



AL-AMEEN ENGINEERING COLLEGE

(AUTONOMOUS)

**Accredited by NAAC with "A" Grade :: An ISO Certified Institution
(Affiliated to Anna University, Chennai & Approved by AICTE, New Delhi)
Karundevanpalayam, NanjaiUthukkuli Post, Erode – 638 104, Tamilnadu, INDIA.**

CURRICULUM

SEMESTERS – I to VIII

(Regulations 2023)

CHOICE BASED CREDIT SYSTEM

B.Tech. Information Technology

Applicable to the Students admitted to B.E. / B.Tech. Programmes from the AY 2023-24

KNOWLEDGE LEVELS (BLOOM'S TAXONOMY)

Notation	Knowledge Levels
K1	Remembering
K2	Understanding
K3	Applying
K4	Analysing
K5	Evaluating
K6	Creating

VISION

The department of Information Technology aspires to become a **school of excellence** in providing **quality education, constructive research** and **professional opportunities in Information Technology**.

MISSION

To provide academic programs that engage, enlighten and empower the students to **learn technology through practice, service and outreach**.

To educate the students about **social responsibilities and entrepreneurship**

To encourage **research through continuous improvement** in infrastructure, curriculum and faculty development in collaboration with industry and institutions.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	Graduates will have progressive learning and successful career in Information, Communication Technologies and their applications.
PEO 2	Graduates will be leaders in their chosen field.
PEO 3	Graduates will utilize the acquired technical skills and knowledge for the benefit of society.

PROGRAM OUTCOMES (POs)	
PO 1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAM SPECIFIC OUTCOMES (PSOs)	
PSO 1	Technical Skills: Apply the fundamental knowledge to develop computer based solutions in the areas related to information management and networking.
PSO 2	Leadership Skills: Demonstrate professionalism and ethics in managing academic/ non-academic activities as a team and an individual.

CURRICULUM

SEMESTER I

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23MA1T1	Calculus & Differential Equations	BS	40	60	3	1	0	4
THEORY COURSES WITH LABORATORY COMPONENTS									
2	23EN1LT2	Communicative English	HS	50	50	3	0	2	4
3	23PH1LT3	Engineering Physics	BS	50	50	3	1	2	5
4	23CY1LT4	Engineering Chemistry	BS	50	50	3	1	2	5
5	23CS1LT5	Problem Solving and C Programming	ES	50	50	3	0	4	5
MANDATORY COURSE									
6		Universal Human Values 1 – Induction Programme	MC	-	-	-	-	-	-
7	23HS1T6	Heritage of Tamil	MC	100	-	1	0	0	1
Total						16	3	10	24

SEMESTER II

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23EN2T1	Technical English	HS	40	60	3	0	0	3
2	23HS2T2	Environmental Sciences	MC	100	0	3	0	0	0
3	23HS2T3	Tamils And Technology	MC	100	0	1	0	0	1
4	23MA2T4	Algebra and Number Theory	BS	40	60	3	1	0	4
THEORY COURSE WITH LABORATORY COMPONENTS									
5	23CS2LT1	Python Programming	ES	50	50	3	0	4	5
6	23EE2LT2	Basics of Electrical and Electronics Engineering	ES	50	50	3	0	4	5
Total						16	1	8	18

SEMESTER III

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23HS3T1	Constitution of India	MC	100	-	3	0	0	0
2	23MA3T2	Probability and Queuing Theory	BS	40	60	3	1	0	4
3	23CSCT4	Computer Organization and Architecture	PC	40	60	3	0	0	3
4	23CS3T3	User Interface Design	PC	40	60	3	1	0	4
THEORY COURSES WITH LABORATORY COMPONENTS									
5	23CS3LT1	Object Oriented Programming with Java	PC	50	50	2	0	4	4
6	23CS3LT2	Data Structure and Algorithms	PC	50	50	2	0	4	4
LABORATORY COURSES									
7	23EN3L1	Interpersonal Communication Skills laboratory –I	HS	60	40	0	0	3	1.5
Total						16	2	11	20.5

SEMESTER IV

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23HS4T1	Universal Human Values 2:Understanding Harmony	HS	100	-	2	1	0	3
2	23CS4T2	Software Engineering	PC	40	60	3	0	0	3
3	23IT4T3	Web Technology	PC	40	60	3	1	0	4
4		Open Elective – I	OE	40	60	3	0	0	3
THEORY COURSES WITH LABORATORY COMPONENTS									
5	23CS4LT1	Database Management Systems	PC	50	50	2	0	4	4
6	23CS4LT2	Operating Systems	PC	50	50	2	0	4	4
LABORATORY COURSE									
7	23EN4L1	Interpersonal Communication Skills laboratory –II	HS	60	40	0	0	3	1.5
Total						15	2	11	22.5

SEMESTER V

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1		Principles of Compiler Design	PC	40	60	3	1	0	4
2		Professional Ethics	HS	40	60	3	0	0	3
3		Professional Elective - I	PE	40	60	3	0	0	3
4		Open Elective – II	OE	40	60	3	0	0	3
THEORY COURSES WITH LABORATORY COMPONENTS									
5		Mobile Application and Development	PC	50	50	2	0	4	4
6		Computer Networks	PC	50	50	2	0	4	4
LABORATORY COMPONENTS									
7		Compiler Design Laboratory	PC	60	40	0	0	2	1
EMPLOYABILITY ENHANCEMENT COURSE									
8		Soft Skills -I	EEC	100	-	2	1	0	0
Total						18	2	10	22

SEMESTER VI

Sl. No.	Course Code	Course Title	Category	CIA	ES E	L	T	P	C
THEORY COURSES									
1		Artificial Intelligence	PC	40	60	3	1	0	4
2		Cryptography and Network Security	PC	40	60	3	0	0	3
3		Internet of Things	PC	40	60	3	1	0	4
4		Professional Elective – II	PE	40	60	3	0	0	3
5		Open Elective – III	OE	40	60	3	0	0	3
THEORY COURSES WITH LABORATORY COMPONENTS									
6		Professional Elective – III	PE	50	50	2	0	4	4
EMPLOYABILITY ENHANCEMENT COURSE									
7		Soft Skills –II	EEC	100	-	2	1	0	0
Total						19	3	4	21

SEMESTER VII

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1		Software Project Management	PC	40	60	3	0	0	3
THEORY COURSES WITH LABORATORY COMPONENTS									
2		Professional Elective - IV	PE	50	50	2	0	4	4
3		Machine Learning Techniques	PC	50	50	2	0	4	4
4		Big Data Analytics	PC	50	50	2	0	4	4
5		Professional Elective - V	PE	50	50	2	0	4	4
LABORATORY COMPONENTS									
6		Project Work Phase-I	EEC	100	-	0	0	10	3
Total						11	0	26	22

SEMESTER VIII

Sl. No.	Course Code	Course Title	Category	CI A	ES E	L	T	P	C
LABORATORY COMPONENTS									
1		Project Work Phase-II	EEC	60	40	0	0	24	12
2		Internship	EEC	100	-	2 Weeks			1
Total						0	0	24	13

Total Credits: 163

HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT (HS)

S. No.	Course Code	Course Title	L	T	P	C
1	23EN1LT2	Communicative English	3	0	2	4
2	23EN2T1	Technical English	3	0	0	3
3	23EN3L1	Interpersonal Communication Skills Laboratory-I	0	0	3	1.5
4	23EN4L1	Interpersonal Communication Skills Laboratory -II	0	0	3	1.5
5	23HS4T1	Universal Human Values 2:Understanding Harmony	2	1	0	3
6		Professional Ethics	3	0	0	3

BASIC SCIENCES (BS)

Sl.No.	Course Code	Course Title	L	T	P	C
1	23MA1T1	Calculus& differential Equations	3	1	0	4
2	23PH1LT3	Engineering Physics	3	1	2	5
3	23CY1LT4	Engineering Chemistry	3	1	2	5
4	23MA2T4	Algebra and Number Theory	3	1	0	4
5	23MA3T2	Probability and Queuing Theory	3	1	0	4

ENGINEERING SCIENCES (ES)

Sl.No.	Course Code	Course Title	L	T	P	C
1	23CS1LT5	Problem Solving and C Programming	3	0	4	5
2	23CS2LT1	Python Programming	3	0	4	5
3	23EE2LT2	Basics of Electrical and Electronics Engineering	3	0	4	5

PROFESSIONAL CORE (PC)

Sl.No.	Course Code	Course Title	L	T	P	C
1	23CSCT4	Computer Organization and Architecture	3	1	0	4
2	23CS3T3	User Interface Design	3	1	0	4
3	23CS3LT1	Object Oriented Programming with Java	2	0	4	4
4	23CS4T2	Software Engineering	3	0	0	3
5	23IT4T3	Web Technology	3	1	0	4
6	23CS4LT1	Data Base Management system	2	0	4	4
7	23CS4LT2	Operating System	2	0	4	4
8		Principles of Compiler Design	3	1	0	4
9		Compiler Design Laboratory	0	0	2	1
10		Mobile Application and Development	2	0	4	4
11.		Computer Networks	2	0	4	4
12		Artificial intelligence	3	1	0	4
13		Cryptography and Network Security	3	0	0	3
14		Internet of Things	3	1	0	4
15		Software Project Management	3	0	0	3
16		Machine Learning	2	0	4	4
17		Big Data Analytics	2	0	4	4

PROFESSIONAL ELECTIVES (PE)

Vertical-I (Data Science)						
PE.No.	Course Code	Course Title	L	T	P	C
PE I		Exploratory DataAnalysis	3	0	0	3
PE II		BusinessAnalytics	3	0	0	3
PE III		Video Image and Analytics	2	0	4	4
PE IV		Computer Vision	2	0	4	4
PE V		Big Data Analytics	2	0	4	4

Vertical-II (Cloud Computing andData CenterTechnologies)						
PE.No.	Course Code	Course Title	L	T	P	C
PE I		Data Warehousing	3	0	0	3
PE II		Software Defined Networks	3	0	0	3
PE III		Cloud Services Management	2	0	4	4
PE IV		Storage Technologies	2	0	4	4
PE V		Security and Privacy in Cloud	2	0	4	4

Vertical-III (Cyber Security andData Privacy)						
PE.No.	Course Code	Course Title	L	T	P	C
PE I		Ethical Hacking	3	0	0	3
PE II		Digital and Mobile Forensics	3	0	0	3
PE III		Security and Privacy in Cloud	2	0	4	4
PE IV		Modern Cryptography	2	0	4	4
PE V		Crypto currency and Block chain Technologies	2	0	4	4

Vertical-IV (Creative Media)						
PE.No.	Course Code	Course Title	L	T	P	C
PE I		Augmented Reality/Virtual Reality	3	0	0	3
PE II		Digital marketing	3	0	0	3
PE III		Multimedia Data Compression and Storage	2	0	4	4
PE IV		UI and UX Design	2	0	4	4
PE V		Video Creation and Editing	2	0	4	4

Vertical-V (Artificial Intelligence and Machine Learning)						
PE.No.	Course Code	Course Title	L	T	P	C
PE I		Knowledge Engineering	3	0	0	3
PE II		Optimization Techniques	3	0	0	3
PE III		Text and Speech Analysis	2	0	4	4
PE IV		Neural Networks and Deep Learning	2	0	4	4
PE V		Game Theory	2	0	4	4

OPEN ELECTIVES (OE)

Sl.No.	Course Code	Course Title	L	T	P	C
1.		Open Elective-I	3	0	0	3
2.		Open Elective-II	3	0	0	3
3.		Open Elective-III	3	0	0	3

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

Sl. No.	Course Code	Course Title	L	T	P	C
1		Soft Skills - I	2	1	0	0
2		Soft Skills - II	2	1	0	0
3		Project Work Phase - I	0	0	10	3
4		Project Work Phase - II	0	0	24	12
5		Internship	2 Weeks			1

MANDATORY COURSES (MC)

Sl.No.	Course Code	Course Title	L	T	P	C
1.		Universal Human Values 1 - Induction Programme	0	0	0	0
2.	23HS1T6	Heritage of Tamil	1	0	0	1
3.	23HS2T2	Environmental Sciences	3	0	0	0
4.	23HS2T3	Tamil And Technology	1	0	0	1
5.	23HS3T1	Constitution of India	3	0	0	0

VALUE ADDED COURSES (VAC)

Sl.No.	Course Code	Course Title	Credits
1.		J2EE	3
2.		Php, Mysql	2
3.		Android Application Development	2
4.		Arduino	3
5.		Hardware And Network Trouble Shooting	2
6.		Ethical Hacking	3
7.		Web Designing	2

OPEN ELECTIVE COURSES OFFERED TO OTHER DEPARTMENTS (OE)

Sl.No.	Course Code	Course Title	L	T	P	C
1.		Fundamentals of Databases	3	0	0	3
2.		Python Programming and Frameworks	3	0	0	3
3.		Data Structures	2	0	4	4
4.		Computational Science for Engineers	3	0	0	3
5		Java Programming	3	0	0	3
6		Web Engineering	3	0	0	3
7		Fundamentals of Blockchain	3	0	0	3
8		Introduction to Artificial Intelligence	3	0	0	3
9		Fundamentals of Internet of Things	3	0	0	3
10		Cloud Technology	3	0	0	3

CURRICULUM BREAKDOWN STRUCTURE

Subject	AICTE suggested breakdown of credits	Total number of credits	Curriculum Content (% of total number of credits of the program)
Humanities and Social Sciences including Management (HS)	16	16	9.8
Basic Sciences (BS)	23	22	13.4
Engineering Sciences (ES)	29	15	9.2
Professional Core (PC)	59	65	39.8
Program Electives (PE)	12	18	11.04
Open Electives (OE)	9	9	5.5
Employability Enhancement Courses (EEC) – Practical Courses and Project Work	15	16	9.8
Mandatory Courses (MC)	0	2	1.2
Total	163	163	100.00

CREDIT SUMMARY

Sl. No.	Subject Area	Credits per Semester								Total Credits	AICTE Suggested Credits
		I	II	III	IV	V	VI	VII	VIII		
1	HS	4	3	1.5	4.5	3				16	16
2	BS	14	4	4						22	23
3	ES	5	10							15	29
4	PC			15	15	13	11	11		65	59
5	PE					3	7	8		18	12
6	OE				3	3	3			9	9
7	EEC							3	13	16	15
8	MC	1	1							2	0
TOTAL		24	18	20.5	22.5	22	21	22	13	163	163

HS – Humanities and Social Sciences including Management

BS– Basic Sciences

ES– Engineering Sciences

PC– Professional Core

PE– Professional Electives

OE– Open Electives

EEC – Employability Enhancement Courses

MC – Mandatory Courses

SEMESTER I

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23MA1T1	Calculus & Differential Equations	BS	40	60	3	1	0	4
THEORY COURSES WITH LABORATORY COMPONENTS									
2	23EN1LT2	Communicative English	HS	50	50	3	0	2	4
3	23PH1LT3	Engineering Physics	BS	50	50	3	1	2	5
4	23CY1LT4	Engineering Chemistry	BS	50	50	3	1	2	5
5	23CS1LT5	Problem Solving and C Programming	ES	50	50	3	0	4	5
MANDATORY COURSE									
6		Universal Human Values 1 – Induction Programme	MC	-	-	-	-	-	-
7	23HS1T6	Heritage of Tamil	MC	100	-	1	0	0	1
Total						16	3	10	24

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23MA1T1	CALCULUS AND DIFFERENTIAL EQUATIONS	3	1	0	4

COURSE LEARNING OUTCOMES (COs)							
After Successful completion of the course, the students should be able to				RBT Level	Topics Covered		
CO1	Apply eigen values and eigenvectors to convert quadratic form to canonical form through orthogonal diagonalization.			K3	1		
CO2	Understand the basic concepts of derivatives to estimate maxima and minima of multivariable functions.			K2	2		
CO3	Identify appropriate integral techniques to find area and volume of the given region			K3	3		
CO4	Apply various integral theorems for solving engineering problems involving cubes and parallelepipeds.			K3	4		
CO5	Solve first order Ordinary Differential Equations and apply them to certain physical situations.			K3	5		

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO2	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO3	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO4	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO5	3	3	3	3	-	-	-	1	3	2	-	2	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	MATRICES								9 + 3	
Eigen values and Eigen vectors – properties (without proof) – Cayley Hamilton theorem (Without proof) –Diagonalization using orthogonal transformation.										
Topic - 2	FUNCTIONS OF SEVERAL VARIABLES								9 + 3	
Partial derivatives – Total derivative – Jacobians - Taylor’s series expansion – Extreme values of functions of two variables – Lagrange’s multipliers method.										
Topic - 3	MULTIPLE INTEGRALS								9 + 3	
Double integrals– Change of order of integration – Triple integrals – Applications in area and volumes.										
Topic - 4	LINE AND SURFACE INTEGRALS								9 + 3	
Gradient, Divergence and curl– Directional Derivative – Irrotational and solenoidal vector fields – Green’s theorem – Green’s theorem in a plane – Gauss divergence theorem – Stokes theorem (excluding proof).										
Topic - 5	ORDINARY DIFFERENTIAL EQUATION								9 + 3	
Second and higher order linear differential equations with Constant coefficients – Variable coefficients – Euler Cauchy equation – Legendre’s equation – Method of variation of Parameters – Simple Applications.										
THEORY	45		TUTORIAL	15		PRACTICAL	0		TOTAL	60

BOOK REFERENCES	
1	Jain R.K and Iyengar S.R.K, “Advanced Engineering Mathematics”, 5 rd Edition, Narosa Publishing House, New Delhi, Reprint 2019.
2	Ramana B.V., “Higher Engineering Mathematics”, Tata Mcgraw Hill Publishing Company, New Delhi, 2017.
3	Kreyszig E., “Advanced Engineering Mathematics”, 10 th Edition, John Wiley Sons, 2012.(E-BOOK)
4	Glyn James., “Advanced Modern Engineering Mathematics”, Pearson Education Limited, 2018.
5	N P Bali, Manish Goyal, “A Text Book of Engineering Mathematics”, 9 rd Edition, Laxmi Publication Private Limited, 2010.
6	GrewalB.S., “Higher Engineering Mathematics”, 43 rd Edition, Khanna Publications New Delhi, 2015

OTHER REFERENCES	
1	https://www.slideshare.net/mailrenuka/matrices-and-application-of-matrices
2	https://testbook.com/maths/application-of-vector#:~:text=Application%20of%20Vector%20Calculus,gravitational%20fields%2C%20and%20fluid%20flow.&text=To%20find%20the%20rate%20of,mass%20of%20a%20fluid%20flows .
3	https://youtu.be/wtuq1oSButE
4	https://www.slideshare.net/abhinavsomani3/applications-of-maths-in-our-daily-life-41607055

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23EN1LT2	COMMUNICATIVE ENGLISH	3	0	2	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Improve communication skills and language comprehension with error-free strategies.		K2	1
CO2	Analyze the effectiveness of soft skills in different scenarios.		K3	2
CO3	Explore the fascinating world of word-stress, sentence stress and intonation.		K4	3
CO4	Enhance reading and writing skills to excel in career.		K4	4
CO5	Develop strong public speaking abilities.		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO2	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO3	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO4	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO5	-	-	-	-	-	-	-	1	3	3	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic – 1	LANGUAGE INTROSPECTION							9		
<p>GRAMMAR COMPONENTS:Vocabulary Building - Word Formation–Prefixes and Suffixes– ‘Wh’ questions and Yes or No questions.</p> <p>LINGUISTIC FUNCTIONS:Short comprehension Passages –Skimming and Scanning-Developing hints</p>										
Topic – 2	SOFT SKILLS							9		
<p>GRAMMAR COMPONENTS:Sentence structures- Punctuation – Kinds of sentences - Subject-verb Agreement.</p> <p>LINGUISTIC FUNCTIONS:Introducing and Sharing Information from Newspaper including Dialogues and Conversations– Short Narrative Descriptions – Paragraph Writing – Greeting- Jumbled Sentences-</p>										
Topic – 3	CAREER GUIDANCE							9		
<p>GRAMMAR COMPONENTS:Single-word substitutes –Pronouns – Degrees of Comparison</p> <p>LINGUISTIC FUNCTIONS:Reading Comprehension – Verbal and Non-verbal Communication –Public Speaking - Describing and Classification of Different Kinds of Innovation – Narration Act. (Language through Literature)- Negotiation Skills.</p>										
Topic – 4	TECHNICAL WRITING							9		
<p>GRAMMAR COMPONENTS:Articles-Modal Verbs – Uses of Prepositions (of Time, Place, Direction and Spatial Relations)</p> <p>LINGUISTIC FUNCTIONS: Preparing Instructions and Manuals - Reporting Events and Research – Writing Recommendations – Interpreting Diagrammatic Representations, esp. Bar Graphs and Pie Charts.</p>										
Topic – 5	BUSINESS CORRESPONDENCE							9		
<p>GRAMMAR COMPONENTS: Numerical Adjectives –Phrases and Clauses- Synonyms and Antonyms-Different Tense Forms of Verbs.</p> <p>LINGUISTIC FUNCTIONS: Writing short Essays- Dialogue Writing- Technical and Business Proposals – Role play – Narrating Incidents – Extempore and persuasive speech- Conversations - Telephonic Conversations.</p>										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

LIST OF EXPERIMENTS	
1	Self-introduction and introducing others
2	Negotiation Skills
3	Public Speaking
4	Body Language
5	Narrating incidents
6	Telephonic Conversation
7	Representations
8	Technical Proposals

BOOK REFERENCES	
1	Technical English 1 Paperback – 15 December 2019 by Prof. Ravindra Nath Tiwari (Author)
2	Developing English Language Skills-I: (NEP 2020 for the University of Delhi) by Pooja Khanna
3	Sem-I Communication Skills I Edition/Reprint: 2022 Author(s): B.v.pathak Publisher: NIRALI PRAKASHAN Product ID: 591991
4	Sem-1 Communication Skills (English) ISBN: 9788119883493 Edition/Reprint: 2023-24 Author(s): Dr. Yogesh Malshette Publisher: NIRALI PRAKASHAN Product ID: 626280
5	English Language & Comprehension (Useful For Graduate Level) ISBN: 9789386791672 Edition/Reprint: 2022 Author(s): Editorial Board Publisher: UPKAR PRAKASHAN Product ID: 514358 Country of Origin: India
6	Communication Skills in English AICTE Prescribed Textbook (English) DIP122EN Paperback – Big Book, 1 January 2022by Anjana Tiwari (Author)

OTHER REFERENCES	
1	https://youtu.be/x60GHpQ8gJk?list=PLWPirh4EWFpFIEISxplDIEhRDZHkBD-0n
2	https://youtu.be/BO7j-X87rM8
3	https://youtu.be/QMIQv7yPlkI
4	https://www.youtube.com/live/zb07Wo9_2Lc?si=nnPc83pP-gFHvRfD

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23PH1LT3	ENGINEERING PHYSICS	3	1	2	5

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Utilize the conceived concepts and techniques for synthesizing novel crystals.		K2	1
CO2	Classify the extensive properties of solid materials to use it in material fabrication field.		K2	2
CO3	Understand the principles of thermodynamics and apply it in real systems.		K2	3
CO4	Analyze the properties of the Laser beam and apply it in industrial and medical field.		K3	4
CO5	Apply advanced technical methods by assessing the fibre optics.		K3	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	2	-	-	1	3	2	1	2	-	-
CO2	3	2	2	2	2	-	-	1	3	2	1	2	-	-
CO3	3	2	2	1	2	-	-	1	3	2	1	2	-	-
CO4	3	2	2	2	2	-	-	1	3	2	1	2	-	-
CO5	3	2	2	1	2	-	-	1	3	2	1	2	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1		CRYSTAL PHYSICS							9+3	
Unit cell-Bravais lattices, directions and planes in a crystal, Miller indices – inter-planar distances - coordination number and packing factor for SC, BCC, FCC, HCP and diamond structures - growth of single crystals: solution and melt growth techniques.										
Topic - 2		PROPERTIES OF MATTER							9+3	
Hooke's Law - Stress-Strain Diagram - Elastic moduli - Poisson's Ratio - Expression for bending moment of beam and depression of Cantilever - Expression for Young's modulus by Non-uniform bending and its experimental determination.										
Topic - 3		THERMAL PHYSICS							9+3	
Transfer of heat energy - thermal conduction, convection and radiation – heat conduction in solids – thermal conductivity - Lee's disc method - theory and experiment - conduction through compound media (series and parallel) – thermal insulation – applications: heat exchangers, refrigerators, ovens and solar water heaters.										
Topic - 4		LASER TECHNOLOGY							9+3	
Laser characteristics -Spontaneous emission and stimulated emission-Einstein's coefficients-Pumping methods- Components of a laser -CO ₂ laser-Solid state laser(Nd:YAG)-Semiconductor diode lasers – Application of laser in science and technology.										
Topic - 5		FIBER OPTICS							9+3	
Fiber optical communication system – Structure of an optical fiber- Numerical aperture and acceptance angle- Classification of optical fibers (Materials, modes and refractive index profile)- Displacement and temperature sensor- Medical Endoscopy.										
THEORY	45		TUTORIAL	15		PRACTICAL	00		TOTAL	60
LIST OF EXPERIMENTS										
<ol style="list-style-type: none"> Determination of young's modulus by non- uniform bending. Determination of young's modulus by uniform bending. Torsional pendulum - determination of moment of inertia and rigidity modulus. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer. Determination of Wavelength, and particle size using Laser. Determination of thermal conductivity of a bad conductor using Lee's disc method. Air wedge – determination of thickness of a thin wire. Determination of acceptance angle and numerical aperture of an optical fiber. 										
THEORY	00		TUTORIAL	00		PRACTICAL	30		TOTAL	30

BOOK REFERENCES

1	Avadhanulu M N, Kshirsagar P G and Arun Murthy TVS, “A Text book of Engineering Physics”, 2 nd Edition, S Chand Publishing, New Delhi, 2022
2	Dr.G.Senthilkumar “ Engineering Physics-1” Revised & Animated Version, VRB Publishers Pvt.Ltd.,2017
3	Dr.R.Suresh “ A Text book of Engineering Physics”, 2 nd Edition, Sri Krishna Hi-tech Publishing Pvt, Ltd., Chennai,2019.
4.	Dr.P.Mani “ A Text book of Engineering Physics”,Dhanam Publications.,Chennai.,2022.
5.	Dr.M.Arumugam “ A Text book of Engineering Physics”, Anuradha Publications.,Chennai.,2020.
6.	Serway and Jewett, “Physics for Scientists and Engineers with Modern Physics”, 6th Edition, Thomson Brooks Cole, 2008

OTHER REFERENCES

1	https://nptel.ac.in/courses/115/105/115105099/
2	https://nptel.ac.in/courses/115/106/115106061/
3	https://www.youtube.com/watch?v=_JOchLyNO_w
4	https://www.journals.elsevier.com › Journals
5	https://nptel.ac.in/courses/118/104/118104008/
6	https://www.digimat.in/nptel/courses/video/122107035/L37.html

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23CY1LT4	ENGINEERING CHEMISTRY	3	1	2	5

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Apply the suitable water softening methods to avoid boiler troubles.		K3	1
CO2	Analyze the calorific value of different types of fuels.		K2	2
CO3	Choose suitable forms of energy sources for applying it in energy sectors.		K2	3
CO4	Understand the working process of spectroscopy to analyse the wavelength of electromagnetic radiations.		K3	4
CO5	Classify the types of polymers for fabrication.		K3	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2	-	-	2	1	2	2	2	2	-	-
CO2	3	2	1	1	-	-	2	1	2	2	2	2	-	-
CO3	3	2	2	1	-	-	3	1	2	2	2	2	-	-
CO4	3	2	2	1	1	-	1	1	2	2	2	2	-	-
CO5	3	2	1	2	-	-	1	1	2	2	2	2	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	WATER CHEMISTRY								9+3	
Hardness of water – Types – Units – Boiler troubles (Scale and Sludge, Priming and Foaming and Caustic Embrittlement) – Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal and Calgon conditioning) and External treatment (Ion exchange process and Zeolite process) – Desalination of brackish water – Reverse Osmosis.										
Topic - 2	FUELS								9+3	
Fuels: Introduction - Classification of fuels – Coal – Analysis of coal (Proximate and Ultimate Analysis) - Carbonization - Manufacture of metallurgical coke (Otto Hoffmann method) - Petroleum – Bergius Process - Knocking - Octane number - Diesel oil - Cetane number - Natural gas - Compressed natural gas (CNG) - Liquefied petroleum gases (LPG) - Power alcohol.										
Topic - 3	BATTERIES AND FUEL CELLS								9+3	
Batteries - Types of batteries – primary battery - dry cell. Secondary battery - lead acid battery, Nickel- Cadmium battery - Lithium Batteries- Fuel cells – Hydrogen -Oxygen fuel cell. - Solar energy conversion - solar cells – Application.										
Topic - 4	SPECTROSCOPY								9+3	
Introduction – Laws of spectroscopy - Block diagram, Instrumentation, Working and application of Visible spectroscopy and Ultra Violet spectroscopy – Infrared spectroscopy – Flame photometry – Atomic adsorption spectroscopy.										
Topic - 5	ENGINEERING MATERIALS								9+3	
Polymer – Types of polymerization – Preparation, properties, uses of Nylon(6,6), Poly Vinyl Chloride (PVC). Plastics – Types - Rubbers – SBR – Nanomaterials – Synthesis and its applications of Nanomaterials. Abrasives – Classification, Properties- Manufacture of SiC.										
THEORY	45		TUTORIAL	15		PRACTICAL	0		TOTAL	60
LIST OF EXPERIMENTS										
<ol style="list-style-type: none"> 1. Estimation of total hardness in water by EDTA method. 2. Determination of viscosity coefficient of a given oil / fuel / polymer using Ostwald's viscometer. 3. Estimation of Ferrous Ammonium Sulfate (FAS) using standard potassium Dichromate solution potentiometrically. 4. Estimation of sodium / potassium present in water using photometer. 5. Synthesis of Polymers (Phenol Formaldehyde or Urea Formaldehyde Resins). 6. Conductometric estimation of Strong Acid and Weak acid from a given mixture. 7. Determination of chloride content of water sample by Argentometric method. 8. Determination of strength of given hydrochloric acid using pH meter. 										
THEORY	0		TUTORIAL	0		PRACTICAL	30		TOTAL	30

BOOK REFERENCES	
1	S.S Dara and S.S. Umare 'A Textbook of Engineering Chemistry for Anna University', S.Chand Publication, 2020
2	Shikha Agarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019
3	"Engineering Chemistry" by Dr.A.Ravikrishna, Sri Krishna Hi Tech Publishing Company, 2021
4	"Experiments In Engineering Chemistry" – Payal B Joshi, I.K. International Publishing House. 2016
5	Group Theory and Spectroscopy by Pragati Prakashan Alka L Gupta and Mukesh Kumar Alka L Gupta and Mukeshkumar ,2021
6	Anil Kumar P.V Polymer Chemistry, First Edition -2021

OTHER REFERENCES	
1	https://sctevtodisha.nic.in/wp-content/uploads/2021/03/Engineering-Chemistry-1ST-YEAR-LM.pdf
2	https://www.youtube.com/watch?v=Fyq4Q5yWDDU&list=PLyqSpQzTE6M927gXIZdVbbsyj9cmxam-b
3	https://www.youtube.com/watch?v=nh2xbyOaERw
4	https://archive.nptel.ac.in/courses/104/106/104106122/
5	https://nptel.ac.in/courses/118104008
6	https://www.britannica.com/science/water

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23CS1LT5	PROBLEM SOLVING AND C PROGRAMMING	3	0	4	5

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the basic concepts to write efficient C program.		K2	1
CO2	Implement the identified looping and control statements in C program for developing applications.		K2	2
CO3	Understand the concepts of arrays and strings to develop C program with different dimensions.		K2	3
CO4	Write and implement C programs using user defined functions.		K2	4
CO5	Apply dynamic memory allocation functions for assigning memory space during execution.		K3	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	-	-	-	2	2	3	3	2	3	-	-
CO2	1	2	3	2	2	-	2	2	3	3	-	3	-	2
CO3	3	2	2	-	-	-	2	2	3	3	2	3	-	2
CO4	1	3	2	2	-	-	2	2	3	3	-	3	2	-
CO5	3	2	-	-	-	-	2	2	3	3	3	3	-	2

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	PROBLEM SOLVING AND C PROGRAMMING BASICS								9	
General Problem Solving: Algorithms, Flowcharts and Pseudo-codes, implementation of algorithms Basics of C Programming : Introduction to C - Structure of C program - Programming Rules – Compilation – Errors - C Declarations: Tokens - keywords - identifiers - constants - data types - variable declaration and initialization - type conversion - constant and volatile variables - operators and expressions.										
Topic - 2	DECISION CONTROL STATEMENTS								9	
Managing Input and Output operations, Decision Control Statements: Decision control statements, Selection/conditional branching Statements: if, if-else, nested if, if-elif-else statements. Basic loop Structures/Iterative statements: while loop, for loop, selecting appropriate loop. Nested loops break and continue statements.										
Topic - 3	ARRAYS AND STRINGS								9	
Introduction to Array - Definition - Array initialization - Characteristics - One Dimensional Array - Array operations -Two dimensional arrays -Strings and String handling functions.										
Topic - 4	FUNCTIONS								9	
Functions: Basics - definition - Elements of User defined Functions - return statement, Function types, Parameter Passing Techniques, Function returning more values - Passing Array to Functions - Recursion - Storage classes.										
Topic - 5	POINTERS AND FILE MANAGEMENT								9	
Pointer concepts - Pointers & Arrays, Structure concepts - Defining, Declaring, Accessing Member Variables, Structure within Structure - Union - File Management in C- Dynamic Memory allocation.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

LIST OF EXPERIMENTS	
Experiment-1	Draw the flowchart for the following using Raptor tool. a) Simple interest calculation b) Greatest among three numbers c) Find the sum of digits of a number.
Experiment-2	Programs for demonstrating the use of different types of operators like arithmetic, logical, relational and ternary operators (Sequential and Selection structures).
Experiment-3	Programs for demonstrating repetitive control statements like ‘for’, ‘while’ and ‘do-while’ (Iterative structure).
Experiment-4	Programs for demonstrating one-dimensional and two-dimensional numeric array.

Experiment-5	Programs to demonstrate modular programming concepts using functions.									
Experiment-6	Programs to implement various character and string operations with and without built-in library functions.									
Experiment-7	Programs to demonstrate the use of pointers.									
Experiment-8	Programs to illustrate the use of user-defined data types.									
Experiment-9	Programs to implement various file management.									
Experiment-10	Program Using Dynamic memory allocation functions.									
THEORY	0		TUTORIAL	0		PRACTICAL	0		TOTAL	60

BOOK REFERENCES	
1	Ashok N. Kamthane, "Programming in C", 2nd Edition., Pearson Education, 2013.
2	Sumitabha Das, "Computer Fundamentals and C Programming", 1st Edition, McGraw Hill, 2018.
3	Yashavant Kanetkar, "Let us C", 16th Edition, BPB Publications, 2018.
4.	C programming for problem solving. Paperback – Import, 9 October 2020 by Sukhendra Singh (Author), Hemant Jain (Author)
5.	Let Us C: Authentic guide to C programming language - 19th Edition Paperback – 15 December 2022 by Yashavant Kanetkar (Author)

OTHER REFERENCES	
1	R. G. Dromey, "How to Solve it by Computer", Pearson Education India; 1st edition, ISBN10: 8131705625, ISBN-13: 978-8131705629.
2	Maureen Spankle, "Problem Solving and Programming Concepts", Pearson; 9th edition, India, ISBN10: 9780132492645, ISBN-13: 978- 013249264.
3	ReemaThareja., "Programming in C", 2nd Edition, Oxford University Press, New Delhi, 2018.
4	Balagurusamy E., "Programming in ANSI C", 7th Edition, Mc Graw Hill Education, 2017.

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23HS1T6	HERITAGE OF TAMILS	1	0	0	1

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the extensive literature of Tamil and its classical nature.		K2	1
CO2	Understand the heritage of sculpture, painting and musical instruments of ancient people.		K2	2
CO3	Review on folk and material arts of Tamil people.		K2	3
CO4	Realization of thinai concepts trade and victory of chozha dynasty.		K2	4
CO5	Understand the contribution of tamils in Indian freedom struggle, self esteem movement and siddha medicine.		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	LANGUAGE AND LITERATURE							3		
Language Families in India – Dravidan Languages – Tamil as a Classical Language – Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature-Management Principles in Thirukural – Tamil Epics and Impact of Buddhism and Jainism in Tamil Land – Bakthi Literature Azhwars and Nayanmars – Forms of Minor Poetry – Development of Modern Literature in Tamil- Contribution of Bharathiyar and Bharathidhasan										
Topic - 2	HERITAGE –ROCK ART PAINTINGS TO MODERN ART-SCULPTURE							3		
Hero stone to modern sculpture – Bronze icons – Tribes and their handicrafts – Art of Temple car making – Massive Terracotta sculptures, Villages deities, Thiruvalluvar Statue at Kanyakumari, Making of Musical instruments – Mirudhangam , Parai, Veenai , Yazh and Nadhaswaram – Role of Temples in Social and Economic Life of Tamils										
Topic - 3	FOLK AND MARTIAL ARTS							3		
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance – Sports and Games of Tamils										
Topic - 4	THINAI CONCEPT OF TAMILS							3		
Flora and Fauna of Tamils & Aham and Puram concept from Tholkappiyam and Sangam Literature – Aram concept of Tamils – Education And Literacy during Sangam Age – Ancient Cities and Ports of Sangam Age – Export and Import during Sangam Age – Overseas Conquest of Cholas										
Topic - 5	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE							3		
Contribution of Tamils to Indian Freedom Struggle – The Cultural Influence of Tamils over the other parts of India – Self –Respect movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions and Manuscripts – Print History of Tamil Books										
THEORY	15		TUTORIAL	0		PRACTICAL	0		TOTAL	15

BOOK REFERENCES	
1	தமிழகவரலாறு –மக்களும்பண்பாடும்கேகேபிள்ளை (வெளியீடு :தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்)
2	கணினித்தமிழ் – முனைவர். இல. சுந்தரம் (விகடன் பிரசுரம்)
3	கீழடிவைகைநதிகரையில்சங்ககாலநகரநாகரிகம்தொல்லியல்துறைவெளியீடு
4	Social Life of Tamils(Dr.K.K.Pillai) A joint publication of TNTB and ESC and RMRL – (in print)
5	Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) Published by International Institute of Tamil Studies.
6	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi) Published by International Institute of Tamil Studies.

Semester	Programme	Course Code	Course Name	L	T	P	C
I	B.E. / B.Tech., Common to all	23HS1T6	தமிழர்மரபு	1	0	0	1

பாடம்கற்றதின்விளைவுகள்				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	தமிழ்மொழியின்செந்தன்மைமற்றும்இலக்கியங்கள் குறித்து தெரிதல்புரிதல்.		K2	1
CO2	தமிழர்களின்சிற்பக்கலைஓவியக்கலைமற்றும்இசைக்கருவிகள் குறித்து தெளிவுபுரிதல்.		K2	2
CO3	தமிழர்களின்நாட்டுப்புறகலைகள்மற்றும்வீரவிளையாட்டுகள் குறித்து அறிமுகம்புரிதல்.		K2	3
CO4	தமிழர்களின் திணைகோட்பாடுகள் சங்ககாலவணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள் புரிதல்.		K2	4
CO5	இந்திய தேசிய இயக்கம் சுயமரியாதை இயக்கம் மற்றும் சித்தமருத்துவம் பற்றி புரிதல்.		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

பாடத்திட்டங்கள்										
அலகு 1	மொழிமற்றும்இலக்கியம்							3		
இந்தியமொழிக்குடும்பங்கள்-திராவிடமொழிகள்-தமிழ்ஒருசெம்மொழி-தமிழ்செவ்விலக்கியங்கள் -சங்கஇலக்கியத்தின்சமயச்சார்பற்றதன்மை -சங்கஇலக்கியத்தில்கிர்தல்அறம் -திருக்குறளில்மேலாண்மைகருத்துக்கள் -தமிழ்க்காப்பியங்கள் -தமிழகத்தில்சமணபௌத்தசமயங்களின்தாக்கம்-பக்திஇலக்கியம்-ஆழ்வார்கள்மற்றும்நாயன்மார்கள்-சிறுநிலக்கியங்கள்-தமிழில்நவீனஇலக்கியத்தின்வளர்ச்சி-தமிழ்இலக்கியவளர்ச்சியில்பாரதியார்மற்றும்பாரதிதாசன்ஆகியோரின்பங்களிப்பு.										
அலகு 2	மரபுபாறைஓவியங்கள்முதல்நவீனஓவியங்கள்வரை-சிற்பக்கலை							3		
நடுகல்முதல்நவீனசிற்பங்கள்வரை - ஐம்பொன்சிலைகள் - பழங்குடியினர்மற்றும்அவர்கள்தயாரிக்கும்கைவினைப்பொருட்கள்,பொம்மைகள்-தேர்செய்யும்கலை-சுடுமண்சிற்பங்கள்-நாட்டுப்புறதெய்வங்கள்-குமரிமுனையில்திருவள்ளுவர்சிலை-இசைக்கருவிகள்-ருதங்கம்,பறை,வீணை,யாழ்,நாதஸ்வரம் - தமிழர்களின்சமூகபொருளாதாரவாழ்வில் கோவில்களில்பங்கு										
அலகு 3	நாட்டுப்புறகலைகள்மற்றும்வீரவிளையாட்டுகள்							3		
தெருக்கூத்து,கரகாட்டம்,வில்லுப்பாட்டு,கணியான்கூத்து,ஓயிலாட்டம்,தோல்பாவைக்கூத்து,சிலம்பாட்டம்,வளரி,புலியாட்டம்,தமிழர்களின்விளையாட்டுகள்										
அலகு 4	தமிழர்களின்திணைக்கோட்பாடுகள்							3		
தமிழகத்தின்தாவரங்களும்,விலங்குகளும்-தொல்காப்பியம்மற்றும்சங்கஇலக்கியத்தில்அகம்மற்றும்புறக்கோட்பாடுகள்-தமிழர்கள்போற்றியஅறக்கோட்பாடு-சங்ககாலத்தில்எழுத்தறிவும்,கல்வியும்-சங்ககாலநகரங்களும்,துறைமுகங்களும்-சங்ககாலத்தில்ஏற்றுமதிமற்றும்இறக்குமதி-கடல்கடந்தநாடுகளில்சோழர்களின்வெற்றி										
அலகு 5	இந்தியதேசியஇயக்கம்மற்றும்இந்தியபண்பாட்டிற்குதமிழர்களின்பங்களிப்பு							3		
இந்தியவிடுதலைப்போரில்தமிழர்களின்பங்கு-இந்தியாவின்பிறப்பகுதிகளில்தமிழ்ப்பண்பாட்டின்தாக்கம் -சுயமரியாதைஇயக்கம்-இந்தியமருத்துவத்தில்சித்தமருத்துவத்தின்பங்கு -கல்வெட்டுகள் ,கையெழுத்துப்படிக்கள் -தமிழ்ப்புத்தகங்களின்அச்சுவரலாறு										
THEORY	15		TUTORIAL	0		PRACTICAL	0		TOTAL	15

BOOK REFERENCES

1	தமிழகவரலாறு –மக்களும்பண்பாடும்கேகேபிள்ளை (வெளியீடு :தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்)
2	கணினித்தமிழ் – முனைவர்.இல.சுந்தரம் (விகடன்பிரசுரம்)
3	கீழடிவைகைநதிகரையில்சங்ககாலநகரநாகரிகம்தொல்லியல்துறைவெளியீடு
4	Social Life of Tamils(Dr.K.K.Pillai) A joint publication of TNTB and ESC and RMRL – (in print)
5	Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) Published by International Institute of Tamil Studies.
6	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi) Published by International Institute of Tamil Studies.

SEMESTER II

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23EN2T1	Technical English	HS	40	60	3	0	0	3
2	23HS2T2	Environmental Sciences	MC	100	0	3	0	0	0
3	23HS2T3	Tamils And Technology	MC	100	0	1	0	0	1
4	23MA2T4	Algebra and Number Theory	BS	40	60	3	1	0	4
THEORY COURSE WITH LABORATORY COMPONENTS									
5	23CS2LT1	Python Programming	ES	50	50	3	0	4	5
6	23EE2LT2	Basics of Electrical and Electronics Engineering	ES	50	50	3	0	4	5
Total						16	1	8	18

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. / B.Tech., Common to all	23EN2T1	TECHNICAL ENGLISH	3	0	0	3

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Learn about personality development to enhance interactions.		K2	1
CO2	Improve skills by cultivating self-confidence.		K4	2
CO3	Increase social abilities by mastering communication.		K2	3
CO4	Reveal true personality for stronger interactions.		K6	4
CO5	Develop the ability to speak confidently in any situation		K6	5

PRE-REQUISITE	COMMUNICATIVE ENGLISH
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO2	-	-	-	-	-	-	-	1	2	3	-	3	-	-
CO3	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO4	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO5	-	-	-	-	-	-	-	1	-	3	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1								9		
<p>GRAMMAR COMPONENTS: Mixed Tenses • Homophones • Homonyms • Words often Confused • Pairs of Words • Texting and SMS language</p> <p>LINGUISTIC FUNCTIONS: – – Professional emails, Email etiquette • Paragraph Construction • Introduction to Presentation • Communication • Note Making • Reading advertisements</p>										
Topic - 2								9		
<p>GRAMMAR COMPONENTS: Abbreviations and Acronyms • Concord • Collocations – Fixed and Semi Fixed Expressions.</p> <p>LINGUISTIC FUNCTIONS: Letters / emails of complaint • Telephoning Skills • Leadership and Team Management • Qualities of a Good Leader • Leadership Styles • Decision Making • Problem Solving • Technical Report Writing</p>										
Topic - 3								9		
<p>GRAMMAR COMPONENTS: Direct Indirect Speech • Active Passive Voice • Conditional Sentences</p> <p>LINGUISTIC FUNCTIONS: Group Discussions • Letter to the Editor • Checklists • Reading Comprehension Memo • Notices/Circulars Agenda and Minutes of a Meeting.</p>										
Topic - 4								9		
<p>GRAMMAR COMPONENTS: Misspelled words • Spot the errors • Vocabulary Development • Guessing Meanings of Words.</p> <p>LINGUISTIC FUNCTIONS: • Recommendations • Interviews: Types of Interviews • Preparing Resumes & CV • Covering Letter • Brainstorming.</p>										
Topic - 5								9		
<p>LINGUISTIC FUNCTIONS: Mock Presentation • Job / Internship application – Cover letter & Resume • Casual Conversation • Participating in a Group Discussion • Speeches for special Occasions.</p>										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES	
1	Teaching Communicative English By <u>Dr.N.Badhri</u> Ph.D(Eng.), Ph.D(Edn.),, 2021.
2	Communicative English By S. Kannan Padmasani , 2019.
3	Technical English – II by Prof. Ravindra Nath Tiwari, 2020.
4	Communication Skills (Sem-2) Edition/Reprint: 2022 Author(s): Neelkamal Jhalni Publisher: JHUNJHUNUWALAP Product ID: 526288
5	English Communication ISBN: 9789385879036 Edition/Reprint: 2023 Author(s): Pooja Khanna Publisher: VIKASH PUB HOUSE PVT LTD Product ID: 625971

OTHER REFERENCES

1	https://youtu.be/RkOb-IjkBbw
2	https://youtu.be/8SyZWgzLQSo
3	https://youtu.be/0E9deF06NUU
4	https://youtu.be/CAU2zx2Ri_M?si=jWLM7ZGegmKwO8Ii
5	https://youtube.com/playlist?list=PLyViUDdoFYKypuYyhNF2ZC9xEUE8zDmzx&si=uYKTb1eZGCWwDVon

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. / B.Tech., Common to all	23HS2T2	ENVIRONMENTAL SCIENCES	3	0	0	0

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the scientific inquiry in the field of ecosystems for future life.		K2	1
CO2	Identify the different methods of conservation of biodiversity by analysing the factors that contribute the threat to extinction.		K2	2
CO3	Enumerate the control plan for environmental pollution problems by identifying and quantifying its magnitude and intensity		K2	3
CO4	Understand systematically the natural resources and identify the resource management.		K2	4
CO5	Solve current environmental problems by practising the adoption of sustainability in society and industry		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	2	1	2	3	2	3	2	-	2	-	-
CO2	1	-	-	2	-	2	3	2	3	2	-	2	-	-
CO3	1	-	-	2	-	2	3	2	3	2	-	2	-	-
CO4	1	-	-	2	-	2	3	2	3	2	-	2	-	-
CO5	1	2	2	3	-	2	3	2	3	2	-	2	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	ENVIRONMENT AND ECOSYSTEMS								9 + 3	
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs – Introduction, types, characteristic features, structure and function of the forest ecosystem and aquatic ecosystems (ponds, river and marine). Activity: Study of the ecosystem structure in Cauvery River.										
Topic - 2	BIODIVERSITY								9 + 3	
Introduction to biodiversity - definition: genetic, species and ecosystem diversity –values of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity– endangered and endemic species of India – In-situ and ex- situ conservation of biodiversity. Activity: Study of common plants, insects, birds.										
Topic - 3	ENVIRONMENTAL POLLUTION								9 + 3	
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Thermal pollution (d) Noise pollution – solid waste management: causes, effects and control measures of municipal solid wastes – Hazardous and biomedical waste management -pollution case studies. Activity: Study of air and water pollution in industry										
Topic - 4	NATURAL RESOURCES								9 + 3	
Forest resources: over-exploitation, deforestation, – Water resources: Rain water harvesting-watershed management - utilization of surface and ground water, conflicts over water, dams-benefits and problems Food resources: effects of modern agriculture, fertilizer-pesticide problems - Principles of Green Chemistry- Case studies Activity: Tree plantation and maintenance within the campus										
Topic - 5	SUSTAINABILITY AND POPULATION								9 + 3	
From unsustainable to sustainable development – Environmental Impact Assessment (EIA) –environmental ethics: Issues and possible solutions – climate change, acid rain, ozone layer depletion, and case studies – Environment Protection Act 1986 – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act -Environment and Human Health – Value Education – HIV / AIDS – Women and Child Welfare. Activity: Small group meetings about environment and human health in local area peoples and making poster and short films about HIV / AIDS – women and child welfare.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES	
1	Erach Bharucha, “Environmental Studies for Undergraduate Courses”, Third Edition, Orient Blackswan Pvt Ltd (8 March 2021).
2	Rajagopalan, R, ‘Environmental Studies-From Crisis to Cure’, Oxford University Press, 2015.
3	Benny Joseph, “Environmental Science and Engineering”, Tata McGraw-Hill Education, New Delhi, 2017.
4	e-book: https://www.iisd.org/system/files/2021-04/still-one-earth-natural-resources.pdf
5	e-book: https://www.researchgate.net/publication/11065962_Population_growth_rate_and_its_determinants_An_overview
6	e-book : https://northinlet.sc.edu/wp-content/uploads/2022/03/Biodiversity-book.pdf

OTHER REFERENCES	
1	https://www.youtube.com/watch?v=LjFt7rICU84&t=6s
2	https://archive.nptel.ac.in/courses/120/108/120108004/
3	https://archive.nptel.ac.in/courses/120/108/120108002/
4	https://archive.nptel.ac.in/courses/103/107/103107215/
5	https://archive.nptel.ac.in/courses/127/106/127106004/
6	https://archive.nptel.ac.in/courses/123/105/123105001/

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. / B.Tech., Common to all	23HS2T6	TAMILS AND TECHNOLOGY	1	0	0	1

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the weaving ceramic technology of ancient Tamil people nature.		K2	1
CO2	Understand the construction technology, building materials in Sangam period and case studies.		K2	2
CO3	Infer the metal process, coin and beads manufacturing with relevant archeological evidence.		K2	3
CO4	Realize the agriculture methods, irrigation technology and pearl driving.		K2	4
CO5	Understand the knowledge of scientific tamil and tamil computing.		K2	5

PRE-REQUISITE	Heritage of Tamils

CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1		WEAVING AND CERAMIC TECHNOLOGY						3		
Weaving Industry during Sangam Age-Ceramic technology-Black and Red Ware Potteries(BRW)-Graffiti on Potteries										
Topic - 2		DESIGN AND CONSTRUCTION TECHNOLOGY						3		
Designing and Structural construction House & Designs in household materials during Sangam Age-Building materials and Hero stones of Sangam Age-Details of Stage Constructions in Silappathikaram-Sculptures and Temples of Mamallapuram-Great Temples of Cholas and other worship places-Temples of Nayaka Period-Type study (Madurai Meenakshi Temple)-Thirumalai Nayakar Mahal-Chetti Nadu Houses,Indo-Saracenic architecture at Madras during British Period										
Topic - 3		MANUFACTURING TECHNOLOGY						3		
Art of Ship Building-Metallurgical studies-Iron industry- Iron smelting steel- Copper and gold-Coins are source of history- Minting of Coins-Beads making- industries Stone beads- Glass beads-Terracotta beads- Shell beads/bone beads- Archeological evidences-Gem stone types described in Silapathigaram										
Topic - 4		AGRICULTURE AND IRRIGATION TECHNOLOGY						3		
Dam ,Tank, ponds, sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry-Wells designed for cattle use- Agriculture and Agro Processing- Knowledge of Sea- Fisheries-Pearl-Conche diving-Ancient Knowledge of Ocean- Knowledge Specific Society										
Topic - 5		SCIENTIFIC TAMIL & TAMIL COMPUTING						3		
Development of Scientific Tamil- Tamil computing- Digitalization of Tamil Books- Development of Tamil Software- Tamil Virtual Academy- Tamil Digital Library- Online Tamil Dictionaries-Sorkuvai Project										
THEORY	15		TUTORIAL	0		PRACTICAL	0		TOTAL	15

BOOK REFERENCES	
1	தமிழகவரலாறு –மக்களும்பண்பாடும்கேகேபிள்ளை (வெளியீடு :தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்)
2	கணினித்தமிழ் – முனைவர். இல. சந்திரம் (விகடன்பிரசுரம்)
3	கீழடிவைகைநதிகரையில்சங்ககாலநகரநாகரிகம்தொல்லியல்துறைவெளியீடு
4	Social Life of Tamils(Dr.K.K.Pillai) A joint publication of TNTB and ESC and RMRL – (in print)
5	Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) Published by International Institute of Tamil Studies.
6	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi) Published by International Institute of Tamil Studies.

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. / B.Tech., Common to all	23HS2T6	தமிழரும்தொழில்நுட்பமும்	1	0	0	1

பாடம் கற்றதின் விளைவுகள்				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	சங்ககாலத் தமிழர்களின் நெசவு மற்றும் பானை வனைதல் தொழில்நுட்பம் குறித்த கற்றுணர்தல்.		K2	1
CO2	சங்ககாலத் தமிழர்களின் கட்டட தொழில்நுட்பம், கட்டுமான பொருட்கள் மற்றும் அவற்றை விளக்கும் தளங்கள் குறித்து புரிதல்.		K2	2
CO3	சங்ககாலத் தமிழர்களின் உலோகத்தொழில் ,நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றி அறிதல்.		K2	3
CO4	சங்ககாலத் தமிழர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் பற்றி புரிதல்.		K2	4
CO5	நவீன அறிவியல் தமிழ் மற்றும் கணித்தமிழ் குறித்து புரிந்து கொள்ளலும் மற்றும் பயன்படுத்துதலும்		K2	5

PRE-REQUISITE	தமிழர் மரபு
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

பாடத்திட்டங்கள்									
அலகு 1	நெசவு மற்றும் பானைத் தொழில்நுட்பம்						3		
சங்ககாலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள்- பாண்டங்களில் கீறல் குறியீடுகள்.									
அலகு 2	வடிவமைப்பு மற்றும் கட்டிட தொழில்நுட்பம்						3		
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் மற்றும் சங்ககாலத்தில் வீட்டு பொருட்களின் வடிவமைப்பு -சங்க காலத்தில் கட்டுமான பொருட்களும் நடுக்கல்லும் சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் -மாமல்லபுர சிற்பங்களும் கோவில்களும் -சோழர் காலத்து பெருங் கோயில்கள் மற்றும் பிற வழிபாட்டுத்தலங்கள் -நாயக்கர் கால கோயில்கள்- மாதிரி கட்டமைப்புகள் பற்றி அறிதல் - மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் -செட்டிநாடு வீடுகள்- பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ சாரோ செமி கட்டிடக்கலை									
அலகு 3	உற்பத்தித் தொழில்நுட்பம்						3		
கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருகுதல், எக்கு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள் - கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள்- எலும்புத் துண்டுகள்- தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.									
அலகு 4	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்						3		
அணை, ஏரி, குளங்கள் ,மதகு - சோழர் காலக் குமிழித்தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்.									
அலகு 5	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்						3		
அறிவியல் தமிழின் வளர்ச்சி - கணினித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணைய கல்விக் கழகம் - தமிழ் மின்நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத்திட்டம்.									
THEORY	1		TUTORIAL	0		PRACTICAL	0	TOTAL	15
	5								

BOOK REFERENCES

1	தமிழக வரலாறு –மக்களும் பண்பாடும் கேகே பிள்ளை (வெளியீடு : தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
2	கணினித் தமிழ் – முனைவர். இல. சந்திரம் (விகடன் பிரசுரம்)
3	கீழடி வைகை நதி கரையில் சங்க கால நகர நாகரிகம் தொல்லியல் துறை வெளியீடு
4	Social Life of Tamils(Dr.K.K.Pillai) A joint publication of TNTB and ESC and RMRL – (in print)
5	Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) Published by International Institute of Tamil Studies.
6	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi) Published by International Institute of Tamil Studies.

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E.,CSE&B.TECH IT & AIDS	23MA2T4	ALGEBRA AND NUMBER THEORY	3	1	0	4

COURSE LEARNING OUTCOMES (COs)

After Successful completion of the course, the students should be able to		RBT Level	Topics Covered
CO1	Understand the fundamental concepts of vector algebra and their role in modern mathematics.	K2	1
CO2	Apply orthogonalization method to solve the problems on linear transformation.	K3	2
CO3	Determine the accurate and efficient use of advanced algebraic techniques.	K2	3
CO4	Use Chinese remainder theorem to solve a system two or more simultaneous linear congruences.	K3	4
CO5	Apply classical theorems to solve multiplicative functions.	K3	5

PRE-REQUISITE CALCULUS AND DIFFERENTIAL EQUATIONS

CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)

COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO2	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO3	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO4	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO5	3	3	3	3	-	-	-	1	3	2	-	2	-	-

COURSE ASSESSMENT METHODS

DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	VECTOR SPACES								9 + 3	
Vector spaces-Subspaces-Linear combinations and linear system of equations-Linear dependence and independence-Bases and dimensions										
Topic - 2	LINEAR TRANSFORMATION AND INNER PRODUCT SPACES								9 + 3	
Linear transformation-Null spaces and ranges-Dimension theorem-Matrix representation of a linear transformation-Inner product-Norms-Gram Schimdt orthogonalization process										
Topic - 3	DIVISIBILITY THEORY AND CANONICAL DECOMPOSITIONS								9 + 3	
Division algorithm – Base - b representations – Number patterns – Prime and composite numbers – GCD– Euclidean algorithm – Fundamental theorem of arithmetic – LCM										
Topic - 4	DIOPHANTINE EQUATIONS AND CONGRUENCES								9 + 3	
Linear Diophantine equations – Congruence’s – Linear Congruence’s - Applications: divisibility tests -Modular exponentiation-Chinese remainder theorem – 2 x 2 linear systems.										
Topic - 5	CLASSICAL THEOREMS AND MULTIPLICATIVE FUNCTIONS								9 + 3	
Wilson’s theorem – Fermat’s little theorem – Euler’s theorem – Euler’s Phi functions – Tau and Sigma functions.										
THEORY	45		TUTORIAL	15		PRACTICAL	0		TOTAL	60

BOOK REFERENCES	
1	Ramana B.V., “Higher Engineering Mathematics”, Tata Mcgraw Hill Publishing Company, New Delhi, 2017.
2	“Algebraic Number Theory”, Second Edition, Richard A.Mollin, 2011.(E-Book)
3	J.H.van Lint, “Introduction to Coding Theory”, Third Edition, Springer.
4	David M,Burton, “Elementary Number Theory”, Seventh Edition, Tata Mcgraw Hill, 2023.
5	Martin Erickson & Anthony Vazzana, “Introduction to Number Theory”, Chapman & Hall/CRC, 2011.
6	“Algebraic Number Theory”, J.S. Milne, Version 3.08 July 19, 2020.(E-Book)
7	“Linear Algebra and Partial Differential Equations”, G.Balaji Publishers, First edition, 2018.

OTHER REFERENCES	
1	https://youtu.be/Qm_OS-8COwU
2	https://youtu.be/KOkuTXrv5Gg
3	https://youtu.be/ru7mWZJIRQg

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. CSE , B.TECH. IT, B.TECH AI&DS	23CS2LT1	PYTHON PROGRAMMING	3	0	4	5

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the basics of Python Programming constructs.		K2	1
CO2	Explain the implementation of all strings functions.		K2	2
CO3	Apply most appropriate programming constructs and features to solve the problems with list, tuples and dictionaries.		K3	3
CO4	Explain the programming skills for the use of the logical constructs of language using function and files.		K2	4
CO5	Demonstrate significant experience with the Python program development environment.		K2	5

PRE-REQUISITE		NIL													
CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)															
Cos	Programme Learning Outcomes (POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2	3	-	-	-	2	2	3	3	2	3	-	-	
CO2	1	2	3	2	2	-	2	2	3	3	-	3	-	2	
CO3	3	2	2	-	-	-	2	2	3	3	2	3	-	2	
CO4	1	3	2	2	-	-	2	2	3	3	-	3	2	-	
CO5	3	2	-	-	-	-	2	2	3	3	3	3	-	2	

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	INTRODUCTION TO PYTHON							9		
Introduction to python: Features - Execution of python program – Flavors of Python – Comments - Data Types: Built-in data types– Sequences – Set - Literals– Operators – Input and Output Statements - Control Statements : if – if-else –if-else-if – while-For –Nested loops – the else suite - Break – Continue - pass - assert – return.										
Topic - 2	STRINGS							9		
Strings and Characters: Creating – Length – Indexing – Slicing – Repeating – Concatenation – Comparing - Removing Spaces - Finding Sub Strings - Counting Substrings in a String - Strings are Immutable - Replacing a String with another String - Splitting and Joining Strings - Changing Case of a String - Checking Starting and Ending of a String - Formatting the Strings.										
Topic - 3	LISTS , TUPLES AND DICTIONARIES							9		
Lists: Creating Lists – Updating - Concatenation - Repetition - Methods – Sorting. Tuples: Creating - Accessing – Operations – Functions - Nested Tuples - Inserting Elements, Modifying Elements, Deleting Elements from a tuples. Dictionaries: Operations – Methods - Using for Loop with Dictionaries – Sorting the Elements of a Dictionary using Lambdas.										
Topic - 4	ARRAYS ,FUNCTIONS AND FILES							9		
Arrays: One Dimensional arrays - Multi Dimensional arrays - Functions: Defining – Calling – Returning - Pass by Object Reference – Formal, Actual, Positional, Keyword, Default & Variable Length Arguments - Local and Global Variables - Recursive Functions - Lambdas - Function Decorators. Files - Types of Files - Opening & Closing a File - Working with Text Files Containing Strings - Working with Binary Files.										
Topic - 5	MODULES AND FRAMEWORKS							9		
Modules: Importing module –Features – Built in functions. - Python Environment and Frameworks: NumPy: NumPy Arrays – Computation on NumPy Arrays – Aggregation – Sorting Arrays – Structured Arrays.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

LIST OF EXPERIMENTS	
Experiment-1	Programs for demonstrating the use of different types of operators.
Experiment-2	Programs for demonstrating control statements.
Experiment-3	Programs to implement various string operations.
Experiment-4	Programs for demonstrating the following i. Lists ii. Tuples iii. Dictionaries.
Experiment-5	Programs to demonstrate concepts using functions.
Experiment-6	Implement user defined functions using python.
Experiment-7	Programs to implement applications using File handling.

Experiment-8	Programs to demonstrate modules.									
Experiment-9	Create programs to solve problems using various data structures in python.									
Experiment-10	Perform data manipulation using NumPy.									
THEORY	0		TUTORIAL	0		PRACTICAL	60		TOTAL	60

BOOK REFERENCES	
1	Dr. R. Nageswara Rao, “Core Python Programming”, Dreamtech Press, 2021 Edition.
2	Jake Vander Plas, —”Python Data Science Handbook Essential Tools for Working with Data”, 1st Edition O’Reilly Publishers, 2016 for Unit V.
3	Head-First Python, 2 nd Edition, Paul Barry (O’Reily, 2016)

OTHER REFERENCES	
1	Kenneth A. Lambert, “Fundamentals of Python: First Programs”, Cengage Learning, 2018.
2	Wesley J. Chun, “Core Python Programming”, Pearson Education, 2013.

Semester	Programme	Course Code	Course Name	L	T	P	C
II	B.E. CSE, B.Tech IT, B.Tech AI&DS	23EE2LT2	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	3	0	4	5

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Apply the knowledge of basic circuit laws; analyze the DC and AC circuits using mesh and nodal analysis.		K3	1
CO2	Illustrate the knowledge in constructional details and working principles of DC and AC machines.		K2	2
CO3	Analyze the characteristics of different electronic devices such as Diodes and Transistors.		K4	3
CO4	Demonstrate the various number systems and simplify the logical expressions using Boolean functions.		K2	4
CO5	Build the concepts of Fundamentals of Electrical and Electronic Instruments.		K3	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3									3	3	1
CO2	3	2	2									3	3	3
CO3	3	3	3									2	3	2
CO4	3	3	3									2	2	0
CO5	3	2	2									3	2	1

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1		ELECTRICAL CIRCUITS						9		
DC Circuits: Ohm's Law - Kirchoff's Laws –Independent and Dependent Sources – Nodal Analysis, Mesh analysis with Independent sources only (Steady state) AC Circuits: Waveforms – Average and RMS Value - Power and Power factor – Single and Three Phase Balanced Circuits.										
Topic - 2		ELECTRICAL MACHINES						9		
Construction, Working Principle and Applications of DC Generators, DC Motors, Single Phase Transformer, Single Phase Induction Motor.										
Topic - 3		ANALOG ELECTRONICS						9		
Introduction - Characteristics of PN Junction Diode and Zener Diode – Half wave and Full wave Rectifiers – Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics.										
Topic - 4		DIGITAL ELECTRONICS						9		
Binary Number System – Boolean Algebra theorems– Digital circuits - Introduction to sequential Circuits– Flip-Flops – Registers and Counters – A/D and D/A Conversion.										
Topic - 5		MEASUREMENTS AND INSTRUMENTATION						9		
Functional elements of an instrument - Standards and Calibration - Operating Principle of Moving Coil and Moving Iron meters - Energy Meter - CT and PT - DSO - Data acquisition.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

LIST OF EXPERIMENTS	
Experiment-1	Experimental verification of Ohm's law.
Experiment-2	Experimental verification of Kirchoff's Voltage and Current laws.
Experiment-3	Open circuit and Load characteristics of DC Shunt generator.
Experiment-4	Load test on DC Shunt motor.
Experiment-5	Load test on DC Series motor.
Experiment-6	Open circuit and Short circuit tests on single phase transformer.
Experiment-7	Load test on single-phase induction motor.
Experiment-8	Characteristics of Semi conductor diode and Zener diode.
Experiment-9	Measurement of ripple factor in Half wave and full wave rectifiers.

Experiment-10	Characteristics of a NPN Transistor under CE, CC and CB configurations.									
Experiment-11	Study of logic gates AND, OR, NOT and EX-OR gates.									
Experiment-12	Implementation of Boolean Functions, Adder/ Subtractor circuits.									
Experiment-13	Measurement of energy using single phase energy meter.									
Experiment-14	Study of DC and AC motor starters.									
THEORY	0		TUTORIAL	0		PRACTICAL	60		TOTAL	60

BOOK REFERENCES	
1	Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi, 2001.
2	D.P. Kothari and I.J. Nagrath, 'Electric Machines', McGraw Hill Publishing Company Ltd, 2002.
3	Balbir Kumar, Shail.B.Jain, "Electronic Devices and Circuits" PHI learning private limited, 2nd edition 2014.
4	M. Morris Mano, 'Digital Design with an introduction to the VHDL', Pearson Education, 2013.
5	A.K.Shawney, "A Course in Electrical and Electronics Measurements & Instrumentation", Dhanpat Rai & Co. 2020.

OTHER REFERENCES	
1	https://youtu.be/-F7UJxGpkqw?si=q4k_ThrcTOCl5yj3
2	https://youtu.be/KwctEJaYers?si=4lOCFtNiWjLBy2FA
3	https://youtu.be/EdUAecpYVWQ?si=tWhNn-0Hb2srXtuN
4	https://youtu.be/2xXErGeeb_Q?si=vwd_nhujjo7Wt1Va
5	https://youtu.be/HY39LA6H-Lo?si=n38kcYulidSmlbM9

SEMESTER III

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23HS3T1	Constitution of India	MC	100	-	3	0	0	0
2	23MA3T2	Probability and Queuing Theory	BS	40	60	3	1	0	4
3	23CSCT4	Computer Organization and Architecture	PC	40	60	3	0	0	3
4	23CS3T3	User Interface Design	PC	40	60	3	1	0	4
THEORY COURSES WITH LABORATORY COMPONENTS									
5	23CS3LT1	Object Oriented Programming with Java	PC	50	50	2	0	4	4
6	23CS3LT2	Data Structure and Algorithms	PC	50	50	2	0	4	4
LABORATORY COMPONENTS									
7	23EN3L1	Interpersonal Communication Skills laboratory –I	HS	60	40	0	0	3	1.5
Total						16	2	11	20.5

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E. CSE & B.Tech.IT	23HS3T1	CONSTITUTION OF INDIA	3	0	0	0

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand and abide the rules of the Indian constitution.		K2	1
CO2	Understand the functions of Central government.		K2	2
CO3	Understand the function of state government.		K2	3
CO4	Understand the various constitutional functions and laws.		K2	4
CO5	Understand the different culture among the people of India		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	2	2	3	3		3		1
CO2						1	2	2	3	3		3		1
CO3						1	2	2	3	3		3		1
CO4						1	2	2	3	3		3		1
CO5						1	2	2	3	3		3		1

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	INTRODUCTION								9	
Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Role of the Election Commission.										
Topic - 2	STRUCTURE AND FUNCTION OF CENTRAL AND STATE GOVERNMENT								9	
Union Government – Structures of the Union Government and Functions – President – Vice President– Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review. State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.										
Topic - 3	CONSTITUTION FUNCTIONS OF INDIA AND INDIAN SOCIETY								9	
Indian Federal System – Central – State Relations – President’s Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India. Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections										
Topic - 4	POLICIES AND ACTS – GENERAL								9	
Insurance and Bonding – Laws Governing Sale, Purchase and use of Urban and Rural Land – Land Revenue Codes – Tax Laws – Income Tax, Sales Tax , Excise and Custom duties and their Influence on Construction Cost – Legal Requirements for Planning – Property Law– Agency Law – Local Government Laws for Approval.										
Topic - 5	POLICIES AND ACTS ON INFRASTRUCTURE DEVELOPMENT								9	
A Historical Review of the Government Policies on Infrastructure – Current Public Policies on Transportations – Power and telecom Sector – Plans for Infrastructure Development – Legal framework for Regulating Private Participation in Roads and Highways – Ports and Airport and Telecom.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES	
1	Durga Das Basu, “Introduction to the Constitution of India”, Prentice Hall of India, New Delhi,2018.
2	R.C.Agarwal, “Indian Political System”, S.Chand and Company, New Delhi, 2004
3	Maciver and Page, “Society: An Introduction Analysis”, Mac Milan India Ltd., New Delhi,2007
4	K.L.Sharma, “Social Stratification in India: Issues and Themes”, Jawaharlal Nehru University, New Delhi,2006.

OTHER REFERENCES	
1	https://nptel.ac.in/courses/106/105/106105034/
2	https://www.youtube.com/watch?v=6XTYoZymbwE
3	https://www.youtube.com/watch?v=MP6VIAE_7WY

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E.CSE & B.Tech.IT	23MA3T2	PROBABILITY AND QUEUEING THEORY	3	1	0	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Relate and apply the concept of probability and random variables and predict probabilities of events in models following normal distribution.		K2	1
CO2	Interpret discrete and continuous probability distributions including requirements, mean and variance for making decisions		K2	2
CO3	Compute correlation between variables, and predict unknown values using regression.		K3	3
CO4	Classify different types of random processes and use it to find whether it is SSS or WSS.		K2	4
CO5	Analyse the situation and select an appropriate queuing model techniques for solving problems based on Little's formula.		K4	5

PRE-REQUISITE	CALCULUS AND DIFFERENTIAL EQUATIONS, ALGEBRA AND NUMBER THEORY
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO2	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO3	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO4	3	3	3	3	-	-	-	1	3	2	-	2	-	-
CO5	3	3	3	3	-	-	-	1	3	2	-	2	-	-

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	PROBABILITY								9 + 3	
Probability-Axioms of probability –Conditional probability-Total probability-Bayes’ theorem-Discrete and continuous random variables – Moments – Moment generating functions										
Topic - 2	DISTRIBUTION FUNCTIONS								9 + 3	
Binomial distribution-Poisson distribution-Exponential distribution-Uniform distribution-Normal distribution-Applications.										
Topic - 3	TWO-DIMENSIONAL RANDOM VARIABLES								9 + 3	
Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression.										
Topic - 4	RANDOM PROCESSES								9 + 3	
Classification – Stationary process – Markov chain – Bernoulli and Poisson process.										
Topic - 5	QUEUEING MODELS								9 + 3	
Markovian queues – Birth and death processes – Single and multiple server queueing models – Little’s formula with finite waiting rooms.										
THEORY	45		TUTORIAL	15		PRACTICAL	0		TOTAL	60

BOOK REFERENCES	
1	Miller. S.L. and Childers. D.G., —“Probability and Random Processes with Applications to Signal Processing and Communications ”, Academic Press, 2013.
2	Peebles, P.Z., "Probability, Random Variables and Random Signal Principles ", Tata McGraw Hill, 4 th Edition, New Delhi, 2011.
3	Oliver . C. Lbe., “Fundamentals of applied probability and random processes” Academic Press, 2007.
4	Taha, H.A., “Operations Research”, 8 th Edition, Pearson India Education Services, Delhi, 2009.
5	Donald Gross, John F. Shortle, James M .Thomson, Carl M. Haris.,”Fundamentals of Queueing theory”,4 th Edition, Wiley India Pvt Ltd,2013.
6	“Probability, Statistics”, and “Queueing Theory Computer Science Applications”, Second Edition, ARNOLD O. ALLEN.

OTHER REFERENCES	
1	https://youtu.be/InVTILPF2e8
2	https://youtu.be/8963i2DnFiQ
3	https://youtu.be/HfAXKnibhKw

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E. CSE & B.Tech.IT	23CSCT4	COMPUTER ORGANIZATION AND ARCHITECTURE	3	0	0	3

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Identify the basics structure of computers, operations and instructions.		K3	1
CO2	Illustrate the arithmetic and logic unit.		K2	2
CO3	Analyze pipelined execution and design control unit.		K4	3
CO4	Classify the parallel processing architectures.		K4	4
CO5	Organize the various memory systems and I/O communication.		K3	5

PRE-REQUISITE	FUNDAMENTALS OF COMPUTING PROGRAMMING
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2					2	2	3	3		3		
CO2	3		2				2	2	3	3		3	2	
CO3	3						2	2	3	3		3		
CO4	3	3					2	2	3	3		3		
CO5		3	2				2	2	3	3		3	2	

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	BASIC STRUCTURE OF COMPUTERS							9		
Functional Units — Basic Operational Concepts — Performance — Instructions: Language of the Computer — Operations, Operands — Instruction representation — Logical operations — decision making — MIPS Addressing.										
Topic - 2	ARITHMETIC FOR COMPUTER							9		
Addition and Subtraction — Multiplication — Division — Floating Point Representation — Floating Point Operations — Sub word Parallelism.										
Topic - 3	PROCESSOR AND CONTROL UNIT							9		
A Basic MIPS implementation — Building a Data path — Control Implementation Scheme — Pipelining — Pipelined data path and control — Handling Data Hazards & Control Hazards — Exceptions.										
Topic - 4	PARALLELISIM							9		
Parallel processing challenges — Flynn's classification — SISD, MIMD, SIMD, SPMD, and Vector Architectures — Hardware multithreading — Multi-core processors and other Shared Memory Multiprocessors — Introduction to Graphics Processing Units, Clusters, Warehouse Scale Computers and other Message-Passing Multiprocessors.										
Topic - 5	MEMORY & I/O SYSTEM							9		
Memory Hierarchy — memory technologies — cache memory — measuring and improving cache performance — virtual memory, TLB's — Accessing I/O Devices — Interrupts — Direct Memory Access — Bus structure — Bus operation — Arbitration — Interface circuits — USB.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES	
1	"Computer Architecture: A Quantitative Approach" by John L. Hennessy and David A. Patterson (6th Edition, 2021).
2	"Computer Organization: Basic Processor Structure" by Robert L. Boccia (1st Edition, 2017).
3	"Essentials of Computer Organization and Architecture" by Linda Null and Julia Lobur (4th Edition, 2019).
4	"Introduction to Computer Architecture: A General Purpose Approach" by Anshuman Sahu (1st Edition, 2019).
5	"Computer Systems: Theory, Technology, and Applications" by Gabriel Heifets (1st Edition, 2018).
6	"Computer Architecture and Organization: From 8085 to Core2Duo and Beyond" by Subrata Ghoshal

OTHER REFERENCES

1	https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/
2	https://www.javatpoint.com/computer-organization-and-architecture-tutorial
3	https://www.youtube.com/watch?v=O18D69VKX2k
4	https://www.youtube.com/watch?v=IbEr8B09W-M
5	https://medium.com/@longeardev/computer-organization-and-architecture-fundamentals-of-computer-organization-bdd7dc4c0219

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E. CSE & B.Tech.IT	23CS3T3	USER INTERFACE DESIGN	3	1	0	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the importance of user interface and benefits of good design.		K2	1
CO2	Develop an effective user interface considering human characteristics, interaction speeds and business functions in relevance to design standards and guidelines		K3	2
CO3	Develop system menus, navigation schemes, windows, buttons, text boxes, selection controls and presentation controls for a user interface.		K3	3
CO4	Demonstrate the use of multimedia system components in creating text, graphics, icons, images and video for web pages.		K2	4
CO5	Develop test cases and evaluate the working system of windows layout for a mobile user interface.		K3	5

PRE-REQUISITE	OBJECT ORIENTED PROGRAMMING WITH JAVA
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	-	3	2	3	3	3	3	2	3	3	3
CO2	2	3	2	-	2	-	3	2	3	3	2	3	2	2
CO3	3	-	3	-	3	-	3	2	2	3	2	3	2	2
CO4	3	3		-	-	-	3	2	3	2	2	3	3	2
CO5	3	2	2	-	-	-	3	2	3	3	2	2	3	3

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT									
Topic - 1		INTRODUCTION TO USER INTERFACE						9+3	
Defining the User Interface – Importance and Benefits of Good Design-Graphical User Interface– Direct Manipulation-Characteristics of Graphical User Interface- Characteristics of Web User Interface Principles of User Interface Design.									
Topic - 2		HUMAN COMPUTER INTERACTION						9+3	
Human Characteristics in Design-Human Considerations in Design-Human Interaction Speeds. Business Functions: Business Definition and Requirement Analysis-Determining Basic Business Functions-Design Standards or Style Guides									
Topic - 3		NAVIGATION AND LAYOUT						9+3	
Getting Around: Navigation, Signposts, and Wayfinding: Signposts- Wayfinding- Navigation Types – Design Considerations – Navigational Models – Patterns. Layout of Screen Elements: Basics of Layout – Patterns.									
Topic - 4		VISUAL STYLE AND MOBILE INTERFACES						9+3	
Visual Style and Aesthetics: Basics of Visual Design – Visual Design for Enterprise Applications – Range of Visual Styles. Mobile Interfaces: Challenges and Opportunities of Mobile Design – Approach to Mobile Design – Patterns									
Topic - 5		ACTIONS AND COMMANDS - FORMS AND CONTROLS						9+3	
Actions and Commands: Tap, Swipe, and Pinch -Rotate and Shake -Buttons -Menu Bars - Menus – Toolbars - Links- Action Panels - Hover Tools - Keyboard Actions- Drag-and-Drop -Typed Commands-Affordance- Direct Manipulation.									
THEORY	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60		

BOOK REFERENCES	
1	Designing The User Interface: Strategies for Effective Human-Computer Interaction” -Ben scneidermn, Maxine cohen, Steven Jacobs, Catherine Plaisant, 2024
2	Soren Lauesen, “User Interface Design: A Software Engineering Perspective”, Pearson/AddisonWesley, 2005.
3	Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd.,2002
4	Avram Joel Spolsky, “User Interface Design for Programmers”, Apress, 2001
5	Wilbert O. Galitz , “The Essential Guide to User Interface Design - An Introduction to GUI Design Principles and Techniques”, Second Edition, John Wiley & Sons, Inc.,2018.

OTHER REFERENCES	
1	https://en.wikipedia.org/wiki/User_interface_design
2	https://www.tutorialspoint.com/software_engineering/software_user_interface_design.htm
3	https://www.designingui.com

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.Tech IT , B.Tech AI&DS, B.E(CSE)	23CS3LT1	OBJECT ORIENTED PROGRAMMING WITH JAVA	2	0	4	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Explain the object-oriented programming concepts, and apply them in solving problems		K2	1
CO2	Determine the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes.		K3	2
CO3	Illustrate the implementation of packages and interfaces		K3	3
CO4	Infer the concepts of exception handling and multithreading.		K4	4
CO5	Outline the design of Graphical User Interface using applets and swing controls.		K4	5

PRE-REQUISITE

CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2
CO1	3	3	2			3	2	3	3	3	3	3	2	2
CO2			2			3	2	3	3	3	3	3		3
CO3		2				3	2	3	3	3	3	3		
CO4	3	3			2	3	2	3	3	3	3	3	2	2
CO5			2			3	2	3	3	3	3	3		

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	INTRODUCTION TO OOPS CONCEPTS AND CLASSES									6
Introduction to OOP– Java Fundamentals - Data Types, Variables, and Arrays Operators - Control Statements – Classes – Methods –Constructors- Garbage Collection.										
Topic - 2	STRINGS, INHERITANCE, INTERFACES, AND PACKAGES									6
Strings: introduction to Strings, String operations, Inheritance:- Types of Inheritance, Method overriding, Final keyword. Packages and Interfaces										
Topic - 3	EXCEPTION HANDLING & MULTI-THREADING									6
Exception Handling: Fundamentals, Types of exception handling, Multi-threading: Thread Class, creating multiple threads, life cycle of thread, thread properties										
Topic - 4	I/O STREAMS AND COLLECTION FRAME WORK CLASSES									6
I/O Streams: Byte Stream Classes and Character Stream Classes. Collection Frame work : Hierarchy of collection framework, Array List, Linked List, Vector, Stack, Queue, Priority Queue, Hash Set, Linked Hash Set, Tree Set										
Topic - 5	SWINGS									6
Swing – Introduction, limitations of AWT, MVC architecture, components, containers, Event Handling- Handling mouse and keyboard events										
THEORY	30		TUTORIAL	0		PRACTICAL	0		TOTAL	30
LIST OF EXPERIMENTS										
1	Write a program to find the factorial of a given number.									
2	Write a program to print numbers in sorting order.									
3	Write a program on illustration of use of packages									
4	Write a program on illustration of use of string operations in java									
5	Write a program to implement interfaces.									
6	Write a program that implements a stack ADT that converts infix expression into postfix expression.									
7	Write a program to read a file and displays the file on the screen within line number before eachline.									
8	Write a program to copy contents of a file into another file using Filestreams.									
9	Write a program for handling Array Index Out of Bounds Exception and Divide-by-zeroException.									
10	Write a program for custom exception creation.									
11	Write a program on multi-threading showing how CPU time is shared among all the threads.									
12	Write a program for Producer-Consumer problem using threads.									
THEORY	0		TUTORIAL	0		PRACTICAL	60		TOTAL	60

BOOK REFERENCES	
1	Object Oriented Programming with Java Laboratory Manual, Al-Ameen Publications, 2020
2	"The Phoenix Project: A Novel about IT, DevOps, and Helping Your Business Win" by Gene Kim, Kevin Behr, and George Spafford (2018).
3	"The DevOps Handbook: How to Create World-Class Agility, Reliability, & Security in Technology Organizations" by Gene Kim, Patrick Debois, John Willis, and Jez Humble (:2016).
4	"Scrum: The Complete Guide to Scrum Agile Project Management" by Tim Bakers (2020).
5	"Project Management: A Systems Approach to Planning, Scheduling, and Controlling" by Harold Kerzner 13th Edition, 2017).
6	"Agile Project Management: Principles and Best Practices" by Stelian Roman (2021).
OTHER REFERENCES	
1	https://www.w3schools.com/java/java_oop.asp
2	https://www.freecodecamp.org/news/object-oriented-programming-concepts-java/
3	https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/
4	https://www.youtube.com/watch?v=6T_HgnjoYwM
5	https://www.youtube.com/watch?v=j0lBrYSIYaU

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E. CSE & B.Tech.IT	23CS3LT2	DATA STRUCTURES & ALGORITHMS	2	0	4	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand the concepts of ADTS and Analyzethe various Linked list Concepts with algorithms.		K2	1
CO2	Apply the different linear data structures like stack and queue to various computing problems.		K3	2
CO3	Understand the uses of variousnon-linear data structures - trees and analyse their performance.		K2	3
CO4	Examine the performance of various trees and Graphs..		K4	4
CO5	Analyze and understand the concepts of various sorting, searching and hashing algorithms.		K4	5

PRE-REQUISITE	FUNDAMENTALS OF COMPUTING AND PROGRAMMING
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
Cos	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3						1	3	3		3		2
CO2	2	2						1	3	3	2	2		2
CO3	3	3		3				1	3	3		3	2	
CO4	2	3		3				1	3	3		3		
CO5	2							1	3	3	3	3	3	

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	LIST							6		
LISTS Abstract Data Types (ADTs) – List ADT – Array-based implementation – Linked list implementation – Singly linked lists – Circularly linked lists – Doubly-linked lists – Applications of lists – Polynomial ADT.										
Topic - 2	STACKS AND QUEUES							6		
Stack ADT – Operations – Applications – Balancing Symbols – Evaluating arithmetic expressions Infix to Postfix conversion– Queue ADT – Operations – Circular Queue – DeQueue – Applications of Queues.										
Topic - 3	TREES							6		
Tree ADT – Tree Traversals - Binary Tree ADT – Expression trees – Binary Search Tree ADT – AVL Trees – Priority Queue (Heaps) – Binary Heap.										
Topic - 4	MULTIWAY SEARCH TREES AND GRAPHS							6		
B-Tree – B+ Tree – Graph Definition – Representation of Graphs – Types of Graph - Breadth-first traversal – Depth-first traversal — Bi-connectivity – Euler circuits – Topological Sort – Dijkstra's algorithm – Minimum Spanning Tree – Prim's algorithm – Kruskal's algorithm										
Topic - 5	SEARCHING, SORTING AND HASHING TECHNIQUES							6		
Searching – Linear Search – Binary Search. Sorting – Bubble sort – Selection sort – Insertion sort – Shell sort – Merge Sort – Hashing – Hash Functions – Separate Chaining – Open Addressing –Rehashing – Extendible Hashing										
THEORY	30		TUTORIAL	0		PRACTICAL	0		TOTAL	30

LIST OF EXPERIMENTS										
1	Array implementation of Stack, Queue and Circular Queue ADTs									
2	Implementation of Singly Linked List									
3	Linked list implementation of Stack and Linear Queue ADTs									
4	Implementation of Polynomial Manipulation using Linked list									
5	Implementation of Evaluating Postfix Expressions, Infix to Postfix conversion									
6	Implementation of Binary Search Trees									
7	Implementation of AVL Trees									
8	Implementation of Heaps using Priority Queues									
9	Implementation of Dijkstra’s Algorithm									
10	Implementation of Prim’s Algorithm									
11	Implementation of Linear Search and Binary Search									
12	Implementation of Insertion Sort and Selection Sort									
13	Implementation of Merge Sort									
THEORY	0		TUTORIAL	0		PRACTICAL	60		TOTAL	60

BOOK REFERENCES	
1	Reema Thareja, "Data structures using C, 1 st Edition. Oxford University Press, 2018.
2	Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed. "Fundamentals of Data Structures in C", 2,4 Edition, University Press, 2017.
3	Thomas H. Cormen, Charles E. Leiserson, "Introduction to Algorithms", 3 rd Edition, 2016.
4	Robert Sedgewick and Kevin Wayne, "Algorithms", 4 th Edition, 2016
5	Michael T. Goodrich, Roberto Tamassia, "Data Structures and Algorithms in Python", 5 th Edition, 2017
6	Steven S. Skiena, "The Algorithm Design Manual", Revised Edition, 2019

OTHER REFERENCES	
1	https://www.youtube.com/watch?v=BBpAmxU_NQo
2	https://www.youtube.com/watch?v=WwfhLC16bis
3	https://www.youtube.com/watch?v=DWpVGpNfDmM
4	https://www.youtube.com/watch?v=YWqla0UX-38
5	https://www.youtube.com/watch?v=44A_jk4_Rx8

Semester	Programme	Course Code	Course Name	L	T	P	C
III	B.E. / B.Tech., Common to all	23EN3L1	INTERPERSONAL COMMUNICATION SKILLS LAB I	0	0	3	1.5

After Successful completion of the course, the students should be able to		RBT Level
CO1	Produce appropriate and accurate language for transactions of various kinds.	K3
CO2	Understand and converse with their higher authorities/ subordinates/ other persons concerned.	K3
CO3	Expose their personality effectively	K4
CO4	Acquire the skills in the key areas of communication viz., socializing, telephoning and negotiations.	K4
CO5	Perceive work ethics and work culture.	K2

PRE-REQUISITE	COMMUNICATIVE ENGLISH & TECHNICAL ENGLISH
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO2	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO3	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO4	-	-	-	-	-	-	-	1	3	3	-	3	-	-
CO5	-	-	-	-	-	-	-	1	3	3	-	3	-	-

LIST OF EXPERIMENTS	
1	Conversation Practice Sessions (To be done as real-life interactions)
2	Talking to friends
3	Listening skills
4	Email Etiquette
5	Business English

6	Discussion on the clips									
7	Decision Making									
8	Developing Conversation									
THEORY	0		TUTORIAL	0		PRACTICAL	45		TOTAL	45

BOOK REFERENCES	
1	Communication skills in English by Anjana Tiwari, 2021
2	How to improve your communication skills by Dawood Khan,2021.
3	Communication to connect, 2020.

OTHER REFERENCES	
1	https://youtu.be/cC2vxmBDAG8
2	https://youtu.be/l3RSiSUwIT0
3	https://youtu.be/cyXADWE7KPo

SEMESTER IV

Sl. No.	Course Code	Course Title	Category	CIA	ESE	L	T	P	C
THEORY COURSES									
1	23HS4T1	Universal Human Values 2:Understanding Harmony	HS	100	-	2	1	0	3
2	23CS4T2	Software Engineering	PC	40	60	3	0	0	3
3	23IT4T3	Web Technology	PC	40	60	3	1	0	4
4		Open Elective - I	OE	40	60	3	0	0	3
THEORY COURSES WITH LABORATORY COMPONENTS									
5	23CS4LT1	Database Management Systems	PC	50	50	2	0	4	4
6	23CS4LT2	Operating Systems	PC	50	50	2	0	4	4
LABORATORY COURSE									
7	23EN4L1	Interpersonal Communication Skills laboratory –II	HS	60	40	0	0	3	1.5
Total						15	2	11	22.5

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. / B.Tech., Common to all	20HS4T1	UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY	2	1	0	3

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Understand Need, Basic Guidelines, Content and Process for Value Education		K2	1
CO2	Understand Harmony in the Human Being - Harmony in Myself		K2	2
CO3	Understand Harmony in the Family and Society- Harmony in Human Relationship		K2	3
CO4	Understand Harmony in the Nature and Existence - Whole existence as Coexistence		K2	4
CO5	Understand Harmony on Professional Ethics		K2	5

PRE-REQUISITE	NIL
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1							2	2	3	3		2	2	
CO2							2	2	3	3		2	2	
CO3							2	2	3	3		2	2	
CO4							2	2	3	3		2	2	
CO5							2	2	3	3		2	2	

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
INDIRECT	1	Course Exit Survey

COURSE CONTENT		
Topic - 1	Course Introduction - Need, Basic Guidelines, Content and Process for Value Education	9
<p>1. Purpose and motivation for the course, recapitulation from Universal Human Values-I</p> <p>2. Self-Exploration–what is it? - Its content and process; Natural Acceptance and Experiential Validation- as the process for self-exploration</p> <p>3. Continuous Happiness and Prosperity- A look at basic Human Aspirations</p> <p>4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority</p> <p>5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario</p> <p>6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.</p>		
Topic - 2	Understanding Harmony in the Human Being - Harmony in Myself!	9
<p>7. Understanding human being as a co-existence of the sentient „I“ and the material „Body“</p> <p>8. Understanding the needs of Self („I“) and „Body“-happiness and physical facility</p> <p>9. Understanding the Body as an instrument of „I“ (I being the doer, seer and enjoyer)</p> <p>10. Understanding the characteristics and activities of „I“ and harmony in „I“</p> <p>11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail</p> <p>12. Programs to ensure Sanyam and Health.</p>		
Topic - 3	Understanding Harmony in the Family and Society- Harmony in Human Relationship	9
<p>13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship</p> <p>14. Understanding the meaning of Trust; Difference between intention and competence</p> <p>15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship</p> <p>16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals</p> <p>17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.</p>		

Topic - 4	Understanding Harmony in the Nature and Existence - Whole existence as Coexistence								9	
18. Understanding the harmony in the Nature 19. Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self regulation innature 20. Understanding Existence as Co-existence of mutually interacting units in all pervasivespace 21. Holistic perception of harmony at all levels ofexistence.										
Topic - 5	Implications of the above Holistic Understanding of Harmony on Professional Ethics								9	
22. Natural acceptance of humanvalues 23. Definitiveness of Ethical HumanConduct 24. Basis for Humanistic Education, Humanistic Constitution and Humanistic UniversalOrder 25. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above productionsystems. 26. Case studies of typical holistic technologies, management models and productionsystems 27. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions andorganizations 28. Sumup										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES	
1	Jeevan Vidya: E.K. Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004
3	The Story of Stuff (Book)by Annie Leonard , 2011
4	The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5	Small is Beautiful - E. F Schumacher.
6	Slow is Beautiful - Cecile Andrews
7	Economy of Permanence - J C Kumarappa
8	India Wins Freedom - Maulana Abdul Kalam Azad
9	Vivekananda - Romain Rolland (English)
10	Gandhi - Romain Rolland (English)

OTHER REFERENCES	
1	https://www.youtube.com/watch?v=XGxNCFjDGEg
2	https://www.c-span.org/video/?292709-1/the-story-stuff

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. CSE & B.Tech. IT	23CS4T2	SOFTWARE ENGINEERING	3	0	0	3

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Design solutions using common life cycle models for a given software problem		K2	1
CO2	Apply the Requirement engineering process with emphasis on elicitation analysis and modeling for any given software requirement.		K3	2
CO3	Identify appropriate design strategies and analyze the requirement specifications for any software system		K2	3
CO4	Examine various software testing techniques and analyze the given software requirements to determine appropriate testing techniques in commercial software environments		K4	4
CO5	Inference the process of software project management and estimate the suitable cost		K4	5

PRE-REQUISITE	FUNDAMENTALS OF COMPUTING AND PROGRAMMING
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3						1	3	3		3		2
CO2	2	2						1	3	3	2	2		2
CO3	3	3		3				1	3	3		3	2	
CO4	2	3		3				1	3	3		3		
CO5	2							1	3	3	3	3	3	

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	THE SOFTWARE PROCESS								9	
Software Engineering: Generic View of Process – Software Engineering Practice – Software Process Model: Prescriptive Models – Waterfall Models – Increment – Evolutionary and Specialized model – Comparison Study of Software Process Models – Agile Process and Models										
Topic - 2	REQUIREMENTS ANALYSIS AND SPECIFICATION								9	
Software Requirements: Need for SRS, Requirement Process, Problem Analysis: Informal & formal Approaches, Data Flow Modeling, Object Oriented Modeling, Prototyping, Requirements Specifications: Characteristics of an SRS, Components of SRS, Specification Language, Structure of Requirement Document: IEEE Standards for SRS, Validation, Metrics.										
Topic - 3	SOFTWARE DESIGN								9	
Designing: Function Oriented Design: Design Principles: Problem Partitioning and Hierarchy, Abstraction, Modularity, Top Down and Bottom-Up Strategies, Module Level Concepts: Coupling, Cohesion; Structure Design Methodology, Verification, Introduction to Object Oriented Design & User Interface Design, Software Measurement Metrics: Various Size Oriented Measures- Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures Control Flow Graphs.										
Topic - 4	SOFTWARE TESTING TECHNIQUES								9	
Product Specifications - Defining the Final Product - Data Flow Diagram, Data Dictionary, Structured English, Decision Trees, Decision Tables - Feasibility Study. Software Testing : Test Plan - Development Testing : Verification and Validation - General Testing Methods : White Box and Black Box Testing - Unit Testing - System Integration Testing - Validation Testing - System testing										
Topic - 5	PROJECT MANAGEMENT								9	
Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM. Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.										
THEORY	45		TUTORIAL	0		PRACTICAL	0		TOTAL	45

BOOK REFERENCES

1	"Clean Architecture: A Craftsman's Guide to Software Structure and Design" by Robert C. Martin (First Edition, 2017).
2	Roger S. Pressman and Bruce Maxim "Software Engineering: A Hands-On Approach" (Ninth Edition, 2021).
3	Roger S. Pressman "Software Engineering: A Practitioner's Approach" (Ninth Edition, 2021).
4	Andrew Hunt and David Thomas "The Pragmatic Programmer: Your Journey to Mastery" (20th Anniversary Edition, 2019).
5	Roger S. Pressman and Bruce Maxim "Software Engineering: A Practitioner's Guide" (Ninth Edition, 2021).
6	Roger S. Pressman and Bruce Maxim "Software Engineering: A Hands-On Approach" (Ninth Edition, 2021).

OTHER REFERENCES

1	https://en.wikipedia.org/wiki/Software_engineering
2	https://www.geeksforgeeks.org/software-engineering/
3	https://www.youtube.com/watch?v=Ws6zCMdp9Es
4	https://www.youtube.com/watch?v=IHx9ImEMuzQ
5	https://www.geeksforgeeks.org/software-engineering-introduction-to-software-engineering/

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. CSE	23IT4T3	WEB TECHNOLOGY	3	1	0	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Identify the fundamental concept of web structure and creation of static webpage.		K3	1
CO2	Discuss the various functions of JavaScript to build dynamic webpage creation.		K3	2
CO3	Describe the importance of CSS and Bootstrap in webpage deigning.		K3	3
CO4	Discuss the basic concepts and analyzed data processing in PHP.		K3	4
CO5	Develop Simple web based application and perform database operation in PHP.		K4	5

PRE-REQUISITE	PYTHON PROGRAMMING
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
Cos	Programme Learning Outcomes (POs)												PSOs	
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	-	2	3	2	3	3	3	3	3	3	-
CO2	2	-	-	-	2	3	2	3	3	3	3	3	-	3
CO3	3	2	2	-	2	3	2	3	3	3	3	3	2	2
CO4	2	3	3	-	3	3	2	3	3	3	3	3	-	3
CO5	3	3	3	2	2	3	2	3	3	3	3	3	3	2

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests
	2	Other Assessments (Assignment, Quiz etc...)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT									
Topic - 1	WEBSITE BASICS, HTML 5						9		
Web Essentials: Clients, Servers and Communication – World wide web – HTTP Request Message – HTTP Response Message – HTML5 – Tables -Lists – Image – HTML5 control elements – Drag and Drop – Audio – Video controls – CSS3 –Backgrounds -Border Images – Colors – Shadows – Text – Transformations – Transitions – Animations.									
Topic - 2	JAVA SCRIPT						9		
JavaScript: JavaScript DOM Model – Variables and Data types – Operators – Control statements – Functions – Arrays – Objects- Exception Handling-Validation.									
Topic - 3	SERVLETS						9		
Servlets – Servlet Architecture – Servlet Life cycle – Introduction to Java Server Pages: Basic JSP – MVC Paradigm.									
Topic - 4	PHP AND XML						9		
PHP – Introduction – String processing – Regular expressions – Form processing & Business logic – Creating a database in MySQL. XML Introduction – Structuring data – XML namespaces – DTDs – XML Schema .									
Topic - 5	INTRODUCTION TO ANGULAR and WEB APPLICATIONS FRAMEWORKS						9		
Introduction to AngularJS, MVC Architecture, Expressions and data binding, Style Directives, Controllers, Filters, Forms, Routers; Web Applications Frameworks and Tools –Node JS- React-Django-UI & UX.									
THEORY	45		TUTORIAL	15		PRACTICAL	0	TOTAL	60

BOOK REFERENCES	
1	Jeffrey C. Jackson, "Web Technologies - A Computer Science Perspective ", 11th Impression, Pearson Education, 2012.
2	P. J. Deitel, H. M. Deitel, "Internet & World Wide Web How to Program", Fourth Edition, Eleventh Impression, Pearson Education, 2016.
3	Robert W. Sebesta, "Programming the World Wide Web", 8th edition, Pearson Education, 2015.
4	Joel Murach and Michael Urban, "Murach's Java Servlets and JSP",3rd edition, Murach Books, 2014.
5	Luke Welling, Laura Thomson, "PHP and MySQL Web Development", Fifth Edition, Pearson Education.

OTHER REFERENCES	
1	http://www.nptel.ac.in/courses/106105084/ , "Internet Technology", Prof. Indranil Sengupta, IIT-Kharagpur.
2	https://nptel.ac.in/courses/106101163/45/ , "Testing of Web Applications and Web Services", Prof. Meenakshi D'Souza, IIT- Bombay
3	https://en.wikibooks.org/wiki/Introduction_to_Information_Technology/Web_Technologies
4	https://youtu.be/JLcaX0XlQuI

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. CSE / B.Tech. IT	23CS4LT1	DATABASE MANGEMENT SYSTEM	2	0	4	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Explain the basic concepts of the database management systems		K2	1
CO2	Examine SQL queries to create, manipulate and control the database		K3	2
CO3	Apply normalization technique to design database		K3	3
CO4	Analyse database transactions using ACID properties		K4	4
CO5	Compare the various storage and optimization techniques		K4	5

PRE-REQUISITE	FUNDAMENTALS OF COMPUTING AND PROGRAMMING
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
Cos	Programme Learning Outcomes (POs)											PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO10	PO1 1	PO1 2	PSO 1	PSO2
CO1	2	1		-	-	-	-	-	-	-	-	2	3	2
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	3
CO3	3	3	2	-	-	-	-	-	-	-	-	2	3	3
CO4	3	3	2	-	-	-	-	-	-	-	-	2	3	3
CO5	2	1	-	-	3	-	-	-	-	-	-	2	3	2

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	INTRODUCTION TO RELATIONAL DATABASE							6		
What is database system-purpose of database system-view of data-relational databases-database architecture-transaction management--Database Schema and Diagram Relational Algebra — ER Diagrams — Entities. Attributes, Relationships, Constraints,										
Topic - 2	STRUCTURED QUERY LANGUAGE							6		
Basics of SQL, DDL, DML,DCL,TCL — creation, alteration, defining constraints — Functions —aggregate functions, Built-in functions — Views — Joins — Procedure										
Topic - 3	DATABASE DESIGN							6		
Relational database model: Logical view of data, keys, integrity rules. Functional dependencies - Normalization - Normal forms based on primary keys (1 NF, 2NF, 3NF, BCNF, 4NF, 5NF) - Triggers – Cursor										
Topic - 4	TRANSACTION MANAGEMENT							6		
Transaction management: ACID properties-serializability and concurrency control-Lock based concurrency control (2PL, Deadlocks),Time stamping methods- optimistic methods-database recovery management.										
Topic - 5	IMPLEMENTATION TECHNIQUES AND NoSQL DATABASE							6		
Indexing and Hashing - Si- tree Index Files - B Tree Index Files - Query Processing and optimization - Introduction to NoSQL Databases - Types of NOSQL Databases- NoSQLVs SQL - Limitations of NoSQL - Basics of MONGODB										
THEORY	30		TUTORIAL	0		PRACTICAL	0		TOTAL	30
LIST OF EXPERIMENTS										
Experiment-1	Conceptual Database design using E-R model — case study									
Experiment-2	Implementation of SQL commands DDL, DCL, TCL									
Experiment-3	Queries to demonstrate implementation of various integrity and key constraints									
Experiment-4	Practice on various DML commands to write a query to interact with database									
Experiment-5	Practice on and aggregate functions and views									
Experiment-6	Implement joins, nested queries and stored procedures									
Experiment-7	Practice on procedural extensions (Functions, Cursors, Triggers)									
Experiment-8	Document Database creation using Mongo DB									
Experiment-9	Creation of database objects: Synonyms, Sequences, Views, Indexes and save point									
Experiment-10	Create an Employee database to set various constraints									
THEORY	0		TUTORIAL	0		PRACTICAL	30		TOTAL	30

BOOK REFERENCES

1	"Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan (7th Edition, 2019).
2	"SQL Performance Explained" by Markus Winand (latest edition: 2nd Edition, 2018).
3	"Modern Database Management" by Jeffrey A. Hoffer, Ramesh Venkataraman, and Heikki Topi (latest edition: 13th Edition, 2018).
4	"Database Systems: Design, Implementation, and Management" by Carlos Coronel, Steven Morris, and Peter Rob (latest edition: 13th Edition, 2019).
5	"SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL" by John L. Viescas and Michael J. Hernandez (latest edition: 4th Edition, 2018).
6	"Database Internals: A Deep Dive into How Distributed Data Systems Work" by Alex Petrov (latest edition: 1st Edition, 2019).

OTHER REFERENCES

1	Pramod J. Sadalage and Mann Fowler, "NoSQL Distilled: A Brief guide to merging world of Polyglot persistence", 24 Edition, Addison Wesley, 2012.
2	Ramakrishnan and Gehrke, 'Database Management Systems', 3,4 Edition, McGraw Hill, 2003.
3	https://nptetac.in/courses/106/105/106105175/ .
4	https://www.edureka.co/mongodb-certification-training .
5	https://www.coursera.org/learn/introduction-to-nosql-databases .

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. CSE / B.Tech. IT	23CS4LT2	OPERATING SYSTEMS	2	0	4	4

COURSE LEARNING OUTCOMES (COs)				
After Successful completion of the course, the students should be able to			RBT Level	Topics Covered
CO1	Describe the important computer system resources and the role of operating system.		K2	1
CO2	Identify the various CPU scheduling algorithms and to handle deadlock mechanisms.		K2	2
CO3	Compare and contrast various memory management schemes.		K2	3
CO4	Implementation of functionality of file system and I/O system.		K3	4
CO5	Perform administrative tasks on Linux Servers.		K3	5

PRE-REQUISITE	OBJECT ORIENTED PROGRAMMING WITH JAVA
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	-	-	-	2	2	3	3	2	3	-	-
CO2	1	2	3	2	2	-	2	2	3	3	-	3	-	2
CO3	3	2	2	-	-	-	2	2	3	3	2	3	-	2
CO4	1	3	2	2	-	-	2	2	3	3	-	3	2	-
CO5	3	2	-	-	-	-	2	2	3	3	3	3	-	2

COURSE ASSESSMENT METHODS		
DIRECT	1	Continuous Assessment Tests (Theory Component)
	2	Laboratory Record and Model Practical Examinations (Laboratory Component)
	3	End Semester Examinations
INDIRECT	1	Course Exit Survey

COURSE CONTENT										
Topic - 1	OPERATING SYSTEM OVERVIEW								6	
Computer System Overview – Basic Elements - Operating system Overview - Evolution of Operating System; Operating System Structures and Services -System Calls - System Programs - OS Generation and System Boot.										
Topic - 2	PROCESS MANAGEMENT								6	
Process concepts - Process Scheduling - Inter-process Communication ; CPU Scheduling criteria and algorithms - Threads -Threading issues; Process Synchronization - The Critical-Section problem-Semaphore - Mutex – Synchronization problems. Deadlock – Deadlock prevention, avoidance and Detection.										
Topic - 3	MEMORY MANAGEMENT								6	
Main Memory - Contiguous allocation -Paging – Segmentation, Segmentation with paging; Virtual Memory - Demand paging - Page Replacement Algorithms - Thrashing.										
Topic - 4	FILE SYSTEMS AND I/O SYSTEMS								6	
Disk Structure – Disk Scheduling, swap space management ; File concept – Directory Structure-File system mounting, File Sharing and Protection; File System Structure, Directory implementation, Allocation Methods, Free Space Management ; I/O Systems – I/O Hardware -Application I/O interface, Kernel I/O subsystem, Streams, Performance.										
Topic - 5	OS DESIGN PRINCIPLES								6	
Linux System - Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System; Mobile OS -iOS and Android - Architecture and SDK Framework, Media Layer, Services Layer, Core OS Layer, File System.										
THEORY	30		TUTORIAL	0		PRACTICAL	0		TOTAL	30

COURSE CONTENT	
Experiment-1	Write programs using basic Unix commands and shell programming.
Experiment-2	Write programs using process and file management system calls of UNIX operating system.
Experiment-3	Develop programs to Implement CPU scheduling algorithms (FCFS, SJF, SRTF, Priority, and Round Robin).
Experiment-4	Developing application to implement Inter Process Communication using shared memory and pipes.
Experiment-5	Develop a program to understand synchronization using producer-consumer problem.
Experiment-6	Develop a program to understand deadlock avoidance using Bankers algorithm.
Experiment-7	Develop programs to implement the page replacement algorithms (FIFO, Optimal, and LRU).
Experiment-8	Develop programs to implement disk scheduling algorithms (FCFS, SSTF, SCAN, C-SCAN).
Experiment-9	Implementation of the various File Organization Techniques (Sequential , Random and Serial).

Experiment-10	Implementation of the following File Allocation Strategies a) Sequential b) Indexed C) linked.									
THEORY	0		TUTORIAL	0		PRACTICAL	60		TOTAL	60

BOOK REFERENCES	
1	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”,9th Edition, John Wiley and Sons Inc., 2013.
2	Ramaz Elmasri, A. Gil Carrick, David Levine, “Operating Systems – A Spiral Approach”,Tata McGraw Hill Edition, 2010.
3	Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Pearson Education, 2004.
4	Daniel P Bovet and Marco Cesati, “Understanding the Linux kernel”, 3rd edition, O’Reilly, 2005.
5	Neil Smyth, “iPhone iOS 4 Development Essentials – Xcode”, Fourth Edition, Payload media, 2011.

OTHER REFERENCES	
1	https://en.wikipedia.org/wiki/Operating_system
2	https://www.geeksforgeeks.org/what-is-an-operating-system/
3	https://www.javatpoint.com/operating-system
4	https://www.youtube.com/watch?v=fkGCLIQx1MI
5	https://www.youtube.com/watch?v=26QPDBe-NB8

Semester	Programme	Course Code	Course Name	L	T	P	C
IV	B.E. / B.Tech., Common to all	23EN4L1	INTERPERSONAL COMMUNICATION SKILLS LAB - II	0	0	3	1.5

After Successful completion of the course, the students should be able to		RBT Level
CO1	Equip them with the English language skills required for the successful Undertaking of academic studies.	K3
CO2	Read and understand any text in English according to the inputs given by the teacher in the classroom.	K2
CO3	Write and speak good English in all situations.	K4
CO4	Acquire guidance and practice in general and classroom conversation and to engage in specific academic speaking activities.	K4
CO5	Make effective presentations.	K2

PRE-REQUISITE	COMMUNICATIVE ENGLISH, TECHNICAL ENGLISH & INTERPERSONAL COMMUNICATION SKILLS LAB - I
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CO / PO MAPPING (1 – Weak, 2 – Medium, 3 – Strong)														
COs	Programme Learning Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1										3		3		
CO2									2	3		3		
CO3									2	3		3		
CO4									2	3		3		
CO5										3		3		

LIST OF EXPERIMENTS	
1	Role Play
2	Empathy
3	Time Management
4	Body Language

5	Mock Interview										
6	Group Discussion										
7	Presentation										
8	Team Building Skills										
THEORY		0	TUTORIAL		0	PRACTICAL		45	TOTAL		45

BOOK REFERENCES	
1	Communication Skill by Dale Carnegie,2022.
2	Communication: Core Interpersonal Skills by Gjyn O'Toolee,2020.
3	Effective Communication in the workplace by David L.Lewis,2019.
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