AR/VR	Data Warehousing
Web servers Hacking Techniques	Denial Of Service	Network Forensics	Cloud Security Frameworks	Crypto currency and Block chain Technologies	Virtualization
IOT Hacking	Session Hijacking	Mobile Forensics	Security and Privacy in Cloud	Modern Cryptography	Storage Technologies
Industry Supported Course	Cloud Pen Testing	Web Forensics	Enterprise Security	Machine Learning security	Software Defined Networks

Registration of Professional Elective Courses from Verticals: Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also.

Chairman (BoS)
23/9/23

13

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
VERTICAL 1: ETHICAL HACKING											
1.	23CB1P01	Network scanning concepts	PEC	3	0	0	3	3	40	60	100
2.	23CB1P02	SQL injection	PEC	3	0	0	3	3	40	60	100
3.	23CB1P03	Evading IDS and Firewalls	PEC	3	0	0	3	3	40	60	100
4.	23CB1P04	Social Engineering	PEC	3	0	0	3	3	40	60	100
5.	23CB1P05	System Hacking	PEC	3	0	0	3	3	40	60	100
6.	23CB1P06	Web servers Hacking Techniques	PEC	3	0	0	3	3	40	60	100
7.	23CB1P07	IOT Hacking	PEC	3	0	0	3	3	40	60	100
8.	23CB1P08	Industry Supported Course	PEC	3	0	0	3	3	40	60	100
VERTICAL 2: VULNERABILITY ASSESSMENT AND PENETRATION TESTING											
1.	23CB1P09	Cloud computing	PEC	3	0	0	3	3	40	60	100
2.	23CB1P10	Enumeration	PEC	3	0	0	3	3	40	60	100
3.	23CB1P11	Vulnerability Analysis	PEC	3	0	0	3	3	40	60	100
4.	23CB1P12	Malware Threats	PEC	3	0	0	3	3	40	60	100
5.	23CB1P13	Threat Analysis	PEC	3	0	0	3	3	40	60	100
6.	23CB1P14	Denial Of Service	PEC	3	0	0	3	3	40	60	100
7.	23CB1P15	Session Hijacking	PEC	3	0	0	3	3	40	60	100
8.	23CB1P16	Cloud Pen Testing	PEC	3	0	0	3	3	40	60	100
VERTICAL 3: DIGITAL FORENSICS											
1.	23CB1P17	Introduction to Cyber Forensics	PEC	3	0	0	3	3	40	60	100
2.	23CB1P18	Cyber attacks and counter measures	PEC	3	0	0	3	3	40	60	100
3.	23CB1P19	Computer Forensics	PEC	3	0	0	3	3	40	60	100
4.	23CB1P20	Database Forensics	PEC	3	0	0	3	3	40	60	100
5.	23CB1P21	Memory Forensics	PEC	3	0	0	3	3	40	60	100
6.	23CB1P22	Network Forensics	PEC	3	0	0	3	3	40	60	100
7.	23CB1P23	Mobile Forensics	PEC	3	0	0	3	3	40	60	100

Chairman (BoS)   23/9/23

14

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
8.	23CB1P24	Web Forensics	PEC	3	0	0	3	3	40	60	100
VERTICAL4: DEVSEC OPS											
1.	23CB1P25	DevOps	PEC	3	0	0	3	3	40	60	100
2.	23CB1P26	Dockers and Kubernetes	PEC	3	0	0	3	3	40	60	100
3.	23CB1P27	Continuous Integration and deployment	PEC	3	0	0	3	3	40	60	100
4.	23CB1P28	Secure Development Life Cycle	PEC	3	0	0	3	3	40	60	100
5.	23CB1P29	Infrastructure as code Security	PEC	3	0	0	3	3	40	60	100
6.	23CB1P30	Cloud Security Frameworks	PEC	3	0	0	3	3	40	60	100
7.	23CB1P31	Security and Privacy in Cloud	PEC	3	0	0	3	3	40	60	100
8.	23CB1P32	Enterprise Security	PEC	3	0	0	3	3	40	60	100
VERTICAL 5: EMERGING TECHNOLOGIES											
1.	23CB1P33	Machine Learning Techniques	PEC	3	0	0	3	3	40	60	100
2.	23CB1P34	Computer Vision	PEC	3	0	0	3	3	40	60	100
3.	23CB1P35	Artificial Intelligence	PEC	3	0	0	3	3	40	60	100
4.	23CB1P36	Audio and Video processing	PEC	3	0	0	3	3	40	60	100
5.	23CB1P37	AR/VR	PEC	3	0	0	3	3	40	60	100
6.	23CB1P38	Crypto currency and Block chain Technologies	PEC	3	0	0	3	3	40	60	100
7.	23CB1P39	Modern Cryptography	PEC	3	0	0	3	3	40	60	100
8.	23CB1P40	Machine Learning security	PEC	3	0	0	3	3	40	60	100
VERTICAL 6: FULL STACK DEVELOPMENT											
1.	23CB1P33	App development	PEC	3	0	0	3	3	40	60	100
2.	23CB1P34	UI and UX Design	PEC	3	0	0	3	3	40	60	100
3.	23CB1P35	Software Testing and Automation	PEC	3	0	0	3	3	40	60	100
4.	23CB1P36	Principles of Programming Language	PEC	3	0	0	3	3	40	60	100
5.	23CB1P37	Data Warehousing	PEC	3	0	0	3	3	40	60	100
6.	23CB1P38	Virtualization	PEC	3	0	0	3	3	40	60	100

23/9/23

Chairman (BoS)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
7.	23CB1P39	Storage Technologies	PEC	3	0	0	3	3	40	60	100
8.	23CB1P40	Software Defined Networks	PEC	3	0	0	3	3	40	60	100

23/9/23

Chairman (BoS)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
MANAGEMENT ELECTIVES											
1.	23GE1732	Total Quality Management	HSMC	3	0	0	3	**3**	40	60	100
2.	23GE1733	Principles of Management	HSMC	3	0	0	3	**3**	40	60	100
3.	23GE1734	Engineering Economics	HSMC	3	0	0	3	**3**	40	60	100
4.	23GE1735	Human Resource Management	HSMC	3	0	0	3	**3**	40	60	100
5.	23GE1736	Industrial Management	HSMC	3	0	0	3	**3**	40	60	100
MANDATORY COURSE											
MANDATORY COURSE - I											
1	23MC1531	Environmental Science and Sustainability	MC	2	0	0	2	**0**	100	-	100
2	23MC1532	Indian Constitution	MC	2	0	0	2	**0**	100	-	100
3	23MC1533	Essence of Indian Traditional Knowledge	MC	2	0	0	2	**0**	100	-	100
4	23MC1534	Introduction to Gender Studies	MC	2	0	0	2	**0**	100	-	100
MANDATORY COURSE - II											
1	23MC1631	Life Science for Engineers	MC	2	0	0	2	**0**	100	-	100
2	23MC1632	Disaster Management	MC	2	0	0	2	**0**	100	-	100
3	23MC1633	Industrial Maintenance and Safety Engineering	MC	2	0	0	2	**0**	100	-	100
4	23MC1634	Intellectual Property Rights	MC	2	0	0	2	**0**	100	-	100

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
OPEN ELECTIVE COURSES OFFERED BY CSE-CS DEPARTMENT											
OPEN ELECTIVE - I											
1.	23CB1E01	Fundamentals of Cyber security	OEC	3	0	0	3	**3**	40	60	100
2.	23CB1E02	Vulnerability Testing Techniques	OEC	3	0	0	3	**3**	40	60	100
OPEN ELECTIVE - II											

Chairman (BoS)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
3.	23CB1E03	Cyber laws	OEC	3	0	0	3	3	40	60	100
4.	23CB1E04	Basics of Digital Forensics	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVE - III											
5.	23CB1E05	Penetration Testing Techniques	OEC	3	0	0	3	3	40	60	100
6.	23CB1E06	Malware Analysis	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVE - IV											
7.	23CB1E07	Principles of DevSecOps	OEC	3	0	0	3	3	40	60	100
8.	23CB1E08	Cloud Security	OEC	3	0	0	3	3	40	60	100

23/9/23

Chairman (BoS)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
MANAGEMENT ELECTIVES											
1.	23GE1732	Total Quality Management	HSMC	3	0	0	3	**3**	40	60	100
2.	23GE1733	Principles of Management	HSMC	3	0	0	3	**3**	40	60	100
3.	23GE1734	Engineering Economics	HSMC	3	0	0	3	**3**	40	60	100
4.	23GE1735	Human Resource Management	HSMC	3	0	0	3	**3**	40	60	100
5.	23GE1736	Industrial Management	HSMC	3	0	0	3	**3**	40	60	100
MANDATORY COURSE											
MANDATORY COURSE - I											
1	23MC1531	Environmental Science and Sustainability	MC	2	0	0	2	**0**	100	-	100
2	23MC1532	Indian Constitution	MC	2	0	0	2	**0**	100	-	100
3	23MC1533	Essence of Indian Traditional Knowledge	MC	2	0	0	2	**0**	100	-	100
4	23MC1534	Introduction to Gender Studies	MC	2	0	0	2	**0**	100	-	100
MANDATORY COURSE - II											
1	23MC1631	Life Science for Engineers	MC	2	0	0	2	**0**	100	-	100
2	23MC1632	Disaster Management	MC	2	0	0	2	**0**	100	-	100
3	23MC1633	Industrial Maintenance and Safety Engineering	MC	2	0	0	2	**0**	100	-	100
4	23MC1634	Intellectual Property Rights	MC	2	0	0	2	**0**	100	-	100

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
OPEN ELECTIVE COURSES OFFERED BY CSE-CS DEPARTMENT											
OPEN ELECTIVE - I											
1.	23CB1E01	Fundamentals of Cyber security	OEC	3	0	0	3	**3**	40	60	100
2.	23CB1E02	Vulnerability Testing Techniques	OEC	3	0	0	3	**3**	40	60	100
OPEN ELECTIVE - II											

Chairman (BoS)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
OPEN ELECTIVE COURSES											
OPEN ELECTIVE - I											
1.	23BM1E01	Basics of Biomedical Instrumentation	OEC	3	0	0	3	3	40	60	100
2.	23BM1E02	Imaging Equipments	OEC	3	0	0	3	3	40	60	100
3.	23EC1E01	Analog and Digital Communication	OEC	3	0	0	3	3	40	60	100
4.	23EC1E02	Electronic Devices and Circuits	OEC	3	0	0	3	3	40	60	100
5.	23ME1E01	Energy Conservation and Management	OME	3	0	0	3	3	40	60	100
6.	23ME1E02	Reverse Engineering	OME	3	0	0	3	3	40	60	100
7.	23EE1X01	Solar and Wind Energy Systems	OEC	3	0	0	3	3	40	60	100
8.	23EE1X02	Electrical Wiring and Lighting	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVE - II											
1.	23BM1E03	Biometric systems	OEC	3	0	0	3	3	40	60	100
2.	23BM1E04	Human Assist Devices	OEC	3	0	0	3	3	40	60	100
3.	23EC1E03	PCB Design and Fabrication	OEC	3	0	0	3	3	40	60	100
4.	23EC1E04	Digital Signal Processing	OEC	3	0	0	3	3	40	60	100
5.	23ME1E03	Quality Engineering	OME	3	0	0	3	3	40	60	100
6.	23ME1E04	Fire Safety Engineering	OME	3	0	0	3	3	40	60	100
7.	23EE1X 03	Electrical Safety	OEC	3	0	0	3	3	40	60	100
8.	23EE1X 04	Energy Conservation and Management	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVE - III											
1.	23BM1E05	Wearable Devices	OEC	3	0	0	3	3	40	60	100
2.	23BM1E06	Medical Informatics	OEC	3	0	0	3	3	40	60	100
3.	23EC1E05	Electronic Hardware and Troubleshooting	OEC	3	0	0	3	3	40	60	100
4.	23EC1E06	Microprocessors and Microcontrollers	OEC	3	0	0	3	3	40	60	100
5.	23ME1E05	Industrial Management	OME	3	0	0	3	3	40	60	100

23/9/23

Chairman (BoS)

19

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
6.	23ME1E06	Industrial Design & Rapid Prototyping Techniques	OME	3	0	0	3	3	40	60	100
7.	23EE1X 05	Electric Vehicle	OEC	3	0	0	3	3	40	60	100
8.	23EE1X 06	Introduction to Embedded System	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVE - IV											
1.	23BM1E07	Assistive Technology	OEC	3	0	0	3	3	40	60	100
2.	23BM1E08	Medical Innovation and Entrepreneurship	OEC	3	0	0	3	3	40	60	100
3.	23EC1E07	Wireless Communication	OEC	3	0	0	3	3	40	60	100
4.	23EC1E08	Digital Image Processing	OEC	3	0	0	3	3	40	60	100
5.	23ME1E07	Drone Technologies	OME	3	0	0	3	3	40	60	100
6.	23ME1E08	Robotics	OME	3	0	0	3	3	40	60	100
7.	23EE1X07	Micro grid and Smart Grid	OEC	3	0	0	3	3	40	60	100
8.	23EE1X08	Sensors and Transducers	OEC	3	0	0	3	3	40	60	100

Summary										
Name of the Programme: B.E Computer Science and Engineering(Cyber Security)										
CATEGORY	I	II	III	IV	V	VI	VII	VIII	TOTAL CREDITS	%
HSMC	4	2.5	3	-	-	-	6	-	15.5	9.5
BSC	8	8	4	-	-	-	-	-	20	12.3
ESC	8.5	8.5	-	-	-	-	-	-	17	10.4
PCC	-	4.5	16	22	12	9		-	63.5	39.0
PEC	-	-	-	-	6	6	6	-	18	11.0
OEC	-	-	-	-	3	3	6	-	12	7.4
EEC	-	-	1	2	1	3	2	8	17	10.4
MC	✓	-	-	-	✓	✓	-	-	-	-
Total	20.5	23.5	24	24	22	21	20	8	163	100.0

Malathi 23/9/23
Chairman (BoS)

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes, Moreover, for minor degree the student can register for courses from any one of the following verticals also.

VERTICALS FOR MINOR DEGREE
(In addition to all the verticals of other programmes)

VERTICAL I FINTECH AND BLOCK CHAIN	VERTICAL II ENTREPRENEURSHIP	VERTICAL III PUBLIC ADMINISTRATION	VERTICAL IV BUSINESS DATA ANALYTICS	VERTICAL V ENVIRONMENT AND SUSTAINABILITY
Financial Management	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable infrastructure Development
Fundamentals of Investment	Team Building & Leadership Management for Business	Constitution of India	Datamining for Business Intelligence	Sustainable Agriculture and Environmental Management
Banking, Financial Services and Insurance	Creativity & Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials
Introduction to Blockchain and its Applications	Principles of Marketing Management for Business	Administrative Theories	Marketing and Social Media Web Analytics	Materials for Energy Sustainability
Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation and Supply Chain Analytics	Green Technology
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis
-	-	-	-	Integrated Energy Planning for Sustainable Development
-	-	-	-	Energy Efficiency for Sustainable Development

Chairman (BoS) 23/9/23

(choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
VERTICAL I: FINTECH AND BLOCK CHAIN											
1.		Financial Management	PEC	3	0	0	3	3	40	60	100
2.		Fundamentals of Investment	PEC	3	0	0	3	3	40	60	100
3.		Banking, Financial Services and Insurance	PEC	3	0	0	3	3	40	60	100
4.		Introduction to Blockchain and its Applications	PEC	3	0	0	3	3	40	60	100
5.		Fintech Personal Finance and Payments	PEC	3	0	0	3	3	40	60	100
6.		Introduction to Fintech	PEC	3	0	0	3	3	40	60	100
VERTICAL II : ENTREPRENEURSHIP											
1.		Foundations of Entrepreneurship	PEC	3	0	0	3	3	40	60	100
2.		Team Building & Leadership Management for Business	PEC	3	0	0	3	3	40	60	100
3.		Creativity & Innovation in Entrepreneurship	PEC	3	0	0	3	3	40	60	100
4.		Principles of Marketing Management for Business	PEC	3	0	0	3	3	40	60	100
5.		Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3	40	60	100
6.		Financing New Business Ventures	PEC	3	0	0	3	3	40	60	100
VERTICAL III : PUBLIC ADMINISTRATION											
1.		Principles of Public Administration	PEC	3	0	0	3	3	40	60	100
2.		Constitution of India	PEC	3	0	0	3	3	40	60	100
3.		Public Personnel Administration	PEC	3	0	0	3	3	40	60	100
4.		Administrative Theories	PEC	3	0	0	3	3	40	60	100
5.		Indian Administrative System	PEC	3	0	0	3	3	40	60	100
6.		Public Policy Administration	PEC	3	0	0	3	3	40	60	100
VERTICAL IV: BUSINESS DATA ANALYTICS											
1.		Statistics for Management	PEC	3	0	0	3	3	40	60	100

23/9/23

Chairman (BoS)

2.		Datamining for Business Intelligence	PEC	3	0	0	3	3	40	60	100
3.		Human Resource Analytics	PEC	3	0	0	3	3	40	60	100
4.		Marketing and Social Media Web Analytics	PEC	3	0	0	3	3	40	60	100
5.		Operation and Supply Chain Analytics	PEC	3	0	0	3	3	40	60	100
6.		Financial Analytics	PEC	3	0	0	3	3	40	60	100
VERTICAL V: ENVIRONMENT AND SUSTAINABILITY											
1.		Sustainable infrastructure Development	PEC	3	0	0	3	3	40	60	100
2.		Sustainable Agriculture and Environmental Management	PEC	3	0	0	3	3	40	60	100
3.		Sustainable Bio Materials	PEC	3	0	0	3	3	40	60	100
4.		Materials for Energy Sustainability	PEC	3	0	0	3	3	40	60	100
5.		Green Technology	PEC	3	0	0	3	3	40	60	100
6.		Environmental Quality Monitoring and Analysis	PEC	3	0	0	3	3	40	60	100
7.		Integrated Energy Planning for Sustainable Development	PEC	3	0	0	3	3	40	60	100
8.		Energy Efficiency for Sustainable Development	PEC	3	0	0	3	3	40	60	100

INDUCTION PROGRAMME

This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have a broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

23/9/23

Chairman (BoS)

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it everyday for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii) Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, make decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don'ts, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity
 Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi) Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area

Chairman (BoS)

24

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the underprivileged.

(viii) Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering / Technology / Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science.

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

23/9/23

Chairman (BoS)

23HS1131	PROFESSIONAL COMMUNICATION	Category	L	T	P	C
		HSMC	3	0	0	3

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- Engage learners in meaningful language activities to improve their reading and writing skills.
- Learn to use basic grammatical structures in suitable contexts.
- Help learners understand the purpose, audience, contexts of different types of writing.
- Develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.
- Demonstrate an understanding of job applications and interviews for internship and placements.

UNIT - I	Understanding comparisons and contrasts	9

Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contexts and emails. Writing - Writing emails / letters introducing oneself, Email etiquette - Compare and Contrast Essay. Grammar - Present Tenses - Question types: Why/ Yes or No/ and Tags. Vocabulary - Synonyms; One word substitution; Abbreviations & Acronyms (as used in technical contexts).

UNIT - II	Writing reports and vocabulary	9

Reading - Reading longer technical texts, biographies, travelogues, newspaper reports, Excerpts from literature, and travel & technical blogs, Writing - Paragraph writing, Short Report on an event (field trip etc.). Grammar - Active Passive Voice transformations, Infinitive and Gerunds, Past Tenses - Subject-Verb Agreement; and Prepositions. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms, Phrasal verbs.

UNIT - III	Description of process	9

Reading - advertisements, gadget reviews; user manuals, case studies, excerpts from literary texts, news reports etc. Writing – Writing definitions; instructions; and Product /Process description, Checklists, Problem solution essay / Argumentative Essay. Grammar – Degrees of comparison; Future Tenses; If conditional sentences. Vocabulary – Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNIT - IV	Classifications and Recommendations	9

Reading – Newspaper articles, Journal reports – and Non Verbal Communication (tables, pie charts etc,); Writing – Recommendations, Note-making / Note-taking - Transferring information from non verbal (chart , graph etc, to verbal mode). Grammar – Articles; Pronouns - Possessive & Relative pronouns, Reported Speech, Modals Vocabulary – Collocations.

1

UNIT - V	Summation and Description	9

Reading – Reading editorials; and Opinion Blogs, Company profiles, Statement of Purpose; Writing – Essay Writing (Descriptive or narrative), Job / Internship application – Cover letter & Resume; Grammar – Numerical adjectives, Relative Clauses, Vocabulary - Cause & Effect Expressions – Content Vs Function words.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Compare and contrast products and ideas in technical texts.	Analyse
CO2	Identify cause and effects in events, industrial processes through technical texts.	Remember
CO3	Analyse problems in order to arrive at feasible solutions and communicate in the written format.	Analyse
CO4	Report events and the processes of technical and industrial nature.	Analyse
CO5	Present their opinions in a planned and logical manner, and draft effective resumes in context of job search.	Understand

TEXT BOOKS:

1	English for Engineers & Technologists, 2020 edition, Orient Blackswan Private Ltd. Department of English, Anna University.
2	Dr. KN. Shoba, and Dr. Lourdes Joevani, English for Science & Technology Cambridge University Press 2021. Francis, Department of English, Anna University.

REFERENCES:

1	Meenakshi Raman, SangeetaSharm, Technical Communication – Principles And Practices, Oxford Univ. Press, 2016, New Delhi.
2	Lakshminarayanan, A Course Book On Technical English, Scitech Publications (India) Pvt.Ltd.
3	Aysha Viswamohan, English For Technical Communication, McGraw Hill Education,
4	Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House.
5	Dr. V. Chellammal, Learning to Communicate –Allied Publishing House, New Delhi, 2003.

Chairman (BoS)   2

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Mapping of COs with POs and PSOs														
CO1	-	-	-	-	-	-	-	2	3	3	-	-	-	-
CO2	-	-	-	-	-	-	-	2	3	3	-	-	-	-
CO3	-	-	-	-	-	-	-	2	3	3	-	-	-	-
CO4	-	-	-	-	-	-	-	2	3	3	-	-	-	-
CO5	-	-	-	-	-	-	-	2	3	3	-	-	-	-
Avg.	-	-	-	-	-	-	-	2	3	3	-	-	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
3	0	0	3	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION:

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

J.C [signature]
Chairman (BoS)

3

23GE1131	FUNDAMENTALS OF COMPUTER PROGRAMMING	Category	L	T	P	C
		ESC	2	1	0	3

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings
- To develop modular applications in C using functions
- To develop applications in C using pointers and structures
- To do input/output and file handling in C

UNIT - I	INTRODUCTION	9

Generation and Classification of Computers- Basic Organization of a Computer –Number System – Binary – Decimal – Conversion – Problems. Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.

UNIT - II	BASICS OF C PROGRAMMING	9

Introduction to programming paradigms – Applications of C Language - Structure of C program – C programming: Data Types - Constants – Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT - III	ARRAYS AND STRUCTURE	9

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search. Structure - Nested structures – Pointer and Structures – Array of structures – Self-referential structures – Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

UNIT - IV	FUNCTIONS AND POINTERS	9

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions –Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT - V	FILE PROCESSING	9

Files –: Introduction to file management, Simple file management functions for text files. Types of file processing: Sequential access, Random access – Sequential access file - Example Program: Finding average of numbers stored in sequential access file - Random access file - Example Program: Transaction processing using random access files – Command line arguments.

TOTAL: 45 PERIODS

Chairman (BoS)
23/9/23

1

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Demonstrate knowledge on C Programming constructs.	Applying
CO2	Develop simple applications in C using basic constructs.	Applying
CO3	Design and implement applications using arrays and structures.	Applying
CO4	Develop and implement modular applications in C using functions and pointers.	Applying
CO5	Design applications using sequential and random access file processing.	Applying

TEXT BOOKS:

1	ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2	Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCES:

1	Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition,Pearson Education, 2018.
2	Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3	Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C",McGraw-Hill Education, 1996.
4	Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
5	Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013
6	https://onlinecourses.nptel.ac.in/noc20_cs91
7	https://www.w3schools.com/c/index.php

Mapping of COs with POs and PSOs														
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	-	-	-	-	-	2	2	-	-
CO2	3	3	3	3	2	-	-	-	-	-	2	2	-	-
CO3	3	3	3	3	2	-	-	-	-	-	2	2	-	-
CO4	3	3	3	3	2	-	-	-	-	-	2	2	-	-
CO5	3	3	3	3	2	-	-	-	-	-	2	2	-	-
Avg.	3	3	3	3	2	-	-	-	-	-	2	2	-	-

23/9/23

Chairman (BoS)

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)		End Semester Examination (ESE)	
2	1	0	3	Theory only (40%)		Theory only (60%)	

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

Chairman (BoS) 23/9/23

23GE1132	ENGINEERING GRAPHICS	Category	L	T	P	C
		ESC	2	0	4	4

(Common to All Branches)

OBJECTIVES:

The Course will enable learners:

- To expose the students to follow the standards of Engineering Graphics.
- To draw the Engineering curves.
- To demonstrate the concepts of orthographic and isometric projections.
- To draw the section of solids and development of solids.
- To develop the ability to convey the engineering information through drawings.

UNIT - I	PLANE CURVES	6 + 12 =18

Geometrical construction, Curves used in engineering practices: Conic Sections- Construction of ellipse, parabola and hyperbola by eccentricity method - Construction of cycloid - Construction of involutes - Drawing of tangents and normal to the above curves.

UNIT - II	PROJECTIONS OF POINTS, STRAIGHT LINES AND PLANES	6 + 12 =18

Projection of points, Projection of straight lines (First angle projections) inclined to both the planes - Determination of true lengths of a straight line and its inclinations with reference planes by rotating line method and traces of a line. Projection of oblique planes.

UNIT - III	PROJECTION OF SOLIDS	6 + 12 =18

Projection of solids like Prisms, Pyramids, Cylinder and Cone when the axis is inclined to one of the reference planes and parallel to the other by rotating object method.

UNIT - IV	SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES	6 + 12 =18

Introduction – Sections of solids like Prisms, Pyramids, Cylinders and Cones when the section plane is perpendicular to one of the principal planes and inclined to the other. Development of lateral surfaces of right solids - Prisms, cylinders, pyramids and cones.

UNIT - V	ORTHOGRAPHIC VIEWS AND ISOMETRIC PROJECTION	6 + 12 =18

Introduction – Conversion of pictorial views into orthographic views. Orthographic projection. Isometric drawing of Prisms, pyramids, cylinders and cones.

Introduction to AutoCAD

Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)

TOTAL: 30 + 60 = 90 PERIODS

COURSE OUTCOMES -

Upon completion of the course, the students will be able to:

COs	Description	Blooms Taxonomy Level
CO1	Construct the conic curves, involutes and cycloid.	Understand
CO2	Draw the practical problems involving projections of lines and planes.	Apply
CO3	Draw the projections of solids.	Apply
CO4	Draw projections of section of solids and development of surfaces.	Apply
CO5	Draw the Orthographic and isometric views of the objects	Apply

Chairman (BoS)

TEXT BOOKS:

| 1 | Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008. |
| 2 | Natarajan K.V, "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018. |

REFERENCES:

1	Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019
2	Gopalakrishnan K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017
3	Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015
4	Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
5	Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.
6	Engineering Drawing Practice for Schools and Colleges BIS SP46:2003 (R2008), Published by Bureau of Indian Standards (BIS), 2008.
7	Luzzader, Warren.J. and Duff,John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.

NPTEL LINK:
1. https://nptel.ac.in/courses/112103019
2. https://nptel.ac.in/courses/112102304

LIST OF EQUIPMENTS/SOFTWARE NEEDED:
1. Computer with CAD software

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	2	2	2	-	-	-	1	-	-	2	-	-
CO2	2	2	2	2	2	-	-	-	1	-	-	2	-	-
CO3	2	2	3	3	2	-	-	-	1	-	-	2	-	-
CO4	3	2	3	2	3	-	-	-	1	-	-	2	-	-
CO5	3	3	3	3	3	-	-	-	1	-	-	2	-	-
Avg.	2.2	2	2.6	2.4	2.4	-	-	-	1	-	-	2	-	-

Mapping of COs with POs and PSOs

Chairman (BoS)

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
2	0	4	4	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted in to 40 marks for internal assessment.

Chairman (BoS)

23GE1133	HERITAGE OF TAMILS	Category	L	T	P	C
		HSMC	1	0	0	1

Common to All Branches	

UNIT - I	LANGUAGE AND LITERATURE	3

Language Families in India - Dravidian Languages – Tamil as a Classical Language – Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT - II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE	3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT - III	FOLK AND MARTIAL ARTS	3

Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT - IV	THINAI CONCEPT OF TAMILS	3

Flora and Fauna of Tamils &Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT - V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	3

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

	Total Periods:15

TextBooks:

1	Historical Heritage of the Tamils, Dr.S.V.Subatamanian, Dr.K.D. ThirunavukkarasuPublished by: International Institute of Tamil Studies.
2	The Contributions of the Tamils to Indian Culture, Dr.M.ValarmathiPublished by: International Institute of Tamil Studies.

J.c பிரபு
Chairman (BoS)

References:	
1	Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,Tamil Nadu)
2	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
3	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

ASSESSMENT SYSTEM:

L	**T**	**P**	**C**	**Continuous Internal Examination (CIE)**	**End Semester Examination (ESE)**
1	0	0	1	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION:

Assessment	**Portions**	**Duration**	**Max. Mark**	**Max CIE Marks**
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

Chairman (BoS)

23MA1141	MATRICES & CALCULUS	Category	L	T	P	C
		BSC	2	1	2	4

(Common to All Branches)

OBJECTIVES:

The Course will enable learners:

- To examine the concepts of basic linear algebra techniques needed for deep learning algorithm.
- To familiarize the differential calculus.
- To familiarize the functions of several variables. This is needed in many branches of engineering.
- To understand the various techniques of integration.
- To illustrate the simple applications of multi variable calculus and vector calculus.

UNIT - I	MATRICES	6+3+6=15

Linear and orthogonal transformation (definitions) – Eigen values and eigen vectors – Properties of Eigen values – Cayley- Hamilton theorem– Reduction to diagonal form – Reduction of a quadratic form to canonical form–Nature of quadratic forms.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Calculate the characteristic equation
2. Finding the Eigen values and Eigen vectors.
3. Find diagonalization of a given matrix.

(Laboratory – 6)

UNIT - II	DIFFERENTIAL CALCULUS	6+3+6=15

Representation of functions - Limit of a function – Calculating limits using the limit laws – Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation - Applications : Maxima and Minima of functions of one variable.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluating the Limits & Continuity
2. Find the derivative of a function.
3. Determine the maxima and minima.

(Laboratory – 6)

UNIT - III	FUNCTIONS OF SEVERAL VARIABLES	6+3+6=15

Partial derivatives – Homogeneous functions and Euler's theorem – Total derivative – Differentiation of implicit functions – Change of variables – Jacobians – Taylor's theorem for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluating Jacobian matrix of any function.
2. Find the Taylor's series for functions of two variables.
3. Evaluating the maxima and minima.

(Laboratory – 6)

Chairman (Bos)

1

UNIT - IV	INTEGRAL CALCULUS	6+3+6=15

Definite and Indefinite integrals – Substitution rule – Techniques of Integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions – Integration of rational functions by partial fractions.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluating definite integrals.
2. Evaluating indefinite integrals.
3. Evaluation techniques of integration.

(Laboratory – 6)

UNIT - V	MULTIPLE INTEGRALS &VECTOR CALCULUS	6+3+6=15

Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Applications: Moments and center of mass. Scalar and vector point functions – Gradient – Directional derivative – Divergence and curl – Irrotational and Solenoidal fields.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluation double integrals.
2. Evaluation triple integrals.
3. Evaluating directional derivative, divergence and curl.

(Laboratory – 6)

TOTAL: 30+15+30 = 75 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Apply the concept of change quadratic form to canonical form in various fields of engineering.	Apply
CO2	Solve maxima & minima problems using rules of differentiation.	Apply
CO3	Solve the problems based on maxima and minima for functions of two variables using partial derivatives.	Apply
CO4	Determine integrals using techniques of integration such as, substitution, partial fractions and integration by parts.	Apply
CO5	Apply knowledge about evaluating double integrals, triple integrals and used to calculate area and volume. Understand the fundamentals in vector calculus.	Apply

Chairman (BoS)

2

TEXT BOOKS:

1.	B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2014.
2.	James Stewart, " Calculus : Early Transcendentals ", Cengage Learning, 8th Edition, New Delhi, 2015.

REFERENCES:

1	N. P. Bali, Manish Goyal "A Textbook of Engineering Mathematics", 8th Edition, Laxmi Publications, Delhi.
2	Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley and Sons,10th Edition, New Delhi, 2016.
3	Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016.
4	Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.
5	S. S. Sastry "Engineering Mathematics" Volume 1, 4thEdition, PHI Learning private Limited, New Delhi, 2010.

NPTEL LINKS:

1	https://archive.nptel.ac.in/courses/111/108/111108157/
2	https://nptel.ac.in/courses/111107112
3	https://archive.nptel.ac.in/courses/111/106/111106146/
4	https://archive.nptel.ac.in/courses/111/104/111104144/

LIST OF EQUIPMENTS/SOFTWARE NEEDED:

1. MATLAB

Mapping of COs with POs and PSOs													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	-	-	-	-	2	-	-	2	-	-
CO2	3	3	3	3	-	-	-	-	2	-	-	1	-	-
CO3	3	3	3	2	-	-	-	-	2	-	-	2	-	-
CO4	3	3	3	2	-	-	-	-	2	-	-	2	-	-
CO5	3	3	3	2	-	-	-	-	2	-	-	1	-	-
Avg.	3	3	2.8	2.4	0	0	0	0	2	0	0	1.6	0	0

Chairman (BoS)

ASSESSMENT SYSTEM:					
L	**T**	**P**	**C**	**Continuous Internal Examination (CIE)**	**End Semester Examination (ESE)**
2	1	2	4	Theory (25%) Laboratory (25 %)	Theory (35%) Laboratory (15%)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100*

*The weighted average shall be converted into 25 marks for internal assessment.

LABORATORY

Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	Total
75	25	100*

*Total marks shall be converted into 25 marks

Chairman (BoS)

23CY1141	ENGINEERING CHEMISTRY	Category	L	T	P	C
		BSC	3	0	2	4

(Common to All Branches)

OBJECTIVES:
The Course will enable learners to:
- Inculcate sound understanding of water quality parameters and water treatment techniques.
- Introduce the principles of electrochemical reactions.
- Impart knowledge about various methods for corrosion prevention and protection of materials.
- Familiarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.
- Facilitate the understanding of the basic concepts of polymer chemistry and the basic principles and preparatory methods of nanomaterials.

UNIT - I	WATER TREATMENT	9 + 6 =15

Introduction - Characteristics imparted by impurities in water - Hardness of water - Equivalents of calcium carbonate - Units of hardness - Scale and sludge formation in boilers - Caustic embrittlement - Boiler Corrosion - Priming and foaming - Softening methods - (Internal: Colloidal, phosphate, Calgon and sodium aluminate - External: Ion exchange process, Zeolite Process) - Drinking water or Municipal water - Desalination of brackish water: Reverse osmosis.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of total, temporary and permanent hardness of water by EDTA method.
2. Determination of chloride content of water sample by Argentometric method.

(Laboratory – 6)

UNIT - II	ELECTROCHEMISTRY	9 + 6 =15

Introduction - Types of conductors - Conductance in electrolytic solution - factors affecting conductance - Electrochemical cell - Electrode potential and EMF of a galvanic cell - Measurement of electrode potential - Electrochemical series and its applications - Nernst equation (derivation), numerical problems - types of electrodes - reference electrode (calomel) - ion selective electrode - glass electrode. E-vehicles.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of the amount of NaOH using a conductivity meter.
2. Determination of the amount of acids in a mixture using a conductivity meter.

(Laboratory – 6)

UNIT - III	CORROSION AND ITS CONTROL	9 + 6 =15

Introduction - Dry corrosion - Wet Corrosion - Mechanism of Dry and wet corrosion - Galvanic corrosion - Concentration cell corrosion - Pitting corrosion - Intergranular corrosion - Waterline corrosion - Factors influencing corrosion - Corrosion control - Sacrificial anode and impressed current cathodic method.

(Theory – 9)

List of Exercise/Experiments:
1. Corrosion experiment – Weight loss method.
2. Determination of dissolved oxygen content in water sample by Winkler's method.

(Laboratory – 6)

Chairman (BoS)

UNIT - IV	ENERGY SOURCES AND STORAGE DEVICES	9 + 6 =15

Introduction - Nuclear fission - Nuclear fusion - Nuclear reactor - Breeder reactor - Solar energy conversion: Principle, working and applications of solar cells. Wind energy. Batteries: Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery; Fuel cells: H_2-O_2 fuel cell.

(Theory – 9)

List of Exercise/Experiments:
1. Estimation of the iron content of the given solution using a potentiometer.
2. Determination of strength of Dil.H_2SO_4 using a conductivity meter.

(Laboratory – 6)

UNIT - V	SMART MATERIALS FOR ENGINEERING APPLICATIONS	9 + 6 =15

Polymers - types of polymerization (addition, condensation and copolymerization only) – mechanism of addition polymerization (free radical mechanism only) – Preparation, properties and uses of polyvinyl chloride (PVC) and polyamides (nylon – 6,6).
Nanomaterials : Introduction – properties of nano materials - Preparation – top-down process (Laser ablation method only) - bottom-up process (Electro deposition method only) – Applications of nanomaterials in various fields.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of concentration of $BaCl_2$ by conductometric titrations.
2. Preparation of ZnO nanocrystal by precipitation method.

(Laboratory – 6)

	TOTAL: 45 + 30 = 75 PERIODS

COURSE OUTCOMES

Upon completion of the course, the students will be able to:

Course Outcome	Description	Bloom's Taxonomy Level
CO1	Identify the quality of water from quality parameter data and apply suitable treatment methodologies to treat water.	Apply
CO2	Examine the principle and working of various electrochemical cells.	Analyze
CO3	Implement the concept of corrosion and its control.	Apply
CO4	Recognize different forms of energy resources and apply them for suitable applications in energy sectors.	Apply
CO5	Apply the basic concepts of polymer chemistry and nano-science in designing the materials for engineering and technology applications.	Apply

TEXT BOOKS:	
1.	P. C. Jain and Monika Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 2022.
2.	S.S.Dara and S.S.Umare, "A Text book of Engineering Chemistry", 12th Edition, S.Chand & Company, New Delhi, 2013.
3.	Shikha Agarwal, "Engineering Chemistry", Cambridge University Press, New Delhi, 2015.

Chairman (BoS)

	REFERENCES:
1.	V.R.Gowarikar, Polymer Science, 2nd edition, New Age International Publishers, 2021.
2.	J.C.Kuriacose and J.Rajaram, "Chemistry in Engineering and Technology", Volume-1 & Volume-2, Tata McGraw-Hill Education Pvt. Ltd., 2010.
3.	Geoffrey A.Ozin, Andre C. Arsenault and Ludovico Cademartiri, "Nanochemistry: A Chemical Approach to Nanomaterials", 2nd Edition, RSC publishers, 2015.
4.	Prasanna Chandrasekhar, "Conducting polymers, fundamentals and applications– Including Carbon Nanotubes and Graphene", Second Edition, Springer Science & Business Media, NewYork, 2019.
5.	J.Mendham, R.C.Denney, J.D.Barnes, M. J.K.Thomas and B.Sivasankar, "Vogel's Quantitative Chemical Analysis", 6th edition, Pearson Education Pvt. Ltd., 2019.

	NPTEL LINKS:
1.	https://nptel.ac.in/courses/113101098
2.	https://nptel.ac.in/courses/113105102
3.	https://archive.nptel.ac.in/courses/104/105/104105039/

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	-	1	1	-	-	-	-	1	-	-
CO2	3	2	-	-		1	2	-	-	-	-	1	-	-
CO3	3	2	-	-	-	1	2	-	-	-	-	1	-	-
CO4	3	1	2	1	-	2	2	-	-	-	-	2	-	-
CO5	3	2	-	-	-	1	2	-	-	-	-	1	-	-
Avg.	3	2	1	1	-	1	2	-	-	-	-	1	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
3	0	2	4	Theory (25%) Laboratory (25 %)	Theory (35%) Laboratory (15 %)

CONTINUOUS INTERNAL EXAMINATION:

THEORY				
Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	
CIE - 2	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
Improvement / Missed Test	2.5 units	3 Hours	100	

Other Assessment Methods	Quizzes (10 MCQ per unit)	20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test	20	
			100

*The weighted average shall be converted into 40 marks for internal assessment.

LABORATORY		Total
Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	
75	25	100*

* Total marks shall be converted into 60 marks

J.C.2 23/8/23
Chairman (BoS)

23GE1151	PROGRAMMING IN C LABORATORY	Category	L	T	P	C
		ESC	0	0	3	1.5

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- To develop programs in C using basic constructs.
- To develop programs in C using arrays.
- To develop applications in C using strings, pointers, functions.
- To develop applications in C using structures.
- To develop applications in C using file processing.

LIST OF EXPERIMENTS:

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

1. Search, generate, manipulate data using MS office/ Open Office

2. I/O statements, operators, expressions

3. decision-making constructs: if-else, goto, switch-case, break-continue

4. Loops: for, while, do-while

5. Arrays: 1D and 2D, Multi-dimensional arrays, traversal

6. Strings: operations

7. Functions: call, return, passing parameters by (value, reference), passing arrays to function.

8. Recursion

9. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers

10. Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions.

11. Files: reading and writing, File pointers, file operations, random access, processor directives.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Demonstrate knowledge on C programming constructs.	Applying
CO2	Develop programs in C using basic constructs.	Applying
CO3	Develop programs in C using arrays and structures.	Applying
CO4	Develop applications in C using strings, pointers, functions.	Applying
CO5	Develop applications in C using file processing.	Applying

23/9/23

Chairman (BoS)

1

CONTENT													
Mapping of COs with POs and PSOs													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO2	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO3	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO4	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO5	3	3	3	3	2	-	-	-	2	2	3	2	-	-
Avg.	3	3	3	3	2	-	-	-	2	2	3	2	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
0	0	3	1.5	Laboratory only (60 %)	Laboratory only (40 %)

LABORATORY		
Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	Total
75	25	100*

* Total marks shall be converted into 60 marks

23/9/23

Chairman (Bos

23GE1231	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Category	L	T	P	C
		ESC	3	0	0	3

(Common to All Branches except ECE & EEE)

OBJECTIVES:

The Course will enable learners to:

- Know the basics of DC & AC Electric circuits.
- Understand the concepts of DC Electrical machines and transformers
- Understand the concepts of AC Electrical machines
- Understand the basic Concept of Analog Electronics
- Know the different measuring instruments and calibration.

UNIT - I	ELECTRICAL CIRCUITS	9

DC Circuits: Electrical quantities – Basic circuit elements (R, L and C), – Ohm's law - Kirchhoff current and voltage laws – Simple Problems – Mesh and nodal analysis of simple circuits with independent sources.

AC circuits : Waveforms, Average, RMS Value , Form Factor – Instantaneous Power , Real power, Reactive power, Apparent power and power factor (Simple Problems)

UNIT - II	DC MACHINES AND TRANSFORMERS	9

Construction and Working of DC Machines – EMF equation – Working Principles of DC Motor Torque equation – Electrical and Mechanical Characteristics–Two, Three, Four Point Starters.

Construction and working of Transformer – EMF Equation - Step Down – Step Up - -All day efficiency.

UNIT - III	AC MACHINES	9

Construction and Operation of Three Phase Induction Motor – Squirrel Cage – Slip Ring – Single phase Induction Motor – Double Field Revolving Theory– Split phase – Capacitor Start and Run – Shaded Pole – Applications – Construction and Operation of Synchronous Motor.

UNIT - IV	ANALOG ELECTRONICS	9

Construction and I-V Characteristics of PN Junction diode – Zener Diode – Bipolar Junction Transistor CE,CB, CC Configuration - Rectifiers – Half Wave and Full Wave Bridge Rectifier

UNIT - V	MEASUREMENTS AND INSTRUMENTATION	9

Functional Elements of an Instrument, Standards and Calibration, Operating Principle of Moving Coil (PMMC) and Moving Iron Meters – Attraction - Repulsion, TwoWatt Meter Method of Power Measurements – Energy Meter

TOTAL: 45 PERIODS

Chairman (BoS)

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Bloom's Taxonomy Level
CO1	Apply the fundamentals of electric circuits to solve simple circuits.	Apply
CO2	Interpret the construction and working of different types of DC machines and Transformer	Understand
CO3	Elucidate the construction and working of AC electrical machines	Understand
CO4	Describe the working of simple electronic devices and circuits.	Understand
CO5	Understand the working of Measuring instruments.	Understand

TEXT BOOKS:

1	D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2	D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3	David A. Bell, "Electronic Devices and Circuits", Oxford Higher Education press, 5 th Edition,2010

REFERENCES:

1	L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
2	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
3	V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.
4	Robert L. Boylestad and Louis Nasheresky, "Electronic Devices and Circuit Theory", 10th Edition, Pearson Education / PHI, 2008.
5	Learning Resources: https://onlinecourses.nptel.ac.in/noc20_ee64/ https://archive.nptel.ac.in/courses/108/105/108105155/

Chairman (BoS)

COs/POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2
Mapping of COs with POs and PSOs															
CO1	3	3	2	2	-	-	-	-	-	-	1	-	-	2	-
CO2	3	2	1	1	-	-	-	-	-	-	1	-	-	2	-
CO3	3	2	-	-	-	-	-	-	-	-	1	-	-	2	-
CO4	3	2	-	-	-	-	-	-	-	-	1	-	-	2	-
CO5	3	2	1	-	-	-	-	-	-	-	1	-	-	2	-
Avg.	3	2.2	1.3	1.3	-	-	-	-	-	-	1	-	-	2	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examinations (CIE)	End Semester Examination (ESE)
3	0	0	3	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION :

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

Chairman (BoS)

23CS1231	PYTHON PROGRAMMING	Category	L	T	P	C
		ESC	2	1	0	3

<div align="center">(Common to All Branches)</div>

OBJECTIVES:

The Course will enable learners to:

- Understand the basics of problem solving.
- Illustrate the concept of control structures and string operations
- Develop the logical thinking abilities using functions.
- Create programs using list, tuples and dictionaries.
- Implement file handling and exceptions in program.

UNIT - I	INTRODUCTION TO PYTHON PROGRAMMING	9

Fundamentals of Computing – Identification of Computational Problems - Need for Computer languages-Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language)-algorithmic problem solving.

Introduction to Python-Running python-The first program- Arithmetic operators-Values and Types-Assignment statements-variables names-expression and statements-order operations-comments-debugging.

UNIT - II	CONDITIONALS AND ITERATION	9

Conditionals : Floor division and modulus-Boolean expressions-Logical operators-conditional execution-alternative execution-chained conditionals- Nested conditionals

Iteration: Reassignment-updating variables-the while statements-break-square root -algorithms-Strings: len-traversal with for loop-slices-strings are immutable-searching-looping and counting-string methods-The in operator-comparison.

UNIT - III	FUNCTIONSAND FRUITFUL FUNCTIONS	9

Functions: Function calls-Math functions-composition-adding new functions-definitions and uses-flow of execution-parameters and arguments-variables and parameters are local-stack diagram-fruitful functions and void.

Fruitful functions: Return values- Increment development-composition-boolean functions- recursive functions-more recursion examples.

UNIT - IV	COLLECTIONS	9

List: A list is a sequence-mutable-traversing a list-list operations-slices-methods-map,filter and reduce, deleting elements-list and strings –aliasing-list artguments

Dictionary: Mapping- collection of counters-looping and dictionaries-reverse lookup-dictionaries and lists-memos-Global variables.

Tuples: Tuples are immutable- assignment- return vales-variable length argument tuples-list and tuples

Chairman (BoS) 23/9/23

dictionaries and tuples-sequences of sequences.

UNIT - V	FILE HANDLING AND EXCEPTIONS	9

Files: Persistence-Reading and writings-format operator-filenames and paths- catching exceptions-databases-pickling-pipes-writing modules-Overview of Numpy and pandas packages.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
Upon completion of the course, the students will be able to:

Course	Description	Bloom's
CO1	Select appropriate algorithm to simple computational problems	Remember
CO2	Demonstrate various control constructs	Understand
CO3	Construct Python program using functions.	Apply
CO4	Illustrate python programs using list, tuples and dictionary concepts	Apply
CO5	Interpret and handle data using file operations	Apply

TEXT BOOKS:

1	Karl beecher,"Computational thinking:A Beginner's guide to problem solving and Programming",Firstedition,BCS learning and Development limited ,2017.
2	Allen B.Downey, ``Think Python: How to Think Like a Computer Scientist'', 2nd edition, Updated for Python3, Shroff/O'Reilly Publishers,2016 (http://greenteapress.com/wp/think-python/)

REFERENCES:

1	Charles Dierbach, Introduction to Computer Science using Python: A Computational Problem Solving Focus,2nd Edition, Wiley India Edition, 2017.
2	Martic C Brown, Python: The Complete Reference, 4th Edition, McGraw Hill Publishers, 2018.
3	Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 2nd Edition, No starch Press, 2019.
4	Kenneth A. Lambert, "Fundamentals of Python: First Programs" ,CENGAGE Learning, 2012.
6	https://archive.nptel.ac.in/courses/106/106/106106182/

Mapping of COs with POs and PSOs														
COs/POs	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	-	-	-	-	-	2	2	3		
CO2	3	3	3	3	2	-	-	-	-	-	2	2	3		
CO3	3	3	3	3	2	-	-	-	-	-	2	2	3		

Chairman (BoS)

CO4	3	3	3	2	1	-	-	-	-	-	2	1	3		
CO5	2	2	2	2	1	-	-	-	-	-	1	1	2		
Avg.	3	3	3	3	2	-	-	-	-	-	2	2	3		

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
2	1	0	3	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	
CIE - 2	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	40
				100

*The weighted average shall be converted into 40 marks for internal assessment.

23GE1232	TAMILS AND TECHNOLOGY	Category	L	T	P	C
		HSMC	1	0	0	1

Common to All Branches

UNIT - I	WEAVING AND CERAMIC TECHNOLOGY	3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY	3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- ThirumalaiNayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT - III	MANUFACTURING TECHNOLOGY	3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold-Coins as source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT - IV	AGRICULTURE AND IRRIGATION TECHNOLOGY	3

Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT - V	SCIENTIFIC TAMIL & TAMIL COMPUTING	3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

Total Periods:15

Chairman (BoS)

Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.

References:	
1	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
2	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.) Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, TamilNadu)

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
1	0	0	1	Theory only (40%)	Theory only (60%)

CONTINUOUS INTERNAL EXAMINATION:

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

Chairman (BoS)

23MA1241	PROBABILITY AND STATISTICS	Category	L	T	P	C
		BSC	2	1	2	4

(Common to All Branches)

OBJECTIVES:

The Course will enable learners:

- To provide the required skill to apply the statistical tools in engineering problems.
- To introduce the basic concepts of probability and random variables.
- To introduce the basic concepts of two dimensional random variables.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- To acquire the knowledge of statistical quality control.

UNIT - I	PROBABILITY AND RANDOM VARIABLES	6+3+6=15

Introduction – Definitions of Probability – Total Probability and the Baye's Theorem – Independent Events – Random variables – Definition – Distribution function – Discrete and Continuous random Variables – Expectation – Moment of random Variables and the Variance – Binomial, Geometric, Poisson, Exponential, Uniform and Normal distributions.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Introduction to Python through Probability.
2. Finding the Conditional probability.
3. Evaluating Normal distributions.

(Laboratory – 6)

UNIT - II	TWO - DIMENSIONAL RANDOM VARIABLES	6+3+6=15

Introduction – Joint Distributions – Properties – Marginal and conditional distributions – Discrete and Continuous Random variables – Covariance and Correlation Coefficient – Linear regression – Application of the Transformation method – Central Limit Theorem.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluating the Covariance.
2. Finding the Correlation.
3. Plotting the Random Variable.

(Laboratory – 6)

UNIT - III	MEASURES OF DISPERSION	6+3+6=15

Measures of Central tendency – Mean, Median and Mode – Measure of Dispersion – Skewness and Kurtosis – Coefficient of Dispersion – Graphical Representation of Frequency distribution.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)

1. Evaluating the Mean, Median and Mode.
2. Evaluating the Karl Pearson's Coefficient of Skewness.
3. Evaluation of Coefficient of Dispersion.

Laboratory – 6)

Chairman (BoS)

UNIT - IV	TESTING OF HYPOTHESIS	6+3+6=15

Hypothesis testing: One sample and two sample test for means and proportions of large samples (Z-test), One sample and two sample test for means of small samples (t-test). Chi-square – Independence of Attribute and Goodness of fit – F distributions for equality of variances.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)
1. Evaluating large samples.
2. Evaluating small sample using Chi-square test.
3. Evaluation of small sample using F distribution.

(Laboratory – 6)

UNIT - V	STATISTICAL QUALITY CONTROL	6+3+6=15

Control charts for measurements (X and R charts) – Control charts for attributes (p, c and np charts) – Tolerance limits - Acceptance sampling.

List of Exercise/Experiments: (Theory – 6, Tutorial – 3)
1. Evaluating X and R charts.
2. Evaluating p, c and np charts.
3. Evaluating Tolerance limits.

(Laboratory – 6)

TOTAL: 30+15+ 30 = 75 PERIODS

COURSE OUTCOME:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Illustrate the knowledge of the fundamental concepts of probability and standard distributions which can describe real life phenomenon.	Apply
CO2	Understand the basic concepts of two dimensional random variables and apply in engineering applications.	Apply
CO3.	Apply the concepts of measures of central tendency and measures of dispersion in real life problems.	Apply
CO4	Apply the concept of testing of hypothesis for small and large samples in real life problems.	Apply
CO5	Understand and apply the concepts of statistical quality control in engineering problems.	Apply

Chairman (BoS)

TEXT BOOKS:

1	Oliver C.Ibe., "Fundamentals of Applied and Random Processes", Elsevier, New Delhi, 2005.
2	Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, 11th edition, New Delhi, 2002.
3	Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th edition, 2007.

REFERENCES:

1	Devore. J.L., "Probability and Statistics for Engineering and the Sciences, Cengage Learning, New Delhi, 8th Edition, 2014.
2	Papoulis, A. and Unnikrishnapillai, S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4th Edition, New Delhi, 2010.
3	Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004.
4	Johnson, R.A., Miller, I and Freund J.,"Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2011.
5	R.C.Gupta, "Statistical Quality Controls", 8th Edition, Khanna Publishers, Delhi, 2008.

NPTEL LINKS:

1	https://archive.nptel.ac.in/courses/111/102/111102111/
2	https://archive.nptel.ac.in/courses/111/105/111105090/
3	https://nptel.ac.in/courses/111104146
4	https://nptel.ac.in/courses/110105087

LIST OF EQUIPMENTS / SOFTWARE:

1. Python - Open source

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	-	-	-	-	2	-	1	2	-	-
CO2	3	2	2	3	-	-	-	-	2	-	-	2	-	-
CO3	3	2	2	3	-	-	-	-	2	-	1	2	-	-
CO4	3	2	2	3	-	-	-	-	2	-	-	2	-	-
CO5	3	2	2	3	-	-	-	-	2	-	-	1	-	-
Avg.	3	2	2	3	0	0	0	0	2	0	1	1.8	0	0

Chairman (BoS)

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
2	1	2	4	Theory (25%) Laboratory (25 %)	Theory (35%) Laboratory (15%)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100*

*The weighted average shall be converted into 25 marks for internal assessment.

LABORATORY

Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	Total
75	25	100*

*Total marks shall be converted into 25 marks

Chairman (BoS)

23PH1141	ENGINEERING PHYSICS	Category	L	T	P	C
		BSC	3	0	2	4

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:
- Introduce the basics of laser, fibre optics and its application.
- Impart the basic knowledge of quantum physics.
- Equip with the theories of electrical and thermal properties of conducting materials.
- Instill knowledge on physics of semiconductors, determination of charge carriers and device applications.
- Enable the students to gain knowledge of magnetic, superconducting materials and its application.

UNIT - I	LASER AND FIBRE OPTICS	9 + 6 =15

Lasers: Principles of spontaneous emission and stimulated Emission – Population Inversion – Einstein's coefficients A & B - Semiconductor lasers (Homo junction & Hetero junction) - **Fibre Optics**: Propagation of light in optical fibres - Numerical aperture and acceptance angle - Types of optical fibres (material, refractive index, and mode) – Fibre optic sensors: Pressure and Displacement sensors.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of divergence of laser beam.
2. Determination of acceptance angle and numerical aperture of an optical fibre.

(Laboratory – 6)

UNIT - II	QUANTUM MECHANICS	9 + 6 =15

Introduction – Origin of de-Broglie's concept of Matter waves – Physical significance of wave function – Schrödinger wave equation (Time dependent & time independent) – Electron beam in field free space - Electron beam in free state of step barrier - Quantum tunneling (concept only) – Tunneling microscope - Particle in rectangular box.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of Planck's constant by using light-emitting diodes (LEDs).
2. Determination particle size of Lycopodium powder using semiconductor laser.

(Laboratory – 6)

UNIT - III	PROPERTIES OF CONDUCTING MATERIALS	9 + 6 =15

Electrical Properties: Classical free electron theory – Expression for Electrical conductivity – Thermal conductivity – Wiedemann franz law – Drawbacks of classical free electron theory – Quantum theory – Fermi distribution function – Fermi energy and carrier concentration – Density of energy states.

(Theory – 9)

List of Exercise/Experiments:
1. To determine the resistance per unit length of a Carey Foster's bridge wire and resistivity of Unknown wire.
2. Determination of thermal conductivity of a bad conductor by Lee's disc method.

(Laboratory – 6)

J.C. 23/11/23

Chairman (BoS)

1

UNIT - IV	SEMICONDUCTOR PHYSICS	9 + 6 =15

Introduction - Intrinsic semiconductors: Carrier concentration in intrinsic semiconductors – Fermi level of intrinsic semiconductors – Variation of fermi level with temperature in intrinsic semiconductor – Extrinsic semiconductors: carrier concentration in n-type & p-type semiconductors – Fermi level of extrinsic semiconductors – variation of fermi level with temperature in extrinsic semiconductor– Hall effect – Reverse bias devices: Photo diodes – Solar cells.

(Theory – 9)

List of Exercise/Experiments:
1. Band gap determination of intrinsic semiconductor.
2. Determination of wavelength of semiconductor diode laser.

(Laboratory – 6)

UNIT - V	MAGNETIC AND SUPERCONDUCTING MATERIALS	9 + 6 =15

Magnetic Materials: Introduction – Origin of magnetic moment – Dia, Para and Ferromagnetic Magnetism – Hysteresis – Soft and Hard magnetic materials
Superconducting Materials: Principle of Superconductivity – Properties and types of superconductors – Application of superconductors: Magnetic levitation.

(Theory – 9)

List of Exercise/Experiments:
1. Determination of hysteresis loss using B-H loop.
2. Determination of width of the groove of CD using laser.

(Laboratory – 6)

TOTAL: 45 + 30 = 75 PERIODS

COURSE OUTCOMES:
Upon completion of the course, the students will be able to:

Course Outcome	Description	Bloom's Taxonomy Level
CO1	Apply the comprehended knowledge about LASER and fibre optic communication system in various engineering applications.	Apply
CO2	Understand the fundamental principles of quantum mechanics.	Understand
CO3	Gain knowledge on classical and quantum electron theories and Thermal conductivity.	Understand
CO4	Analyse the working of semiconductor devices like Photo diodes and Solar cells.	Analyse
CO5	Interpret the properties of magnetic materials and their applications in superconducting devices.	Apply

TEXT BOOKS:
1. Bhattacharya D K, Poonam Tandon, Engineering Physics, Oxford University Press, 2017.
2. Gaur R K, Gupta S L, Engineering Physics, Dhanpat Rai Publication, 2016.
3. Avadhanulu M N, Kshirsagar P G and Arun Murthy TVS, A textbook of Engineering Physics 11th Edition, S.Chand and Company Ltd, New Delhi, 2018.

J. c. 25/8/23

Chairman (BoS)

2

REFERENCES:
1. K.Thyagarajan and A.Ghatak. Lasers: Fundamentals and Applications, Laxmi Publications, (Indian Edition), 2019.
2. Jasprit Singh, Semiconductor Devices: Basic Principles, Wiley 2012.
3. Kasap, S.O. Principles of Electronic Materials and Devices, McGraw-Hill Education, 2007.
4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGraw-Hill (Indian Edition), 2017.

PRACTICAL REFERENCES:
1. A.K. Katiyar (Author), C.K. Pandey, Engineering Physics: Theory and Practical Paperback, 2015.

Learning Resources:
1. https://archive.nptel.ac.in/courses/113/106/113106039/
2. https://vlab.amrita.edu/?sub=1

Mapping of COs with POs and PSOs

COs/ POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	3	3	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	2	1	-	1	-	-	-	-	-	-	1	-	-
CO3	3	2	1	-	1	-	-	-	-	-	-	1	-	-
CO4	3	2	1	-	1	-	-	-	-	-	-	1	-	-
CO5	3	-	-	1	2	-	-	-	-	-	-	1	-	-
Avg.	3	2.3	1	1	1.3	-	-	-	-	-	-	1	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
3	0	2	4	Theory (25%) Laboratory (25 %)	Theory (35%) Laboratory (15 %)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

Chairman (BoS)

3

LABORATORY		Total
Evaluation of Laboratory Record (100 Marks)	**Model Practical Examination (100 Marks)**	
75	25	100*
* Total marks shall be converted into 60 marks		

Chairman (BoS)

23EC1241	DIGITAL PRINCIPLES AND SYSTEMS DESIGN	Category	L	T	P	C
			2	1	2	4

(Common to CSE, IT, CSE(CS))

OBJECTIVES:

The Course will enable learners:

- To present the fundamentals of digital circuits and simplification methods
- To practice the design of various combinational digital circuits using logic gates
- To bring out the analysis and design procedures of various Synchronous Sequential circuits
- To bring out the analysis and design procedures of various Asynchronous Sequential circuits
- To introduce IC families, semiconductor memories and related technology.

UNIT - I	BASIC CONCEPTS	9+6=15

Review of number systems-representation-conversions, Review of Boolean algebra- theorems, sum of product and product of sum simplification, canonical forms min term and max term, Simplification of Boolean expressions- Karnaugh map, completely and incompletely specified functions, Implementation of Boolean expressions using universal gates, Tabulation methods

(Theory – 9)

List of Exercise/Experiments:

1. Verification of Boolean theorems using Basic gates.
2. Verification of Boolean theorems using universal gates.
3. Design and implementation of combinational circuits using basic gates for arbitrary functions

(Laboratory – 6)

UNIT - II	COMBINATIONAL LOGIC CIRCUITS	9+6=15

Problem formulation and design of combinational circuits - Code-Converters, Half and Full Adders, Binary Parallel Adder – Carry look ahead Adder, BCD Adder, Magnitude Comparator, Decoder, Encoder, Priority Encoder, Mux/Demux, Case study: Digital trans-receiver / 8 bit Arithmetic and logic unit, Parity Generator/Checker, Seven Segment display decoder

(Theory – 9)

List of Exercise/Experiments:

1. Design and implementation of combinational circuits using basic gates for arbitrary functions
2. Implementation of 4-bit binary adder and subtractor circuits.
3. Implementation of code converters.

(Laboratory – 6)

UNIT - III	SYNCHRONOUS SEQUENTIAL CIRCUITS	9+6=15

Latches, Flip flops – SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis and design of clocked sequential circuits – Design - Moore/Mealy models, state minimization, state assignment, lock - out condition circuit implementation - Counters, Ripple Counters, Ring Counters, Shift registers, Universal Shift Register. Model Development: Designing of rolling display/real time clock

(Theory – 9)

List of Exercise/Experiments:

1. Implementation of Encoder circuits
2. Implementation of the synchronous counters
3. Implementation of Decoder circuits

(Laboratory – 6)

Chairman (BoS)

UNIT - IV	ASYNCHRONOUS SEQUENTIAL CIRCUITS	9+6=15

Stable and Unstable states, output specifications, cycles and races, state reduction, race free assignments, Hazards, Essential Hazards, Fundamental and Pulse mode sequential circuits, Design of Hazard free circuits.

(Theory – 9)

List of Exercise/Experiments:
1. Implementation of a Universal Shift register. (Parallel In Parallel Out, Bi-directional Shift Register, Universal Shift Register)

(Laboratory – 6)

UNIT - V	LOGIC FAMILIES AND PROGRAMMABLE LOGIC DEVICES	9+6=15

Logic families- Propagation Delay, Fan - In and Fan - Out - Noise Margin - RTL ,TTL,ECL, CMOS - Comparison of Logic families - Implementation of combinational logic/sequential logic design using standard ICs, PROM, PLA and PAL, basic memory, static ROM,PROM,EPROM,EEPROM EAPROM.

(Theory – 9)

List of Exercise/Experiments:
1. Implementation of Universal Shift registers (Serial In Serial Out, Serial In Parallel Out, Parallel In Serial Out.)

(Laboratory – 6)

TOTAL: 45+30=75 PERIODS

COURSE OUTCOMES:
Upon completion of the course, the students will be able to:

Course Outcome	Description	Bloom's Taxonomy Level
CO1	Use Boolean algebra and simplification procedures relevant to digital logic.	Apply
CO2	Design various combinational digital circuits using logic gates.	Apply
CO3	Analyze and design synchronous sequential circuits.	Analyze
CO4	Analyze and design asynchronous sequential circuits.	Analyze
CO5	Understand Logic, IC families and Semiconductor memories.	Understand

TEXT BOOKS:
1. M. Morris Mano and Michael D. Ciletti, 'Digital Design', Pearson, 5th Edition, 2013.(Unit - I -V)

REFERENCES:
1. Charles H. Roth, Jr, 'Fundamentals of Logic Design', Jaico Books, 4th Edition, 2002.
2. William I. Fletcher, "An Engineering Approach to Digital Design", Prentice- Hall of India, 1980.
3. Floyd T.L., "Digital Fundamentals", Charles E. Merril publishing company, 1982.
4. John. F. Wakerly, "Digital Design Principles and Practices", Pearson Education, 4th Edition, 2007

NPTEL:
https://nptel.ac.in/courses/117105080
https://onlinecourses.nptel.ac.in/noc21_ee39/preview

Chairman (BoS)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	-	-	-	-	1	1	-	-	-	-
CO2	3	3	2	2	-	-	-	-	1	1	-	-	-	-
CO3	3	3	2	2	-	-	-	-	1	1	-	-	-	-
CO4	3	3	2	2	-	-	-	-	1	1	-	-	-	-
CO5	3	2	2	2	-	-	-	-	1	1	-	-	-	-
Avg.	3	3	2	2	-	-	-	-	1	1	-	-	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
2	1	2	4	Theory (25%) Laboratory (25 %)	Theory (35%) Laboratory (15 %)

CONTINUOUS INTERNAL EXAMINATION:

THEORY

Assessment	Portions	Duration	Max. Mark	Max CIE Marks
CIE - 1	2.5 units	3 Hours	100	Best 2 out of 3 and Converted to 60
CIE - 2	2.5 units	3 Hours	100	
Improvement / Missed Test	2.5 units	3 Hours	100	
Other Assessment Methods	Quizzes (10 MCQ per unit)		20	40
	Assignment / Case Study / Seminar / Tutorial / Mini Project / Open Book Test		20	
				100

*The weighted average shall be converted into 40 marks for internal assessment.

LABORATORY		Total
Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	
75	25	100*

* Total marks shall be converted into 60 marks

Chairman (BoS)

23CS1251	PYTHON PROGRAMMING LABORATORY	Category	L	T	P	C
		ESC	0	0	3	1.5

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- To familiarize with Python programming constructs.
- To learn basic programming constructs in Python
- To use Python data structures-Lists,tuples and Dictionaries
- To do input and output with files using python
- To develop solutions for real time applications

LIST OF EXPERIMENTS:

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

1. Variables ,Expressions, Arithmetical operations
2. Selective statements and Iterative statements
3. String operations-Palindrome, substring, length of string
4. Functions, Fruitful functions, Call –by-value and Call-by-reference , Recursion
5. List- Create a list, Slicing, add elements in list, find prime number
6. Dictionary - Create, convert list to dictionary, Change Value of Dictionary
7. Tuples - Create, Iterating through a Tuple, Check if an Item Exists in the Python Tuple
8. Packages – Installation and simple programs
9. Files and Exceptions.
10. Python based Solution to real world problem 1
11. Python based Solution to real world problem 2
12. Python based Solution to real world problem 3

TOTAL: 45 PERIODS

Chairman (BoS) 23/9/23

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Demonstrate knowledge on Python programming constructs.	Applying
CO2	Develop programs in python using Functions	Applying
CO3	Implementation Python data structures	Applying
CO4	Develop python programs using functions.	Applying
CO5	Develop applications in python for real time problems	Applying

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
							Mapping of COs with POs and PSOs							
CO1	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO2	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO3	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO4	3	3	3	3	2	-	-	-	2	2	3	2	-	-
CO5	3	3	3	3	2	-	-	-	2	2	3	2	-	-
Avg.	3	3	3	3	2	-	-	-	2	2	3	2	-	-

ASSESSMENT SYSTEM:
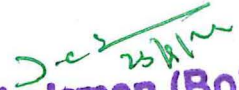
L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
0	0	3	1.5	Laboratory only (60 %)	Laboratory only (40 %)

LABORATORY		Total
Evaluation of Laboratory Record (100 Marks)	**Model Practical Examination (100 Marks)**	
75	25	100*
* Total marks shall be converted into 60 marks		

Chairman (BoS)   23/9/23

23GE1251	COMMUNICATION LABORATORY	Category	L	T	P	C
		HSMC	0	0	3	1.5

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- Provide self-paced learning to consolidate their understanding of advanced grammar and vocabulary Methods
- Equip the students with the LSRW skills required to handle advanced communication situations in English
- Speak in simple sentences without any hesitation
- Draft basic formal written communication
- To provide audio and video support to ensure meaningful skill acquisition

UNIT - I	GRAMMAR	9

Types of Sentences - Tenses & Voice- Concord - Auxiliary-Infinitive – Article - preposition - Comparative and Superlative adjective. Discourse Markers - Linkers: sequential – past time (later) Connecting words expressing cause and effect, contrast. Markers to structure informal spoken discourse Verb forms Wh- and Yes/No Questions in present / past Complex question tags

Broader range of intensifiers; So, such, too, enough, Connecting words expressing cause and effect, contrast.

UNIT - II	LISTENING	9

Short conversations / monologues: numbers and spelling (dates, prices, percentages, figures, etc.)

and locate specific information, longer monologue and note taking - gap filling, Understanding the gist and extracting main idea. Conversation between two employees – Description of gadgets – Enquiring about orders and deliveries – Chasing an order: Telephone Conversations – Radio Interview – Voicemail messages and phone conversations – Welcome speech at a conference – Statistical information,

UNIT - III	SPEAKING	9

Talking about oneself, agreeing and disagreeing, expressing preferences - mini-presentation on a business theme (Oral) - Giving information and expressing opinions - discussion on business - related topics - Helping students in achieving clarity and fluency; manipulating paralinguistic features of speaking (voice modulation, pitch, tone stress, effective pauses) Conducting Task oriented interpersonal, informal and semiformal Speaking / Classroom Presentation - Teaching strategies for Group Discussion - Teaching Cohesion and Coherence - Teaching effective communication & strategies for handling criticism and adverse remarks - Teaching strategies of Turn- taking, effective intervention, and courtesies, Role Play, Mock & HR Interview.

UNIT - IV	READING	9

Short texts and understand the main message (signs, messages, postcards, notes, emails, labels) – Read and find specific information- Interpreting visual information-Comprehend detailed factual information—gather the gist- understand grammar and structure of the given passage- transferring information - Radio Commentary, Technical Texts and Case Studies - Guiding students for Intensive & Extensive Reading – Reading notices, messages, adverts, leaflets, contents pages, graphs, charts,

tables, business letters, product descriptions, reports, minutes, newspaper or magazine articles, memos.

| UNIT - V | WRITING | 9 |

Internal written communication - short messages to colleagues - note, message, memo, email-External communication - letter, email, notice-set phrases for letters and e-mails-Cohesive devices - All varieties of Technical Report, Business Letters and Job Application - Punctuation & Spelling, Semantics of Connectives, Modifiers and Modals, variety of sentences and paragraphs - Organizational Communication: Memo, Notice, Circular, Agenda / Minutes

TOTAL = 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy
CO1	Understand and apply the basic grammar and learn the range of vocabulary	Understand
CO2	Listen enthusiastically and consolidate the messages and information of monologues and dialogues	Remember
CO3	Convey the views and opinions clearly in simple sentences	Apply
CO4	Read and comprehend the statistics and texts with clear understanding	Analyse
CO5	Write the contexts relevant to the topics efficiently.	Understand

TEXT BOOKS:

| 1 | Whitby Norman, Business Benchmark Pre-Intermediate to Intermediate Student's Book CUP Publications, 3rd Edition, 2018 |
| 2 | Wood Ian, Williams Anne, Cowper Anna, Pass BEC Preliminary , Cengage Learning, 2n Edition, 2015. |

REFERENCES:

| 1 | BEC Preliminary – Cambridge Handbook for Language Teachers, 2nd Edition, CUP 2000. |
| 2 | Hewings Martin – Advanced grammar in use- Upper-Intermediate Proficiency, CUP, 3r Edition, 2013. |

Chairman (BoS)

							Mapping of COs with POs and PSOs									
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	2	3	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	2	3	-	-	-	-	-
CO3	2	-	-	-	-	-	-	1	2	3	-	-	-	-	-
CO4	2	-	-	-	-	-	-	2	-	3	-	-	-	-	-
CO5	2	-	-	-	-	-	-	1	-	3	-	-	-	-	-
Avg.	2	-	-	-	-	-	-	1	2	3	-	-	-	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
0	0	3	1.5	60	40

CONTINUOUS INTERNAL EXAMINATION:

LABORATORY		
Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	Total
75	25	100*
* Total marks shall be converted into 60 marks		

Chairman (BoS)

3

23GE1252	ENGINEERING EXPERIENCE LABORATORY	Category	L	T	P	C
		ESC	0	0	3	1.5

(Common to All Branches)

OBJECTIVES:

The Course will enable learners:

- To provide exposure to the students with hands on experience on various basic engineering Practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & MECHANICAL)

PART - I	CIVIL ENGINEERING PRACTICES	10

PLUMBING WORK:

a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other Components which are commonly used in household.

b) Preparing plumbing line sketches.

c) Laying pipe connection to the suction side and delivery side of a pump

CARPENTRY WORK:

a) Sawing and Planning work

b) Making joints like T-Joint, Cross lap joint, Mortise joint and Tenon joint.\

c) Making of Mini Table, Hammer Handle, Bench, Pencil holder box, etc (Any one)

PART II	MECHANICAL ENGINEERING PRACTICES	13

WELDING WORK:

a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.

b) Welding of Ladder, Truss Section, Frame, Channel, Tablet / Phone stand, Metal box, etc(Any one)

c) Practicing gas welding.

BASIC MACHINING WORK:

a) (Simple) Turning.

b) (Simple) Drilling and Tapping.

SHEET METAL WORK:

a) Making of a square tray, Funnel.

STUDY EXERCISE:

a) Study of centrifugal pump, household mixer and air conditioner.

Chairman (BoS)

Chairman (BoS)

GROUP – B (ELECTRICAL & ELECTRONICS)		
PART III	**ELECTRICAL ENGINEERING PRACTICES**	**12**
	a) Introduction to one way ,Two way and Stair case wiring b) Introduction to Lighting system – CFL, LED, FL c) Energy measurement using Analog and Digital Meters d) Measure the Voltage and current of Fan Regulators(Resistor Type and Electronic Type) e) Study of Electrical and fire safety	
PART IV	**ELECTRONIC ENGINEERING PRACTICES**	**10**
	a) Study and Types of PCBs b) Soldering practice on PCB and Measurement the Resistance values c) Design of full wave Rectifier with & without filter d) Calibrate and Measurement of Different AC parameters using CRO (Peak - Peak, RMS Period, Frequency) e) Study and Familiarization of Linked in.	
	TOTAL: 45 PERIODS	

COURSE OUTCOMES:

Upon completion of the course, the students will be able to:

Course Outcome	Description	Blooms Taxonomy Level
CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household woodwork.	Apply
CO2	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping.	Apply
CO3	Making of a basic sheet metal component.	Apply
CO4	Perform Staircase & Lamp wiring and realize the importance of Electrical safety	Apply
CO5	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	Apply

Chairman (BoS)   Chairman (BoS)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	2	-	-	-	1	-	2	-	-	1	-	-
CO2	2	-	2	-	-	-	1	-	2	-	-	1	-	-
CO3	2	-	2	-	-	-	1	-	2	-	-	1	-	-
CO4	2	-	2	-	-	-	1	-	2	-	-	1	-	-
CO5	2	-	2	-	-	-	1	-	2	-	-	1	-	-
Avg.	2	-	2	-	-	-	1	-	2	-	-	1	-	-

ASSESSMENT SYSTEM:

L	T	P	C	Continuous Internal Examination (CIE)	End Semester Examination (ESE)
0	0	3	1.5	Laboratory only (60 %)	Laboratory only (40 %)

LABORATORY

Evaluation of Laboratory Record (100 Marks)	Model Practical Examination (100 Marks)	Total
75	25	100*

* Total marks shall be converted into 60 marks

Chairman (BoS)

Chairman (BoS)