



**K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215**

**(Autonomous)**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**B.E. - Computer Science and Engineering**

**(REGULATIONS 2024)**

**Vision of the Institution**

<b>IV</b>	To become a globally renowned institution in engineering and management, committed to providing holistic education that fosters research, innovation and sustainable development.
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**Mission of the Institution**

<b>IM 1</b>	Deliver value-based quality education through modern pedagogy and experiential learning.
<b>IM 2</b>	Enrich engineering and managerial skills through cutting-edge laboratories to meet evolving global demands.
<b>IM 3</b>	Empower research and innovation by integrating collaboration, social responsibility, and commitment to sustainable development.

**Vision of the Department / Programme: (Computer Science and Engineering)**

<b>DV</b>	To produce globally competent researchers and innovators in Computer Science and Engineering, committed to ethical values and sustainable development.
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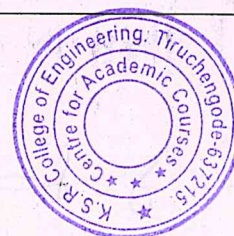
**Mission of the Department / Programme: (Computer Science and Engineering)**

<b>DM 1</b>	Provide high-quality learner-centric education in computer science and engineering through experiential learning and modern pedagogy.
<b>DM 2</b>	Enhance holistic, value-driven education through state-of-the-art laboratory facilities to meet global industry demand.
<b>DM 3</b>	Promote interdisciplinary innovation and research committed to sustainable development.

**Program Educational Objectives (PEOs): (Computer Science and Engineering)**

<b>The graduates of the program will be able to</b>	
<b>PEO 1</b>	<b>Core Competency:</b> Graduates will integrate engineering fundamentals and computing to devise innovative solutions and effectively resolve complex problems.
<b>PEO 2</b>	<b>Professionalism:</b> Graduates will drive sustainable and ethical solutions by integrating creative thinking and collaborative learning.
<b>PEO 3</b>	<b>Career Development:</b> Graduates will enhance their careers through continuous learning, innovation, and research to meet the evolving needs of the industry.


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## Program Outcomes (POs) of B.E. - Computer Science and Engineering

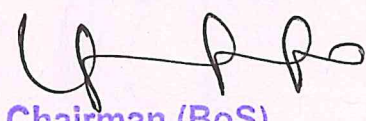
Program Outcomes (POs)	
PO1	<b>Engineering Graduates will be able to:</b> <b>Engineering Knowledge:</b> Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2	<b>Problem Analysis:</b> Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO3	<b>Design/Development of Solutions:</b> Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4	<b>Conduct Investigations of Complex Problems:</b> Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5	<b>Engineering Tool Usage:</b> Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6).
PO6	<b>The Engineer and The World:</b> Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7	<b>Ethics:</b> Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8	<b>Individual and Collaborative Team work:</b> Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9	<b>Communication:</b> Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
PO10	<b>Project Management and Finance:</b> Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11	<b>Life-Long Learning:</b> Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes (PSOs)	
PSO1	<b>Technical competency:</b> Develop and Implement computer solutions that accomplish goals to the industry, government or research by exploring new technologies.
PSO2	<b>Professional awareness:</b> Grow intellectually and professionally in the chosen field.

  
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		<b>K. S. R COLLEGE OF ENGINEERING</b> An Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A++' Grade)								<b>Curriculum</b> <b>UG</b> <b>R - 2024</b>					
<b>Department</b>		<b>Department of Computer Science and Engineering</b>													
<b>Programme</b>		<b>B.E. Computer Science and Engineering</b>													
<b>SEMESTER I</b>															
S. No.	Course Code	Course Title	Category	Periods / Semester					Credit C = T/30	Max. Marks					
				L	T	P	SL	Tot		CA	ES	Tot			
Induction Programme			-	-	-	-	-	-	-	-	-	-	-		
<b>THEORY COURSES</b>															
1	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100			
2	24EET06	Basics of Electrical and Electronics Engineering	ESC	45	0	0	45	90	3	40	60	100			
3	24ITT16	Programming for Problem Solving	ESC	45	0	0	45	90	3	40	60	100			
4	24GET19	தமிழ்மரபு/ Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100			
<b>THEORY COURSES WITH LABORATORY COMPONENT</b>															
5	24MAI19	Matrices and Calculus	BSC	30	15	30	45	120	4	50	50	100			
6	24CHI06	Chemistry for Engineers	BSC	45	0	30	45	120	4	50	50	100			
<b>LABORATORY COURSES</b>															
7	24ITP16	Programming for Problem Solving Laboratory	ESC	0	0	30	0	30	1	60	40	100			
8	24MEP16	Engineering Graphics Laboratory	ESC	15	0	30	15	60	2	60	40	100			
9	24GEP16	Engineering Experience Laboratory	ESC	0	0	30	0	30	1	60	40	100			
<b>EMPLOYABILITY ENHANCEMENT COURSE</b>															
10	24SSP19	Aptitude and Coding Skills - I	EEC	0	0	30	0	30	1	60	40	100			
<b>TOTAL</b>				<b>240</b>	<b>15</b>	<b>180</b>	<b>255</b>	<b>690</b>	<b>23</b>	<b>1000</b>					



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Applicable for the students admitted from 2024-2025 onwards

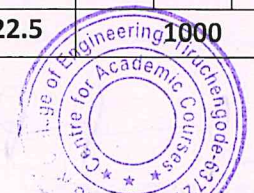




## SEMESTER II

S. No.	Course Code	Course Title	Category	Periods / Semester					Credit C = T/30	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1	24CST29	Python Programming	PCC	45	0	0	45	90	3	40	60	100
2	24CST21	Design Thinking	PCC	30	0	0	30	60	2	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பம் / Tamils and Technology	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4	24MAI29	Probability and Statistics	BSC	30	15	30	45	120	4	50	50	100
5	24PHI07	Engineering Physics	BSC	45	0	30	45	120	4	50	50	100
6	24ECI26	Digital Principles and System Design	ESC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7	24ENP29	Professional Communication Laboratory	HSMC	0	0	30	0	30	1	60	40	100
8	24CSP29	Python Programming Laboratory	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9	24SSP29	Aptitude and Coding Skills - II	EEC	0	0	30	0	30	1	60	40	100
MANDATORY COURSE												
10	24MCP09	Mandatory Course - I	MC	0	0	30	0	30	0	-	-	
TOTAL				210	15	210	225	660	21	900		
SEMESTER III												
S. No.	Course Code	Course Title	Category	Periods / Semester					Credit C = T/30	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1	24MAT37	Discrete Mathematical structures	BSC	45	15	0	60	120	4	40	60	100
2	24CST36	Data Structures	PCC	45	0	0	45	90	3	40	60	100
3	24CST37	Java Programming	PCC	45	0	0	45	90	3	40	60	100
4	24ITT36	Operating Systems	PCC	45	0	0	45	90	3	40	60	100
5	24CST38	Computer Organization and Architecture	PCC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
6	24CSP36	Data structuresLaboratory	PCC	0	0	45	0	45	1.5	60	40	100
7	24CSP37	Java Programming Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8	24ITP36	Operating Systems Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
9	24CBP36	Design Studio - I	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
10	24SDP39	Soft Skills Development- III	EEC	0	0	30	0	30	1	60	40	100
TOTAL				225	15	195	240	675	22.5	1000		

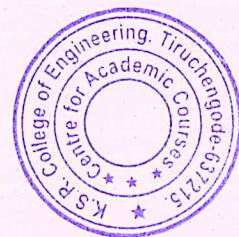
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SEMESTER IV												
S. No.	Course Code	Course Title	Category	Periods / Semester					Credit	Max. Marks		
				L	T	P	SL	Tot	C =T/30	CA	ES	Tot
THEORY COURSES												
1	24MAT46	Numerical and Computational Techniques	BSC	45	15	0	60	120	4	40	60	100
2	24ITT46	Database Management Systems	PCC	45	0	0	45	90	3	40	60	100
3	24CST41	Design and Analysis of Algorithms	PCC	45	0	0	45	90	3	40	60	100
4	24GET49	Universal Human values	HSMC	45	0	0	45	90	3	40	60	100
5	24CST42	Software Engineering	PCC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
1	24ECI46	Microprocessors and Microcontrollers	ESC	30	0	30	30	90	3	50	50	100
LABORATORY COURSES												
7	24ITP46	Database Management Systems Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8	24CBP46	Design Studio - II	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9	24SDP49	Soft Skills Development- IV	EEC	0	0	30	0	30	1	60	40	100
TOTAL				255	15	135	270	675	22.5	900		

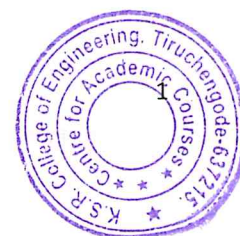
  
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24ENT19	PROFESSIONAL COMMUNICATION	Category	L	T	P	SL	C
		HSMC	45	0	0	45	3
(Common to All Branches)							
<b>PRE-REQUISITE:</b> A comprehensive understanding of basic English grammar, vocabulary, and sentence structure with familiarity in Communication and Technical Writing are considered as pre-requisite for the course.							
<b>OBJECTIVE:</b> To equip learners with essential verbal and written communication skills, including technical writing, necessary for academic, professional, and workplace success.							
UNIT - I	UNDERSTANDING COMPARISONS AND CONTRASTS						(9)
<b>Reading:</b> Technical brochures, telephone messages, social media messages. <b>Writing:</b> Emails/letters introducing oneself, Compare and Contrast Essay. <b>Grammar:</b> Present Tenses, Framing WH and Yes-No questions. <b>Vocabulary:</b> Portmanteau words, One-word substitutions.							
UNIT - II	WRITING REPORTS AND PARAGRAPHS						(9)
<b>Reading:</b> Technical texts, biographies, travelogues, travel & technical blogs. <b>Writing:</b> Paragraph writing, Short Report on an event/industrial visit. <b>Grammar:</b> Past Tenses, Active & Passive Voice transformations, Prepositions. <b>Vocabulary:</b> Word formations using Prefixes & Suffixes.							
UNIT - III	DESCRIBING THE PROCESS/PRODUCT						(9)
<b>Reading:</b> Advertisements, gadget reviews, user manuals, news reports. <b>Writing:</b> Definitions, Instructions, Product/Process description, Checklists. <b>Grammar:</b> Future Tenses, If clauses, Concord. <b>Vocabulary:</b> Nominal Compounds, Discourse Markers (connectives & sequence words).							
UNIT - IV	TRANSCODING AND RECOMMENDATIONS						(9)
<b>Reading:</b> Newspaper articles, Journal reports. <b>Writing:</b> Recommendations, Transcoding.(Conversion of non-verbal to verbal information) <b>Grammar:</b> Articles, Relative pronouns, Modals. <b>Vocabulary:</b> Collocations, Homonyms.							
UNIT - V	SUMMATION AND DESCRIPTION						(9)
<b>Reading:</b> Editorials and Opinion blogs, Company profiles. <b>Writing:</b> Descriptive/Narrative Essays, Job/Internship Application with Resume. <b>Grammar:</b> Numerical adjectives, Relative Clauses. <b>Vocabulary:</b> Cause & Effect Expressions, Homophones.							
TOTAL (T:45 , SL:45) = 90 PERIODS							

*Signature*  
**Chairman (Bos)**





**COURSE OUTCOMES:**

At the end of the course, the learners will be able to:

COs	Course Outcome	Cognitive Level
CO1	Recognize the structure of comparison texts using correct tenses and appropriate vocabulary.	Understand
CO2	Construct short paragraphs and reports using past tense and clear expressions.	Understand
CO3	Comprehend processes and products using future forms and appropriate vocabulary.	Understand
CO4	Interpret visuals like charts or graphs to produce well-structured written content.	Understand
CO5	Draft essays and job applications clearly, using proper grammar and structure.	Understand

**TEXT BOOKS:**

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2023.
2. Nitin Bhatnagar, Communicative English for Engineers and Professionals, Pearson, 2024.

**REFERENCES:**

1. Dr. K.N. Shoba, and Dr. Lourdes Jovani, English for Science & Technology-II Cambridge University Press. Francis, Department of English, Anna University, 2023.
2. Lakshminarayanan, A Course Book on Technical English, Scitech Publications (India) Pvt. Ltd. 2022.
3. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2023.

**Mapping of COs with POs and PSOs**

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

1-Low, 2-Medium, 3-High

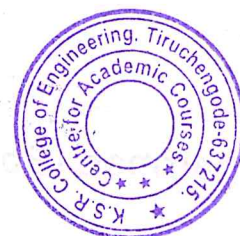
  
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24EET06	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	Category	L	T	P	SL	C
		ESC	45	0	0	45	3
(Common to AE, BME, CSE, CSE (CS), CSD, CSE (IoT), IT, MECH, SFE)							
<b>PREREQUISITE:</b> Basic knowledge of calculus, differential equations, and physics (especially electromagnetism) with strong problem-solving skills for circuit analysis.							
<b>OBJECTIVE:</b> <ul style="list-style-type: none"><li>To introduce the fundamentals of electrical and electronic systems, enabling analysis and application of basic circuits, machines and digital components.</li></ul>							
UNIT - I	DC AND AC CIRCUITS						(9)
DC circuits: Electrical quantities – Ohm's law – Kirchhoff's current and voltage laws – Series and parallel resistors – Simple problems. AC circuits: Waveforms, average value, RMS value, form factor, peak factor, power and power factor – Pure R, L and C – Series RL and RC circuits.							
UNIT - II	ELECTRICAL MACHINES						(9)
DC machine: construction, working principle and applications – Single phase induction motor: Capacitor start capacitor run induction motor – Three phase induction motor: construction and working principle – Single phase transformer: construction and working principle.							
UNIT - III	ELECTRICAL INSTALLATIONS						(9)
Classification of wiring system – Earthing – Types: pipe earthing, plate earthing, strip earthing – On-line and Off-line UPS – Lamps: Fluorescent tube, LED.							
UNIT - IV	ANALOG ELECTRONICS						(9)
PN junction diode and Zener diode: Principle of operation and V-I characteristics – Half and full wave rectifier – Bipolar Junction Transistor: Construction and working.							
UNIT - V	DIGITAL ELECTRONICS						(9)
Digital logic gates: NOT, AND, OR, NAND, NOR, EXOR – Digital circuits: half-adder, full-adder, JK and D flip flop – Introduction to Arduino components and IDE.							
LECTURE = 45, SELF LEARNING = 45, TOTAL = 90 PERIODS							

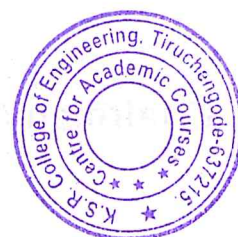
  
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COURSE OUTCOMES:														
Upon completion of the course, the students will be able to:														
COs	Course Outcome												Bloom's Taxonomy Level	
CO1	Interpret the fundamental concepts of electrical circuits to solve the DC and AC circuit problems.												Understand	
CO2	Elaborate the construction and working principles of DC machines, induction motors and transformers.												Understand	
CO3	Describe the wiring systems, earthing techniques and the functionality of UPS and lighting systems.												Understand	
CO4	Identify the operation and characteristics of PN junction, Zener diode and BJT.												Understand	
CO5	Illustrate the functionality of digital logic gates, adders, flip-flops and Arduino components.												Understand	
TEXT BOOKS:														
1 Kothari D.P and Nagrath I.J, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill, Uttar Pradesh, 2020.														
2 Bhattacharya S.K, "Basic Electrical and Electronics Engineering", Pearson Education, Delhi, Second Edition, 2017.														
REFERENCES:														
1 Jain V.K, Amitabh Bajaj, "Design of Electrical Installation", University Science Press, New Delhi, 2016.														
2 Ramamoorthy M, Chandra Sekhar O, "Electrical Machines", PHI Learning Pvt. Ltd, Delhi, 2018.														
3 Christopher Siu, "Electronic Devices, Circuits, and Applications", Springer International Publishing, 2022.														
4 Kothari D.P, Dhillon J.S, "Digital Circuits & Design", First Edition, Pearson, Delhi, 2015.														
Mapping of COs with POs and PSOs														
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	1	1	-	2	-	-
CO2	3	2	-	-	-	-	-	-	1	1	-	2	-	-
CO3	3	2	-	-	-	-	-	-	1	1	-	2	-	-
CO4	3	2	-	-	-	-	-	-	1	1	-	2	-	-
CO5	3	2	-	-	-	-	-	-	1	1	-	2	-	-

  
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24ITT16	PROGRAMMING FOR PROBLEM SOLVING	Categ ory	L	T	P	SL	C
		ESC	45	0	0	45	3
(Common to AUTO, BME, CSE, CSE(CS), CSD, CSE(IoT), IT, ECE, EEE, MECH and SFE)							
<b>PREREQUISITE:</b> Students must have basic computer literacy, including familiarity with operating systems, file management, and software usage. A Basic understanding of algorithms and flowcharts are required to design and visualize problem solving strategies. Students must have basic knowledge on programming principles, such as variables, simple data types, control structures, problem solving and logical thinking skills.							
<b>OBJECTIVES:</b> The course introduces fundamental programming concepts using the C language, covering computer organization, algorithm representation, and basic syntax. Students will learn control structures, functions, arrays, pointers, and string handling. The course also covers complex data types like structures and unions, storage classes, and file operations. By the end, students will be able to analyze problems, design algorithms, and implement solutions using C programming.							
UNIT – I	INTRODUCTION TO COMPUTING AND C					(9)	
Introduction to Computing: Organization of computer – Hardware and Software – Number system and Conversions – Representation of an algorithm: pseudo code, flowchart with examples. Introduction to C – Features of C – Structure of C program – Character set – C tokens – Keywords – Identifiers – Constants – Variables – Data types – Operators – Precedence and Associativity.							
UNIT – II	CONTROL STRUCTURES					(9)	
Decision Making and Branching: Introduction – decision making with if statement – simple if statement – if-else statement – nested if-else statements – if-else-if ladder statement – switch statement – goto statement – conditional operator – Decision making and looping: Introduction – while statement – do-while statement – for statement.							
UNIT – III	FUNCTIONS AND ARRAY					(9)	
Functions: Declaration and definition – Function prototype – parameter and arguments – Return type – passing argument by value and by reference – Function scope and lifetime – Function pointer – Arrays: array declaration and initialization – One dimensional array and Two dimensional array with example.							
UNIT – IV	POINTERS AND STRINGS					(9)	
Pointers: Definition – Initialization – Pointer’s arithmetic – Pointers to pointers – Pointers and arrays. String: Declaring and initializing string variables – String handling functions and operations.							
UNIT – V	STRUCTURE, UNION AND FILE					(9)	
Structures: Declaration – Definition – Structure within a structure – Union – Storage classes – Preprocessor directives – Files: Defining and opening a file – Closing a file – input/output operations on files – Command line arguments.							
L= 45, T=0, P=0, SL=45, TOTAL: 90 PERIODS							

*S. Gargyxx*  
**Chairman (BOS)**





**COURSE OUTCOMES:**

At the end of the course, the learners will be able to:

COs	Course Outcome	Cognitive Level
CO1	Discuss about number systems and perform conversions between different number systems and depict about basic structure of C program.	Understand
CO2	Apply the concept of Looping and conditional statements to solve real-world programming problems efficiently. .	Apply
CO3	Develop modular programs using functions and implement single and two-dimensional arrays for efficient data storage and manipulation.	Apply
CO4	Apply pointer concepts with arrays and functions, and develop efficient C programs using string operations for effective memory management and text processing.	Apply
CO5	Implement user-defined data types using structures and unions, manage memory with storage classes and perform file operations and command-line processing in C programs.	Apply

**TEXT BOOKS:**

1. Herbert Schildt, C - The Complete Reference, Tata McGraw-Hill, New Delhi, Fourth Edition, 2017.
2. Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Third Edition, 2011.

**REFERENCES:**

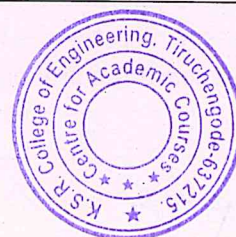
1. Yashavant Kanetkar, "Let Us C: Authentic guide to C programming language", BPB Publication, 19th Edition, 2022.
2. Robert C. Seacord, "Effective C", No Starch Press, 2020.
3. E Balagurusamy, "Programming In Ansi C", McGraw Hill Education, Eighth Edition, 2019.
4. Ashok N.Kamathane, 'Computer Programming, Pearson Education, India, Third Edition ,2015.
5. <https://archive.nptel.ac.in/courses/106/105/106105171/>

**Mapping of COs with POs and PSOs**

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

1-low, 2-medium, 3-high

  
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24GET19	தமிழர்மரபு	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(அனைத்து துறைகளுக்கும் பொதுவானது)							
முன்கூட்டிய துறைசார் அறிவு : தேவை இல்லை							
அலகு - I	மொழி மற்றும் இலக்கியம்						[03]
இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலயக்கிகியங்கள் - சங்க இலக்கியத்தின் சமயச்சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலகியங்கள் தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கியவளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.							
அலகு - II	மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை						[03]
நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனியில் திருவள்ளுவர் சிலை - இசை கருவிகள் - மிருதங்கம், பறை. வீணை. யாழ். நாதஸ்வரம் - தமிழர்களின் சமூகபொருளாதார வாழ்வில் கோவில்களின் பங்கு.							
அலகு - III	நாட்டுப் புறக் கலைகள் மற்றும் வீர விளையாட்டுக்கள்						[03]
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.							
அலகு - IV	தமிழர்களின் திணைக் கோட்பாடுகள்						[03]
தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.							
அலகு - V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு						[03]
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறபகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்ச வரலாறு.							
Total (L= 15, SL=15) =30 Periods							

  
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பாடம் கற்றத்தின் விளைவுகள்: பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1:	தமிழ்மொழியின் செந்ததன்மை மற்றும் இலக்கியம் குறித்த தெரிதல்	புரிதல்
CO2:	தமிழர்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு.	புரிதல்
CO3:	தமிழர்களின் நாட்டுப் புரைக் கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு	புரிதல்
CO4:	தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககாலவணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.	புரிதல்
CO5:	இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல்.	புரிதல்

**Text Books:**

1	தமிழகவரலாறு-மக்களும்பண்பாடும்-கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்), உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002
2	கணினித்தமிழ்முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016

**Reference Books :**

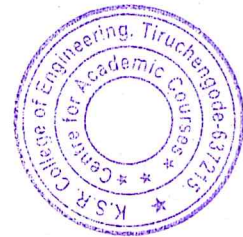
1	கீழடி-வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல்துறைவெளியீடு)
2	பொருளை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
4	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-

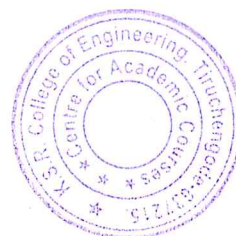
1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)

  
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24GET19	HERITAGE OF TAMILS	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(Common to all branches)							
<b>Prerequisite(s):</b> No prerequisites are needed for enrolling into the course							
UNIT - I	LANGUAGE AND LITERATURE						[03]
Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.							
UNIT - II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE						[03]
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.							
UNIT - III	FOLK AND MARTIAL ARTS						[03]
Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.							
UNIT - IV	THINAI CONCEPT OF TAMILS						[03]
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.							
UNIT - V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE						[03]
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.							
Total (L= 15, SL=15) =30 Periods							
<b>Course Outcomes:</b>							<b>Cognitive Level</b>
<b>At the end of the course, the student will be able to</b>							
CO1:	Recognize the extensive literature of Tamil and its classical nature.						Understand
CO2:	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.						Understand
CO3:	Review on folk and martial arts of Tamil people.						Understand
CO4:	Insight thinai concepts, trade and victory of Chozha dynasty.						Understand
CO5:	Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine.						Understand

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Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
Reference Books:	
1	Social Life of the Tamils – The. Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
2	The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Published by International Institute of Tamil Studies).
3	Keeladi – ‘Sangam City Civilization on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)													

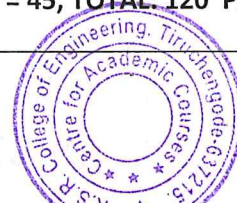
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24MAI19	MATRICES AND CALCULUS		Category	L	T	P	SL	C
			BSC	30	15	30	45	4
SEMESTER I - B.E / B.TECH ( Common to All Branches )								
<b>PREREQUISITE</b> The Students should have a basic understanding of calculus, matrices, and differential equations to effectively follow the concepts in this course.								
<b>OBJECTIVES:</b> Build a strong foundation in eigen values, eigen vectors, quadratic forms, and higher-order linear differential equations. Develop skills in differential and vector calculus to analyze curves, optimize multivariable functions, and interpret vector fields.								
UNIT - I	LINEAR ALGEBRA						(9)	
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (Excluding proof) – Cayley Hamilton theorem (excluding proof) – Quadratic forms – Reduction of quadratic form to canonical form by orthogonal transformation.								
UNIT - II	ORDINARY DIFFERENTIAL EQUATIONS						(9)	
Linear differential equations of second and higher order with constant coefficients – Differential equations with variable coefficients – Cauchy's and Legendre's linear equations – Method of variation of parameters.								
UNIT - III	DIFFERENTIAL CALCULUS						(9)	
Curvature - Radius of curvature (Cartesian co-ordinates only) – Centre of curvature and Circle of curvature – Involute and Evolute (Parabola, Ellipse, Hyperbola and Rectangular hyperbola ).								
UNIT - IV	FUNCTIONS OF SEVERAL VARIABLES						(9)	
Partial derivatives – Euler's theorem for homogenous functions – Taylor's series expansion - Maxima and Minima for functions of two variables – Method of Lagrangian multipliers.								
UNIT - V	VECTOR CALCULUS						(9)	
Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Green's theorem in plane, Gauss divergence theorem and Stoke's theorem (Cube, Cuboid and Rectangular Paralleopiped only).								
<b>List of Exercise/Experiments(MAT LAB):</b>  1. Calculate the characteristic equation and eigenvalues 2. Find the eigenvector and diagonalization of a given matrix. 3. SolvingODE with constant coefficients 4. Detect the solution of ODE with variable coefficients 5. Identifythe radius of curvature 6. Establish theEvolute of curve. 7.Reckon the Taylor's series for functions of two variables. 8.Computethe maxima and minima. 9.Estimatethe directionalderivative, divergence and curl. 10. Determine line integral, surface integral and volume integral.								
L = 30 , T = 15 & P = 30 & SL = 45, TOTAL: 120 PERIODS								

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**COURSE OUTCOMES:**

At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Apply eigen values, eigen vectors, and the Cayley-Hamilton theorem to solve matrix problems and diagonalize quadratic forms into canonical form.	Apply
CO2	Apply methods to solve second and higher-order linear differential equations with constant and variable coefficients.	Apply
CO3	Apply concepts of differential calculus to find curvature, center of curvature, and evolutes of standard Cartesian conic sections.	Apply
CO4	Apply partial derivatives, Jacobians, and lagrangian multipliers to determine local extremum of multivariable functions.	Apply
CO5	Apply vector differential operators to the vector fields and verify Green's, Gauss divergence, and Stokes' theorems for geometries.	Apply

**TEXT BOOKS:**

1. Ravish R Singh and Mukul Bhatt, "Engineering Mathematics – I", Mc-Graw Hill Publications, New Delhi, 2<sup>nd</sup> Edition, 2020.
2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40<sup>th</sup> Edition, 2020.

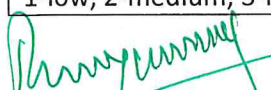
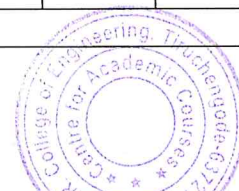
**REFERENCES:**

1. Bali N. P and Manish Goyal, "Engineering Mathematics", Laxmi Publications Pvt Ltd., 7<sup>th</sup> Edition, 2020.
2. Dass H.K, "Advance Engineering Mathematics", S. Chand and company, 11<sup>th</sup> Edition, 2014.
3. Jain R.K. and lyengar S.R.K, "Advanced Engineering Mathematics", Narosa Publications, 8<sup>th</sup> Edition, 2012.
4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10<sup>th</sup> Edition 2016.
5. <https://archive.nptel.ac.in/courses/111/108/111108157/>
6. <https://archive.nptel.ac.in/courses/111/105/111105122/>

**Mapping of COs with POs and PSOs**


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

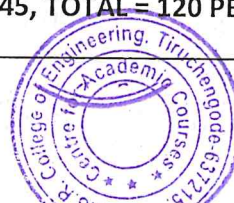
1-low, 2-medium, 3-high

  
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24CH106	CHEMISTRY FOR ENGINEERS	Category	L	T	P	SL	C
		BSC	45	0	30	45	4
(Common to AI&DS, BME, CSE, CSE(CS), CSE(CSD), CSE(IoT), ECE, EEE and IT)							
<b>PREREQUISITE</b> The students must have knowledge about the basic concepts of water parameters, electro chemistry, organic reactions and their applications.							
<b>OBJECTIVES:</b> To equip the learners to apply the chemical principles and their applications in the engineering fields.							
UNIT - I	WATER TREATMENT						(9)
Hardness – types, units – estimation of hardness by EDTA method; Boiler feed water – requirements, disadvantages of using hard water in boilers – scale and sludge – priming and foaming – caustic embrittlement – boiler corrosion. Softening methods – internal conditioning – calgon, phosphate – external conditioning – zeolite process and ion exchange process; Desalination – reverse osmosis. Domestic water treatment (Sterilisation process Only).							
UNIT - II	ELECTROCHEMISTRY AND CORROSION						(9)
Introduction – electrode potential – Nernst equation – EMF series and its significance; E – Vehicles - Need - Types – Advantages and Disadvantages; Corrosion – causes, consequences – classification – chemical corrosion – electro chemical corrosion – mechanism; Galvanic & differential aeration corrosion – factors influencing corrosion – corrosion control (Sacrificial anode and Impressed Current Cathodic protection method).							
UNIT - III	ENERGY STORAGE DEVICES						(9)
Batteries – primary battery – Dry cell, secondary batteries – lead-acid and lithium-ion batteries. Fuel cells – H <sub>2</sub> -O <sub>2</sub> fuel cell, solar cells – principle, applications and advantages; Nuclear energy: Light water Nuclear power plant - breeder reactor.							
UNIT - IV	POLYMER CHEMISTRY						(9)
Polymer – definition – degree of polymerization – functionality. Polymerization – addition, condensation and co-polymerization – free radical mechanism of addition polymerization; Preparation properties & uses of PVC, Nylon – 6,6 & Teflon. Plastics – classification – thermosetting and thermoplastics. Fabrication of polymers – compression and Injection moulding.							
UNIT - V	NANO CHEMISTRY AND COMPOSITES						(9)
Introduction – basics of nanochemistry – distinction between nanoparticles, molecules and bulk materials - synthesis of nanomaterials [CVD, laser evaporation, pyrolysis] - applications of nanomaterials. Composite – Introduction: Definition and need for composite – Types of composites: Properties and application of FRP and MMC.							
<b>List of Exercise/Experiments:</b> 1. Estimation of total, permanent and temporary hardness of water sample By EDTA method 2. Estimation of chloride content in water by Argentometric method [Mohr's Method] 3. Conductometric titration of strong acid with strong base (HCl Vs NaOH) 4. Estimation of dissolved oxygen in water (Winkler's Method) 5. Conductometric titration of mixture of acids (HCl & CH <sub>3</sub> COOH) with strong base 6. Estimation of Fe <sup>2+</sup> ion by potentiometric titration 7. Estimation of HCl by p <sup>H</sup> - Metry 8. Conductometric precipitation titration using BaCl <sub>2</sub> -Na <sub>2</sub> SO <sub>4</sub>							
L = 45, P = 30, SL = 45, TOTAL = 120 PERIODS							

  
 Chairman (BoS)





**COURSE OUTCOMES:**

At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Interpret the treatment solutions for drinking water, boiler feed water, and wastewater reuse.	Understand
CO2	Describe different types of electrochemical cells, including galvanic and electrolytic cells.	Understand
CO3	Categorize different energy storage methods, such as batteries, fuel cell and solar cell for the production of electricity.	Understand
CO4	Summarize the basic concepts of polymer chemistry in designing the materials for engineering and technology.	Understand
CO5	Illustrate the nano materials and composites for engineering and technology.	Understand

**TEXT BOOKS:**

1. S S. Dara and S. S. Umare, "A Text book of Engineering Chemistry", S.Chand & Co.Ltd., 12<sup>th</sup> Edition, 2015.
2. P.C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub. Co., 16<sup>th</sup> Edition, 2013.
3. Wiley, "Engineering Chemistry", Wiley India Pvt. Ltd., 2<sup>nd</sup> Edition, 2013.

**REFERENCES:**

1. Dr. A. Ravikrishnan, "Engineering Chemistry", Srikrishna Hi-tech Publishing Company Pvt. Ltd., 21<sup>st</sup> Edition, 2022.
2. J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas and B. Sivasankar, "Vogel's Text book of Quantitative Chemical Analysis", Pearson Education Pvt., Ltd., 6<sup>th</sup> Edition, 2019.
3. Shashi Chala, "A Text book of Engineering Chemistry", Dhanpat Rai Pub. Co., 2015.
4. S. K. Bhasin and Sudha Rani, "Laboratory Manual of Engineering Chemistry", Dhanpat Rai Publishing Company Private Limited, 3<sup>rd</sup> Edition, 2012.

**Mapping of COs with POs and PSOs**

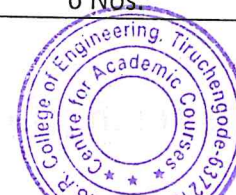
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	3	2	-	-	-	1	-	2	1	-	1	-	-
CO2	3	2	-	-	-	1	-	2	1	-	1	-	-
CO3	3	2	-	-	-	1	-	2	1	-	1	-	-
CO4	3	2	-	-	-	1	-	2	1	-	1	-	-
CO5	3	2	-	-	-	1	-	2	1	-	1	-	-

1-low, 2-medium, 3-high

**Laboratory Equipment Details**  
(Requirements for a batch of 30 students)

S.No.	Description of Equipment	Quantity required
1.	Electronic balance	1 No.
2.	pH meter	6 Nos.
3.	Conductivity meter	6 Nos.
4.	Potentiometer	6 Nos.

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**Chairman (BoS)**





24ITP16	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	Category	L	T	P	SL	C
		ESC	0	0	30	0	1
(Common to AUTO, BME, CSE, CSE(CS), CSD, CSE(IoT), IT, ECE, EEE, MECH and SFE)							
<b>PREREQUISITE:</b>  Students are expected to have foundational knowledge of basic programming principles. This includes an understanding of variables and data types such as integers, floats, and characters, as well as familiarity with fundamental control structures like conditional statements (if-else) and loops (for, while).							
<b>OBJECTIVES:</b>  The lab is designed to provide hands-on experience with fundamental computer applications like MS Word, Excel, PowerPoint, and MS Access. It also aims to develop practical programming skills in C, enabling students to write, debug, and execute programs that incorporate core concepts such as control flow, functions, strings, pointers, and file handling. The lab will help students apply theoretical knowledge to real-world problems, enhancing their problem-solving and programming proficiency.							
<b>List of Experiments:</b>  1. Prepare a Bio-data using MS Word with appropriate page, text and table formatting options and send the same to too many recipients using mail merge.  2. Prepare a mark sheet with five subjects for five students in MS Excel File using Formulas, Functions and charts.  3. i) Prepare a Power Point presentation for your organization with varying animation effects using timer.  ii) Prepare a Student Database in MS Access, manipulate the data and generate report.  4. Design an algorithm and flowchart with example.  5. Program using I/O statements and expressions.  6. Programs using decision-making constructs: if-else, goto, switch-case, break-continue.  7. Loops: for, while, do-while.  8. Arrays: 1D and 2D  9. Functions: passing parameters by (value, reference), Recursion.  10. Strings: operations.  11. Pointers.  12. Structures and File operations.							
L=0, T=0, P=30, SL=0, TOTAL: 30 PERIODS							

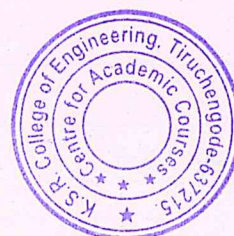
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COURSE OUTCOMES:													
At the end of the course, the students will be able to:													
COs	Course Outcome										Experiment	Cognitive Level	
CO1	Apply the basic concept of MS word, Excel, Power Point presentation and MS Access.										1,2,3,4	Apply	
CO2	Develop the program using the concept of control statements.										5,6,7	Apply	
CO3	Demonstrate the use of functions and arrays in Programming.										8,9	Apply	
CO4	Apply the concepts of pointers and strings.										10,11	Apply	
CO5	Develop the program using the files and structure operations.										12	Apply	
REFERENCES:													
1. Jeff Szuha, "Learn C Programming", Packt Publishing, United Kingdom, Second Edition, 2022.													
2. E Balagurusamy, "Programming In Ansi C", McGraw Hill Education, Eighth Edition, 2019.													
Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PSO1	PSO 2
CO1	3	3	2	–	–	–	–	1	1	–	–	3	2
CO2	3	3	2	–	–	–	–	1	1	–	–	3	2
CO3	3	3	2	–	–	–	–	1	1	–	–	3	2
CO4	3	3	2	–	–	–	–	1	1	–	–	3	2
CO5	3	3	2	–	–	–	–	1	1	–	–	3	2
Avg.	3	3	2	–	–	–	–	1	1	–	–	3	2
1-low, 2-medium, 3-high													
LIST OF EQUIPMENTS (For a Batch of 30 Students)													
Sl. No	Name of the Equipment's											Qty.	
1.	A computer with a modern processor, RAM and windows or linux.											30 Nos.	
2.	Microsoft Office Suite (preferably MS Office 2016 or later) including: <ul style="list-style-type: none"><li>MS Word (for document preparation and mail merge)</li><li>MS Excel (for mark sheet creation, formulas, functions, and charts).</li><li>MS PowerPoint (for presentations with animations and timers).</li><li>MS Access (for database creation, data manipulation, and report generation).</li><li>Email Client (e.g., Outlook or any configured email system) for sending mail merge outputs.</li></ul>											30 Nos.	
3.	Turbo C software or any standard C Compiler (e.g., GCC, Code Blocks)											30 Nos.	

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24MEP16	ENGINEERING GRAPHICS LABORATORY	Category	L	T	P	SL	C
		ESC	15	0	30	15	2

**(Common to BME, CSE, CSE(CS), CSD, CSE(IoT), IT, ECE, EEE)**

#### PREREQUISITE

Engineering Graphics Laboratory requires a good understanding of geometry. This includes knowledge of shapes, angles, dimensions, and spatial reasoning. The ability to visualize and interpret three-dimensional objects from two-dimensional drawings is crucial.

#### OBJECTIVES:

Instruct the utility of drafting & modeling packages in orthographic and isometric drawings and train the usage of 2D and 3D modeling

#### List of Exercise/Experiments:

1. Study of drawing tools, commands and coordinate systems in 2D software.
2. Cycloid and Conic curves.
3. Orthographic projections of pictorial views.
4. Orthographic views of straight lines.
5. Orthographic views of planes.
6. Orthographic views of simple solids.
7. The sectional view and the true shape of simple solids.
8. Development of lateral surfaces of simple solids.
9. Isometric projection of simple solids.
10. Drafting the 2D multi-view drawings from 3D model.

#### LIST OF EQUIPMENT (for a batch of 30 Students)

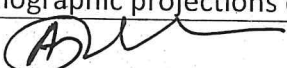
S.No.	Name of the Equipment	Quantity
1.	Intel i3 Processor, 8 GB RAM with 2 GB Graphics Card	30 Nos
2.	Licensed software for drafting and modeling	30 Nos

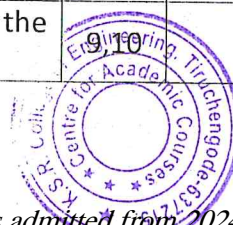
**L:15 P:30 SL:15 TOTAL: 60 PERIODS**

#### COURSE OUTCOMES:

At the end of the course, the students will be able to:

COs	Course Outcome	Exp. No.	Cognitive Level
CO1	Explain the fundamentals of engineering drawing and AutoCAD tool.	1	Understand
CO2	Construct projections of points, lines, and planes, then develop a virtual drawing using AutoCAD tool.	2,3 & 4	Apply
CO3	Apply projection principles to convert pictorial views into orthographic drawings	5,6	Apply
CO4	Model the Solid Projections and Sectioning of the solids by the AutoCAD tool.	7,8	Apply
CO5	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	9,10	Apply

  
A. S. Nairman (BOS)





**REFERENCES:**

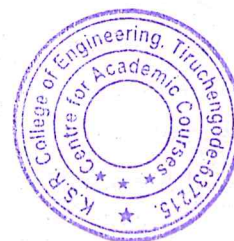
1. Bhatt. N. D., Engineering Drawing, Charotar Publishing House, Fifty Third Edition, 2014.
2. Basant Agarwal and Agarwal. C. M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, 2018.

**Mapping of COs with POs and PSOs**

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

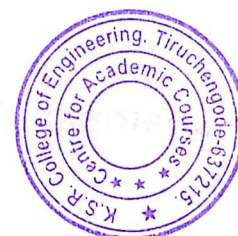
1-low, 2-medium, 3-high

  
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24GEP16	ENGINEERING EXPERIENCE LABORATORY	Category	L	T	P	SL	C
		ESC	0	0	30	0	1
(Common to BME, CSE, CSE(CS), CSD, CSE(IoT), ECE, EEE, IT)							
<b>PREREQUISITE:</b> A solid foundation in basic electrical components such as switches, wires, fuses, and light bulbs, including the roles of line, neutral, and ground wires. Basic understanding of physics and core principles of electrical and mechanical engineering.							
<b>OBJECTIVE:</b> To develop practical skills in basic electrical wiring, electronic interfacing with Arduino and IoT, and fundamental mechanical tools and systems.							
<b>LIST OF EXPERIMENTS</b>							
<b>GROUP - A (ELECTRICAL)</b>							
1. Fluorescent lamp wiring. 2. Stair-case wiring. 3. Residential house wiring using switches, fuse, indicator and lamp. 4. Measurement of Energy in single phase system.							
<b>GROUP - B (ELECTRONICS)</b>							
1. Study of Electronic Components, Instruments, Internet of Things (IoT) and Arduino IDE. 2. Controlling the Light Emitting Diode (LED) with a push button using Arduino. 3. Interfacing of a Sensor (Ultrasonic, Rain, Voltage, Current & PIR) with Arduino Uno. 4. Controlling of LED through Wi-Fi using ESP8266.							
<b>GROUP - C (MECHANICAL)</b>							
1. Study of plumbing line sketches for water supply and carpentry tools. 2. Study of welding tools and centrifugal pump.							
<b>COURSE OUTCOMES:</b>							
At the end of the course, the students will be able to:							
COs	Course Outcome					Bloom's Taxonomy Level	
CO1	Construct different types of wiring used in residential houses.					Apply	
CO2	Measure the energy in single-phase system.					Apply	
CO3	Demonstrate different electronic components, instruments, IoT and Arduino IDE.					Apply	
CO4	Construct the control circuit with the help of Arduino and sensors.					Apply	
CO5	Describe the plumbing, carpentry, welding components and centrifugal pump works for engineering practices and applications.					Understand	

  
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**REFERENCES:**

1. Gupta J.P., "A Course in Electrical Installation Estimating and Costing", S.K. Kataria and Sons, Delhi, Reprint 2013 Edition, 2013.
2. Mike Cheich, "Arduino Book for Beginners", Programming Electronics Academy, 2021.

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

**LIST OF EQUIPMENT (For a Batch of 30 Students)**

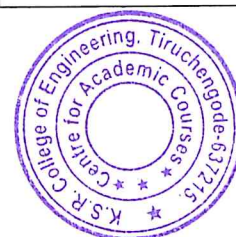
S.No.	Name of the Equipment	Qty.
1.	Single-phase house wiring setup	2 Nos.
2.	Staircase wiring setup	2 Nos.
3.	Fluorescent lamp wiring setup	2 Nos.
4.	Energy Meter	5 Nos.
5.	Electrical Measuring Instruments	10 Nos.
6.	Ultrasonic Sensor	5 Nos.
7.	Rain Sensor	5 Nos.
8.	Voltage Sensor	5 Nos.
9.	Current Sensor	5 Nos.
10.	PIR Sensor	5 Nos.
11.	ESP8266 & Cable	15 Nos.
12.	Arduino UNO & Cable	15 Nos.
13.	DHT 11	5 Nos.
14.	Temperature sensor	5 Nos.
15.	Red LED	15 Nos.
16.	2-leg push Button	15 Nos.
17.	4-leg push Button	15 Nos.
18.	Personal Computer	15 Nos.

  
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24SSP19	APTITUDE AND CODING SKILLS – I	Category	L	T	P	SL	C
		EEC	0	0	30	0	1
(Common to All Branches)							
<b>OBJECTIVES:</b> The course aims to introduce students to the fundamentals of aptitude, highlighting its importance and real-world applications. It is designed to build proficiency in verbal reasoning, thereby enhancing analytical and problem-solving skills. The curriculum also focuses on developing a strong foundation in English grammar, essential for effective communication.							
UNIT - I	BASIC OF NUMBER SYSTEMS & FOUNDATION						(6)
Introduction to Number System and its Classification - Divisibility Rules and Problems –Place Value & Face Value - HCF & LCM and its properties.							
UNIT - II	BASICS OF SHARE BASED CONCEPTS						(6)
Introduction to Average – Basics of Ratio and proportion – Basics of Partnership–Introduction to Percentage							
UNIT - III	LOGICAL REASONING						(4)
Analogies - Alpha and numeric series - Number Series - Coding and Decoding - Direction and distance							
UNIT - IV	VERBAL ABILITY						(7)
Introduction to Grammar – Tenses – Parts of Speech – Preposition – Articles – Modal Verbs							
UNIT - V	C PROGRAMMING						(7)
C Basics-Control Statements Decision making – Functions – Arrays & Strings – Pointers - User Defined Data Types - Storage Classes - Memory Management - Preprocessor.							
TOTAL: 30 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Explain the classification of number systems, apply divisibility rules to identify number properties						Understand
CO2	Apply the concepts of averages, ratios, and proportions to solve real-life problems and interpret data effectively.						Apply
CO3	Solve number series problems by identifying and applying suitable numerical patterns or rules.						Apply
CO4	Apply the rules of grammar to enhance written and spoken communication.						Apply
CO5	Apply the fundamental concepts of C programming to develop efficient and structured programs.						Apply

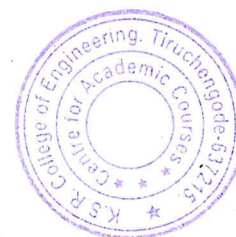
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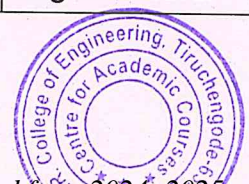
<b>TEXT BOOKS:</b> <ol style="list-style-type: none"> <li>1. R S Aggarwal, Quantitative Aptitude for Competitive Examinations.</li> <li>2. R.S. Aggarwal, A Modern Approach to Verbal &amp; Non-Verbal Reasoning</li> <li>3. Wren &amp; Martin, High School English Grammar &amp; Composition</li> <li>4. Brian W. Kernighan and Dennis Ritchie, The C Programming Language 2e, Pearson Education, 2015.</li> <li>5. Yashavant Kanetkar, The C Programming Language 2e, BPB publications, 15<sup>th</sup> Edition, 2016</li> </ol>													
<b>REFERENCES:</b> <ol style="list-style-type: none"> <li>1. <a href="https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm">https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm</a></li> <li>2. Stephen G. Kochana, Programming in C, 3<sup>rd</sup> Edition.</li> <li>3. K. N. King, C Programming: A Modern Approach, 2e, 2008.</li> <li>4. Aaron M. Tenenbaum, Yedidiah Langsam, and Moshe J. Augenstein, Data Structures Using C, Pearson Education India, 1990.</li> <li>5. Robert L. Kruse and Bruce P. Leung, Data Structures and Program Design in C, Pearson Education 2007.</li> <li>6. <a href="https://www.geeksforgeeks.org/c-programming-language/">https://www.geeksforgeeks.org/c-programming-language/</a></li> <li>7. <a href="https://www.geeksforgeeks.org/data-structures/">https://www.geeksforgeeks.org/data-structures/</a></li> </ol>													
<b>Mapping of COs with POs and PSOs</b>													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	3	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	3	2	-	2	-	-	2	-	-	3	-	-
Avg.	3	3	3	-	2	-	-	2	-	-	3	-	-

  
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24CST29	PYTHON PROGRAMMING	Category	L	T	P	SL	C
		ESC	45	0	0	45	3
(Common to All Branches)							
<b>PREREQUISITE:</b> A basic understanding of programming principles such as variables and loops, paired with good problem-solving abilities is required. Logical thinking and analytical skills are critical for effective programming.							
<b>OBJECTIVES:</b> To provide a comprehensive foundation in Python programming, covering core concepts, data structures, OOP principles, file and database handling as well as web and GUI development using frameworks like Django and Tkinter.							
UNIT – I	FUNDAMENTALS OF PYTHON						(9)
Introduction to Python – Advantages of Python programming – Variables and Data types – Comments – Indentation– I/O function – Operators – Selection control structures – Looping control structures – Functions: Declaration – Types of arguments – Anonymous functions: Lambda.							
UNIT – II	HANDLING STRINGS AND EXCEPTIONS						(9)
Strings – List – Tuples – Dictionaries– Sets – Exception Handling: Built-in Exceptions – User-defined exception – Modules and Packages.							
UNIT – III	OBJECT ORIENTED PROGRAMMING CONCEPTS						(9)
Object Oriented Programming basics –Inheritance and Polymorphism – Operator Overloading and Overriding – Get and Set Attribute Values – Name Mangling – Duck Typing – Relationships.							
UNIT– IV	FILES AND DATABASES						(9)
File I/O operations – Directory Operations – Reading and Writing in Structured Files: CSV and JSON – Data manipulation using MySQL.							
UNIT – V	WEB PROGRAMING AND GUI USING PYTHON						(9)
Frameworks: Introduction to Django – Django CRUD– Socket Programming– Sending email –UI design: Tkinter – Events– CGI: Introduction to CGI Programming, GET and POST Methods.							
L=45,T=0, P=0,SL=45,TOTAL: 90 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level

  
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CO1	Describe Python syntax to write code using data types, operators, loops and conditionals.	Understand
CO2	Interpret string manipulation, data structures and exception handling to build robust applications.	Understand
CO3	Implement object-oriented programming principles including inheritance and polymorphism to design effective solutions.	Apply
CO4	Apply file I/O operations and database management techniques to efficiently manage and manipulate data.	Apply
CO5	Develop web applications and graphical user interfaces using Python frameworks and libraries.	Apply

**TEXT BOOKS:**

1. Yashwant Kanetkar, Aditya Kanetkar, "Let Us Python", BPB Publications, 5th Edition, 2023.
2. Wesley J.Chun, "Core Python Programming", Pearson Education, 2nd Edition, 2017.

**REFERENCES:**

1. Robert Oliver, "Python Quick Start Guide: The Simplified Beginner's Guide to Python Programming Using Hands-On Projects and Real-World Applications", Clyde Bank Media LLC, 1st Edition, 2023
2. Allen B. Downey, "Think Python", O'Reilly Media, 2nd Edition, 2016.
3. David Beazley, Brian K. Jones, "Python Cookbook", O'Reilly Media, 3rd Edition, 2013
4. Mark Lutz, "Python Pocket Reference", O'Reilly Media, 5th Edition, 2014
5. [www.python.org](http://www.python.org)
6. [https://onlinecourses.swayam2.ac.in/cec22\\_cs20/preview](https://onlinecourses.swayam2.ac.in/cec22_cs20/preview)

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO2
CO1	3	2	-	-	-	-	-	1	1	-	2	3	2
CO2	3	2	-	-	-	-	-	1	1	-	2	3	2
CO3	3	3	2	-	-	-	-	1	1	-	2	3	2
CO4	3	3	2	-	-	-	-	1	1	-	2	3	2
CO5	3	3	2	-	-	-	-	1	1	-	2	3	2

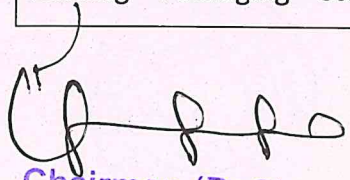
1-low, 2-medium, 3-high

  
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24CST21	DESIGN THINKING	Category	L	T	P	SL	C
		PCC	30	0	0	30	2
(COMMON TO CSE,CSE(CS),CSE(IOT),CSD and IT)							
<b>PRE-REQUISITE</b> Students are expected to have an empathetic mindset to help them understand users, a curious mindset to explore and questions assumptions, a collaborative mindset for interdisciplinary teamwork, an iterative approach for refining ideas and creativity to generate innovative solutions							
<b>OBJECTIVES</b> To equip students with knowledge and skills in Design Thinking by introducing its fundamental principles and guiding them through the stages of Feel, Define, Divergence and Convergence and Communication using practical tools and case studies to encourage creative problem solving and user centered innovation							
UNIT - I	FUNDAMENTALS OF DESIGN THINKING					(6)	
What is Design Thinking? – When to use Design Thinking? – How to do it? – Who are involved in this? – Design The Thinking – Personal Visualization, The Wheel of Life & Balancing Priorities – Appreciating ‘Design’ – The 3 Laws of Design Thinking.							
UNIT - II	STEP 1: THE ‘FEEL’ STAGE					(6)	
What is this stage about? – What role does a Design Thinker play in this stage? Tools – What is the purpose in this stage? – Persona – Journey Mapping – Stakeholder Mapping & CATWOE Analysis – Cartographic Perspective (LO) – Empathy Map – Case Study: Understanding the Stakeholders.							
UNIT - III	STEP 2: THE ‘DEFINE’ STAGE					(6)	
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Five-Whys – Anti-Pattern – Paraphrasing the Problem – Challenge Mapping – LORD: Definitive skill set for a Design Thinker – Case Study: Relooking at the Problem.							
UNIT - IV	STEP 3: THE ‘DIVERGENCE’ & ‘CONVERGENCE’ STAGE					(6)	
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Brainstorming – Metaphor – Random Association Technique – End-State Visualization – 10gm-100gm-1000gm – Prototyping – Wire framing for digital products – Case Study: Prototyping and Communicating for Effective Outcome.							
UNIT - V	STEP 5: THE ‘COMMUNICATION’ STAGE					(6)	
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – The 4Cs Framework – Naming – Packaging – Story boarding – Presentation – Distribution.							



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L=30,T=0,P=0, TOTAL: 30 PERIODS

**COURSE OUTCOMES:**

At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Summarize the key principles of design thinking and their relevance to real-world problem contexts.	Understand
CO2	Interpret the significance of a design mindset in fostering creativity and innovation.	Understand
CO3	Apply design thinking methods effectively at each stage of the problem-solving process.	Apply
CO4	Implement the phases of design thinking to address complex challenges systematically.	Apply
CO5	Execute design thinking techniques and tools to create, test, and refine potential solutions.	Apply

**TEXT BOOKS:**

1. UnMukt – The Science & Art of Design Thinking, Arun Jain
2. Don Norman, The Design of Everyday Things, MIT Press, 2013
3. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and inspires innovation, Harper Collins Publishers Ltd, New York, First Edition, 2009.

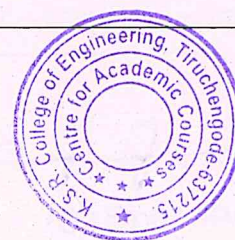
**REFERENCES:**

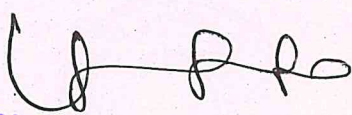
1. Chrisitan Mueller-Roterberg, Handbook of Design Thinking – Tips & Tools for how to design thinking, kindle Direct Publishing, First Edition, 2018.
2. Johnny Schneider, Understanding Design Thinking, Lean and Agile, O'Reilly Media, California, First Edition, 2017
3. Roger Martin, The Design of Business, Why Design Thinking is the next competitive advantage, Harvard Business Press, United States, First Edition, 2009.
4. Idris Mootee, Design Thinking for Strategic Innovation, John Wiley & Sons Inc, New Jersey, First Edition, 2013.

**Mapping of COs with POs and PSOs**

COs /	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	3	2	-	-	-	-	1	1	1	-	1	2	1
CO2	2	2	-	-	-	-	1	1	1	-	1	2	1
CO3	3	3	2	-	-	-	1	1	1	-	1	3	2
CO4	3	3	2	-	-	-	1	1	1	-	1	3	2
CO5	3	3	3	-	-	-	1	1	1	-	1	3	2

1-low, 2-medium, 3-high

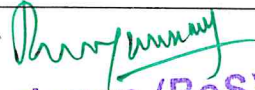


  
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24GET29	தமிழரும் தொழில் நுட்பமும்	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(அனைத்து துறைகளுக்கும் பொதுவானது)							
முன் கூட்டிய துறைசார் அறிவு : தேவை இல்லை							
அலகு - I	நெசவு மற்றும் பாணைத் தொழில்நுட்பம்					[03]	
சங்ககாலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் கருப்பு சிவப்பு பாண்டங்கள்-பாண்டகளில் கீறல் குறியீடுகள்							
அலகு - II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்					[03]	
சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும்-சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்-மாமல்லபுரச் சிற்பங்களும், கோவில்களும்-சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள்-நாயக்கர் காலக்கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன்ஆலயம் மற்றும் திருமலைநாயக்கர்மஹால் - செட்டிநாட்டுவீடுகள்-பிரிட்டிஷ்காலத்தில் சென்னை இந்தோ-சாரோசெனிக் கட்டிடக் கலை.							
அலகு - III	உற்பத்தித் தொழில்நுட்பம்					[03]	
கப்பல் கட்டும் கலை-உலோகவியல்-இரும்புத்தொழிற்சாலை-இரும்பை உருக்குதல், எஃகு-வரலாற்றுச்சான்றுகளாக செம்பு மற்றும் தங்கநாணயங்கள்-நாணயங்கள் அச்சடித்தல்-மணி உருவாக்கும் தொழிற்சாலைகள்-கல் மணிகள்-கண்ணாடி மணிகள்-சுடு மண்மணிகள்-சங்குமணிகள்-எலும்புத்துண்டுகள்-தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.							
அலகு - IV	வேளாண்மை மற்றும் நீர்ப் பாசனத் தொழில்நுட்பம்					[03]	
அணை, ஏரி, குளங்கள், மதகு-சோழர்காலகுமிழித்தாம்பின் முக்கியத்துவம்-கால்நடை பராமரிப்பு-கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்-வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள்-கடல்சார் அறிவு - மீன் வளம்-முத்து மற்றும் முத்துக் குளித்தல்-பெருங்கடல் குறித்த பண்டைய அறிவு-அறிவுசார் சமூகம்.							
அலகு - V	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்					[03]	
அறிவியல் தமிழின் வளர்ச்சி- கணினித்தமிழ் வளர்ச்சி-தமிழ் நூல்களை மின்பதிப்பு செய்தல்-தமிழ் மென் பொருட்கள் உருவாக்கம்-தமிழ் இணையக்கல்விக் கழகம்-தமிழ் மின்நூலகம்-இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.							
Total (L= 15, SL=15)=30 Periods							

பாடம் கற்றத்தின் விளைவுகள் : பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1	சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பாணைவனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்ந்தல்.	புரிதல்
CO2	சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளக்கும் தளங்கள் குறித்து அறிவு.	புரிதல்
CO3	சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு.	புரிதல்
CO4	சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு.	புரிதல்
CO5	நவீன அறிவியல் தமிழ் மற்றும் கணினி தமிழ் குறித்த புரிந்துகொள்ளலும் மற்றும் பயன்படுத்தலும்.	பகுப்பாய்வு

  
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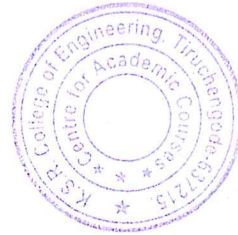


Text Books :	
1	தமிழகவரலாறு- மக்களும் பண்பாடும்- கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்)
2	கணினித்தமிழ் - முனைவர் இல. சுந்தரம் (விகடன் பிரசுரம்)
Reference Books :	
1	கீழடி- வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல் துறை வெளியீடு)
2	பொருறை - ஆற்றங்கரை நாகரிகம் ( தொல்லியல் துறை வெளியீடு)
3	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by : The Author)
4	Porunai Civilization (Jointly Published by: Department of Archaeology &Tamilnadu Textbook and Educational Services Corporation, Tamilnadu)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)													

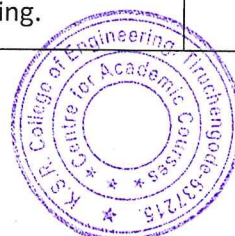
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24GET29	TAMILS AND TECHNOLOGY	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(Common to All Branches)							
Prerequisite(s): No prerequisites are needed for enrolling into the course							
UNIT - I	WEAVING AND CERAMIC TECHNOLOGY					[03]	
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.							
UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY					[03]	
Designing and Structural construction House & Designs in household materials during Sangam Age – Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram– Sculptures and Temples of Mamallapuram– Great Temples of Cholas and other worship places – Temples of Nayaka Period – Type study (Madurai Meenakshi Temple) – ThirumalaiNayakar Mahal –Chetti Nādu Houses, Indo –Saracenic architecture at Madras during British Period.							
UNIT - III	MANUFACTURING TECHNOLOGY					[03]	
Art of Ship Building – Metallurgical studies – Iron industry – Iron smelting, steel – Copper and gold – Coins as source of history – Minting of Coins – Beads making – industries Stone beads – Glass beads –Terracotta beads –Shell beads/ bone beats – Archeological evidences – Gem stone types described in Silappathikaram.							
UNIT - IV	AGRICULTURE AND IRRIGATION TECHNOLOGY					[03]	
Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry – Wells designed for cattle use – Agriculture and Agro Processing – Knowledge of Sea – Fisheries – Pearl – Conche diving – Ancient Knowledge of Ocean – Knowledge Specific Society.							
UNIT - V	SCIENTIFIC TAMIL & TAMIL COMPUTING					[03]	
Development of Scientific Tamil – Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.							
Total (L= 15, SL=15) =30 Periods							
Course Outcomes:						Cognitive Level	
At the end of the course, the student will be able to							
CO1	Understand the weaving and ceramic technology of ancient Tamil People nature.					Understand	
CO2	Comprehend the construction technology, building materials in sangam Period and case studies.					Understand	
CO3	Infer the metal process, coin and beads manufacturing with relevant archeological evidence					Understand	
CO4	Realize the agriculture methods, irrigation technology and pearl diving.					Understand	
CO5	Apply the knowledge of scientific Tamil and Tamil computing.					Apply	


*Chairman (BoS)*




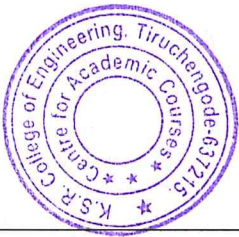


Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
Reference Books:	
1	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
2	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies).
3	Keeladi – ‘Sangam City Civilization on the banks of river Vaigai; (Jointly Published by: Department of Archaeology &Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (dr.K.K.Pillay) (Published by: The Author)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	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	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)													

  
Chairman (BoS)



24MAI29	PROBABILITY AND STATISTICS	Category	L	T	P	SL	C
		BSC	30	15	30	45	4
SEMESTER II - B.E / B.TECH ( Common to All Branches )							
PREREQUISITE:							
A basic understanding of algebra, calculus, and introductory statistics is required to grasp the concepts of probability, hypothesis testing, and statistical methods used in engineering and quality control.							
OBJECTIVES:							
To build a foundational understanding of probability and random variables, enable the application of two-dimensional random variables in engineering contexts, develop the ability to perform hypothesis testing for both small and large samples, introduce the principles of experimental design in agricultural studies, and provide knowledge of statistical quality control techniques.							
UNIT - I	ONE DIMESIONAL RANDOM VARIABLES					(9)	
One dimensional Random Variable - Discrete and continuous random Variables -Expectations - Moment generating functions and their properties - Binomial, Poisson, Uniform and Normal distributions.							
UNIT - II	TWO - DIMENSIONAL RANDOM VARIABLES					(9)	
Joint distributions – Marginal and conditional distributions – Covariance – Karl Pearson's Coefficient of Correlation - Spearman's Rank Correlation - Regression Analysis.							
UNIT - III	TESTING OF HYPOTHESIS					(9)	
One sample and two sample test for means of large samples (Z- test), One sample and two sample test for means of small samples (t-test), Chi-square - Independent of Attributes - F test for equality of variances.							
UNIT - IV	DESIGN OF EXPERIMENTS					(9)	
Analysis of variance - One way and two way classifications - Completely Randomized Design - Randomized Block Design - Latin Square Design.							
UNIT - V	STATISTICAL QUALITY CONTROL					(9)	
Control charts for measurements ( $\bar{X}$ and R charts) – Control charts for C and P charts – Acceptance sampling for construction of an OC curve.							
List of Exercise/Experiments (R Software):							
<div><div>1. Determine the probability by using binomial distribution.</div><div>2. Find the probability with the help of normal distribution.</div><div>3. Determine the correlation co-efficient between X and Y.</div><div>4. Calculate and plot the regression lines.</div><div>5. Test the significance of difference between experimental and theoretical values of the data by using chi-square test.</div><div>6. Examine the small samples using F distribution.</div><div>7. Analyze the data using Randomized Block Design (RBD).</div><div>8. Inspect the data using Latin Square Design (LSD).</div><div>9. Find the <math>\bar{X}</math> and R charts.</div><div>10. Compute c and p charts.</div></div>							
<div><div></div><div><div></div><div>L = 30 , T = 15 &amp; P = 30 &amp; SL = 45, TOTAL: 120 PERIODS</div></div></div>							

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**COURSE OUTCOMES:**

At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Apply the concepts of one dimensional random variables to compute expectations and analyze the standard distributions.	Apply
CO2	Apply statistical methods to compute marginal and conditional distributions, and perform correlation and regression analysis.	Apply
CO3	Apply Z-test, t-test, Chi-square test, and F-test to analyze sample data and draw inferences on independence of attributes.	Apply
CO4	Apply analysis of variance techniques for one-way and two-way classifications, and implement experimental designs using CRD, RBD and LSD.	Apply
CO5	Construct control charts for measurements Mean and Range charts and attributes charts to assess process control and product quality.	Apply

**TEXT BOOKS:**

1. S.P. Gupta, "Statistical Methods", Sulthan Chand & Sons, 46<sup>th</sup> Edition ,2021.
2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4<sup>th</sup> edition, 2007.

**REFERENCES:**

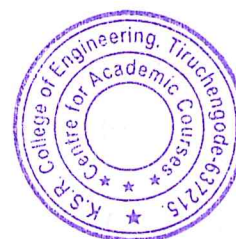
1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8<sup>th</sup> Edition, 2014.
2. Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004.
3. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 9<sup>th</sup> Edition, 2010.
4. R.C.Gupta, "Statistical Quality Controls", Khanna Publishers, Delhi, 8<sup>th</sup> Edition , 2008.

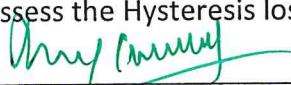
**Mapping of COs with POs and PSOs**

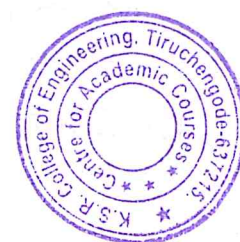
COs/ POs	PO1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	1	-	-	2	-	-
CO2	3	3	3	3	2	-	-	1	-	-	2	-	-
CO3	3	3	3	3	2	-	-	1	-	-	2	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-
Avg.	3	3	3	3	2	-	-	1	-	-	2	-	-

1-low, 2-medium, 3-high

*[Signature]*  
Chairman (BoS)



24PHI07	ENGINEERING PHYSICS	Category	L	T	P	SL	C
		BSc	45	-	30	45	4
(Common to AIDS, BME,CSE,CSE(IoT),CS,ECE,EEE &IT)							
<b>PREREQUISITE:</b> The students must have knowledge about basic concepts of light sources, dual nature of radiation, conductivity of metals, semiconducting materials, different types of magnetic materials, super conducting materials and their applications.							
<b>OBJECTIVES:</b> To provide a comprehensive understanding of the fundamental principles, mechanisms, applications of lasers, fiber optics, quantum physics, semiconductors, magnetic materials and superconductors in modern Science and technology.							
UNIT – I	LASER AND FIBRE OPTICS						( 9 )
<b>Lasers:</b> Principles of spontaneous emission and stimulated emission - Einstein's co-efficient A & B- population inversion – CO <sub>2</sub> laser – semiconductor diode laser – homo – junction & hetero – junction (qualitative analysis only) – applications. <b>Fibre Optics:</b> propagation of light in optical fibre– numerical aperture and acceptance angle – types of optical fibre (materials, refractive index profile and modes of propagation) – applications -fibre optic sensors: pressure and displacement sensors.							
UNIT – II	QUANTUM MECHANICS						( 9 )
Introduction – black body radiation– Planck's theory (derivation) – deduction of Wien's displacement law and Rayleigh – Jean's Law from Planck's theory– Compton effect (derivation) – de-Broglie concept of matter waves – physical significance of a wave function – Schrödinger wave equations (Time dependent & time independent) – particle in a box (one dimensional).							
UNIT – III	CONDUCTING MATERIALS						( 9 )
Classical free electron theory – expression for electrical conductivity – thermal conductivity – Wiedemann-Franz law – drawbacks of classical free electron theory – quantum theory – Fermi energy – Fermi -Dirac distribution function – density of states and carrier concentration of metals.							
UNIT – IV	SEMICONDUCTING MATERIALS						( 9 )
Introduction – Intrinsic semiconductor: carrier concentration in an intrinsic semiconductor– Fermi level of an intrinsic semiconductor– variation of Fermi energy level with temperature – Extrinsic semiconductors: carrier concentration in n– type and p-type semiconductors (qualitative analysis only)– Fermi level of extrinsic semiconductors– variation of Fermi energy level with temperature and carrier concentration in an extrinsic semiconductors – Hall effect – determination of Hall co-efficient for n – and p – type semiconductors– applications.							
UNIT – V	MAGNETIC AND SUPERCONDUCTING MATERIALS						( 9 )
<b>Magnetic Materials:</b> Introduction – origin of magnetic moment – dia, para and ferromagnetic materials– domain theory of ferro-magnetism – Hysteresis – soft and hard magnetic materials. <b>Superconducting Materials:</b> Introduction to superconductivity – properties and types of superconductor – application of superconductors: magnetic levitation– SQUIDS– cryotron.							
<b>List of exercises/experiments:</b> 1. Determine the thickness of the given thin paper using Air wedge method. 2. Find the acceptance angle and numerical aperture of a given optical fibre. 3. Evaluate the wavelength of semiconductor laser. 4. Estimate the particle size of the lycopodium powder using semiconductor laser 5. Enumerate the thermal conductivity of a bad conductor by Lee's disc method. 6. Compute the band gap of an intrinsic semiconductor. 7. Calculate the width of the CD groove with a help of semiconductor laser. 8. Assess the Hysteresis loss of magnetic materials using B-H curve.							
 R.V.M. RANGARAJAN CHAIRMAN							
Lecture: 45, Laboratory: 30, SL:45, TOTAL: 120 PERIODS							



D. R.V.M. RANGARAJAN  
CHAIRMAN

Lecture: 45, Laboratory: 30, SL:45, TOTAL: 120 PERIODS



**Course Outcomes:****At the end of the course, the students will be able to:**

COs	Course Outcome	Cognitive level
CO1	Elucidate laser principles, types, light propagation and the applications of optical fibers.	Understand
CO2	Apply quantum theory for Planck's theory, Compton Effect and Schrödinger's equation of matter waves.	Apply
CO3	Calculate electrical conductivity and Fermi energy by considering quantum free electron theory.	Apply
CO4	Infer charge carrier behavior in intrinsic, extrinsic semiconductors and Hall effect.	Understand
CO5	Describe principles, classifications, applications of magnetic materials and superconductors.	Understand

**Text Books :**

1. M.N. Avadhanulu and P.G. Kshirsagar, "A text book of Engineering Physics", S. Chand and Company, New Delhi, 11<sup>th</sup> Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7<sup>th</sup> Edition, 2014.

**Reference Books :**

1. R. Murugesan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand & Company, New Delhi, 17<sup>th</sup> Edition, 2014.
2. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 1<sup>st</sup> Edition, 2011.
3. S.O. Pillai, "Solid State Physics", New Age Publication, Chennai, 10<sup>th</sup> Edition, 2023.
4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill, New Delhi, 7<sup>th</sup> Edition, 2015.

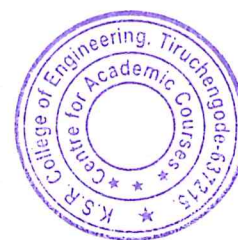
**Mapping of COs with POs and PSOs**

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

1-low, 2-medium, 3-high



BoS chairman

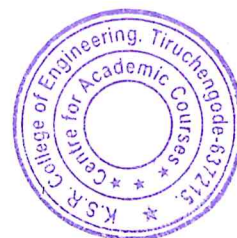
**Chairman (BoS)**

24PHI07 - ENGINEERING PHYSICS  
I Year B.E (AIDS, BME, CSE, CSE (IOT), CS, ECE, EEE & B.Tech IT)  
Requirements for a batch of 30 students  
Regulation (2024)

S.No.	Description of Equipment	Quantity required
1.	Air wedge apparatus. (with traveling microscope and accessories)	5 Nos
2.	Acceptance angle and numerical aperture of an optical fibre. (with accessories)	5 Nos
3.	Wavelength of semiconductor laser beam. ( with accessories)	5 Nos
4.	Particle size of Lycopodium powder. (with accessories)	5 Nos
5.	Lee's disc apparatus. (with accessories)	5 Nos
6.	Band gap apparatus. (with accessories)	5 Nos
7.	Width of the groove of CD using laser. (with accessories)	5 Nos
8.	B-H curve apparatus. (with accessories)	5 Nos

BoS chairman

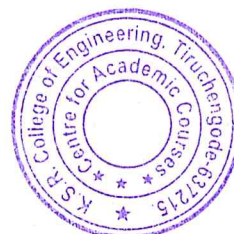
**Chairman (BoS)**





24ECI26	DIGITAL PRINCIPLES AND SYSTEM DESIGN	Category	L	T	P	SL	C	
		PCC	45	0	30	45	4	
<b>PREREQUISITE:</b> Students should have basic knowledge on binary numbers, logic gates, algebra and discrete mathematics.								
<b>OBJECTIVE:</b> This course provides a comprehensive understanding of digital logic design, covering number systems, Boolean algebra, combinational and sequential circuits, and processor architecture. It equips students with the skills to design and analyze digital systems using logic gates, Karnaugh maps, and Hardware Description Languages (HDL).								
UNIT - I	BOOLEAN ALGEBRA AND LOGIC GATES						(9)	
Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates.								
UNIT - II	COMBINATIONAL LOGIC						(9)	
Combinational Circuits – Analysis and Design Procedures – Adder and Subtractor – Magnitude Comparator – Code Converters – Decoders and Encoders – Multiplexers and Demultiplexers.								
UNIT - III	SYNCHRONOUS SEQUENTIAL LOGIC						(9)	
Sequential Circuits – Latches and Flip Flops – Analysis and Design Procedures – State Reduction and State. Assignment – Shift Registers – Counters.								
UNIT - IV	PROCESSOR DESIGN						(9)	
Processor Organization – Design of ALU: Arithmetic Circuits – Logic Circuits – Arithmetic Logic Unit – Status Register – Design of Shifter – Processor Unit.								
UNIT - V	SIMPLE COMPUTER DESIGN AND HDL						(9)	
Inter Register Transfer – Conditional Control Statements – Instruction Codes – Design of a Simple Computer – Hardware Description Language (HDL) for Combinational Circuits and Sequential Logic Circuits								
<b>List of Experiments:</b> 1. Verification of Boolean theorems using logic gates. 2. Design and implementation of combinational circuits using logic gates for arbitrary functions, Code Converters. 3. Design and implementation of combinational circuits using MSI devices: a) 4 - bit binary adder / subtractor b) Parity generator / checker c) Multiplexers and De-Multiplexers 4. Design and implementation of sequential circuits: a) Shift-registers b) Synchronous counter 5. HDL Models for combinational / sequential circuits.								
TOTAL(T:45, P:30, SL:45) : 120 PERIODS								
<b>COURSE OUTCOMES:</b> <b>At the end of the course, the learners will be able to:</b>								
COs	Course Outcome						Exp. No	Cognitive Level
CO1	Apply Boolean theorems and techniques, Karnaugh Map and Tabulation method for simplifying Boolean functions.						1	Apply
CO2	Develop skills to design and analyze combinational logic circuits, including adders, subtractors, and multiplexers.						2,3	Apply
CO3	Design synchronous sequential circuits using latches, flip-flops						4	Apply
CO4	Design processors which include arithmetic and logic circuits.						4	Apply

*C. Guntur*  
Chairman (BoS)

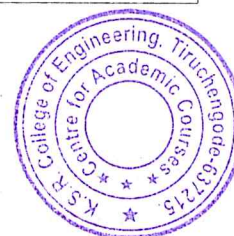


CO5	Design simple computer architectures and implement using HDL for both combinational and sequential logic circuits										5	Apply	
TEXT BOOKS:													
1. Morris Mano, M., “Digital Logic and Computer Design”, Prentice-hall of India private limited, First Edition, 2016.													
2. John F. Wakerly, “Digital Design Principles and Practices”, Pearson Education, Fourth Edition, 2008.													
REFERENCES:													
1. Charles H. Roth Jr, “Fundamentals of Logic Design”, Jaico Publishing House, Fifth Edition, 2003.													
2. Kharate, G.K., “Digital Electronics”, Oxford University Press, First Edition, 2012.													
3. Morris Mano, M., and Michael D. Ciletti, “Digital Design”, Pearson Education, Fifth Edition, 2013.													
4. Donald D. Givone, “Digital Principles and Design”, Tata Mcgraw Hill, First Edition, 2003.													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	1	2	-	-	3	-	-
CO2	3	3	2	-	2	-	1	2	-	-	3	-	-
CO3	3	3	2	-	2	-	1	2	-	-	3	-	-
CO4	3	3	2	-	2	-	1	2	-	-	3	-	-
CO5	3	3	2	-	3	-	1	2	-	-	3	-	-

**LIST OF EQUIPMENT (For a batch of 30 students)**

Sl.No.	Name of the Equipment	Qty
1	Digital IC Tester	2
2	Digital IC Trainer Kit	15
3	Dual/Single Mode Power Supply	15
4	Digital Multimeter	5
5	Computer with HDL Simulation Software	5
6	IC7400	50
7	IC7404	50
8	IC7402	50
9	IC7408	50
10	IC7411	50
11	IC7432	50
12	IC7483	50
13	IC7485	50
14	IC7486	50
15	IC7474	50
16	IC7476	50
17	IC7447	50
18	Bread Board	20
19	Wires	Sufficient Quantity

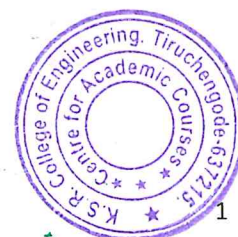
*C. Gunt*  
Chairman (BoS)





24ENP29	PROFESSIONAL COMMUNICATION LABORATORY	Category	L	T	P	SL	C
		HSMC	0	0	30	0	1
(Common to All Branches)							
<b>OBJECTIVE:</b> To enhance learners' proficiency in listening, speaking, reading, and writing through structured activities and professional communication practices relevant to academic and workplace settings.							
UNIT - I	VERBAL AND CRITICAL REASONING						(6)
<b>Syllogism</b> – Drawing conclusions from given logical statements, <b>Assertion and Reason</b> – Judging the link between a claim and its reason, <b>Verbal Analogies</b> – Completing word pairs based on relationships, <b>Statement and Assumption</b> – Identifying hidden assumptions in statements, <b>Statement and Conclusion</b> – Choosing valid conclusions from given data, <b>Critical Reasoning</b> – Evaluating arguments for logic and consistency.							
UNIT - II	LISTENING						(6)
<b>Listening to Announcement</b> – Understanding key details and context from public messages, <b>Short Conversation</b> – Extracting specific information from brief dialogues, <b>Motivational Speech</b> – Grasping main ideas, tone, and speaker's intent, <b>Telephone Conversation</b> – Comprehending spoken exchanges over the phone.							
UNIT - III	SPEAKING						(6)
<b>Talking about Oneself</b> – Sharing personal details clearly and confidently, <b>Oral-presentation on a General Topic</b> – Presenting ideas briefly with clarity and structure, <b>Group Discussion on Current Affairs</b> – Expressing and support opinions in group settings, <b>Role Play</b> – Performing situational conversations using appropriate language, <b>Mock &amp; HR Interview</b> – Answering common interview questions with clarity and confidence.							
UNIT - IV	READING						(6)
<b>Reading Short Texts</b> – Understanding the main message and key ideas, <b>Reading for General and Specific Information</b> – Locating relevant details in various texts, <b>Case Studies on Problem Solving</b> – Analyzing real-life scenarios to identify issues and solutions.							
UNIT - V	WRITING						(6)
<b>Written communication: Letters (Apology &amp; Complaint)</b> – Writing formal letters using appropriate tone and structure, <b>E-mails (Appreciation &amp; Permission)</b> – Composing clear and courteous emails, <b>Technical Report</b> – Using standard format for preparing structured technical report, <b>Agenda / Minutes</b> – Preparing format for meeting agendas and recording minutes.							
TOTAL (P:30) = 30 PERIODS							

*Shiny Mary*  
**Chairman (BoS)**



**List of Experiments:**

1. Syllogism, Assertion & Reason and Verbal Analogies
2. Statement & Assumption, Statement & Conclusion and Critical Reasoning
3. Listening: Announcement and Short Conversation
4. Listening: Motivational Speech and Telephone Conversation
5. Speaking: Taking about oneself, Mock & HR Interview and Mini-presentation
6. Speaking: Group Discussion and Role Play
7. Reading: Multiple Choice & Fill in the Blanks
8. Reading: Analyzing Case Studies on Problem Solving
9. Writing: Complaint/Apology Letter and Appreciation/Permission Email
10. Writing: Format of Technical Report and Format of Agenda/Minutes

**COURSE OUTCOMES:**

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

COs	Description	Ex. No.	Cognitive Level
CO1	Comprehend assumptions and draw conclusions from verbal reasoning tasks.	1 & 2	Understand
CO2	Understand spoken texts to identify key points and the speaker's intent.	3 & 4	Understand
CO3	Use appropriate language and tone in personal, group, and interview conversations.	5 & 6	Understand
CO4	Recognize main ideas and supporting points in short texts and case studies.	7 & 8	Understand
CO5	Draft formal letters, emails, reports, and meeting notes in the correct format.	9 & 10	Understand

**TEXT BOOKS:**

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, Pearson India, 2010.
2. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2018.

**REFERENCES:**

1. Jack C Richards, Interchange, Cambridge University Press, 2022.
2. RS Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S Chand, 2024.

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

1-Low, 2-Medium, 3-High

*Manoj Kumar*  
Chairman (BoS)

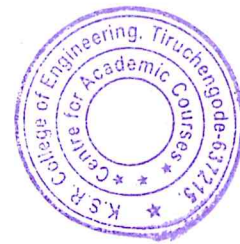




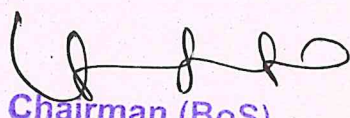
## Lab Requirement for a batch of 30 Students

Sl. No.	Description of Equipment / Software	Quantity required
1.	Server	1
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
2.	Client Systems	30
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
3.	Software	1
	a) Interactive Teacher control software	
	b) English Language Lab Software	
	c) Career Lab Software	

*Murugan*  
Chairman (BoS)



24CSP29	PYTHON PROGRAMMING LABORATORY	Category	L	T	P	SL	C
		ESC	0	0	30	0	1
(Common to All Branches)							
<b>PREREQUISITE:</b> Students must have basic knowledge on programming principles, such as variables, simple data types, control structures, problem solving and logical thinking skills.							
<b>OBJECTIVES:</b> To develop programming skills in Python by performing string operations using functions for mathematical problem-solving, applying conditionals and loops, exploring sets and dictionaries for data handling and gaining foundational knowledge in polymorphism, exception handling, GUI design and web development.							
<b>List of Exercise/Experiments:</b> <div><div>1. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)</div><div>2. Implementing programs using Functions (GCD of two numbers, Factorial)</div><div>3. Scientific problems using conditional statements and loops. (Largest among three numbers, Number series, Number Patterns)</div><div>4. Implementing real-time applications using Sets, Dictionaries (Sorting, Searching, Remove Duplicates)</div><div>5. Implementing real-time/technical applications using Lists, Tuples. (Swapping two elements, Reversing a List / Sorting Tuples)</div><div>6. Create a Python program to demonstrate polymorphism with inheritance. (Single, Multilevel Inheritance, Hierarchical)</div><div>7. Implement a simple calendar in python program without using the calendar module using string array or list.</div><div>8. Write a program to demonstrate the user-defined exception handling mechanism in Python.</div><div>9. Design and implement a graphical user interface to perform any arithmetic operation.</div><div>10. Implementing a web application with MySQL database integration for CRUD operations (Flask / Django Framework)</div></div>							
L=0, T=0, P=30, TOTAL: 30 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							


Chairman (BoS)  
K.S.R. College of Engineering



COs	Course Outcome	Experiments	Cognitive Level
CO1	Apply string operations and functions to solve problems like reversing text, palindrome check, GCD, and factorial.	1,2	Apply
CO2	Solve problems and manage data efficiently using conditionals, loops, sets, and dictionaries.	3,4	Apply
CO3	Develop applications using lists, tuples, and demonstrate polymorphism through inheritance in Python.	5,6	Apply
CO4	Build programs in Python that effectively use arrays or lists along with custom exception handling.	7,8	Apply
CO5	Implement GUI applications and web-based systems with MySQL integration to perform CRUD operations.	9,10	Apply

**REFERENCES:**

1. Yashwant Kanetkar, Aditya Kanetkar, "Let Us Python", BPB Publications, 5th Edition, 2023.
2. Wesley J.Chun, "Core Python Programming", Pearson Education, 2nd Edition, 2017.

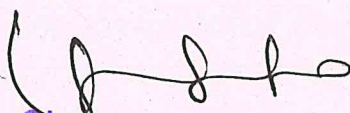
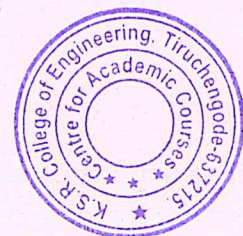
**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	1	-	1	-	2	3	2
CO2	3	3	2	-	-	-	1	-	1	-	2	3	2
CO3	3	3	2	-	-	-	1	-	1	-	2	3	2
CO4	3	3	2	-	-	-	1	-	1	-	2	3	2
CO5	3	3	2	-	-	-	1	-	1	-	2	3	2

1-low, 2-medium, 3-high

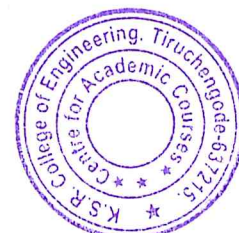
**LIST OF EQUIPMENTS (For a Batch of 30 Students)**

Sl.No	Name of the Equipment's	Qty.
1.	A computer with a modern processor, RAM and Windows or Linux.	30 Nos.
2.	Programming Tools: Python 2.7.11 / 3.x with IDLE	30 Nos.
3.	IDEs: Eclipse (PyDev), VS Code, Jupyter Notebook	30 Nos.

  
 Chairman (BoS)


24SSP29	APTITUDE AND CODING SKILLS –II	Category	L	T	P	SL	C
		EEC	0	0	30	0	1
(Common to All Branches)							
<b>OBJECTIVES:</b> This course aims to expose students to various concepts of aptitude problem solving, enabling them to tackle problems effectively and enhance their analytical skills in alignment with company-specific requirements. It also focuses on developing proficiency in verbal reasoning to strengthen critical thinking abilities.							
UNIT - I	NUMBERS AND SHARE BASED CONCEPTS						(6)
Problems on Numbers – Unit Digits – Squares and Cubes – Remainder Theorem – Averages - Ratio Proportions and Partnership – Percentage – Profit and Loss.							
UNIT - II	BASICS OF WORK BASED CONCEPTS						(6)
Introduction to time and work –Introduction to Time, Speed and Distance, Problems on Trains.							
UNIT - III	LOGICAL REASONING						(4)
Blood Relations – Ranking and Ordering – Inequalities – Cause and Effect.							
UNIT - IV	VERBAL ABILITY						(7)
Yes or No and “WH” Questions – Conjunctions – Count / Uncounted Nouns – Direct and Indirect Speech – Active and Passive Voice.							
UNIT - V	PYTHON PROGRAMMING FUNDAMENTALS						(7)
Introduction-Features-Environment setup; Basic syntax: variable-data types-operators-control statements-if-if-else- loop-break-continue, etc. List- operations on list; String operations- access; Tuple: operations on tuple; Dictionaries: Accessing dictionaries, working with dictionaries; Functions-Exception Handling-Input & Output-Modules-OOPs concepts-Numerical Programming.							
TOTAL: 30 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Interpret fundamental concepts to analyse and approach basic quantitative problems effectively.						Understand
CO2	Apply the concepts of time and work, time, speed and distance, to solve real-time quantitative aptitude problems effectively.						Apply
CO3	Apply logical reasoning techniques to solve problems related to ranking and ordering, decision-making and analytical skills.						Apply
CO4	Apply grammatical concepts to construct grammatically correct and contextually appropriate sentences.						Apply
CO5	Apply fundamental Python programming concepts to develop and implement basic computational solutions.						Apply

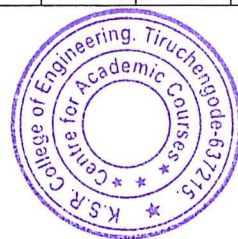
  
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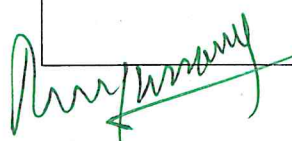


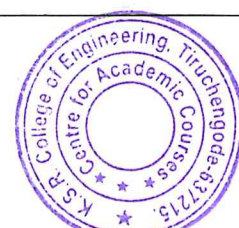
<b>TEXT BOOKS:</b> <ol style="list-style-type: none"> <li>1. R S Aggarwal, Quantitative Aptitude for Competitive Examinations.</li> <li>2. R.S. Aggarwal, A Modern Approach to Verbal &amp; Non-Verbal Reasoning.</li> <li>3. Wren &amp; Martin, High School English Grammar &amp; Composition</li> <li>4. Allen B. Downey, Think Python: How to Think like a Computer Scientist, 2<sup>nd</sup> Edition, O'Reilly Publishers, 2016</li> <li>5. Karl Beecher, Computational Thinking: A Beginner's Guide to Problem Solving and Programming, 1<sup>st</sup> Edition, BCS Learning &amp; Development Limited, 2017.</li> </ol>													
<b>REFERENCES:</b> <ol style="list-style-type: none"> <li>1. Paul Deitel and Harvey Deitel, Python for Programmers, Pearson Education, 1<sup>st</sup> Edition, 2021.</li> <li>2. Martin C. Brown, Python: The Complete Reference, 4<sup>th</sup> Edition, Mc-Graw Hill, 2018.</li> <li>3. <a href="https://www.python.org/">https://www.python.org/</a></li> </ol>													
<b>Mapping of COs with POs and PSOs</b>													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	3	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	3	2	-	2	-	-	2	-	-	3	-	-
Avg.	3	3	3	-	2	-	-	2	-	-	3	-	-

  
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24MAT37	DISCRETE MATHEMATICAL STRUCTURES	Category	L	T	P	SL	C
		BSC	45	15	0	60	4
SEMESTER III - (Common to CSE, CSE(CS), CSD, CSE(IoT) & IT)							
<b>PREREQUISITE:</b> Basic knowledge of set theory, elementary algebra, and mathematical logic, along with analytical thinking skills, is essential for understanding the concepts of discrete structures and their applications in computer science.							
<b>OBJECTIVES:</b> To provide students with a strong foundation in discrete mathematical structures, including propositional and predicate logic, set theory, functions, graph theory, and combinatorics, with a focus on their significance and applications in computer science.							
UNIT - I	PROPOSITIONAL CALCULUS						[12]
Propositions – Logical connectives – Compound propositions - Conditional and biconditional propositions - Truth tables - Tautologies and contradictions - Contra positive - Logical equivalences and implications - Normal forms - Principal conjunctive and disjunctive normal forms - Rules of inference Theory - Validity of arguments.							
UNIT - II	PREDICATE CALCULUS						[12]
Predicates - Statement functions – Variables - Free and bound variables – Quantifiers - Universe of discourse - Logical equivalences and implications for quantified statements - Theory of inference - The rules of universal specification and generalization - Validity of arguments.							
UNIT - III	SET THEORY AND FUNCTIONS						[12]
Set Theory: Cartesian product of sets - Relation on sets – Types of relations and their properties - Relational matrix and the graph of a relation - Equivalence relation. Functions: Definition – Classification of functions – Composition of functions – Inverse functions – Permutation functions.							
UNIT - IV	GRAPH THEORY						[12]
Graphs - Types of graphs – Matrix representation of graphs and graph isomorphism – Connectivity – Euler and Hamilton paths - Trees - Spanning trees - Shortest path algorithm: Dijkstra's algorithm and Kruskal's algorithm.							
UNIT - V	COMBINATORICS						[12]
Mathematical induction – Counting principle – Sum and product rule – The pigeonhole principle - Recurrence relations – Solution of recurrence relations – Generating Functions – Solving recurrence relation by generating functions.							
L = 45, T = 15, SL = 60, TOTAL = 120 PERIODS							

  
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**COURSE OUTCOMES: At the end of the course, the students will be able to:**

COs	Course Outcome	Cognitive Level
CO1	Apply the propositional concepts to determine tautologies, normal forms and validate arguments using rules of inference.	Apply
CO2	Apply the concepts of predicates, quantifiers and rules of inference to validate arguments involving quantified statements.	Apply
CO3	Apply the principles of set theory to represent and examine the relations and functions.	Apply
CO4	Apply the graph theory concepts of Euler and Hamiltonian paths and solve shortest path problems using Dijkstra's and Kruskal's algorithms.	Apply
CO5	Apply the principles of mathematical induction, counting techniques and the pigeonhole principle to solve recurrence relations.	Apply

**TEXT BOOKS:**

1. Trembly J.P, and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw-Hill Publishing Co. Ltd, New Delhi, 43<sup>rd</sup> Re-print 2014.
2. Venkatraman M.K, Sridharan. N and Chandrasekaran N. "Discrete Mathematics", 'The National Publishing Company', Chennai, 2014.

**REFERENCES:**

1. Kenneth. H. Rosen, "Discrete Mathematics and its Applications", Tata McGraw Hill P.Co, 2013, 7<sup>th</sup> Edition.
2. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, "Discrete Mathematical Structures", Pearson Education Pvt Ltd., New Delhi, 2013, Sixth Indian reprint.
3. Grimaldi. R.P. "Discrete and Combinatorial Mathematics: An Applied Introduction", 5<sup>th</sup> Edition, Pearson Education Asia, Delhi, 2013.
4. Koshy. T. "Discrete Mathematics with Applications", Elsevier Publications, 2006.
5. Lipschutz. S. and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3<sup>rd</sup> Edition, 2010.
6. <https://www.youtube.com/watch?v=DmCltf8ypks>

**Mapping of COs with POs and PSOs**

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

1-Low, 2-Medium, 3-High

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24CST36	DATA STRUCTURES	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
(Common To CSE and IT)							
<b>PREREQUISITE:</b> Basic knowledge of discrete mathematics, including sets, relations, functions, logic and problem-solving. Proficiency in C and Python with expertise in loops, functions, pointers and memory management. Familiarity with fundamental data types and operations such as integers, floating points, arrays and structures.							
<b>OBJECTIVES:</b> This course aims to provide a fundamental understanding of data structures and their implementations using arrays and linked lists. It focuses on applying stacks, queues, trees and graphs to solve computational problems. Students will also learn efficient techniques for searching, sorting and hashing with real-world applications.							
UNIT – I	BASICS OF DATA STRUCTURES						(9)
Abstract Data Types (ADTs) – List ADT – Array-based implementation – Linked list implementation – Singly linked lists – Doubly linked lists – Circularly linked lists. Applications of lists – Polynomial ADT – Radix Sort.							
UNIT – II	STACKS AND QUEUE						(9)
Stack ADT – Implementation of Stack using Array and Linked List – Applications of Stack: Evaluating arithmetic expressions – Conversion of Infix to postfix expression. Queue ADT – Implementation of Queue using Array and Linked List – Circular Queue – Applications of Queues.							
UNIT – III	TREES						(9)
Tree ADT – Binary Tree ADT – Binary Tree Traversal – Expression Trees – Binary Search Tree – AVL Trees – Splay Tree – B Tree – B+ Tree – Applications of Trees.							
UNIT – IV	GRAPHS						
Graphs and Types — Topological Sort – Shortest Path Algorithms: Dijkstra's Algorithm–Minimum Spanning Tree: Prim's and Kruskal's algorithms – Breadth First Traversal – Depth First Traversal–Bi-Connectivity Applications of Graphs.							
UNIT – V	SEARCHING, SORTING AND HASHING						(9)
Searching: Linear and Binary Search – Sorting: Bubble Sort – Quick Sort – Insertion Sort – Heap Sort – Merge Sort –Hashing: Hash function – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing.							
L=45, T=0, P=0, SL=45, TOTAL: 90 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Interpret list structures to organize and process data effectively in basic problem scenarios.						Understand

  
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CO2	Construct methods based on stack and queue operations to address expression evaluation and data processing challenges.	Apply
CO3	Implement tree-based structures and traversal algorithms to address problems in data organization, searching and expression evaluation.	Apply
CO4	Apply graph traversal techniques including BFS, DFS, and Dijkstra's shortest path algorithm to resolve computational problems..	Apply
CO5	Solve data storage and retrieval problems using appropriate searching, sorting, and hashing techniques.	Apply

**TEXT BOOKS:**

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Pearson Education, Second Edition, 2018.
2. A. K. Sharma, Data Structures Using C, Pearson Education, Second Edition, 2024.

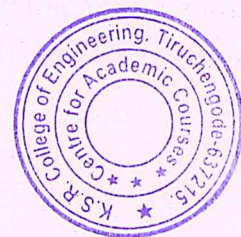
**REFERENCES:**

1. Langsam, Augenstein and Tanenbaum, Data Structures Using C and C++, Pearson Education, Second Edition, 2015.
2. Reema Thareja, Data Structures Using C, Oxford University Press, England, Third Edition, 2023.
3. Alfred V. Aho, Jeffrey D. Ullman John E. Hopcroft, Data Structures and Algorithms, First Edition, Pearson, 2002.
4. Kruse, Data Structures and Program Design in C, Pearson Education, Second Edition, 2006.

**Mapping of COs with POs and PSOs**

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO1	PSO2
CO1	3	2	-	-	-	-	1	1	1	-	3	3	1
CO2	3	3	2	-	-	-	1	1	1	-	3	3	1
CO3	3	3	2	-	-	-	1	1	1	-	3	3	1
CO4	3	3	2	-	-	-	1	1	1	-	3	3	1
CO5	3	3	2	-	-	-	1	1	1	-	3	3	1

1-low, 2-medium, 3-high

  
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24CST37	JAVA PROGRAMMING	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
(Common To CSE, CSD, CSE(IOT) and IT)							
<b>PREREQUISITE:</b> A basic understanding of programming principles such as variables and loops, paired with good problem-solving abilities, is required. Fundamentals of C programming and object oriented concepts.							
<b>OBJECTIVES:</b> This course aims to introduce the fundamentals of Java programming, including data types, control structures, classes and methods. It enables students to recognize object-oriented concepts such as inheritance, interfaces, packages and exception handling. The course also covers multithreading, file I/O operations, string manipulation, database connectivity using JDBC and collections framework.							
UNIT – I	JAVA FUNDAMENTALS						(9)
The Java Buzzwords – Data Types – Variables – Arrays – Operators – Control Statements – Class Fundamentals –Declaring Objects – Methods – Method Overloading – Objects as Parameters – Returning Objects – Recursion – this keyword – Garbage Collection.							
UNIT – II	CONSTRUCTORS AND INHERITANCE						(9)
Constructors – Constructor Overloading – Access Control – static – final – Nested and Inner Class – Inheritance: Basics – Super – Multilevel – Hierarchical – Method Overriding – Abstract class –Final with Inheritance.							
UNIT – III	INTERFACES, PACKAGES AND EXCEPTION HANDLING						(9)
Interfaces – Default Interface Methods – Static Methods in Interface – Packages – Access Protection – Importing Packages –Exception Handling Fundamentals – Types – Uncaught Exceptions –Try and Catch – Multiple Catch – Nested Try – Throw – Throws – Finally –Wrapper Classes							
UNIT-IV	MULTITHREADED PROGRAMMING AND I/O OPERATIONS						(9)
Java Thread Model – Main Thread – Creating a Thread – Creating Multiple Threads – isAlive and join Methods – Thread Priorities - Synchronization – Interthread Communication – Suspending, Resuming, and Stopping Threads – Obtaining a Thread’s State – Using Multithreading – I/O Basics – Reading Console Input – Writing Console Output – The PrintWriter Class – Reading and Writing Files – Automatically Closing a File – Scanner class.							
UNIT – V	STRING, DATABASE CONNECTIVITY AND COLLECTIONS						(9)
String Constructors – String Length – Character Extraction – String Comparison – Searching Strings – Modifying a String – Methods in StringBuffer – JDBC Product Components – JDBC API – JDBC Driver Manager – JDBC Test Suite – JDBC-ODBC Bridge – JDBC Architecture – Establishing Connection – Handling SQL Exceptions – Collections: List – Array List.							
L=45, T=0, P=0, SL=45, TOTAL: 90 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							





COs	Course Outcome	Cognitive Level
CO1	Outline Java concepts involving data types, control structures, classes, methods, and recursion to develop basic programs.	Understand
CO2	Choose object-oriented concepts to design modular programs using constructors, inheritance and access control	Apply
CO3	Compute solutions for robust and reusable Java applications using interfaces, packages and exception handling mechanisms	Apply
CO4	Develop the features of multithreaded programming and input/output operations in Java Programming.	Apply
CO5	Apply the concepts of string manipulations, database connectivity and collections.	Apply

**TEXT BOOKS:**

1. Herbert Schildt, Dr.Danny Coward, Java - The Complete Reference, McGraw-Hill Education, Thirteenth Edition, 2023.
2. Cay S. Horstmann, Core Java Volume 1 - Fundamentals, Prentice Hall, Thirteenth Edition, 2024.


**REFERENCES:**

1. Herbert Schildt, Java - A Beginner Guide, Oracle Press, McGraw-Hill Education, Tenth Edition, 2024.
2. Joshua Bloch, Effective Java: A Programming Language Guide, Addison-Wesley Professional, Fourth Edition, 2023.
3. Allen B. Downey and Chris Mayfield, Think Java: How to Think Like a Computer Scientist, O'Reilly, Second Edition, 2019.
4. [https://onlinecourses.nptel.ac.in/noc22\\_cs47/preview](https://onlinecourses.nptel.ac.in/noc22_cs47/preview).
5. To practice: [www.codingbat.com](http://www.codingbat.com) and [www.geeksforgeeks.com](http://www.geeksforgeeks.com).

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PSO 1	PSO2
CO1	3	2	-	-	-	-	1	1	1	-	2	3	2
CO2	3	3	2	-	-	-	1	1	1	-	2	3	2
CO3	3	3	2	-	-	-	1	1	1	-	2	3	2
CO4	3	3	2	-	-	-	1	1	1	-	2	3	2
CO5	3	3	2	-	-	-	1	1	1	-	2	3	2

1-low, 2-medium, 3-high

  
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24ITT36	OPERATING SYSTEMS	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
(Common To CSE and IOT)							
<b>PREREQUISITE:</b> A basic knowledge of computer fundamentals and experience with C programming are essential. Familiarity with how programs are structured and executed will support the learning of key operating system concepts.							
<b>OBJECTIVES:</b> This course aims to provide a fundamental understanding of operating systems, covering process and thread management, CPU scheduling, synchronization, deadlocks, memory and storage management and file system concepts. It also includes a case study on Linux and Windows to illustrate real-world OS implementations.							
UNIT – I	OVERVIEW OF OPERATING SYSTEMS						(9)
Introduction to Operating Systems – Single Processor Systems – Multiprocessor Systems – Clustered Systems – Operating System Operations – Operating System Services – System Calls – System services – Operating System Structures – Process: Process Concept – Process Scheduling – Operation on Processes – Inter Process Communication.							
UNIT – II	THREADS AND PROCESS SCHEDULING						(9)
Threads: Overview – Multithreading Models. CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms: FCFS – SJF – Priority – Round Robin. Process Synchronization: The Critical Section Problem – Peterson’s Solution – Semaphores – Classic Problems of Synchronization.							
UNIT – III	DEADLOCKS AND MEMORY MANAGEMENT						(9)
Deadlock: Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock – Memory Management: Swapping – Contiguous memory Allocation – Paging – Structure of the Page Table – Segmentation.							
UNIT– IV	VIRTUAL MEMORY AND STORAGE STRUCTURE						(9)
Virtual Memory: Demand Paging – Copy - On - Write – Page Replacement – Allocation of Frames – Thrashing – Mass Storage Structure: Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management – RAID structure.							
UNIT – V	FILE SYSTEM INTERFACE AND IMPLEMENTATION						(9)
File Concepts: Access Methods – Directory Structure – File System Structure – File System Operations – Directory Implementation – Allocation Methods – Free space Management – File Systems – File System Mounting – Partitions and mounting – File Sharing – Case study on LINUX and Windows OS.							
L= 45, T=0, P=0, SL=45, TOTAL: 90 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Describe the foundational elements of operating systems, focusing on						Understand






	process handling and communication between processes.	
CO2	Implement multithreading models, scheduling and synchronization techniques to solve concurrency problems in operating systems.	Apply
CO3	Apply deadlock handling and memory management strategies to manage resources efficiently.	Apply
CO4	Interpret the concepts of virtual memory and storage structures including RAID and swap-space management.	Understand
CO5	Summarize the structure and management of file systems in Linux and Windows operating systems.	Understand

**TEXT BOOKS:**

1. Silberschatz, Galvin, Gagne, Operating System Concepts, John Wiley and Sons, Tenth Edition, 2021.
2. Andrew S. Tanenbaum and Herbert Bos, Modern Operating Systems, Pearson Publications, Fifth Edition, 2024.

**REFERENCES:**

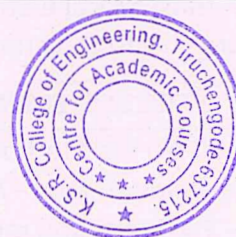
1. William Stallings, Operating Systems – Internals and Design Principles, Ninth Edition, Pearson Publications, 2018.
2. Dhananjay M. Dhamdhare, Operating Systems - A Concept-Based Approach, Third Edition, Tata McGraw Hill Education, 2012.
3. Remzi H Arpaci-Dusseau, Operating Systems: Three Easy Pieces, India, First Edition, 2018.
4. Richard Fox, Linux with Operating System Concepts, Taylor & Francis Limited, United States, Second Edition, 2014.

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	1	1	-	2	3	2
CO2	3	3	2	-	-	-	-	1	1	-	2	3	2
CO3	3	3	2	-	-	-	-	1	1	-	2	3	2
CO4	3	2	-	-	-	-	-	1	1	-	2	3	2
CO5	3	2	-	-	-	-	-	1	1	-	2	3	2

1-low, 2-medium, 3-high

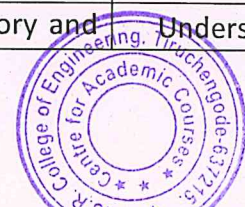
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24CST38	COMPUTER ORGANIZATION AND ARCHITECTURE	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
(Common To CSE and CSE(CS))							
<b>PREREQUISITE:</b> Students should have a basic understanding of digital electronics, number systems, programming and computer fundamentals to grasp the concepts of computer architecture effectively.							
<b>OBJECTIVES:</b> The objective of this course is to introduce the fundamental concepts of computer architecture, including computer structure, instruction execution and control mechanisms. It aims to provide a clear understanding of pipelining, control unit design, memory hierarchy, various storage devices and input/output organization with standard interfaces.							
UNIT – I	BASIC STRUCTURE AND ARITHMETIC OPERATIONS						(9)
Functional Units – Basic Operational Concepts – Performance – Instruction Set Architecture – Memory Locations and Addresses – Instructions and Instruction sequencing – Addressing Modes – RISC and CISC Styles – Fixed Point and Floating Point Operations.							
UNIT – II	BASIC PROCESSING UNIT						(9)
Fundamental Concepts – Instruction Execution – Hardware Components – Instruction Fetch and Execution Steps – Hardwired Control – CISC Style Processor: Micro Programmed Control – Nano Programming.							
UNIT – III	PIPELINING EXECUTION						(9)
Basic Concepts – Pipeline Organization – Pipelining Issues – Data Dependencies – Memory Delays – Branch Delays – Resource Limitations – Performance Evaluation – Superscalar Operation.							
UNIT– IV	MEMORY SYSTEM AND STORAGES						(9)
Basic Concepts – Semiconductor RAM Memories – Read Only Memories – Memory Hierarchy – Cache Memories – Performance Considerations – Virtual Memory – Secondary Storage Devices.							
UNIT – V	I/O ORGANIZATION						(9)
Accessing I/O Devices: I/O Device Interface, Programmed I/O – Interrupts – Direct Memory Access – Buses – Bus Arbitration – Interconnection Standards: SCSI – USB – SATA.							
L-45, T=0, P=0, SL=45, TOTAL: 90 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Describe key computer architecture concepts with functional units, instruction sets, addressing modes, RISC and CISC.						Understand
CO2	Outline the instruction execution steps and working of hardwired micro programmed control.						Understand
CO3	Summarize the concept of pipelined execution and design control unit.						Understand
CO4	Illustrate the hierarchical memory system including cache memory and						Understand

  
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	virtual memory.	
CO5	Interpret the different ways of communicating with I/O devices and standard I/O interfaces.	Understand

**TEXT BOOKS:**

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, Computer Organization and Embedded Systems, McGraw Hill, US, Revised Sixth Edition, 2022.
2. M.Morris Mano, Computer System Architecture, McGraw Hill, United states, Revised Third Edition, 2017.


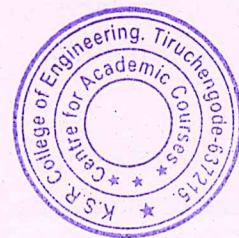
**REFERENCES:**

1. William Stallings, Computer Organization and Architecture - Designing for Performance, Prentice Hall, United states, Eighth Edition, 2010.
2. David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software interface, University of California, Berkeley, Fifth Edition, 2014.
3. Carpinelli, Computer Systems Organization & Architecture, Pearson Education, India, First Edition 2001.
4. T.K Ghosh, Computer Organization and Architecture, Haldia Institute of Technology, West Bengal, Third Edition, 2011.
5. [https://onlinecourses.nptel.ac.in/noc21\\_cs61/preview](https://onlinecourses.nptel.ac.in/noc21_cs61/preview)

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO2
CO1	3	2	-	-	-	-	-	1	1	-	3	3	1
CO2	3	2	-	-	-	-	-	1	1	-	3	3	1
CO3	3	2	-	-	-	-	-	1	1	-	3	3	1
CO4	3	2	-	-	-	-	-	1	1	-	3	3	1
CO5	3	2	-	-	-	-	-	1	1	-	3	3	1

1-low, 2-medium, 3-high

  
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24CSP36	DATA STRUCTURES LABORATORY	Category	L	T	P	SL	C
		PCC	0	0	45	0	1.5
(Common To CSE and IT)							
<b>PREREQUISITE:</b> Basic understanding of mathematical concepts like recursion, combinatorics, and complexity analysis. Familiarity with problem-solving techniques and algorithmic thinking is essential. Logical reasoning and analytical skills will help in developing efficient computational solutions.							
<b>OBJECTIVES:</b> This course aims to develop skills in implementing core data structures and algorithms, including linked lists, stacks, queues, trees, and graphs. Students practice polynomial manipulation, traversals (BFS, DFS, Dijkstra's), and basic sorting techniques like Insertion and Selection Sort.							
<b>List of Experiments:</b>  <div><div>1. Apply linked list (Single, Double and Circular) operations to manage a dynamic collection of data with insertion and deletion.</div><div>2. Design a program to represent and manipulate polynomials using linked lists, supporting operations such as addition and subtraction.</div><div>3. Implement stack operations using arrays and linked lists for efficient data handling</div><div>4. Develop queue functionalities with array-based and linked list-based implementations to manage data effectively.</div><div>5. Implement a binary search tree (BST) to store and retrieve data efficiently by applying insertion, deletion, and search operations.</div><div>6. Apply tree traversal techniques (preorder, inorder, postorder) to navigate a binary tree.</div><div>7. Write a program to explore and analyze graph connectivity using DFS and BFS traversal algorithms.</div><div>8. Solve the shortest path problem using Dijkstra's algorithm on a weighted graph.</div><div>9. Develop a program to implement Linear Search and Binary Search for finding an element in an array.</div><div>10. Design a program to perform sorting of an array using Insertion Sort and merge Sort techniques.</div></div>							
L=0, T=0, P=45, SL=0, TOTAL: 45 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome	Experiment	Cognitive Level				
CO1	Apply linked lists to manage dynamic data and perform polynomial operations.	1,2	Apply				
CO2	Compute stack and queue-based solutions using arrays and linked	3,4	Apply				

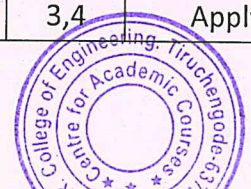


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K.S.R. College of Engineering

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Applicable for the students admitted from 2024-2025 onwards





	lists for effective data handling and organization.		
CO3	Design binary search tree operations and traversal techniques to organize and access data efficiently.	5,6	Apply
CO4	Construct DFS and BFS to explore connectivity and apply Dijkstra's algorithm to solve the shortest path problem in a weighted graph.	7,8	Apply
CO5	Demonstrate linear and binary search, along with insertion and selection sort to organize and access data in arrays.	9,10	Apply

**REFERENCES:**

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Pearson Education, Second Edition, 2018.
2. A. K. Sharma, Data Structures Using C, Pearson Education, Second Edition, 2024.

**Mapping of COs with POs and PSOs**

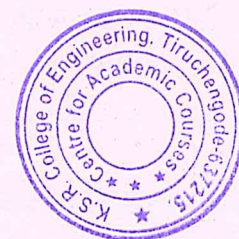
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PS O1	PS O2
CO1	3	3	2	-	-	-	1	-	1	-	2	3	1
CO2	3	3	2	-	-	-	1	-	1	-	2	3	1
CO3	3	3	2	-	-	-	1	-	1	-	2	3	1
CO4	3	3	2	-	-	-	1	-	1	-	2	3	1
CO5	3	3	2	-	-	-	1	-	1	-	2	3	1
Avg.	3	3	2	-	-	-	1	-	1	-	2	3	1

1-low, 2-medium, 3-high

**LIST OF EQUIPMENTS (For a Batch of 30 Students)**

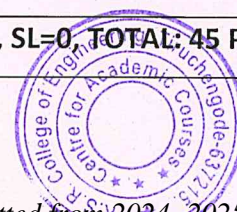
Sl.No	Name of the Equipment's	Qty.
1.	A computer with a modern processor, RAM and Windows or Linux.	30 Nos.
2.	Programming Tools: C/C++ with Turbo C, GCC, or Code::Blocks	30 Nos.
3.	IDEs: Turbo C IDE, Code::Blocks, Notepad++	30 Nos.

  
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24CSP37	JAVA PROGRAMMING LABORATORY	Category	L	T	P	SL	C
		PCC	0	0	45	0	1.5
(Common To CSE, CSD, CSE(IOT)and IT)							
<b>PREREQUISITE:</b> Students must have basic knowledge on programming principles, such as variables, simple data types, control structures and Object Oriented Programming with problem solving and logical thinking skills.							
<b>OBJECTIVES:</b> This course aims to teach fundamental programming concepts such as arrays, loops, classes and objects to solve specific problems. It covers advanced topics including constructors, inheritance, method overriding, interfaces, packages and exception handling. Additionally, students will gain knowledge in multithreading, file processing, database connectivity and collections for building robust applications.							
<b>List of Experiments:</b> <div><div>1. Apply Loop and array operations to develop programs that find the largest and smallest numbers, perform sorting in ascending and descending order, generate the Fibonacci series and check for prime numbers.</div><div>2. Develop applications using classes and objects to manage student details and employee information.</div><div>3. Construct a banking application by applying constructors and inheritance for functionalities like deposit and withdrawal.</div><div>4. Demonstrate method overriding by implementing a credit card processing system that varies behavior across card types.</div><div>5. Implement systems such as a book store and a banking system using interfaces and packages.</div><div>6. Apply exception handling techniques to manage errors in applications like online ticket booking and ATM withdrawal systems.</div><div>7. Design concurrent systems using threading concepts for tasks such as online order processing and hospital patient management.</div><div>8. Create a file-based application like a simple text editor, to practice file input/output operations.</div><div>9. Utilize string handling techniques to implement systems for password validation and user profile management.</div><div>10. Apply Java Database Connectivity (JDBC) to develop student database management.</div></div>							
L=0, T=0, P=45, SL=0, TOTAL: 45 PERIODS							





**COURSE OUTCOMES:**

At the end of the course, the students will be able to:

COs	Course Outcome	Experiment	Cognitive Level
CO1	Apply programming concepts like loops, arrays and object-oriented principles to develop data processing and management applications.	1,2	Apply
CO2	Implement constructors, inheritance and method overriding to design reusable software systems.	3,4	Apply
CO3	Develop modular programs using interfaces and packages, with effective exception handling for runtime errors.	5,6	Apply
CO4	Design concurrent applications using threads and create file-based programs for efficient I/O operations.	7,8	Apply
CO5	Simulate data-driven applications for validation, profile management, and database access using string handling and JDBC	9,10	Apply

**REFERENCES:**

1. Herbert Schildt, Dr. Danny Coward, Java - The Complete Reference, McGraw-Hill Education, Thirteenth Edition, 2023.
2. Cay S. Horstmann, Core Java Volume 1 - Fundamentals, Prentice Hall, Thirteenth Edition, 2024.


**Mapping of COs with POs and PSOs**

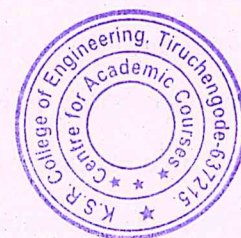
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO2
CO1	3	3	2	-	1	-	1	-	1	-	2	3	1
CO2	3	3	2	-	1	-	1	-	1	-	2	3	1
CO3	3	3	2	-	1	-	1	-	1	-	2	3	1
CO4	3	3	2	-	1	-	1	-	1	-	2	3	1
CO5	3	3	2	-	1	-	1	-	1	-	2	3	1

1-low, 2-medium, 3-high

**LIST OF EQUIPMENTS (For a Batch of 30 Students)**

Sl.No	Name of the Equipment's	Qty.
1.	A computer with a modern processor, RAM and Windows or Linux.	30 Nos.
2.	Programming Tools: Java Development Kit (JDK)	30 Nos.
3.	IDEs: Eclipse, NetBeans, IntelliJ IDEA	30 Nos.

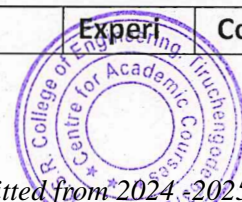
  
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24ITP36	OPERATING SYSTEMS LABORATORY	Category	L	T	P	SL	C
		PCC	0	0	45	0	1.5
(Common To CSE and IT)							
<b>PREREQUISITE:</b> A basic understanding of computer fundamentals is essential. Familiarity with C programming and command-line environments will support system-level programming tasks. Exposure to general programming concepts like functions, memory, and control structures will aid in practical implementation.							
<b>OBJECTIVES:</b> This course aims to develop practical skills in using OS commands, file operations, and process management. Students will learn CPU scheduling, synchronization, deadlock avoidance, memory and file allocation and disk scheduling algorithms through hands-on implementation and simulations.							
<b>List of Experiments:</b>  <ol style="list-style-type: none"><li>1. Install and set up the Windows operating system to apply knowledge of system components and configuration settings.</li><li>2. Use fundamental UNIX commands and develop shell scripts to perform task automation and apply knowledge of the Linux terminal environment.</li><li>3. Implement process management and inter-process communication in a Linux environment using system calls such as fork, exec, getpid, exit, wait, and close.</li><li>4. Construct a program to implement a CPU scheduling algorithm to demonstrate and examine its performance in CPU scheduling.</li><li>5. Develop a program to implement the producer-consumer problem using semaphores to apply concepts of synchronization and mutual exclusion.</li><li>6. Formulate a program to implement the Banker's algorithm to simulate how deadlock can be avoided and resources can be effectively allocated.</li><li>7. Design and simulate a page replacement algorithm to apply memory management techniques.</li><li>8. Apply a memory allocation strategy through programming to explore dynamic partitioning and efficient use of memory.</li><li>9. Construct a program to apply any one file allocation strategies to demonstrate its role in file system design.</li><li>10. Develop a program to implement any one disk scheduling algorithm to analyze its efficiency in reducing seek time.</li></ol>							
L=0,T=0,P=45,SL=0, TOTAL: 45 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						

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		ment	Level
CO1	Demonstrate basic OS commands and file operations using system calls in Linux and Windows.	1,2	Apply
CO2	Develop processes using shell scripting and simulate various CPU scheduling algorithms	3,4	Apply
CO3	Apply semaphores for synchronization and implement deadlock avoidance using the Banker's Algorithm.	5,6	Apply
CO4	Implement contiguous memory allocation and simulate page replacement algorithms such as FIFO, LRU and Optimal.	7,8	Apply
CO5	Design file allocation methods and execute disk scheduling algorithms like FCFS, SSTF, SCAN and C-SCAN.	9,10	Apply

**REFERENCES:**

1. Silberschatz, Galvin, Gagne, Operating System Concepts, Tenth Edition, John Wiley and Sons, 2021.
2. Andrew S. Tanenbaum and Herbert Bos, Modern Operating Systems, Fifth Edition, Pearson Publications, 2024

**Mapping of COs with POs and PSOs**

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO2
CO1	3	3	2	-	-	-	-	1	1	-	2	3	2
CO2	3	3	2	-	-	-	-	1	1	-	2	3	2
CO3	3	3	2	-	-	-	-	1	1	-	2	3	2
CO4	3	3	2	-	-	-	-	1	1	-	2	3	2
CO5	3	3	2	-	-	-	-	1	1	-	2	3	2

1-low, 2-medium, 3-high

**LIST OF EQUIPMENTS (For a Batch of 30 Students)**

Sl.No	Name of the Equipment's	Qty.
1.	A computer with a modern processor and sufficient RAM.	30 Nos.
2.	Operating Systems: Windows, Linux (Ubuntu, CentOS).	30 Nos.
3.	Programming Tools: GCC, GDB, Bash.	30 Nos.
4.	DEs / Editors: Eclipse, Code::Blocks, Vim, Notepad++.	30 Nos.

*S. Gargi XX*  
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24CBP36	DESIGN STUDIO – I	Category	L	T	P	SL	C
		PCC	0	0	30	0	1
(Common to CSE, IT, CSE- CS, CSD)							
<b>PREREQUISITE:</b> A basic understanding of problem-solving, logical reasoning, and the principles of design thinking, including empathy and user-centric development.							
<b>OBJECTIVES:</b> To apply design thinking and computational problem-solving principles to develop, prototype, and present innovative software-based and embedded system solutions using hands-on mini projects.							
<b>List of Exercise:</b>							
Ex. No.	Title	Focus Area					
1.	Algorithms & Flowcharts for Everyday Problems	Computational Thinking					
2.	Mini Compiler for Basic Arithmetic	Lexical Analysis					
3.	Simple Chatbot using Rule-Based Logic	NLP & Design Thinking					
4.	Web Form + Backend Logic	UI/UX + APIs					
5.	Gesture-Based Game Interface	ML Lite + Human-Centered Design					
6.	A) Blinking of LED using Tinker cad	IoT Integration					
	B) Interfacing an Ultrasonic sensor using Tinkercad						
7.	A) Weather Monitoring station using wokwi	Embedded System Simulation					
	B) Digital clock using wokwi						
8.	Password Strength Checker	Data Analysis + Computational Thinking					
9.	Autodesk Fusion - Simulation	3D Modeling + Engineering Simulation					
10.	Mini Project: Complete Design Cycle	Ideation → Design → Prototype → Presentation					
P=30, TOTAL: 30 PERIODS							

### LIST OF HARDWARE AND SOFTWARE RESOURCES

#### Resources Required for a Batch of 30 Students

S.No	Details of Resource	Quantity Required
1.	Desktop Computers: 30 Nos	30
2.	Operating System: Linux or Windows 7 and above	
3.	Software: Turbo C, Visual Studio, UI/UX Applications, Tinkercad, wokwi, Autodesk.	

  
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**COURSE OUTCOMES:**

At the end of the course, the students will be able:

COs	Course Outcome	Exercise No	Cognitive Level
CO1	Identify and analyze real-world problems through design thinking and abstraction	1,2	Analyze
CO2	Apply computing principles to implement practical, user-centered solutions	3,4,5	Apply
CO3	Construct basic prototypes using software/hardware platforms	6,7	Apply
CO4	Assess the effectiveness of full-stack components or intelligent systems for specific applications.	8,9	Evaluate
CO5	Interpret and present the complete solution effectively by applying each phase of the Design Cycle.	10	Analyze

**TEXT BOOKS:**

- 1) Peter J. Denning, Matti Tedre, "Computational Thinking", MIT Press, first edition, 2019.
- 2) Zhiwei Xu, Jialin Zhang, "Computational Thinking: A Perspective on Computer Science", Springer, first edition, 2021

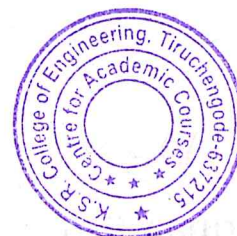
**REFERENCES:**

- 1) Joshua Ellul, Carl James Debono, "TinkercadNetConnector: Connecting emulated IoT devices to the outside world", SoftwareX (Elsevier), 2022.
- 2) Ahmad Zahari Misnan et al., "Embedded Internet of Things (IoT) for Beginners", Politeknik Muadzam Shah (Malaysia), 2021.
- 3) Cormen, Leiserson, Rivest, Stein, "Introduction to Algorithms (CLRS)", MIT Press, Fourth Edition, 2022.
- 4) Aho, Lam, Sethi, Ullman, "Compilers: Principles, Techniques and Tools", Pearson Education, Second Edition, 2006.
- 5) Abelson, Sussman, "Structure and Interpretation of Computer Programs (SICP)", MIT Press, Second Edition, 1996.

**Mapping of Cos with Pos and PSOs**

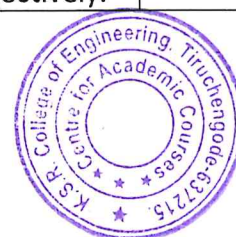
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	2	3	1	-	2	1	-	1	2	3
CO2	3	3	2	-	3	-	-	2	1	-	1	2	3
CO3	3	3	2	-	3	-	-	2	1	-	1	2	3
CO4	3	3	3	3	3	-	-	2	1	-	1	3	3
CO5	3	3	3	2	3	1	1	2	1	-	1	3	3

1-low, 2-medium, 3-high


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24SDP39	SOFT SKILLS DEVELOPMENT – III	Category	L	T	P	SL	C
		EEC	0	0	30	0	1
(Common to All Branches)							
<b>OBJECTIVES:</b> To the concept of aptitude and its relevance in various fields. It highlights the need for aptitude skills and emphasizes their importance in academic and career development. It also focuses on building a strong foundation in English grammar to improve communication skills.							
UNIT - I	TIME SPEED AND DISTANCE						(6)
Relationship Between Time Speed and Distance Time Conversion – Relative Speed – Chasing – Problems on Late, Early and Usual Time							
UNIT - II	PROBLEMS ON TRAINS						(6)
Crossing a Static objects – Crossing a Moving Object: Same and Opposite Direction – Time Difference based Problems.							
UNIT - III	BOATS AND STREAM						(6)
Introduction to Boat in Still Water and Current – Down Stream Speed – Upstream Speed – Speed in Still Water – Rate of Stream.							
UNIT - IV	LOGICAL REASONING						(6)
Seating Arrangements: Circular and Linear Arrangements – Inequalities – Assertion & reasoning.							
UNIT - V	VERBAL ABILITY						(6)
Parts of Speech – Sentence Completion – Idioms and Phrases – Reading Comprehension.							
TOTAL: 30 PERIODS							
<b>COURSE OUTCOMES:</b> At the end of the course, the students will be able to:							
COs	Course Outcome						Cognitive Level
CO1	Apply time, speed, and distance concepts to solve problems involving relative speed, time conversion, and punctuality scenarios.						Apply
CO2	Solve problems on trains with object crossing and time differences using concepts of relative speed and direction.						Apply
CO3	Solve problems involving boats and streams using concepts of upstream, downstream, and current speed.						Apply
CO4	Apply logical reasoning to solve problems on seating arrangements, inequalities, and assertion-reasoning statements.						Apply
CO5	Demonstrate understanding of grammar, vocabulary, and comprehension to complete sentences and interpret texts effectively.						Understand

  
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**TEXT BOOKS:**

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Wren & Martin, "High School English Grammar & Composition".

**REFERENCES:**

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. English for Competitive Examinations – by Edgar Thorpe & Showick Thorpe.
4. <https://prepinsta.com/>.
5. <https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm>.
6. <https://www.youtube.com/@FeelFreetoLearn/playlists>.

**Mapping of COs with POs and PSOs**

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

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