

SANSKARAM UNIVERSITY JHAJJAR



Scheme of Examination and Syllabus for B.Tech. CSE

Under Multiple Entry-Exit, Internships and CBCS-LOCF in accordance to NEP 2020

w.e.f. 2024-25

Table 1: Semester-wise allocation of credits to different verticals

SEM I			
Course Category	Abbreviation	Course Name	Credits
Basic Science Course	BSC	Calculus and Matrices	4
Basic Science Course	BSC	Semiconductor Physics	4
Basic Science Course	BSC	Introduction to Chemistry for Engineers	2
Engg. Sciences Elective	ESE	Computer Aided Engineering Graphics	2
Engg. Sciences Elective	ESE	Programming Fundamental	3
Engg. Sciences Elective	ESE	Principles of Electrical and Electronics Engineering	3
Humanities	HSSM-I	Professional Communication-1	2
Skill enhancement course	SEC	Web Designing	3
Cocurricular Courses	CC (LLC)	Environmental Studies	
Total			23

SEM II			
Course Category	Abbreviation	Course Name	Credits
Basic Science Course	BSC	Linear Algebra and Complex Analysis	4
Basic Science Course	BSC	Introduction to Biology for Engineers	2
Engg. Sciences Elective	ESE	Digital Electronics & Logic Design	3
Basic Science Course	BSC	Discrete Structures	4
Program Core Courses	CC	Data Structure and Algorithm	4
Humanities	HSSM-I	Human Value & Ethics	2
Humanities	HSSM-I	Professional Communication-II	2
Skill enhancement course	SEC	Application-based Programming in Python	1
Ability Enhancement Compulsory Courses course	AECC	Creativity, Innovation & Entrepreneurship Lab	1
Cocurricular Courses	CC (LLC)	General Proficiency-I/NCC/ Sports and Yoga-I/ NSS	
Total			23

Experiential Learning	CP (in Summer)	Summer Internship/Inhouse Project	2
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SEM-III			
Course Category	Abbreviation	Course Name	Credits
Basic Science Course	BSC	Probability and Statistics	4
Program Core Courses	PCC	2 to 3 courses	8
Engg. Sciences Elective	ESE	Microprocessors and Computer Architecture	4
Discipline Specific Elective Courses	DSE	PE-I	3
Humanities	HSSM-I	Management for Engineers	2
Ability Enhancement Compulsory Courses course	AECC	Professional Competency Enhancement-1	1
Skill enhancement course	SEC	Introduction to Cyber Security Lab	1
Total			23
Summer Internship-I /Inhouse Training			2
Honor Courses	HC (Optional)	Honors Paper II	3

SEM-IV			
Course Category	Abbreviation	Course Name	Credits
Program Core Courses	PCC	3 to 4 courses	15
Discipline Specific Elective Courses	DSE	PE-I	3
Open Elective	OE	OE-I	3
Ability Enhancement Compulsory Courses course	AECC	Professional Competency Enhancement-2	1
Skill enhancement course	SEC	Programming Workshop	1
Cocurricular Courses	CC (LLC)	Sports and Yoga - II /NSS-II	
Total			23
Honor Courses	HC (Optional)	Honors Paper II	3

- **Summer internship for min one month earning 2 credits done after 2nd semester**
- **Research internship of minimum 2 months for the Honors through Research students for 4 credits**

SEM-V			
Course Category	Abbreviation	Course Name	Credits
Program Core Courses	CC	3 to 4 courses	10
Discipline Specific Elective Courses	DSE	PE-I	3
Open Elective	OE	OE-I	3
Humanities	HSSM-I	Introduction to Entrepreneur	2
Ability Enhancement Compulsory Courses	AECC	Technical Training-I	1
Skill enhancement course	SEC	Project Based Learning (PBL) -1	1
Experiential Learning	ELC	Seminar and presentation,	1
Experiential Learning	ELC	Community Connect	1
Cocurricular Courses	CC (LLC)	Constitution of India, Law and Engineering /Indian Tradition, Culture and Society	
Total			23
Summer Internship-II /Inhouse Training			2
Honor Courses	HC (Optional)	Honors Paper II	3

SEM-VI			
Course Category	Abbreviation	Course Name	Credits
Program Core Courses	PCC	2 to 3 courses	11
Discipline Specific Elective Courses	DSE	PE-3 and PE-4	6
Open Elective	OE	OE-I	3
Ability Enhancement Compulsory Courses	AECC	Technical Training-II	1
Skill enhancement course	SEC	Project Based Learning (PBL) -2	1
Skill enhancement course	SEC	Special Lab (Android and Mobile App Development Lab)	1
		Constitution of India, Law and Engineering /Indian Tradition, Culture and Society	
Total			23
Honor	HC(Optional)	Honors Paper IV	3

- Summer internship for min one month earning 2 credits done after 4th semester
- Research internship of minimum 2 months for the Honors through Research students for 4 credits

SEM-VII			
Course Category	Abbreviation	Course Name	Credits
Program Core Courses	PCC	2 to 3 courses	7
Discipline Specific Elective Courses	DSE	PE-5, PE-6	6
Open Elective	OE	OE-IV	3
Experiential Learning	ELC	Major Project- 1	4
Total			20
Summer Internship-III /Inhouse Training			2
Honor	HC (Optional)	Honors Paper V	3

SEM-VIII			
Course Category	Abbreviation	Course Name	Credits
Experiential Learning	ELC	Industry / Research Internship*	16
Total			16
Honor	HC (Optional)	Honors Paper VI	3
Experiential learning for Honorsthrough Research	ELC (Optional)	Research	4

- Summer internship for min one month earning 2 credits done after 6th semester
- Research internship of minimum 2 months for the Honors through Research students for 4 credits

SEMESTER: I

SCHOOL OF ENGINEERING & TECHNOLOGY							
B.Tech (Computer Science Engineering)							
Batch: 2024 onwards					TERM: I		
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030101001	Calculus and Matrices	3	1	0	4	BSC
2	030101002	Semiconductor Physics	3	0	0	3	BSC
3	030101003	Principles of Electrical and Electronics Engineering	2	0	0	2	ESC
4	030101004	Programming Fundamental	2	0	0	2	ESC
5	030101005	Web Designing	2	0	0	2	SEC
6	030101006	Introduction to Chemistry for Engineers	2	0	0	2	BSC
7	030101007	Professional Communication-1	1	0	0	1	HSMC
8		Environmental Studies	2	0	0	0	MC
Practical/Viva-Voce/Jury							
9	030101008	Semiconductor Physics Lab	0	0	2	1	BSC
10	030101009	Principles of Electrical and Electronics Engineering Lab	0	0	2	1	ESC
11	030101010	Programming Fundamental Lab	0	0	2	1	ESC
12	030101011	Computer Aided Engineering Graphics Lab	0	0	4	2	ESC
13	030101012	Web Designing Lab	0	0	2	1	SEC
14	030101013	Professional Communication-1 Lab	0	0	2	1	HSMC
		A 3-week Mandatory Induction Program	18	1	10		
TOTAL CREDITS						23	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Elective BSC: Basic Science Course

Programme Structure							
SCHOOL OF ENGINEERING & TECHNOLOGY							
B.Tech (Computer Science Engineering)							
Batch: 2024 Onwards						TERM: II	
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030102001	Linear Algebra and Complex Analysis	3	1	0	4	BSC
2	030102002	Introduction to Biology for Engineers	2	0	0	2	BSC
3	030102003	Data Structures	3	0	0	3	CC
4	030102004	Digital Electronics & Logic Design	2	0	0	2	ESC
5	030102005	Discrete Structures	3	1	0	4	ESC
6	030102006	Professional Communication-II	1	0	0	1	HSMC
7	030102007	Human Value & Ethics	2	0	0	2	HSMC
8		General Proficiency-I/NCC/ Sports and Yoga / NSS	2	0	0	0	VAC
Practical/Viva-Voce/Jury							
9	030102008	Digital Electronics & Logic Design	0	0	2	1	ESC
10	030102009	Data Structure Lab	0	0	2	1	CC
11	030102010	Application-based Programming in Python	0	0	2	1	SEC
12	030102011	Creativity, Innovation & Entrepreneurship Lab	0	0	2	1	AECC
13	030102012	Professional Communication-II Lab	0	0	2	2	HSMC
TOTAL CREDITS						23	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses
BSC: Basic Science Course

School of Engineering and Technology							
B.Tech-Computer Science Engineering							
Batch: 2024 Onwards					TERM: III		
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030103001	Probability and Statistics	3	1	0	4	BSC
2	030103002	Microprocessors and Computer Architecture	3	0	0	3	CC
3	030103003	Object Oriented Programming	3	0	0	3	CC
4	030103004	Design and Analysis of Algorithm	3	0	0	3	CC
5	030103005	Management for Engineers	2	0	0	2	HSMC
6		Program Elective-1	3	0	0	3	DSE
Practical/Viva-Voce/Jury							
7	030103006	Professional Competency Enhancement-1	0	0	2	1	AECC
8	030103007	Microprocessors and Computer Architecture Lab	0	0	2	1	CC
9	030103008	Object Oriented Programming	0	0	2	1	CC
10	030103009	Design and Analysis of Algorithm Lab	0	0	2	1	CC
11	030103010	Introduction to Cyber Security Lab	0	0	2	1	SEC
12	030103011	Summer Internship-I /Inhouse Training	-	-	-	2	IAP
13		MOOCs I for Hons. Degree)					
TOTAL CREDITS						25	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses
BSC: Basic Science Course

School of Engineering and Technology							
B.Tech-Computer Science Engineering							
Batch: 2024 Onwards					TERM: IV		
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030104001	Computer Networks	3	0	0	3	CC
2	030104002	Data Base Management System	3	0	0	3	CC
3	030104003	Theory of Computation	3	0	0	3	CC
4	030104004	Principles of Operating System	3	0	0	3	CC
5		Program Elective-2	3	0	0	3	DSE
6		Open Elective – 1	3	0	0	3	OE
7		Sports and Yoga - II /NSS-II	2	0	0	0	VAC
Practical/Viva-Voce/Jury							
8	030104005	Computer Networks Lab	0	0	2	1	CC
9	030104006	Data Base Management System Lab	0	0	2	1	CC
10	030104007	Principles of Operating System Lab	0	0	2	1	CC
11	030104008	Professional Competency Enhancement-2	0	0	2	1	AECC
12	030104009	Programming Workshop	0	0	2	1	SEC
		MOOCs (Essential for Hons. Degree)					
TOTAL CREDITS						23	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

School of Engineering and Technology								
B.Tech-Computer Science Engineering								
Batch: 2024 Onwards					TERM: V			
S. No.	Course Code	Course	Teaching Load			Credits	Component	
			L	T	P			
THEORY SUBJECTS								
1	030105001	Artificial Intelligence	3	0	0	3	CC	
2	030105002	Software Engineering and Testing Methodologies	3	0	0	3	CC	
3	030105003	Advanced Java Programming	2	0	0	2	CC	
4	030105004	Introduction to Entrepreneur	2	0	0	2	HSMC	
5		Program Elective-3	3	0	0	3	DSE	
6		Open Elective – 2	3	0	0	3	OE	
7		Constitution of India, Law and Engineering /Indian Tradition, Culture and Society	2	0	0		VAC	
Practical/Viva-Voce/Jury								
8	030105005	Artificial Intelligence Lab	0	0	2	1	CC	
9	030105006	Advanced Java Programming Lab	0	0	2	1	CC	
10	030105007	Technical Training-I	0	0	2	1	AECC	
11	030105008	Seminar and Presentation Skills	0	1	0	1	IAP	
12	030105009	Project Based Learning (PBL) -1	0	0	2	1	SEC	
13	030105010	Community Connect	-	-	-	2	IAP	
14	030105011	Summer Internship-II	-	-	-	2	IAP	
15		MOOCs (Essential for Hons. Degree)						
TOTAL CREDITS						25		

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

School of Engineering and Technology							
B.Tech-Computer Science Engineering							
Batch: 2024 Onwards					TERM: VI		
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030106001	Machine Learning	3	0	0	3	CC
2	030106002	Compiler Design	3	0	0	3	CC
3	030106003	Cloud Computing	2	0	0	2	CC
4		Program Elective-3	3	0	0	3	DSE
5		Program Elective-4	3	0	0	3	DSE
6		Open Elective – 3	3	0	0	3	OE
Practical/Viva-Voce/Jury							
7	030106004	Machine Learning Lab	0	0	2	1	CC
8	030106005	Compiler Design Lab	0	0	2	1	CC
9	030106006	Cloud Computing Lab	0	0	2	1	CC
10	030106007	Technical Training-II	0	0	2	1	SEC
11	030106008	Android and Mobile App Development Lab	0	0	2	1	SEC
12	030106009	Project Based Learning (PBL) -2	0	0	2	1	SEC
13		Constitution of India, Law and Engineering /Indian Tradition, Culture and Society	2	0	0		VAC
14		MOOCs (Essential for Hons. Degree)					
TOTAL CREDITS						23	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

School of Engineering and Technology							
B.Tech-Computer Science Engineering							
Batch: 2024 Onwards					TERM: VII		
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
1	030107001	Quantum Computing	3	0	0	3	CC
2	030107002	Big Data Analytics	3	0	0	3	CC
3		Program Elective-5	3	0	0	3	DSE
4		Program Elective-6	3	0	0	3	DSE
5		Open Elective – 4	3	0	0	3	OE
Practical/Viva-Voce/Jury							
6	030107003	Big Data Analytics Lab	0	0	2	1	CC
7	030107004	Major Project- 1	-	-	8	4	IAP
8	030107005	Summer Internship-III	-	-	-	2	IAP
9		MOOCs (Essential for Hons. Degree)					
TOTAL CREDITS						22	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

School of Engineering and Technology							
B.Tech-Computer Science Engineering							
Batch: 2024 Onwards				TERM: VIII			
S. No.	Course Code	Course	Teaching Load			Credits	Component
			L	T	P		
THEORY SUBJECTS							
Practical/Viva-Voce/Jury							
1	030108001	Major Project – 2	-	-	-	16	IAP
	030108002	Industrial Project/Start-ups / Entrepreneurship				16	
TOTAL CREDITS						16	

CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Sl. No	Course Code	Name of the course	Evaluation Scheme I	Evaluation Scheme II						Total Marks	Duration	Total Marks				
				Semester			Practical									
				Theory	CA	ES	CA	ES	Duration							
BP101T	030102001	Engineering Mathematics-I (Calculus and Ordinary Differential Equations)	10	20	20	60	3	3 Hrs	25	75	3 Hrs	100				
BP102T	030102002	Engineering Physics- I (Semiconductor Physics)	10	20	20	60	3	3 Hrs	25	75	3 Hrs	100				
	030102003	Principles of Electrical and Electronics Engineering		20	20	60	3	3 Hrs				100				
	030102004	Digital Electronics & Logic Design		20	20	60	3	3 Hrs				100				
	030102005	Web Designing		20	20	60	3	3 Hrs				100				
	030102006	Professional Communication-II		10	10	30	3	3 Hrs				50				
	030102007	Introduction to Chemistry for Engineers		20	20	60	3	3 Hrs				100				
		Human Value & Ethics		20	20	60	3	3 Hrs				100				
		Engineering Graphics & Drawing		100				3 Hrs				100				
		General Proficiency-I/NCC/ Sports and Yoga / NSS														
	030102008	Digital Electronics & Logic Design							40	60	3 Hrs	100				
		Environmental Studies							40	60	3 Hrs	100				
	030102009	Data Structure Lab							40	60	3 Hrs	100				
		Semiconductor Physics Lab							40	60	3 Hrs	100				
	030102010	Application-based Programming in Python							40	60	3 Hrs	100				
		Principles of Electrical and Electronics Engineering Lab							40	60	3 Hrs	100				
	030102011	Creativity, Innovation & Entrepreneurship Lab							40	60	3 Hrs	100				
		Programming Fundamental Lab							20	30	3 Hrs	50				
	030102012	Professional Communication-II Lab														
		Engineering Graphics & Drawing Lab														
		Total										1200				
		Web Designing Lab														
	Total		70/75*/80#					115/125*/130#	23/24*/26#	Hrs		185/200*/210#	490/525*/540#	31.5/33*/35#	Hrs	675/725*/750#

S. No.	Name of the course	Evaluation Scheme VII semester							Total Marks
		Theory				Practical		Duration	
		CA	CAT	ES	Duration	CA	ES		
1.	Quantum Computing	20	20	60	3 Hrs				100
2.	Big Data Analytics	20	20	60	3 Hrs				100
3.	Program Elective-5	20	20	60	3 Hrs				100
4.	Program Elective-6	20	20	60	3 Hrs				100
5.	Open Elective – 4	20	20	60	3 Hrs				100
6.	Big Data Analytics Lab					40	60	3 Hrs	100
7.	Major Project- 1					100	100	3 Hrs	200
8.	Summer Internship-III					100		3 Hrs	100
Total									900

S. No.	Name of the course	Evaluation Scheme VIII semester							Total Marks
		Theory				Practical		Duration	
		CA	CAT	ES	Duration	CA	ES		
1.	Major Project – 2					300	300	3 Hrs	600
2.	Industrial Project/Start-ups / Entrepreneurship								
Total						300	300	3 Hrs	600

Program Elective

Introduction to Mathematical & Statistical Techniques in Computer Science	Blockchain Foundations	Linux and Shell Programming	Data Analysis using Python	UI/UX Design for Human Computer Interface	Cloud Infrastructure and Services
Intelligent Model Design using AI	Blockchain Engineering	System and Network Security	Data Mining and Predictive Modelling	Front-End Web UI Frameworks and Tools: Bootstrap	Cloud System Administration and Operations
Advanced Computer Vision and Video Analytics	Blockchain Policy: Legal, Social and Economic Impact	Device Level IoT Security	Data Visualization and Dashboards	Front-End Web UI Frameworks and Tools: React Native	Cloud Security and Compliances
Social Network Analysis	Web Development for Blockchain Applications	Vulnerability Analysis in Network Protocols	Social Network Analysis	Server-Side Development Frameworks: Express and Spring	AWS Cloud Support Associate
Reinforcement Learning	Modern Cryptography	Forensics and Cyber Law	Digital Marketing and Trend Analysis	Advanced Database Management System	Developing Solutions for Microsoft Azure
AI in Healthcare	Smart Contracts and Solidity Programming	Malware Analysis for Mobile Devices	Security and Privacy for Big Data Analytics	Front-End UI Frameworks and Tools: Flutter and Django	Software Containerization in DevOps

1	Introduction to Cyber Laws	3	0	0	3	Engineering	
2	Web and Mobile Application security	3	0	0	3	Engineering	
3	Digital Forencics	3	0	2	4	Engineering	
4	Ethical Hacking	3	0	2	4	Engineering	
5	Security Architecture	3	0	0	3	Engineering	
6	Risk Management	3	0	0	3	Engineering	
	Total Credits to be taken				20		

Honors in Program Data Sciences							
S. No	Course Name	L	T	P	C	Category	Prerequisite
1	Applied Stsistical Analysis	3	0	0	3	Engineering	
2	Data Aquasition	3	0	0	3	Engineering	
3	Data Warehouse	3	0	0	3	Engineering	
4	Data Mining	3	0	2	4	Engineering	
5	Business Intelligence	3	0	0	3	Engineering	
6	Big Data Analytics	3	0	2	4	Engineering	
	Total Credits to be taken				20		

Honors in Program Artificial Intelligence and Machine Learning							
S. No	Course Name	L	T	P	C	Category	Prerequisite
1	Soft computing	3	0	0	3	Engineering	
2	Pattern Recognition	3	0	2	4	Engineering	
3	Computer Vision	3	0	2	4	Engineering	
4	Neural Networks	3	0	0	3	Engineering	
5	Introduction to Deep Leaning	3	0	0	3	Engineering	

6	Robotics and Intelligent Systems	3	0	0	3	Engineering
	Total Credits to be taken				20	

S hool: SET

Batch: 2024-2028

**P ogramme:
B.Tech.**

Current Academic Year: 2024-2025

Bra nch:

Semester: 1

1 Course Code

030101001

2 Course Title

Calculus and Ordinary Differential Equations

3 Credits

4

4 Contact Hours
(L-T-P)

3-1-0

Course Status

Compulsory

5	Course Objective	To impart the basic concepts of calculus. <ul style="list-style-type: none"> • To understand the working of sequence & series • To create multivariable differential functions. • To implement matrices in technical applications.
6	Course Outcomes	The student will be able to: CO1 To apply differential and integral calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions CO2 The fallouts of Rolle's Theorem, System of linear equations, Eigenvalues and eigenvectors that is fundamental to application of analysis to Engineering problems. CO3 The tool of power series and Fourier series, matrices and linear algebra for learning advanced Engineering Mathematics CO4 To deal with functions of several variables that are essential in most branches of engineering CO5 To instruct about the Directional derivatives.
7	Course Description	This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of calculus, linear Algebra and Abstract Algebra.
8	Outline syllabus: Calculus and Abstract Algebra	
	Unit 1	Calculus
	Calculus: Indeterminate forms and L'Hospital's rule, Maxima and Minima, Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders, Evolutes and Involutives, Evaluation of definite and improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions, Beta and Gamma functions and their properties.	
	Unit 2	Sequences and Series:
	Sequences and Series: Convergence of sequence and series, Tests for convergence, Power series: Taylor's series, series for exponential, trigonometric and logarithm functions, Fourier series: Half range sine and cosine series, Parseval's theorem.	
	Unit 3	Basic Algebra

	Multivariable Differential Calculus: Limit, Continuity and Partial derivatives, Total derivative, Tangent plane and normal line, Maxima, minima and saddle points, Method of Lagrange multipliers, Gradient, Directional derivatives, Curl and Divergence.	
Unit 4	Matrices	
	Matrices: Inverse and rank of a matrix, Rank-nullity theorem, System of linear equations, Symmetric, skew-symmetric and orthogonal matrices and Orthogonal transformation, Determinants, Eigenvalues and eigenvectors, Diagonalization of matrices, Cayley-Hamilton Theorem.	
Mode	Theory	
Text book/s*	1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002. 2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.	
Other References	1. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill Publishing Company Limited. 2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited. 3. N. P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications. 4. P. Sivaramakrishna Das and C. Vijyakumari, Engineering Mathematics, Pearson Education. 5. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers..	

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO 1	3	3	2	2	3		-	-	-	1	1	1
CO 2	3	3	3	2	2		-	-	-	1	1	2
CO 3	3	3	2	2	2		-	-	-	1	1	1
CO 4	3	3	2	2	2		-	-	-	1	1	1
CO 5	3	3	2	2	2		-	-	-	1	1	2

1-Slight (Low)

2-Moderate (Medium)

3-Substantial (High)

School of SET		Batch:2024-2028
Program: B. TECH		Current Academic Year: 2024-2025
Branch: CSE/EC/EEE		Semester: I
1	Course Code	030101002
2	Course Title	Semiconductor Physics
3	Credits	3
4	Contact Hours (L-T-P)	3-0-0
	Course Status	Compulsory
5	Course Objective	To make students proverbial with the fundamental concepts of Semiconductors materials and their real-life applications for configuring various electronics devices.
6	Course Outcomes	<p>After the completion of this course,</p> <p>CO1: Students will learn the various fundamental theory of materials and concept of solid classification.</p> <p>CO2: Students will learn the fundamental concepts of mobility, conductivity, electrons and holes in an intrinsic semiconductors, Donor and Acceptor impurities (n-type and p-type semiconductor), Fermi levels etc.</p> <p>CO3: Students will gain knowledge about the formation of depletion region, barrier potential, Zener diode, Characteristics of Zener diode etc.</p> <p>CO4: Students will have a clear understanding of Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation, population inversion and pumping, etc.</p> <p>CO5: Students will learn the concept of optical sources: Light emitting diode (construction, basic working principle), semiconductor laser (construction, basic working principle), and optical detectors.</p> <p>CO6: Student will be familiar with the essential concepts of Semiconductors materials technology and their applications in industries.</p>

7	Course Description	This course provides the basic foundation for understanding electronic semiconductor devices and their applications and limitations. It has introductory elements of various concept of material science. This course is essential for students who desire to specialize their engineering in Computer Sciences, Electronics, and Electronics and Electrical engineering.
8	Outline Syllabus	CO Mapping
	Unit 1	Physics of Semiconductor
		Introduction, classical free electron theory (Lorentz-Drude theory and limitations), Quantum theory of free electron (Fermi energy, effect of temperature on Fermi-Dirac distribution) (qualitative analysis) Energy bands, Classification of Solids on the basis of energy band.
	Unit 2	Transport phenomena in semiconductors
		Mobility, conductivity, electrons and holes in an intrinsic semiconductors, Donor and Acceptor impurities (n-type and p-type semiconductor), Fermi levels, carrier densities in semiconductor Concentration of electrons in conduction band and holes in valence band, Drift and diffusion current, Hall effect.
	Unit 3	p-n Junction
		p-n junction, types of p-n junction (step-graded and linearly graded junction) formation of depletion region, barrier potential, Zener diode, Characteristics of Zener diode, Avalanche and Zener breakdown, comparison of Zener diode and pn junction diode, concept of tunneling, I-V characteristics of tunnel diode.
	Unit 4	Laser Physics
		Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation population inversion and pumping, active components of laser, optical amplification or gain threshold condition for laser action, three and four level lasers, Ruby and He-Ne lasers.
	Unit 5	Optoelectronic Devices
		optical sources: Light emitting diode (construction, basic working principle), semiconductor laser (construction, basic working principle) , optical detectors: photodiode (working principle), p-i-n photodiode (working principle), Photovoltaic effect, p-n junction solar cell (basic working idea).
	Mode of Examination	Theory
	Text books	Integrated Electronics- Millman - Halkias, Tata Mc Graw

		Hill	
	Other References	<ol style="list-style-type: none"> 1. Semiconductor Devices Physics and Technology- S M Sze, John Wiley & Sons 2. Semiconductor Device Fundamentals- Robert F. Pierret Addison Wesley Longman. 3. Semiconductor Devices- Kanaan Kano, Pearson Education. 4. Basic Electronics by B.L Thareja 5. Principles of Electronics by V.K Mehta 	

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO 1	3	3	2	2	3	1	-	-	-	1	1	1
CO 2	3	3	3	2	2	2	-	-	-	1	1	2
CO 3	3	3	2	2	2	1	-	-	-	1	1	1
CO 4	3	3	2	2	2	1	-	-	-	1	1	1
CO 5	3	3	2	2	2	1	-	-	-	1	1	2
CO 6	3	3	2	3	2	2	-	-	-	1	1	2

1-Slight (Low)

2-Moderate (Medium)

3-Substantial (High)

School: SSET		Batch: 2024-2028
Programme: B.Tech		Current Academic Year: 2024-2025
Branch:		Semester: I
1	Course Code	030101003
2	Course Title	Principles of Electrical and Electronics Engineering
3	Credits	3

4	Contact Hours (L-T-P)	2-1-0
	Course Status	Compulsory
5	Course Objective	To provide the students with an introductory concept in the field of electrical and electronics engineering to facilitate better understanding of the devices, techniques and equipment used in engineering applications.
6	Course Outcomes	The students will be able to: CO1: Find basic electrical circuits. CO3: Explain the working principle of transformer. CO3: Explain the working principle of dc and ac motors. CO4: Practice the basics of diode to describe the working of rectifier circuits such as half and full wave rectifiers. CO5: Choose the concepts of basic electronic devices to design various circuits. CO6: Combine the basic concepts in Electrical and Electronics Engineering for multi-disciplinary tasks.
7	Course Description	This initial course introduces the concepts and fundamentals of electrical and electronic circuits and devices. Topics include basic circuit analysis, diode and transistor fundamentals and applications. This course also introduces working principle and applications of dc/ac motors and transformers.
8	Outline syllabus	
	Unit 1	DC & AC Circuits
	Electrical circuit elements (R, L and C), series and parallel circuits, concept of equivalent resistance, Kirchhoff current and voltage laws, star-delta conversion, Analysis of simple circuits with dc excitation and Superposition Theorem, Representation of sinusoidal waveforms, peak and rms values, real power, reactive power, apparent power, power factor, Introduction to three phase system, relationship between phase voltages and line voltages,	
	Unit 2	Transformer
	Working principle and construction of transformer, EMF equation, Efficiency of transformer, Power and distribution transformer and difference between them, Transformer applications in transmission and distribution of electrical power	
	Unit 3	Electrical Motors

School: SSET		Batch: 2024-2028
Programme: B.Tech.		Current Academic Year: 2024-2025
Branch:		Semester: 1
1	Course Code	030101004
2	Course Title	Programming Fundamental
3	Credits	2
4	Contact Hours(L-T-P)	2-0-0
	Course Status	Core
5	Course Objective	1. Learn basic programming constructs –data types, decision structures, control structures in C 2. learning logic aptitude programming in c language 3. Developing software in c programming
6	Course Outcomes	The students will be able to: CO1: Define the algorithm, Pseudo-code and flow chart for the given problem. CO2: Explain better understanding of basic concepts of C programming. CO3: Develop logic using array and function. CO4: Construct and implement logic based on the concept of strings and pointers. CO5: Perform user-defined data types and I/O operations in file.
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm
8	Outline syllabus	
	Unit 1	Logic Building
	Flowchart: Elements, Identifying and understanding input/output, Branching and iteration in flowchart, Algorithm design: Problem solving approach (topdown/bottom-up approach), Pseudo Code: Representation of different construct, writing pseudo-code from algorithm and flowchart	
	Unit 2	Introduction to C Programming
	Introduction to C programming language, Data types, Variables, Constants, Identifiers and keywords, Storage classes, Operators and expressions, Types of Statements: Assignment, Control, jumping. Control statements: Decisions, Loops, break, continue	

School: SET		Batch : 2024-2028	
Program: B.Tech		Current Academic Year: 2024-25	
Branch:CSE		Semester:I	
1	Course Code	030101005	Course Name: Web Designing
2	Course Title	Web Designing	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Elective	
5	Course Objective	The objective of this course is to provide a foundation of technologies and technical skills in web development. Based upon the development of a web, this course provides an insight of computer and networking technologies, and hands on experience in web programming.	
6	Course Outcomes	1) Design and develop a simple interactive web application 2) Demonstrate the ability to design web sites utilizing multiple tools and techniques. 3) Build dynamic web pages using JavaScript 4) Apply the network programming knowledge to setup a web site	
7	Course Description	This course is an overview of the modern Web technologies used for the Web development. The purpose of this course is to give students the basic understanding of how things work in the Web world from the technology point of view as well as to give the basic overview of the different technologies.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	Web Page: Static and dynamic sites, client and server end technology, URL syntax, open-source web design tools overview. HTML basic tags, image map, implementation of links, table, form design. Page layout design: using frame, div and span tag, iframes, DHTML		
	Unit 2	HTML5	
	New elements, semantic, canvas, offline webpage, canvas, SVG ,HTML Media: video, audio, HTML API: geolocation ,Location storage, Migration from HTML to HTML5.		
	Unit 3	CSS	
	CSS: Introduction, syntax, selector, text formatting, margin, align, Positioning, background formatting, Navigation bar, and image gallery. CSS3: Introduction, colors, text formatting, fonts formatting, Background formatting ,2D transform, Transition, animation, user interface		
	Unit 4	XML	
	XML: Introduction, syntax, well form XML document , DTD, schema, XML Technology: xlink, xpath, xpointer, xslt ,displaying XML file data into HTML file		
	Unit 5	Java Script	
	Syntax, comment, statement, variable, operators, conditional statements, looping statements , functions, object, events, Accessing form elements , History, pop up windows, cookies. ^[1] _{SEP}		
	Mode of examination	Theory	
	Text book/s*	1. Ivan Bayross, "HTML, DHTML, JavaScript, Perl & CGI", BPB Publication 2. Rick Delorme, " Programming in HTML5 with JavaScript and CSS3", Microsoft	

Other References	<ol style="list-style-type: none"> 1. Burdman, "Collaborative Web Development" Addison Wesley. 2. Chris Bates, "Web Programming Building Internet Applications", 2nd Edition, WILEY. 3. Steven Holzner, "PHP: The Complete Reference", TataMcGraw Hill Publication 	
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PO and PSO mapping with level of strength for Course Name Web Designing

CO's	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12
CO1	3	3	2	1	3							3
CO2	3	3	2	3	3							3
CO3	3	3	2	2	3	1			2			3
CO4	3	3	2	1	3	1			2			3

Schools: SET		Batch: 2024-2028
		Academic Year: 2024-2025
		Semester: 1st
1	Course Code	030101006
2	Course Title	Introduction to Chemistry for Engineers
3	Credits	2
4	Contact Hours (L-T-P)	2-0-0
5	Course Objective	<ul style="list-style-type: none"> • To understand the basic principles of elements, organic reactions, drug synthesis and computational chemistry • To apply the knowledge of different engineering materials, advanced polymers, and nanomaterials to solve complex engineering problems • To analyse and evaluate quality parameters of water and its treatment • Apply the knowledge of free energy, energy storage device, semiconductors and corrosion to design environment friendly & sustainable devices • Apply the knowledge of different instrumental techniques to analyse unknown engineering
6	Course Outcomes	<p>The students will be able to:</p> <p>CO1. Able to understand the basic principles of elements, organic reactions drug synthesis and and computational chemistry</p> <p>CO2. Able to apply the knowledge of different engineering materials, advanced polymers, and nanomaterials to solve complex engineering problems</p> <p>CO3. Able to analyse and evaluate water quality parameters and its treatment</p> <p>CO4. Able to the knowledge of free energy, energy storage device, fuels and corrosion to design environment friendly & sustainable devices</p> <p>CO5. Able to apply the knowledge of different instrumental techniques to analyse unknown engineering materials</p>
7	Course Description	This course is an overview of the modern Chemistry used for the industrial development.

8	Outline syllabus	
	Unit A	Elements and their properties
	Elements and their properties, Bohr's theory for one electron system, Hydrogen spectrum, Quantum numbers, atomic orbitals, Pauli's exclusion principle, Hund's rule, exchange energy, Aufbau principle, electronic configuration and Magnetic properties. Periodic Table for Engineers, Modern Periodic table, Periodic properties, study of advanced functional materials like Silicones, Silicates, Zeolite and alloys like steel, mischmetal, Neodymium alloy and their applications	
	Unit B	Energy devices and Semiconductors
	Use of free energy in chemical equilibria, Laws of Thermodynamics, Enthalpy, Entropy, Spontaneity, Electrochemical Cell, Dry Cell, Mercury Cell, Lead Storage batteries, Ni-Cd Cells, Fuel Cells, Solar Cells, Nernst equation and applications, Electrochemical sensors, Crystals and Semiconductors, Crystals and their defects, Stoichiometric and Non-stoichiometric defects, Band theory and Doping, n-type and p-type semiconductors, Superconductors	
	Unit C	Industrial Applications of Chemistry
	Advanced Polymeric materials, Classification, Engineering Plastics, conducting polymers, bio polymers, polymer composites, Industrial corrosion, Classification, Effects of corrosion, Preventive measures, Analysis of Water Quality, Water quality parameters and treatment, Nano materials, Synthesis of Nano materials, Applications in modern devices, Basic Computational Chemistry, Introduction of computational chemistry and their applications.	
	Unit D	Organic Reaction Products and their spectroscopic analysis
	Organic Reactions, Substitution, Elimination and Addition reactions, Drug designing and synthesis, Paracetamol, Aspirin, Spectroscopic Analysis (1L) UV – Visible Spectra, IR spectra.	
	Unit E	Fuels
	Classification of fuels. Analysis of Coal. Determination of Calorific values (bomb calorimeter & Dulong's method). Biogas. Elementary ideas and simple applications of UV, Visible, IR and H1NMR spectral Techniques.	
10	Texts & References Library Links	<ol style="list-style-type: none"> 1. Chemistry for Engineers, by S. Vairam and Suba Ramesh; Wiley India 2. Fundamentals of Engineering Chemistry, Dr. Sudip bandopadhyay & Dr. Nirmal Hazra 3. Chemistry –I, Gourkrishna Das Mohapatro 4. A text book of Engineering Chemistry, Dr. Rajshree Khare <p><i>Reference Books</i></p> <ol style="list-style-type: none"> 1. Textbook of Engineering Chemistry by Dr. Gopal Krishna Bhatt, Acme Publishers 2. Chemistry (9th ed), by Raymond Chang, Tata McGraw-Hill 3. Chemistry Concepts and Applications by Steven S. Zumdahl; Cengage Learning 4. Engineering Chemistry, Wiley India 5. Engineering Chemistry Author: Abhijit Mallick, Viva Books 6. Text Book of Engineering Chemistry by Harsh Malhotra; Sonali Publications 7. Concise Inorganic Chemistry by J.D. Lee; Wiley India 8. Organic Chemistry (6 ed) by Morrison & Boyd; Pearson Education 9. Physical Chemistry by Gordon M. Barrow; Mc-Graw Hill

PO and PSO mapping with level of strength for Course Name Introduction to Chemistry for Engineers

CO's	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO11	PO12
CO1	3	3	2	2	2						2	2
CO2	3	3	3	3			2				2	2
CO3	3	3	-	-			3				2	2
CO4	3	3	3	2			3				3	2
CO5	3	3	3	3	2						2	2

Schools: SET		Batch: 2024-2028
		Academic Year: 2024-2025
		Semester: 1 st
1	Course Code	030101007
2	Course Title	Professional Communication-1
3	Credits	2
4	Contact Hours (L-T-P)	2-0-0
5	Course Objective	To minimize the linguistic barriers that emerges in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
6	Course Outcomes	The students will be able to: CO1: Enumerate advanced grammar rules and write grammatically correct sentences. CO2: Explain wide vocabulary and punctuation rules and learn strategies for error-free communication. CO3: Interpret texts, pictures and improve both reading and writing skills which would help them in their academic as well as professional career CO4: Comprehend language and improve speaking skills in academic and social contexts. CO5: Develop, share and maximise new ideas with the concept of brainstorming and the documentation of key critical thoughts articulated towards preparing for a career based on their potentials and availability of opportunities. CO6: Collaborate effectively in multi-disciplinary teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.
8	Outline syllabus	

	Unit A	Sentence Structure	
	Subject Verb Agreement. Parts of speech. Writing well-formed sentences, Concord		
	Unit B	Vocabulary Building & Punctuation	
	Homonyms/ homophones, Synonyms/Antonyms, Punctuation/ Spellings (Prefixes-suffixes/UnjumbledWords) ,One Word Substitution, Foreign words, Idioms and Phrases		
	Unit C	Writing Skills	
	Picture Description – Student Group Activity, Summarizing and Paraphrasing, Letter Writing, report Writing, E-mail writing, Digital Communication in Social Space, Advertisements, Story Completion Exercise, Poster Making, Digital Literacy Effective Use of Social Media		
	Unit D	Speaking Skill	
	Phonetics, Vowel and Consonants, Place and Manner of Articulation, Self-introduction/Greeting/Meeting people – Self branding, Describing people and situations, Dialogues/conversations (Situation based Role Plays)		
	Unit E	Professional Skills, Leadership and Management Skills	
	Exploring Career Opportunities, Brainstorming Techniques & Models, Social and Cultural Etiquettes , Internal Communication , Managerial Skills, Entrepreneurial Skills		
9	Texts & References Library Links	<ul style="list-style-type: none"> Blum, M. Rosen. <i>How to Build Better Vocabulary</i>. London: Bloomsbury Publication Comfort, Jeremy (et.al). <i>Speaking Effectively</i>. Cambridge University Press 	

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	1	3		2
CO2	-	-	-	-	-	-	-	-	1	3		2
CO3	-	-	-	-	-	-	-	-	1	3		2
CO4	-	-	-	-	-	-	-	-	1	2	1	2
CO5	-	-	-	-	-	-	-	-	1	2	1	2
CO6	-	-	-	-	-	-	-	-	1	2	1	2

School	SCHOOL OF ENGINEERING & TECHNOLOGY	
Batch	2024-28	
Department	Computer Science Engineering	
Programme	B.Tech, Academic Year: 2023-24	
Semester	1	
1	Course Code	
2	Course Title	Environmental Studies

3	Credits	0
4	Contact Hours (L-T-P)	2-0-0
	Course Status	Compulsory
5	Course Objective	<ol style="list-style-type: none"> 1. Enable students to learn the importance of environmental studies, population growth and sustainable development 2. Provide students an insight to different aspects related to water i.e. water resources, pollution and its control 3. Provide knowledge about air resources i.e. atmosphere, atmospheric pollution, control of air pollution and climate change 4. Provide detailed knowledge about land resources, pollution and management of solid wastes 5. Provide and enrich the students about other natural resources i.e. energy, mineral and food resources and biodiversity and its conservation
6	Course Outcomes	<p>CO1. Understand the scope of environmental study and knowledge about population growth and its effects on environment and health and sustainable development</p> <p>CO2. Comprehend different aspects related to water i.e. water resources, pollution and its control</p> <p>CO3. Understand different aspects related to air resources i.e. atmosphere, atmospheric pollution, control of air pollution and climate change</p> <p>CO4. Appreciate and comprehend land resources, pollution and management of solid wastes</p> <p>CO5. Understand about other natural resources i.e. energy, mineral and food resources and biodiversity and its conservation</p> <p>CO6. Understand overall environmental issues and their ways of their effective management</p>
7	Course Description	<p>Environmental Studies emphasises on various aspects related to environment, its degradation and control measures such as:</p> <ol style="list-style-type: none"> 1. Population and Environment; Sustainable Development 2. Water: Resources, Pollution and Control 3. Air: Atmosphere, Pollution, Control and Climate Change 4. Land: Resources, Pollution and Management <p>Energy, Mineral and Food Resources and Biodiversity and its Conservation</p>
8	Outline syllabus	
	Unit 1	Introduction to the course, Population and Environment and Sustainable Development
		<p>Environmental Studies: Background; Definition; Objectives; Scope; Major environmental issues of concern. Multidisciplinary nature of Environmental Studies , Human Population and Environment: Population growth/explosion and its effects on human health and environment Sustainable Development: Definition; Aim; Sustainability Development Goals (SDGs); Sustainability issues at various levels; Examples/ sustainability initiatives; Pillars of sustainable development; Desired outcomes</p>
	Unit 2	Water: Resources, Pollution and Control
		<p>Water Resources: Water cycle; Total water on earth; Residence time of water in different compartments; Classification of waters as per salt content; Stresses on water resources/ water crises; Water conservation; Water conflicts Water Pollution: Impurities in water; Water quality parameters; Standards; Major categories of water pollutants and their sources and effects; Surface water versus groundwater quality; Point and non-point sources; Pollution of (i) fresh water streams (DO sag curve/ self- purification), (ii) lakes, (iii) groundwater/ aquifers, and (iv) oceans Water: Resources, Pollution and Control</p>
	Unit 3	Air: Atmosphere, Pollution, Control and Climate Change

Atmosphere: Composition and structure; Classification of pollutants; Air pollution: sources and effects on humans, plants and materials; AQI and how it is calculated, Plume Shapes ,Air Pollution Control: Laws; Modifications in fuels and engines; Ambient air quality control; Control equipment's (in vehicles and industry); Stack height Climate Change: Global warming and greenhouse effect; Ozone layer depletion and its consequences; Climate Change and its impact on ecosystem; International agreements		
Unit 4	Land: Resources, Pollution and Management	
Land Resources: Importance; Soil and its formation; Soil profile; Land degradation: causes and effects; Soil conservation through sustainable agriculture , Soil/ Land Pollution: Major categories of soil pollutants:sources and effects Solid Waste Management: Classification of solid wastes; Engineering systems for management; Methods of treatment; Bio-medical wastes; Non-degradable wastes; Hazardous wastes; Electronic wastes; Plastic wastes etc.		
Unit 5	Energy, Mineral and Food Resources and Biodiversity and its Conservation	
Energy Resources: Conventional and non-conventional;Non-renewable and renewable; Fossil fuels: coal, petroleum and natural gas; Solar and wind energy .Mineral, Forest and Food Resources: (i) Minerals - Definition; Importance; Minerals in our diet, Metallic and non-metallic minerals, (ii) Forest - Direct and indirect benefits; Depletion of forest resources: causes and effects; and, (iii) Food - Three main calorie providers; Green revolution		
Biodiversity and its Conservation: Definition; Threats to biodiversity; Extinct, endangered and endemic species;Conservation of biodiversity		
Mode of examination	Theory	
Text book/s*	<ol style="list-style-type: none"> 1. Joseph, Benny, "Environmental Studies", Tata Mcgraw Hill. 2. .Howard S. Peavy, Donald R. Rowe, George Tchobanoglous. Environmental engineering Mc Graw-Hill, 1985 	
Other References	NA	

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1	1	1	2	1	-	1	1	3
CO2	1	2	2	1	-	1	2	-	-	1	1	3
CO3	1	2	2	1	-	2	2	-	-	1	2	3
CO4	1	2	2	1	-	2	2	-	-	1	2	3
CO5	1	2	2	1	1	2	1	2	-	1	2	3
CO6	1	2	2	2	1	2	2	1	-	1	2	3

School: SET		Batch: 2024-2028
Programme: B.Tech		Current Academic Year: 2024-2025
Branch:		Semester: I
1	Course Code	030101008
2	Course Title	Semiconductor Physics Lab
3	Credits	2
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory

5	Course Objective	<ul style="list-style-type: none"> To impart the basic P-N junction diode. To understand Semiconductors. To create dynamic applications in Solar cell. To study the reverse characteristics of Zener diode.
6	Course Outcomes	<p>The students will be able to:</p> <p>CO1 To introduce the concept of P-N junction diode.</p> <p>CO2 To apply the concept of Active and Passive filters and Planks constant.</p> <p>CO3 To impart knowledge of fleshing and quenching experiments.</p> <p>CO4 To Gained knowledge about Semiconductors and the Metal oxide semiconductor field effect (MOSFET) transistor.</p> <p>CO5 To explain the mechanism of Carry Foster bridge and galvanometer.</p>
7	Course Description	In this course is to make students to learn to about vernier calliper, screw gauge, spherometer, spectrometer etc
8	Outline syllabus	
	Experiment 1	To study the forward and reverse characteristics of P-N junction diode.
	Experiment 2	To study the characteristics of transistor in common base configuration.
	Experiment 3	To study the characteristics of transistor in common emitter configuration.
	Experiment 4	To study the characteristics of Junction field effect (JFET) transistor.
	Experiment 5	To study the characteristics of Metal oxide semiconductor field effect (MOSFET) transistor.
	Experiment 6	To study the characteristics of Solar cell and find out the fill factor.
	Experiment 7	To design and study Active and Passive filters.
	Experiment 8	To study the reverse characteristics of Zener diode and voltage regulation using Zener Diode.
	Experiment 9	To determine Planks constant using photocell.
	Experiment 10	To measure e/m of electron using helical method.
	Experiment 11	To find capacitance of condenser using fleshing and quenching experiment.
	Experiment 12	To find temperature co-efficient of platinum using Callender Griffith bridge.
	Experiment 13	To find out low resistance by Carry Foster bridge.
	Experiment 14	To find resistance of galvanometer by post office box.
	Experiment 15	To compare the capacitance of two capacitors using De'Sauty Bridge
	Text book/s*	<ol style="list-style-type: none"> Semiconductor Device Fundamentals- Robert F. Pierret Addison Wesley Longman. Semiconductor Devices- Kanaan Kano, Pearson Education. Basic Electronics by B.L Thareja

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	3	3	2	3	3	3	3	3	3
CO3	2	3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	2	3	3	3

School: SET
Batch:2024-2028
Programme: B.Tech
Current Academic Year: 2024-2028
Branch:
Semester: I

1	Course Code	030101009
2	Course Title	Principles of Electrical and Electronics Engineering Lab
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	To provide the students with an introductory concept in the field of electrical and electronics engineering to facilitate better understanding of the devices, techniques and equipment's used in engineering applications.
6	Course Outcomes	After successful completion of this course the student will be able to: CO1: Configure and analyze any given circuit. CO2: Apply the working of transformer and calculate its efficiency CO3: Explain the working of dc and ac motors and measure its various operating parameters. CO4: Design rectifier circuits such as half and full wave rectifiers and observe its output waveforms. CO5: Evaluate the characteristics of BJT.
7	Course Description	This initial course introduces the concepts and fundamentals of electrical and electronic circuits and devices. Topics include basic circuit analysis, diode and transistor fundamentals and applications. This course also introduces working principle and applications of dc/ac motors and transformers.
8	Outline syllabus	
	Experiment 1	To configure a dc circuit on breadboard, and measure voltage/current across/through each element
	Experiment 2	To verify Kirchhoff's Laws, To verify superposition theorem
	Experiment 3	To find the real power, reactive power, apparent power and power factor of RL & RC load
	Experiment 4	To find the efficiency of transformer by obtaining its losses.
	Experiment 5	To study cut section of DC motor and induction motor.

Experiment 6	To start the DC motor and reverse its direction of rotation.	
Experiment 7	To start an induction motor and reverse its direction of rotation.	
Experiment 8	To determine voltage-current characteristic of diode	
Experiment 9	To assemble and test half wave rectifier circuits for their input and output waveform	
Experiment 10	To assemble and test full wave rectifier circuits for their input and output waveform	
Experiment 11	To determine input and output characteristics of BJT	
Experiment 12	Validation of BJT as a switch	
Experiment 13	Validation of BJT as an amplifier	
Mode of examination	Practical/viva	
Text book/s*	<ol style="list-style-type: none"> 1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", TataMcGraw Hill, 2010- ISBN:9780070146112 2. S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publication. ISBN: 9789332586505 3. Robert L Boylestad, "Electronic Devices and Circuit Theory" Pearson Education, 2009 ISBN: 9780131189058 	

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	3	3						3	3
CO2	3	3	3	3	3						3	3
CO3	2	3	3	3	2						3	3
CO4	3	3	3	3	2						3	3
CO5	3	3	3	3	3						3	3

School	SCHOOL OF ENGINEERING & TECHNOLOGY	
Batch	2024-28	
Department	Computer Science Engineering	
Programme	B.Tech, Academic Year: 2024-25	
Semester	1	
1	Course Code	030101010
2	Course Title	Programming Fundamental Lab
3	Credits	1
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory

5	Course Objective	1. Learn basic programming constructs –data types, decisionstructures, control structures in C 2. learning logic aptitude programming in c language 3. Developing software in c programming
6	Course Outcomes	Students will be able to: CO1: Implement core concept of c Programming CO2: develop programs using Array and String CO3: create Functions for any problem CO4: Use Union and Structure to write any program CO5: implement concept of Pointers CO6: design a real world problem with the help of c programming
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm.
8	Outline syllabus	
	Experiment 1	Draw flowchart for finding leap year
	Experiment 2	Write a c Program to Add Two Integers
	Experiment 3	Write a program to create a calculator
	Experiment 4	Write a c program to convert length meter to cm
	Experiment 5	Write a c program to convert temp
	Experiment 6	Write a c program to swap two numbers
	Experiment 7	Write a c program to calculate the average using arrays
	Experiment 8	Write a c program to find the largest element of the array
	Experiment 9	Write a c program to swap two values using pointers
	Experiment 10	Write a c program to find largest number from array using pointers
	Experiment 11	Write a c program to store information of a student using structure
	Experiment 12	Write a c program to store information of a student using union
	Mode of examination	Practical
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. <i>The CProgramming Language</i>
	Other References	1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999

PO and PSO mapping with level of strength

CO's	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO11	PO12
CO1	2	-	3	2	2	-	-	-	2	-	-	3
CO2	3	-	3	2	2	-	-	-	3	-	-	3
CO3	2	-	3	1	2	-	-	-	2	-	-	3
CO4	1	-	2	1	1	-	-	-	2	-	-	3
CO5	2	-	3	2	2	-	-	-	3	-	-	3
CO6	3	-	3	3	1	-	-	-	2	-	-	3

School: SET		Batch: 2024-2028
Programme: B.Tech		Current Academic Year: 2024-2025
Branch:		Semester: I
1	Course Code	030101012
2	Course Title	Computer Aided Engineering Graphics Lab
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
	Course Status	Compulsory
5	Course Objective	The objective of this introductory course is to make students familiar with computer-aided drafting/ design, introduce them about the basic commands, tools and dimension techniques for creation and presentation of various engineering drawing by using AutoCAD software which helps in visualization and problem solving in engineering disciplines.
6	Course Outcomes	The students will be able to: CO1: Identify the fundamental features of CAD, AutoCAD workspace and user interface. CO2: Apply knowledge of drawing, editing and viewing tool to create two-dimensional engineering drawings in AutoCAD. CO3: Choose advanced features to present an engineering drawing in AutoCAD. CO4: Create an engineering drawing by implementing dimension techniques. CO5: Construct orthographic projections from a pictorial view. CO6: Apply the knowledge of AutoCAD in various industrial practice.
7	Course Description	This introductory course is offered to students to make them proficient in design, layout, product development, and other careers that require technical drawing. Using the current version of the AutoCAD software, students will learn a variety of drawing techniques and be able to replicate specific drawings in multiple perspectives. The pinnacle of the class is to empower and enable students to create using the software provided. Career opportunities in 3D modeling, manufacturing, and engineering will also be explored. No drafting or computer experience is necessary.
8	Outline syllabus	
	Experiment 1	Introduction to AutoCAD and its interface
	Experiment 2	Working with coordinates, drawing of line, circle, arc, polygon and creating sketches
	Experiment 3	Editing of drawing by using editing Tools and Power tools
	Experiment 4	Creating of advanced feature like fillet, chamfer, hatch and using of block
	Experiment 5	Representing text and dimensioning in AutoCAD
	Experiment 6	Creating the drawings of Civil components by using AutoCAD features.
	Experiment 7	Creating the electrical circuit drawings in AutoCAD.
	Experiment 8	Drawing plan and elevation of various buildings in AutoCAD.

Experiment 9	Creating the drawing of renowned constructions such as Taj Mahal in AutoCAD
Experiment 10	Creating of orthographic projections from a pictorial view
Mode	Practical
Text book/s*	1. Ibrahim Zaid, "CAD/CAM- Theory and Practice", McGraw Hill, International Edition.
Software	Auto CAD

CO's	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO11	PO12
CO1	3	3	2	2	2	-	-	-	2	-	-	3
CO2	3	3	2	2	2	-	-	-	3	-	-	3
CO3	3	3	2	2	2	-	-	-	2	-	-	2
CO4	3	3	2	2	1	-	-	-	2	-	-	2
CO5	3	3	2	2	2	-	-	-	3	-	-	3
CO6	3	3	2	2	1	-	-	-	2	-	-	3

School: SET		Batch: 2024-28	
Program: BTECH		Current Academic Year: 2024-25	
Branch: CSE		Semester: I	
1	Course Code	030101012	
2	Course Title	Web Technology Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Provide the knowledge to design and develop web application with and without database. Students will gain the skills and project-based experience needed for entry into web application and development careers. It provides information about web technologies that relate to the interface between web servers and their clients.	
5	Course Objective	<p>On successful completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Design interactive web pages 2. Design web pages/site having validation on user data access. 3. Develop web site for small business and organization or for individual 4. Client server communication RMI 	
6	Course Outcomes	This course is an overview of the modern Web technologies used for the Web development. The purpose of this course is to give students the basic understanding of how different computers and devices to communicate and share resources as well as to give the basic overview of the different technologies.	
7	Course Description	Provide the knowledge to design and develop web application	
8	Outline syllabus		
	Experiment 1	Write HTML code to design College Website	
	Experiment 2	Write HTML code to design students registration form	

Experiment 3	Write javascript code to perform validation on above form.	
Experiment 4	Write a program in XML to create Product Catalog.	
Experiment 5	Write a program for Product Catalog DTD.	
Experiment 6	Write a program to display the XML file data into HTML file.	
Experiment 7	Write a program to count number of character in words in the text written in text area.	
Experiment 8	Write a program to draw circle using mouse click event.	
Experiment 9	Write a program to insert and then retrieve name,rollno,and branch from the database using JDBC	
Experiment 10	Write a program to create registration form using jsp.	
Experiment 11	Write a program to describe jsp:param,jsp:include and jsp forward action.	
Experiment 12	Write a program to implement EJB	
Experiment 13	Write a program to perform addition using RMI	
Experiment 14	Create Chat application using TCP socket Programming.	
Experiment 15	Write a program in which Client keeps reading input from user and sends to the server until “Over” is typed.	
Mode of examination	Jury/Practical/Viva	
Text book/s*	<ol style="list-style-type: none"> Ivan Bayross, "HTML,DHTML, JavaScript, Perl & CGI", BPB Publication Schildt H, "The Complete Reference JAVA2", TMH Schildt H, "The Complete Reference J2EE", TMH 	
Other References	<ol style="list-style-type: none"> Rick Delorme, " Programming in HTML5 with JavaScript and CSS3", Microsoft 	

CO's	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO11	PO12
CO1	3	3	3	2	2	-	-	-	2	-	-	3
CO2	3	3	3	2	2	-	-	-	3	-	-	3
CO3	3	3	3	1	2	-	-	-	2	-	-	2
CO4	3	3	2	1	1	-	-	-	2	-	-	2
CO5	3	3	3	2	2	-	-	-	3	-	-	3
CO6	3	3	3	3	1	-	-	-	2	-	-	3

School: SET		Batch: 2024-2028
Programme: B.Tech		Current Academic Year: 2024-2025
Branch:		Semester: I
1	Course Code	030101012
2	Course Title	Professional Communication-1 Lab
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
	Course Status	Compulsory
5	Course Objective	To minimize the linguistic barriers that emerges in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the studentsto hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
6	Course Outcomes	The students will be able to: CO1: Enumerate advanced grammar rules and write grammaticallycorrect sentences. CO2: Explain wide vocabulary and punctuation rules and learn strategiesfor error-free communication. CO3: Interpret texts, pictures and improve both reading and writing skillswhich would help them in their academic as well as professional career CO4: Comprehend language and improve speaking skills in academic andsocial contexts. CO5: Develop, share and maximise new ideas with the concept of brainstorming and the documentation of key critical thoughts articulated towards preparing for a career based on their potentials and availability ofopportunities. CO6: Collaborate effectively in multi-disciplinary teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.
8	Outline syllabus(LSRW Skills)	
	Experiment 1	Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
	Experiment 2	Conversational skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.
	Experiment 3	Communication : Presentation Skills of Technical Paper/Project Reports/Professional Reports based on proper Stress and Intonation Mechanics.
	Experiment 4	Official /Public Speaking based on Rhythmic Patterns.
	Experiment 5	Theme-Presentation

Experiment 6	Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.
Experiment 7	Argumentative Skills/Role Play Presentation with Stress and Intonation.
Experiment 8	Comprehensions Skills based on Reading and Listening Practicals on a model Audio- Visual Usage.
Experiment 9	Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
Mode	Practical
Text book/s*	1. Ibrahim Zaid, "CAD/CAM- Theory and Practice", McGraw Hill, International Edition.
Software	Auto CAD

CO's	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO11	PO12
CO1					2	3	3	3	2	-	-	3
CO2					2	3	3	3	2	-	-	3
CO3					2	3	3	3	1	-	-	2
CO4					1	3	3	2	1	-	-	2
CO5					2	3	3	3	2	-	-	3
CO6					1	3	3	3	3	-	-	3

Semester II

School: SET		Batch: 2024-2028
Programme: B.Tech.		Current Academic Year: 2024-2025
Branch:		Semester: II
1	Course Code	030102001
2	Course Title	Linear Algebra and Complex Analysis
3	Credits	4
4	Contact Hours (L-T-P)	3-1-0
	Course Status	Compulsory
5	Course Objective	Objectives of the course: <ul style="list-style-type: none"> • To impart the basic concepts of Calculus. • To understand Gauss elimination and Gauss-Jordan elimination. • To create dynamic applications in Calculus. • To implement Gram-Schmidt orthogonalization.

6	Course Outcomes	<p>The student will be able to:</p> <p>CO1 To introduce the concept of L'Hospital's rule .</p> <p>CO2 To describe the Beta and Gamma functions and their properties.</p> <p>CO3 To apply the concept of Linear dependence of vectors.</p> <p>CO4 To impart knowledge of Gauss elimination and Gauss-Jordan elimination.</p> <p>CO5 To know about the Eigenvalues, Eigenvectors.</p> <p>CO6 To instruct about the Cramer's Rule.</p> <p>CO7 To explain the Gram-Schmidt orthogonalization.</p> <p>CO8 Gained knowledge about vectors and calculus.</p>	
7	Course Description	<p>This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of differential and integral calculus, linear Algebra and Abstract Algebra.</p>	
8	Outline syllabus: Calculus and Abstract Algebra		CO mapping
	Unit 1	Calculus	
	<p>Calculus: Indeterminate forms and L'Hospital's rule, Maxima and Minima, Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders, Evolutes and Involutives, Evaluation of definite and improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions, Beta and Gamma functions and their properties.</p>		

Unit 2	Matrices	
Matrices, vectors: addition and scalar multiplication, matrix multiplication. Linear systems of equations, linear Independence, rank of a matrix, determinants, Cramer's Rule Inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.		
Unit 3	Basic Algebra	
Sets, relations and functions. Basics of groups, cyclic groups. Subgroups, basics of Rings and Field.		
Unit 4	Vector spaces	
Vector Space, linear dependence of vectors, basis, dimension. Linear transformations (maps), range and kernel of a linear map, rank and nullity. Inverse of a linear transformation, Matrix associated with a linear map.		
Unit 5	Vector spaces (Prerequisite Module 2 –Matrices & Module-4 Vector spaces)	
Eigenvalues, Eigenvectors, Symmetric, skew-symmetric, and orthogonal Matrices, Diagonalization, Basic introduction of Inner product spaces, Gram-Schmidt orthogonalization.		
Mode	Theory	
Text book/s*	1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002. 2. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2006.	
Other References	1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005. 2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008. 3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010. 4. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East-West press, Reprint 2005.	

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO												
CO 1	3	3	2	2	3	1	-	-	-	1	1	1
CO 2	3	3	3	2	2	2	-	-	-	1	1	2
CO 3	3	3	2	2	2	1	-	-	-	1	1	1
CO 4	3	3	2	2	2	1	-	-	-	1	1	1
CO 5	3	3	2	2	2	1	-	-	-	1	1	2
CO 6	3	3	2	3	2	2	-	-	-	1	1	2

1-Slight (Low)

2-Moderate (Medium)

3-Substantial (High)

School		SCHOOL OF ENGINEERING & TECHNOLOGY
Batch		2024-28
Department		Computer Science Engineering
Programme		B.Tech, Academic Year: 2024-25
Semester		II
1	Course Code	030102002
2	Course Title	Introduction to Biology for Engineers
3	Credits	2
4	Contact Hours (L-T-P)	2-0-0
5	Course Objective	Students will be introduced to the functions and interactions of biological systems from a quantitative perspective. To provide a foundation in biology with engineering of living systems and to apply various tools of traditional engineering fields. To harness potential of living systems for the benefit of human mankind.
6	Course Outcomes	After successfully completion of this course students will be able to: <ol style="list-style-type: none"> 1. To understand the fundamentals of living things, their classification, cell structure and biochemical constituents. 2. To apply the concept of plant, animal and microbial systems and growth in real life situations. 3. To comprehend genetics and the immune system. 4. To know the cause, symptoms, diagnosis and treatment of common diseases. 5. To give a basic knowledge of the applications of biological systems in relevant industries. 6. Understand importance of biological components in everyday life
7	Outline syllabus:	
	Unit A	UNIT I: INTRODUCTION TO LIFE
		Characteristics of living organisms, Cell theory, Structure of prokaryotic and eukaryotic cell
	Unit B	UNIT II: Biomolecules
		General classification and important functions of carbohydrates and lipids, General classification and important functions of proteins, General classification and important functions of DNA and RNA
	Unit C	UNIT III: Genetics and Immune system
		Theories of Evolution, Mendel's laws of inheritance, Immune system and Immunity
	Unit D	UNIT IV: Human Diseases
		Genetic diseases and Infectious diseases, AIDS and Diabetes Cancer and its causes
	Unit E	UNIT V: Biology and its industrial application
		Vaccines and their types ,Bioremediation and biofertilizers ,Bioreactors
	Text book	1. Karp, G. <i>Cell and Molecular Biology, 5th ed.</i> , John Wiley and Sons, Inc.
	Other References	1. Alberts, B. et al. <i>Essential Cell Biology</i> , Garland Publishing, Inc. (ISBN: 081533480X) 4. 2. Berger, S. et al. <i>Introduction to Bioengineering</i> , Oxford University Press (ISBN: 978-0-19-856515-4)

Mapping of Outcomes vs. Topics

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	1	-	-	-	1	3	-	-	-	-	3
CO 2	3	2	-	-	-	2	-	-	-	-	-	3
CO 3	3	3	3	1	1	3	3	2	1	3	-	3
CO 4	3	2	-	-	-	2	2	3	1	2	-	3
CO 5	3	1	1	1	3	1	3	2	1	2	1	3
CO 6	3	3	1	1	2	3	5	1	1	1	-	3

School: SET		Batch :2024-2028	
Program: B.Tech.		Current Academic Year: 2024-25	
Branch:CSE		Semester:II	
1	Course Code	030102004	
2	Course Title	Data Structures	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	<ol style="list-style-type: none"> 1. Learn the basic concepts of Data Structures and algorithms. 2. Design and Implementation of Various Basic and Advanced Data Structures. 3. Learn the concepts of various searching, Sorting and Hashing Techniques. 4. Choose the appropriate data structures and algorithm design method for a specified application. 	
6	Course Outcomes	CO1: Implement operation like traversing, insertion, deletion, searching etc. on various data structures. CO2: Evaluate algorithms and data structures in terms of time and memory complexity. CO3 Understand the application of linear data structure(s) to solve various problems CO4: Understand the application of non linear data structure(s) to solve various problems. CO5: Implement and know when to apply standard algorithms for searching and sorting.	
7	Course Description	This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are	

		studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.	
8	Outline syllabus		
	Unit 1	Introduction	
	Data Structure – Definition, Operations and Applications, Abstract Data Types, Algorithm – Definition, Complexity and Asymptotic notations, Time and Space tradeoffs. Programming Principles – The art of writing programs, Recursion – Definition, Examples- Tower of Hanoi problem, Fibonacci Series. Arrays: Implementation of One Dimensional Arrays, Multidimensional Arrays, Pointer Arrays. Applications of Arrays, Address Calculation, Matrix Operations, Dense and Sparse Data in Arrays.		
	Unit 2	Linked List	
	Concept of Linked List, Garbage Collection, Overflow and Underflow, Array Implementation and Dynamic Implementation of Singly Linked Lists ,Array Implementation and Dynamic Implementation of Doubly Linked List, Circularly Linked List ,Operations on a Linked List- Insertion, Deletion, Traversal, Polynomial Representation and Addition		
	Unit 3	Stack and Queue	
	Stacks: Definitions, Primitive operations, Application of stacks – Conversion of Infix Expression to Postfix form, Evaluation of Postfix Expressions, Queues: Definition, Primitive Operations, Implementation of Circular Queues, Priority Queues ,Dequeues, Application of Queues. Implementation - Linked Stacks, Linked Queues.		
	Unit 4	Tree and Graphs	
	Trees: Terminologies, Binary tree, Representation,Applications – Operations on Binary Search Trees, Binary Search Algorithm, B Trees - Operations on a B Tree, Applications of B-trees.AVL Tree Graph: Terminology, Representation, Traversals- Depth First Search, Breadth First Search. Graph Applications – Minimum Spanning Trees – Prim’s and Kruskal’s Algorithms, Shortest Path – Dijkstra’s andFlyodWarshall’s Algorithm		
	Unit 5	Searching, Sorting and Hashing	
	Implementation and Analysis - Linear search, Binary Search , Implementation and Analysis- Bubble Sort, Merge Sort, Insertion Sort. Implementation and Analysis - Quick Sort, Selection Sort, Heap Sort, Hashing: Concepts and Applications, Hash Functions, Methods of Resolving Clashes		
	Mode of examination	Theory	
	Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein “Data Structures Using C and C++” , PHI 2. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill 4. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education 5. G A V Pai, “Data Structures and Algorithms”, TMH	

CO and PO Mapping

CO	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	3	3	2	2	3							3
CO2	3	3	3	3	3						2	3
CO3	3	3	2	2	3						3	3
CO4	3	3	3	3	3						3	3
CO5	3	3	3	3	3							3

School: SET		Batch :2024-2028	
Program: B.Tech.		Current Academic Year: 2024-25	
Branch:CSE		Semester:II	
1	Course Code	030102004	
2	Course Title	Digital Electronics & Logic Design	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Core	
5	Course Objective	<p>This course provides in-depth knowledge of switching theory and the logic design techniques of digital circuits, which is the basis for design of any digital circuit. The course objectives are:</p> <ul style="list-style-type: none"> • To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems. • To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations. • To implement simple logical operations using combinational logic circuits • To design combinational logic circuits, sequential logic circuits. • To impart to student the concepts of sequential circuits, enabling them to analyze sequential systems in terms of state machines. • To implement synchronous state machines using flip-flops. Choose the appropriate data structures and algorithm design method for a specified application. 	
6	Course	CO1 Be able to manipulate numeric information in different forms CO2 Be able to manipulate simple Boolean expressions using the theorems	

	Outcomes	and postulates of Boolean algebra and to minimize combinational functions. CO3 Be able to design and analyze small combinational circuits and to use standard combinational functions to build larger more complex circuits. CO4 Be able to design and analyze small sequential circuits and to use standard sequential functions to build larger more complex circuits.
7	Course Description	This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.
8	Outline syllabus	
	Unit 1	Number System and Boolean Algebra :
		Number System and Boolean Algebra : Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes. Digital Logic Gates(AND,NAND,OR,NOR,EX-OR,EX-NOR), Properties of XOR Gates, Universal Gates,
	Unit 2	Minimization Techniques:
		Minimization Techniques: Introduction, The minimization with theorems, The Karnaugh Map Method, Three, Four and Five variable K- Maps, Prime and Essential Implicants, Don't Care Map Entries, Using the Maps for Simplifying, Quine-McCluskey Method, Multilevel NAND/NOR realizations.
	Unit 3	Combinational Circuits:
		Design Procedure – Half Adder, Full Adder, Half Subtractor, Full Subtractor, Parallel Binary Adder, Parallel binary subtractor, Binary Multiplier, Multiplexers/DeMultiplexers, decoder, Encoder, Code Converters, Magnitude Comparator. classification of sequential circuits, The binary cell, The S-R-Latch Flip-Flop
	Unit 4	Sequential Circuits:
		Introduction, Basic Architectural Distinctions between Combinational and Sequential circuits, Latches,Flip-Flops, SR,JK,D,T and Master slave, characteristic Tables and equations, Conversion from one type of Flip-Flop to another, Counters - Design of Single Mode Counter, Ripple Counter, Ring Counter, Shift Register, Ring counter using Shift Register
	Unit 5	Memory Devices:
		Classification of memories – ROM : ROM organization, PROM, EPROM,EEPROM, RAM: RAM organization, Write operation, Read operation, Static RAM , Programmable Logic Devices: Programmable Logic Array(PLA),Programmable Array Logic, Implementation of Combinational Logic circuits using ROM,PLA,PAL.
	Mode of examination	Theory
	Other References	<ol style="list-style-type: none"> 1. Digital Design- Morris Mano, PHI, 3rd Edition. 2. Switching Theory and Logic Design-A. Anand Kumar, PHI, 2nd Edition. 3. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge. <p>REFERENCE BOOKS:</p> <ol style="list-style-type: none"> 1. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.

CO	PO1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	3	3	2	2	3							3
CO2	3	3	3	3	3						2	3
CO3	3	3	2	2	3						3	3
CO4	3	3	3	3	3						3	3

		<p>2. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.</p> <p>3. Switching Theory and Logic Design – Bhanu Bhaskara –Tata McGraw Hill Publication, 2012</p> <p>4. Fundamentals of Logic Design- Charles H. Roth, Cengage LEarning, 5th, Edition, 2004.</p> <p>5. Digital Logic Applications and Design- John M. Yarbrough, Thomson Publications, 2006. 6. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.</p>	
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CO and PO Mapping

School		SCHOOL OF ENGINEERING & TECHNOLOGY	
Batch		2024-28	
Department		Computer Science Engineering	
Programme		B.Tech, Academic Year: 2024-25	
Semester		II	
1	Course Code	030102005	Course Name: Discrete Structures
2	Course Title	Discrete Structures	
3	Credits	4	
4	Contact Hours(L-T-P)	3-1-0	
	Course Status		

5	Course Objective	This course provides a mathematical foundation for subsequent study in Computer Science, as well as developing the skills necessary to solve practical problems.
6	Course Outcomes (CO)	After the completion of this course, students will be able to: CO-1. <i>Apply the</i> basic principles of sets and operations in sets. CO-2. <i>Classify</i> logical notation and determine if the argument is or is not valid. CO-3. <i>Construct</i> and prove models by using algebraic structures. CO-4. <i>Analyze</i> basic principles of Boolean algebra with mathematical description. CO-5. <i>Construct</i> Permutations and combinations in counting techniques and applications of Graph Theory. CO-6. <i>Compose</i> computer programs in a formal mathematical manner.
7	Prerequisite	Concepts of algebra
8	Course Contents	
	Unit 1	Introduction to Set Theory, Relations and Functions.
		Set Theory: Introduction, Combination of sets, Multi sets, ordered pairs, Set Identities. Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations. Functions: Definition, Classification of functions, Operations on functions, recursively defined functions.
	Unit 2	Logics and Mathematical Induction
		Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition, Theory of Inference, Natural Deduction. Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic. Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Base cases.
	Unit 3	Algebraic Structures
		Definition, Groups, Subgroups and order, Cyclic Groups, Cosets, Lagrange's theorem, Normal Subgroups, Homomorphism's, Definition and elementary properties of Rings and Fields, Integers Modulo n. Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram.
	Unit 4	Lattices and Applications
		Definition, Properties of lattices – Bounded, Complemented, Modular and Complete Lattice, Morphisms of lattices. Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra. Combinational and sequential Circuits. Recurrence Relation & Generating function: Recursive definition of functions, Recursive algorithms, Method of solving recurrences.
	Unit 5	Graph Theory and Applications.
		Trees: Definition, Binary tree, Binary tree traversal, Binary search tree. Graphs: Definition and terminology, Representation of graphs, Multi graphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph colouring. Combinatory: Introduction, Counting Techniques, Pigeonhole Principle
	Mode of examination	Theory

Text book*	<ol style="list-style-type: none"> 1) <i>I. C. L. Liu, Elements of Discrete Mathematics, second edition 1985, McGraw-Hill Book Company. Reprinted 2000.</i> 2) Jean Paul Trembley, R Manohar, “Discrete Mathematical Structures with Application to Computer Science”, McGraw-Hill. 3) <i>K. H. Rosen, Discrete Mathematics and applications, fifth edition 2003, Tata McGraw Hill Publishing Company.</i>
other references	<ol style="list-style-type: none"> 1) <i>J.L. Mott, A. Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India.</i> 2) <i>W.K. Grassmann and J.P.Trembnlay, Logic and Discrete Mathematics, A Computer Science</i>

CO and PO Mapping

PO and PSO mapping with level of strength for Course Name Discrete Structures

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12
CO1	2	3	3	1	–	3	–	–	3	–	–	3
CO2	2	2	3	–	–	2	–	–	–	–	–	3
CO3	3	2	3	3	3	–	–	–	2	–	–	–
CO4	2	2	3	3	3	–	–	–	–	–	3	3
CO5	2	2	2	3	–	3	–	–	3	–	3	3
CO6	1	2	1	2	3	–	–	–	3	–	3	–
School					SCHOOL OF ENGINEERING & TECHNOLOGY							
Batch					2024-28							
Department					Computer Science Engineering							
Programme					B.Tech, Academic Year: 2024-25							
Semester					II							
1	Course Code				030102006							
2	Course Title				Professional Communication-II							
3	Credits				2							
4	Contact Hours (L-T-P)				1-0-2							
5	Course Objective				To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays.							

6	Course Outcomes	<p>After completion of this course, students will be able to:</p> <p>CO1 Acquire Vision, Goals and Strategies through Audio-visual Language Texts</p> <p>CO2 Synthesize complex concepts and present them in creative writing</p> <p>CO3 Develop MTI Reduction/Neutral Accent through Classroom Sessions & Practice</p> <p>CO4 Determine their role in achieving team success through defining strategies for effective communication with different people</p> <p>CO5 Realize their potentials as human beings and conduct themselves properly in the ways of world.</p> <p>CO6 Acquire satisfactory competency in use of Quantitative aptitude and Logical Reasoning</p>
7	Course Description	The course takes the learnings from the previous semester to an advanced level of language learning and self-comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances.
8	Outline syllabus	
	Unit A	Acquiring Vision, Goals and Strategies through Audio-visual Language Texts
	Pursuit of Happiness / Goal Setting & Value Proposition in life 12 Angry Men / Ethics & Principles The King's Speech / Mission statement in life strategies & Action Plans in Life	
	Unit B	Creative Writing
	Story Reconstruction - Positive Thinking Theme based Story Writing - Positive attitude Learning Diary Learning Log – Self-introspection	
	Unit C	Writing Skills 1
	Precis Paraphrasing Essays (Simple essays)	
	Unit D	MTI Reduction/Neutral Accent through Classroom Sessions & Practice
	Vowel, Consonant, sound correction, speech sounds, Monothongs, Diphthongs and Triphthongs Affricates and Fricative Sounds Speech Sounds Speech Music Tone Volume Diction Syntax Intonation Syllable Stress	
	Unit E	Gauging MTI Reduction Effectiveness through Free Speech
	Jam sessions Extempore Situation-based Role Play	
	Unit F	Leadership and Management Skills

	Innovative Leadership and Design Thinking Ethics and Integrity	
	Unit F	Universal Human Values
	Love & Compassion, Non-Violence & Truth Righteousness, Peace Service, Renunciation (Sacrifice)	
	Unit G	Introduction to Quantitative aptitude & Logical Reasoning
	Analytical Reasoning & Puzzle Solving Number Systems and its Application in Solving Problems	
9	Texts & References Library Links	<ul style="list-style-type: none"> • Wren, P.C.&Martin H. <i>High English Grammar and Composition</i>, S.Chand& Company Ltd, New Delhi. • Blum, M. Rosen. <i>How to Build Better Vocabulary</i>. London: Bloomsbury Publication • Comfort, Jeremy(et.al). <i>Speaking Effectively</i>. Cambridge University Press. <p>The Luncheon by W.Somerset Maugham - http://mistera.co.nf/files/sm_luncheon.pdf</p>

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	1	3	1	2
CO2	-	-	-	-	-	-	-	-	1	3	1	2
CO3	-	-	-	-	-	-	-	-	1	3	1	2
CO4	-	-	-	-	-	-	-	-	1	2	1	2
CO5	-	-	-	-	-	-	-	-	1	2	1	2
CO6	1	-	-	-	-	-	-	-	1	2	1	2

School	SCHOOL OF ENGINEERING & TECHNOLOGY	
Batch	2024-28	
Department	Computer Science Engineering	
Programme	B.Tech, Academic Year: 2024-25	
Semester	II	
1	Course No.	030102007
2	Course Title	Human Value and Ethics
3	Credits	2
4	Contact Hours (L-T-P)	2-0-0

5	Course Objective	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence
6	Course Outcomes	<p>On a successful completion of this course students will be able to</p> <ol style="list-style-type: none"> 1. Understand that the technical education without study of human values can generate more problems than solutions. 2. Define the principles and ideals, which help in making the judgement of what is more important. 3. See that 'I' and 'Body' are two realities, and most of their desires are related to 'I' and not body, while their efforts are mostly centered on the fulfillment of the needs of the body assuming that it will meet the needs of 'I' too. 4. Appreciate the importance of harmony in the self, family and the society for mutual fulfillment. 5. Understand the importance of harmony among human beings, other living beings and entire nature for universal equilibrium and mutual co-existence. 6. Know and practice the ethical approach in profession for continuous happiness and sustained prosperity.
7	Outline of syllabus:	
	Unit A	The Need and Process for Value Education
		The need, basic guidelines, content and process for Value Education Concept of 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration; Continuous Happiness and Prosperity- A look at basic Human Aspirations ,Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
	Unit B	Understanding Harmony in the Human Being - Harmony in Myself
		Human being as a co-existence of the sentient 'I' and the material 'Body' The needs of Self ('I') and 'Body' ; Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) ,The characteristics and activities of 'I' and harmony in 'I' ; Understanding the harmony of I with the Body: Correct appraisal of Physical needs, meaning of Prosperity in detail
	Unit C	Harmony in the Family and Society
		Values in human-human relationship; Trust and Respect as the foundational values of relationship , Understanding the meaning of Trust; Difference between intention and competence; The meaning of Respect; Difference between respect and differentiation; the other salient values in relationship , Harmony in the society (society being an extension of family; Visualizing a universal harmonious order in society - from family to world family
	Unit D	Harmony in the Nature and Existence
		The harmony in the Nature Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
	Unit E	Competence in professional ethics
		Ability to utilize the professional competence for augmenting universal human order Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, Ability to identify and develop appropriate technologies and management patterns for above production systems.

9	Text books	1. R.R Gaur, R Sangal, G P Bagaria, "A foundation course in Human Values and professional Ethics", Excel books, New Delhi
10	Other references	1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. 2. A.N. Tripathy, 2003, Human Values, New Age International Publishers. 3. PL Dhar, RR Gaur, Science and Humanism, Commonwealth Purblishers.

Mapping of Outcomes

CO's	PO 1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12
CO1	1	1	1	1	2	1	2			2	3	1
CO2	1	3	2	2	1	3	1	1	2		3	3
CO3		2	2	2		2	2		1		1	
CO4	1		1	2	3				2	3		2
CO5		3		1	2	3	2	1		2	2	1
CO6	2		1			1			1	1		

School: SET		Batch: 2024-2028
Programme: B.Tech		Current Academic Year: 2024-2025
Branch:		Semester: II
1	Course Code	030101012
2	Course Title	Digital Electronics & Logic Design Lab
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
	Course Status	Compulsory
5	Course Objective	This course provides in-depth knowledge of switching theory and the logic design techniques of digital circuits, which is the basis for design of any digital circuit. The course objectives are: <ul style="list-style-type: none"> • To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems. • To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations. • To implement simple logical operations using combinational logic circuits • To design combinational logic circuits, sequential logic circuits.
6	Course Outcomes	CO1 manipulate numeric information in different forms CO2 Be able to manipulate simple Boolean expressions. CO3 Be able to design and analyze small combinational circuits. CO4 Be able to design and analyze small sequential circuits
7	Course Description	The course is designed to equip students with simple logical operations.
8	Outline syllabus	
	Experiment 1	1. Realize Full Adder and Subtractor using a) Basic Gates and b) Universal Gates

Experiment 2	2. Design and implement Code converters-Binary to Gray and BCD to Excess-3
Experiment 3	3. Design of n-bit Carry Save Adder (CSA) and Carry Propagation Adder (CPA).
Experiment 4	Design and Realization of BCD Adder using 4-bit Binary Adder (IC 7483).
Experiment 5	4. Realization of Boolean Expression for suitable combination logic using MUX 74151 / DMUX 74154
Experiment 6	5. Verify the truth table of one bit and two bit comparators using logic gates and comparator
Experiment 7	Flip Flop Conversion: Design and Realization Design and Implementation of Combinational Logic using PLAs.
Experiment 8	Design and simulation of – Full adder , Flip flop
Experiment 10	Study of Shift Registers (SISO,SIPO, PISO,PIPO)
Experiment 11	Study of TTL Logic Family: Feature, Characteristics and Comparison with CMOS Family
Mode	Practical
Text book/s*	<ol style="list-style-type: none"> 1. Digital Design- Morris Mano, PHI, 3rd Edition. 2. Switching Theory and Logic Design-A. Anand Kumar, PHI, 2nd Edition. 3. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge. <p>REFERENCE BOOKS:</p> <ol style="list-style-type: none"> 1. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3						–	3
CO2	3	3	3	2	3						–	3
CO3	3	3	3	3	3						–	3
CO4	3	3	3	3	3						3	3
School	SCHOOL OF ENGINEERING & TECHNOLOGY											
Batch	2024-28											
Department	Computer Science Engineering											
Programme	B.Tech, Academic Year: 2024-25											
Semester	II											
1	Course Code	030102009										
2	Course Title	Data Structure Lab										
3	Credits	1										

4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	<ol style="list-style-type: none"> 1. Learn the basic concepts of Data Structures and algorithms. 2. Design and Implementation of Various Basic and Advanced Data Structures. 3. Learn the concepts of various searching, Sorting and Hashing Techniques. 4. Choose the appropriate data structures and algorithm design method for a specified application.
6	Course Outcomes	<p>CO1: Implement operation like traversing, insertion, deletion, searching etc. on various data structures.</p> <p>CO2 apply linear data structure(s) to solve various problems</p> <p>CO3: develop the solution of any problem using non linear data structure(s)</p> <p>CO4: create a solution of any problem using searching and sorting techniques</p> <p>CO5: Design a hash function using any programming language</p> <p>CO6: Choose the most appropriate data structure(s) for a given problem</p>
7	Course Description	This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.
8	Outline syllabus	
	Experiment 1	Program to implement Operation on Array such as Traversing, Insertion & Deletion operation
	Experiment 2	Program based on Recursion such as Towers of Hanoi, Fibonacci series etc.
	Experiment 3	Program to implement different operation on the following linked list: Singly, Doubly and circular linked list.
	Experiment 4	Program to Implement Stack operation using Array and Linked list
	Experiment 5	Program to convert infix expression to post fix expression
	Experiment 6	Program on Evaluation of Post fix expression
	Experiment 7	Program to implement queue operation using array and linked list
	Experiment 8	Program to implement circular queue and deque.
	Experiment 10	Program to implement binary tree and BST.
	Experiment 11	Program to implement MST and shortest path algorithm.

Experiment 12	Program on Searching and Hashing	
Experiment 13	Program on Sorting.	
Mode of examination	Practical	
Text book/s*	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH	
Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++", PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill 4. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education 5. G A V Pai, "Data Structures and Algorithms", TMH	

PO and PSO mapping with level of strength

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	-	-	-	-	-	3	-	-	2
CO2	3	2	2	2	2	-	-	-	2	-	-	-
CO3	3	1	3	3	-	-	-	-	3	-	-	1
CO4	3	2	3	2	-	-	-	-	2	-	-	2
CO5	2	2	2	-	-	-	-	-	-	-	-	-
CO6	3	3	2	3	-	-	-	-	3	-	-	-

School	SCHOOL OF ENGINEERING & TECHNOLOGY	
Batch	2024-28	
Department	Computer Science Engineering	
Programme	B.Tech, Academic Year: 2024-25	
Semester	II	
1	Course Code	030102010
2	Course Title	Application-based Programming in Python
3	Credits	1

4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory
5	Course Objective	Emphasis is placed on procedural programming, algorithm design, and language constructs common to most high level languages through Python Programming.
6	Course Outcomes	Upon successful completion of this course, the student will be able to: CO1: Develop programs based on procedural statements like assignments, conditional statements and loops. CO2: Compare and implement different data types of python. CO3: Create programs by using function and function calls. CO4: Formulate clear and accurate logical solution by using OOPS CO5: Apply different modules, packages available in python. CO6: Design real life situational problems and think creatively about solutions of them.
7	Course Description	Python is a language with a simple syntax, and a powerful set of libraries. It is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming.
8	Outline syllabus	
	Experiment 1	Program to implement all conditional statements
	Experiment 2	Program to implement different control structures
	Experiment 3	Program to implement operations on lists
	Experiment 4	Program to implement operations on Dictionary
	Experiment 5	Program to implement operations on Tuple
	Experiment 6	Program to implement Exception Handling
	Experiment 7	Program to use different functions
	Experiment 8	Program to use object oriented concepts like inheritance, overloading polymorphism etc.
	Experiment 10	Program for file handling
	Experiment 11	Program to use modules and package
	Experiment 12	Program to implement searching and sorting
	Mode of examination	Practical/Viva
	Text book/s*	1. The Complete Reference Python, Martin C. Brown, McGraw Hill

Other References	1. Introduction to computing in problem solving using Python, E Balagurusamy, McGraw Hill 2. Introduction to programming using Python, Y. Daniel Liang, Pearson 3. Mastering Python, Rick Van Hatten, Packet Publishing House 4. Starting out with Python, Tony Gaddis, Pearson
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CO and PO Mapping

CO's	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1				2				2
CO2	2	2	1	1	2			2				2
CO3	2	2	1	1	1	1		2				2
CO4	2	2	2	2	1	1		2				2
CO5	2	2	2	2	2	2		2				2
CO6	3	3	2	2	2	3		2				2

School: SET		Batch: 2024-2028	
Program: B.Tech		Current Academic Year: 2024-2025	
Branch: CSE		Semester: II	
1	Course Code	030102011	
2	Course Title	Creativity, Innovation & Entrepreneurship Lab	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-2	
5	Course Objective	1. To familiarize students with Design Thinking concepts and principles. 2. To familiarize students with Architecture of a product and its financial Analysis 3. Development of a new product, new service or the radical innovation of processes 4. Apply Design Thinking approach to various examples and real life applications.	

6	Course Outcomes	<p>Students will be able to:</p> <p>CO1: Explain the basics concepts of Design Thinking</p> <p>CO2: Design solutions as per needs and Translate customer needs into product specifications</p> <p>CO3: To apply product development concepts to the service environment.</p> <p>CO4: Design the Architecture of a product</p> <p>CO5: To apply environmental design concepts to the life cycle of a product.</p> <p>CO6: To apply Design Thinking approach to various examples and real life applications.</p>
7	Course Description	<p>This course introduces Design Thinking methodologies, processes and tools that can be used to make the world a better place. Students explore Design thinking theories and how they can be applied to practical situations relevant to various academic disciplines and organisational roles. Among the topics covered are ideation, prototyping, iteration and innovation. Through personal reflection, students will also examine how they can harness the power of design thinking for leading the creation of value for businesses, organisations and society.</p>
8	Outline syllabus	
	<p>Experiment 1</p> <p>Experiment 2</p> <p>Experiment 3</p> <p>Experiment 4</p> <p>Experiment 5</p> <p>Experiment 6</p> <p>Experiment 7</p> <p>Experiment 8</p> <p>Experiment 10</p> <p>Experiment 11</p>	<p>Learn how to use critical design thinking skills to improve an existing product or create a new one.</p> <p>As a first step toward user innovation, learn to identify consumer requirements and write customer needs statements.</p> <p>Learn how to statistically translate customer needs into product specifications and how product metrics can aid in the definition of those specs.</p> <p>Learn how to design needs solutions using creativity, brainstorming, and concept generation.</p> <p>Investigate prototyping techniques, tactics, and real-world examples of how they were used to generate a design that reflects client wants and product specifications.</p> <p>Learn how to recognise the potential for innovation in service design and how to apply product development concepts to the service environment.</p> <p>Learn how to determine the building blocks of a product using modular and integral product architectures.</p> <p>Learn how to run a financial analysis on your project idea to see if it has a solid business case (Worth-It).</p> <p>Learn how to apply environmental design concepts to the life cycle of a product.</p> <p>Learn how to choose and implement a product development approach that's right for your project (staged, spiral, or agile).</p>

	Mode of examination	Practical	
	Text book/s*	<ul style="list-style-type: none"> • Daniel H. Pink, A whole new mind, Pearson publication, New Delhi • Benyus, J.M.1997. Biomimicry:Innovation Inspired by Nature, HarperCollins,New York • Technical Innovation Center Inc, USA Altshuller G (1997) 40 Principles. TRIZ Keys to Technical Innovation. Technical Innovation Center Inc, USA Andrews P • Kelly, Tom (2001): The Art of Innovation, Lessons in Creativity from IDEO, America’s Leading Design Firm, Doubleday, NY • Tina Seelig, Ingenius, A Crash course on Creativity Hayhouse, U.K • Edward de Bono, Lateral Thinking, Be more creative and productive, Penguin India • Edward de Bono, Teach Yoursel 	

CO and PO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	2	-	-	-	-	-	3
CO2	2	-	-	-	3	2	-	-	2	-	-	3
CO3	3	3	3	-	3	2	-	-	-	-	-	2
CO4	3	3	3	3	-	2	-	2	3	-	-	2
CO5	2	3	2	-	2	2	-	2	-	-	-	1
CO6	3	3	3	3	3	3	-	3	3	3	2	3

School: SET	Batch: 2024-2028
Programme: B.Tech	Current Academic Year: 2024-2025
Branch:	Semester: II
1 Course Code	030101012

2	Course Title	Professional Communication-II Lab
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
	Course Status	Compulsory
5	Course Objective	To minimize the linguistic barriers that emerges in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the studentsto hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
6	Course Outcomes	The students will be able to: CO1: Enumerate advanced grammar rules and write grammaticallycorrect sentences. CO2: Explain wide vocabulary and punctuation rules and learn strategiesfor error-free communication. CO3: Interpret texts, pictures and improve both reading and writing skillswhich would help them in their academic as well as professional career CO4: Comprehend language and improve speaking skills in academic andsocial contexts. CO5: Develop, share and maximise new ideas with the concept of brainstorming and the documentation of key critical thoughts articulated towards preparing for a career based on their potentials and availability ofopportunities. CO6: Collaborate effectively in multi-disciplinary teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.
8	Outline syllabus	
	Experiment 1	Basics of Grammer
	Experiment 2	Activities on Paired Letter/Words
	Experiment 3	Activities on Actions
	Experiment 4	Activities on Blood Relations, conversations, Action words, direction, speech.
	Experiment 5	Listening Skills: News Bulletin, describing a dish, identify synonyms and antonyms, current affairs, press meet , debate , autobiography
	Experiment 6	Speaking skills: Vocabulary, let us speak (pair work) , getting ready to speak, conversation at work place
	Experiment 7	Activities on Words / letters , grammar usage , diary writing ,

		development of headlines, missing letters , comparing and contrasting, biography writing, script writing , interpretation of graphs
Mode		Practical
Text book/s*		1. Ibrahim Zaid, "CAD/CAM- Theory and Practice", McGraw Hill, International Edition.
Software		Auto CAD