



Learn Beyond

**KPR Institute of
Engineering and
Technology**

(Autonomous, Affiliated to Anna University)

CURRICULUM AND SYLLABI REGULATIONS – 2025

**Department of
Electronics Engineering
(VLSI Design and Technology)**

I. Vision and Mission of the Institute

Vision

To become a premier institute of academic excellence by imparting technical, intellectual and professional skills to students for meeting the diverse needs of industry, society, the nation and the world at large

Mission

- Commitment to offer value-based education and enhancement of practical skills
- Continuous assessment of teaching and learning processes through scholarly activities
- Enriching research and innovation activities in collaboration with industry and institutes of repute
- Ensuring the academic processes to uphold culture, ethics and social responsibilities

II. Vision and Mission of the Department

Vision

To be a centre of excellence in education, research, and innovation in Electronics Engineering with specialization in VLSI Design and Technology to meet the evolving needs of society

Mission

The mission of the department is to

- Develop competencies in Electronics Engineering and VLSI Design through skill-based education in collaboration with industry
- Foster research, innovation, and entrepreneurship to develop sustainable solutions for societal needs
- Inculcate professionalism, ethical values, leadership, and lifelong learning

III. Program Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) of the ELECTRONICS ENGINEERING (VLSI DESIGN AND TECHNOLOGY) (EV) represent major accomplishments that the graduates are expected to achieve after three to five years of graduation.

- PEO1:** Apply Electronics Engineering and VLSI Design principles to develop solutions for emerging technological and societal challenges
- PEO2:** Excel in industry, higher education, research, or entrepreneurship through continuous skill development
- PEO3:** Demonstrate leadership, professionalism, ethical values, and lifelong learning in engineering practice

IV. Program Outcomes (POs)

Graduates of the ELECTRONICS ENGINEERING (VLSI DESIGN AND TECHNOLOGY) will be able to

- PO1:** Engineering Knowledge: 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:** Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development (WK1 to WK4)
- PO3:** Design/Development of Solutions: 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:** Conduct Investigations of Complex Problems: 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:** Engineering Tool Usage: 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:** The Engineer and The World: 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:** Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws (WK9)
- PO8:** Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/ multi-disciplinary teams
- PO9:** Communication: 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:** Project Management and Finance: 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:** Life-Long Learning: 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)

Knowledge and Attitude Profile (WK)

- WK1:** A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences
- WK2:** Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline
- WK3:** A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
- WK4:** Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline
- WK5:** Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area
- WK6:** Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
- WK7:** Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development
- WK8:** Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues
- WK9:** Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

V. Program Specific Outcomes (PSOs)

Graduates of the ELECTRONICS ENGINEERING (VLSI DESIGN AND TECHNOLOGY) will be able to

- PSO1:** Design, analyze, and verify VLSI circuits and systems using modern Electronic Design Automation (EDA) tools
- PSO2:** Apply embedded system design and emerging technologies to develop reliable and intelligent electronic solutions

VI. PEO / PO Mapping



Following three levels of correlation should be used:

- 1: Low
- 2: Medium
- 3: High

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
PEO 1	3	3	3	3	3	2	2	2	2	2	2	3	3
PEO 2	3	3	3	3	3	2	2	2	2	2	3	3	3
PEO 3	-	-	-	-	-	-	3	3	3	3	3	-	-

VII. Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Sem	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
I	Professional Communication - I	-	-	-	-	-	-	-	✓	✓	-	✓	-	-
	Multivariable Calculus and Applications	✓	✓	-	-	-	-	-	-	-	-	-	-	-
	Engineering Physics	✓	✓	✓	-	✓	-	-	✓	✓	-	-	-	-
	C Programming	✓	✓	✓	✓	✓	-	-	-	-	-	✓	-	-
	Introduction to Electrical And Electronics Engineering	✓	✓	✓	-	-	-	-	-	-	-	-	-	-
	Makerspace	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
	C Programming Laboratory	✓	✓	✓	✓	-	-	-	-	-	-	✓	-	-
	Induction Program													
	Universal Human Values	-	-	-	-	-	✓	✓	✓	-	-	✓	-	-
	தமிழர் மரபு / Heritage of Tamils	-	-	-	-	-	-	✓	✓	-	✓	-	-	-
	Professional Skill Development - I	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
II	Professional Communication - II	-	-	-	-	-	-	-	✓	✓	-	✓	-	-
	Linear Algebra and Complex Variables	✓	✓	-	-	✓	-	-	-	✓	-	✓	-	-
	Engineering Chemistry	✓	✓	✓	-	✓	-	-	✓	✓	-	✓	-	-
	Python Programming	✓	✓	✓	✓	-	-	-	-	-	-	✓	-	-
	Circuit and Network Theory	✓	✓	✓	-	-	-	-	-	-	-	✓	-	-
	Electronic Devices and Circuits	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓	✓	-
	Python Programming Laboratory	✓	✓	✓	✓	-	-	-	-	-	-	✓	-	-
	Design Thinking	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	-	-
	Environmental Governance and Sustainability	✓	✓	-	-	-	✓	✓	-	✓	-	✓	-	-
	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	-	-	-	-	-	-	✓	✓	-	✓	-	-	-
	Professional Skill Development - II	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-

ELECTRONICS ENGINEERING (VLSI DESIGN AND TECHNOLOGY)

Regulations 2025

For the students admitted from 2025 onwards

CHOICE BASED CREDIT SYSTEM

CURRICULUM FOR I - VIII SEMESTERS



SEMESTER I

No	Course Code	Title	Category	Type	L	T	P	J	C
1	U25REN101	Professional Communication - I	HSMC	TwL	2	-	2	-	3
2	U25RMA101	Multivariable Calculus and Applications	BSC	T	3	1	-	-	4
3	U25RPH01	Engineering Physics	BSC	TwL	2	-	2	-	3
4	U25RCSG01	C Programming	ESC	T	3	-	-	-	3
5	U25RECG01	Introduction to Electrical And Electronics Engineering	ESC	T	3	-	-	-	3
6	U25RGE01	Makerspace	ESC	L	-	-	4	-	2
7	U25RCSG03	C Programming Laboratory	ESC	L	-	-	2	-	1
Total									19
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
8	U25RMNC01	Induction Program	MNC	MNC	-	-	-	-	-
9	U25RMCC01	Universal Human Values	MCC	MCC	3	-	-	-	3
10	U25RMCC02	தமிழர் மரபு / Heritage of Tamils	MCC	Tamil Courses	1	-	-	-	1
11	U25RMCC06	Professional Skill Development - I	MCC	MCC	-	-	-	-	1
Total									5

SEMESTER II

No	Course Code	Title	Category	Type	L	T	P	J	C
1	U25REN201	Professional Communication - II	HSMC	TwL	2	-	2	-	3
2	U25RMA202	Linear Algebra and Complex Variables	BSC	TwL	3	-	2	-	4
3	U25RCY01	Engineering Chemistry	BSC	TwL	2	-	2	-	3
4	U25RCSG04	Python Programming	ESC	T	3	-	-	-	3
5	U25REV201	Circuit and Network Theory	PCC	T	3	-	-	-	3
6	U25RECG02	Electronic Devices and Circuits	PCC	TwL	3	-	2	-	4
7	U25RCSG06	Python Programming Laboratory	ESC	L	-	-	2	-	1
Total									21
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
8	U25RMCC03	Design Thinking	MCC	MCC	1	-	2	-	2
9	U25RMCC04	Environmental Governance and Sustainability	MCC	MCC	2	-	-	-	2
10	U25RMCC05	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	MCC	Tamil Courses	1	-	-	-	1
11	U25RMCC07	Professional Skill Development - II	MCC	MCC	-	-	-	-	1



No	Course Code	Title	Category	Type	L	T	P	J	C
Total									6

T - Theory, L - Laboratory, TwL - Theory with Laboratory, TwP - Theory with Project



SEMESTER I

U25REN101	Professional Communication - I (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: HSMC				
		L	T	P	J	C
		2	0	2	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To develop professional communication skills for academic, technical and workplace environments
- To enhance the listening skills and facilitate effective pronunciation
- To enable students to communicate confidently in individual and team-based situations

COURSE OUTCOMES:

CO 1:	Use appropriate vocabulary and grammatical structures in professional communication	Understand
CO 2:	Communicate confidently in academic, social and workplace situations	Apply
CO 3:	Develop reading and writing skills for technical and professional purposes	Apply
CO 4:	Infer and present information using appropriate communication strategies	Analyze
CO 5:	Demonstrate effective listening, presentation, and teamwork skills in professional contexts	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 2	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 3	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 4	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 5	-	-	-	-	-	-	-	2	3	-	1	-	-

SYLLABUS:

UNIT I: FOUNDATIONS OF PROFESSIONAL COMMUNICATION 6 + 6

Verbal, Non-verbal and Digital Communication - Word chain - Professional Etiquette - Self-Introduction and Elevator Pitch - Growth Mindset and Workplace Communication - Cross-cultural Communication - Professional Terminology - AI-assisted Communication Tools

UNIT II: PROFESSIONAL READING AND WRITING 6 + 6

Reading Technical Articles - Error correction - Manuals and SOPs - Infographics and Data - Email Etiquette - Email Writing - AI-assisted Writing Tools - Ethical Use of AI - Verbal Analogy

UNIT III: LISTENING AND INTERPERSONAL COMMUNICATION 6 + 6

Listening Barriers - Note-taking Techniques - Listening for Problem Solving - Team Communication - Conflict Resolution - Workplace Discussions - Idioms and Phrases

UNIT IV: DIGITAL COMMUNICATION AND PRESENTATION SKILLS

6 + 6

Storytelling Techniques - Discourse markers, linkers and cohesive devices - Data Presentation - Presentation Anxiety Management - Digital Presentation Platforms - Branding - Commonly Confused Words

UNIT V: EMPLOYABILITY AND PROFESSIONALISM

6 + 6

Prefixes, Suffixes and Root Words - LinkedIn Profile - Interview Skills - Group Discussion Strategies - Art of Persuasion - Entrepreneurial Communication - AI in Future Workplace

LIST OF EXPERIMENTS

1. Self-Introduction
2. Group Presentation
3. Listening to TED Talks
4. Listening to Documentaries
5. Digital Profiling

CONTACT PERIODS:

Lecture: 30 Periods Tutorial: - Periods Practical: 30 Periods Project: - Periods Total: 60 Periods

TEXTBOOKS:

1. Ashraf Rizvi, Effective Technical Communication, 3rd Edition, McGraw-Hill Education, 2023
2. Meenakshi Raman & Sangeeta Sharma, Technical Communication: Principles and Practice, 4th Edition, Oxford University Press, 2022
3. Sanjay Kumar & Pushp Lata, Communication Skills, 3rd Edition, Oxford University Press, New Delhi, 2018

REFERENCES:

1. Stephen E. Lucas, The Art of Public Speaking, 14th Edition, McGraw Hill Education, New York, 2023
2. Dale Carnegie, The Quick and Easy Way to Effective Speaking, Updated Edition, Simon & Schuster, New York, 2019
3. Matt Abrahams, Think Faster, Talk Smarter: How to Speak Successfully When You're Put on the Spot, Simon & Schuster, New York, 2024

B7
Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.



SEMESTER I

U25RMA101	Multivariable Calculus and Applications (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: BSC				
		L	T	P	J	C
		3	1	0	0	4

QP PATTERN: A

COURSE OBJECTIVES:

- To provide a comprehensive knowledge of multivariable calculus, including, partial derivatives integral calculus, and vector calculus
- For constructing more convenient for students to apply their calculus knowledge to their various fields of study
- To develop skills in solving first and second order linear differential equations for engineering applications

COURSE OUTCOMES:

- CO 1:** Explain the concepts of multivariable differential calculus, estimate the extreme values and Taylor's Understand formula of two variable functions
- CO 2:** Apply integral calculus to evaluate double integrals over various regions and compute area and volume using double integration **Apply**
- CO 3:** Apply vector calculus to compute directional derivative, divergence, curl, Green's, Stokes' and Gauss divergence theorems **Apply**
- CO 4:** Solve first order ordinary differential equations, model physical phenomena, determine appropriate methods for solving them, and interpret the results **Apply**
- CO 5:** Formulate second-order differential equations, solve the equations, and interpret the solutions for physical models **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	2	-	-	-	-	-	-	-	-	-	-	-
CO 3	3	2	-	-	-	-	-	-	-	-	-	-	-
CO 4	3	2	-	-	-	-	-	-	-	-	-	-	-
CO 5	3	2	-	-	-	-	-	-	-	-	-	-	-

SYLLABUS:

UNIT I: DIFFERENTIAL CALCULUS

9 + 3

Functions of two variables – Partial derivatives – Total derivatives – Taylor's formula for functions of two variables – Extreme Values

UNIT II: INTEGRAL CALCULUS

9 + 3

UNIT II Double integrals – Over rectangles – Over general regions – Fubini's theorem (statement only), Area and Volume by double integration – Reversing the order of integration

UNIT III: VECTOR CALCULUS**9 + 3**

Differentiation in vector field – Gradient of a scalar field – Directional derivative – Divergence of a vector field – Curl of a vector field – Integration in vector field – Line integrals – Work– circulation and flux – Path independence – Conservative fields – Green's – Gauss divergence and Stoke's theorems

UNIT IV: FIRST ORDER LINEAR ORDINARY DIFFERENTIAL EQUATIONS**9 + 3**

Basic concepts of ordinary differential equations – Separable and exact differential equations – Integrating factors and first-order linear differential equations – Mathematical modelling of real-world problems

UNIT V: SECOND ORDER LINEAR DIFFERENTIAL EQUATIONS**9 + 3**

Homogeneous linear equations of second order – linearity principle – second order homogeneous equations with constant coefficients – Euler–Cauchy equation – Non-homogeneous linear second order-solution by variation of parameters

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** 15 Periods **Practical:** - Periods **Project:** - Periods **Total:** 60 Periods

TEXTBOOKS:

1. Thomas G. B. and Finney R. L., "Calculus and Analytic Geometry", Pearson Education, New Delhi, 2012
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India Pvt Ltd, New Delhi, 2012

REFERENCES:

1. Wylie C. R. and Barrett L. C., "Advanced Engineering Mathematics", Tata McGraw-Hill, New Delhi, 2013
2. Peter V.O Neil, "Advanced Engineering Mathematics", Cengage, New Delhi, 2010
3. Michael D. G, "Foundations of Applied Mathematics", Dover Publications, INC, New York, 2013
4. Gilbert Strang, "Calculus", Wellesley Cambridge Press, USA, 2017


 Head of the Department
 Electronics Engineering
 (VLSI Design and Technology)
 KPR Institute of Engineering and Technology
 Arasur, Coimbatore-641407.



SEMESTER I & II

U25RPH01	Engineering Physics (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: BSC				
		L	T	P	J	C
		2	0	2	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To understand the fundamental mechanical and thermal properties of solids and fluids for real-world engineering applications
- To explore advanced concepts in ultrasonic waves and their applications in imaging, testing, and sensing technologies
- To gain insights into semiconductor physics and photonics for their role in modern electronic and optical systems

COURSE OUTCOMES:

CO 1:	Apply the stress-strain behavior concepts in engineering materials and structures	Apply
CO 2:	Apply principles of heat transfer and fluid mechanics to evaluate thermal systems and engineering applications	Apply
CO 3:	Demonstrate the operation of ultrasonic wave generation and detection techniques for industrial and biomedical applications	Apply
CO 4:	Analyze the electrical properties and carrier transport mechanisms in semiconductors and semiconductor devices	Apply
CO 5:	Demonstrate the principles of lasers and optical fibers in communication, sensing, and biomedical applications	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	1	-	1	-	-	1	1	-	-	-	-
CO 2	3	2	1	-	1	-	-	1	1	-	-	-	-
CO 3	3	2	1	-	1	-	-	1	1	-	-	-	-
CO 4	3	2	1	-	1	-	-	1	1	-	-	-	-
CO 5	3	2	1	-	1	-	-	1	1	-	-	-	-

SYLLABUS:

UNIT I: MECHANICAL PROPERTIES OF SOLIDS

6 + 6

Modulus of Elasticity – Stress-strain diagram – Poisson's ratio – Elastic and plastic deformation – Stress-strain behaviour in metals, polymers and ceramics – Bending Moment – Cantilever – Applications (GIRDERS, MEMS)

UNIT II: FUNDAMENTALS OF HEAT TRANSFER AND FLUIDS

6 + 6

Heat transfer – Thermal expansion – Heat conductivity – Lee's Disc method – Surface tension – Viscosity – Coefficient of viscosity using Poiseuille's flow experiment – Solar water heater – Microwave oven – Heat exchangers – Radiators – Cooling towers

UNIT III: ULTRASONICS AND ITS APPLICATIONS**6 + 6**

Properties of Ultrasonic waves – Production of ultrasonic waves – Piezoelectric Oscillator – Magnetostriction Oscillator – Velocity measurement of Ultrasonic waves – SONAR – Non-Destructive Testing – Ultrasound imaging – Ultrasonic scanning methods

UNIT IV: SEMICONDUCTOR PHYSICS**6 + 6**

Properties – Direct and Indirect bandgap-semiconductor – Intrinsic and extrinsic Semiconductors – Carrier concentration in n-type semiconductor – P-type semiconductor – Carrier Transport in Semiconductor – Hall effect – Ohmic contacts – Schottky diode

UNIT V: PHOTONICS**6 + 6**

Interaction of Radiation with Matter – Laser Characteristics – Population Inversion – CO₂ laser – Semiconductor Diode Laser – Laser applications – Total Internal Reflection – Structure and working principle of Optical fibre – Fiber optic Endoscopy – Fiber optic sensors

LIST OF EXPERIMENTS

1. Determine the moduli of elasticity of the given beams and evaluate them for different structural applications. (High/Medium/Low modulus)
2. Evaluate the shear moduli of the different materials and rank them for suitable applications with reference to their strength
3. Select the most effective thermal insulation material from mica, cardboard, and glass for optimal heat protection
4. Determine the Viscosity of Liquids Using Poiseuille's Method and Identify the Fastest-Flowing Liquid
5. Measure the speed of ultrasound in liquids and calculate their compressibility for different hydraulic purposes
6. Categorize the specified semiconducting materials according to their energy bandgap values
7. Determine a semiconducting material's Hall coefficient and identify its type
8. Determination of wavelength of given laser and the particle size of the given samples using diffraction method
9. Use an optical fiber to measure its light-gathering capacity and calculate the propagation angle
10. Calculate the surface tension of different liquids and examine how surfactants affect it
11. Determination of wavelength of various spectral lines by using spectrometer and grating
12. Determination of velocity of light passing through glass medium using spectrometer

CONTACT PERIODS:

Lecture: 30 Periods **Tutorial:** - Periods **Practical:** 30 Periods **Project:** - Periods **Total:** 60 Periods

TEXTBOOKS:

1. M.N. Avadhanulu, P.G. Kshirsagar, and T.V.S. Arun Murthy, "A Textbook of Engineering Physics", 11th edition, S. Chand Publishing, New Delhi, 2022
2. R.K. Gaur and S.L. Gupta, "Engineering Physics", 8th edition, Dhanpat Rai Publications, New Delhi, 2017

REFERENCES:

1. Harald Ibach and Hans Luth, "Solid State Physics: An Introduction", 4th edition, Springer Publications, 2020
2. Charles Kittel, revised by David Pines (Editor) "Introduction to Solid State Physics", 9th edition, Wiley & Sons, US, 2020
3. H.K. Malik and A.K. Singh "Engineering Physics" Publisher: McGraw Hill Education India, 2022
4. https://onlinecourses.nptel.ac.in/noc20_cy17/preview



SEMESTER I

U25RCSG01	C Programming (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: ESC				
		L	T	P	J	C
		3	0	0	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To enable students to understand the fundamentals of problem-solving and C programming, including algorithms, flowcharts, pseudocode, and the structure of a C program
- To develop programming skills using input/output operations, control structures, arrays, strings, functions, pointers, and dynamic memory allocation
- To introduce user-defined data types such as structures and unions for handling complex data effectively
- To familiarize students with file handling concepts and develop C-based solutions for real-world applications

COURSE OUTCOMES:

- CO 1: Explain fundamental programming concepts, problem-solving techniques, and the basic structure of C Understand programs
- CO 2: Develop C programs using input/output functions, operators, decision-making, and iterative control structures Apply
- CO 3: Implement arrays and string handling concepts to solve data processing and real-world applications Apply
- CO 4: Develop modular and efficient programs using functions, recursion, pointers, and dynamic memory allocation techniques Apply
- CO 5: Apply user-defined data types and file handling operations to manage and process data effectively Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 3	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 4	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 5	3	2	1	1	1	-	-	-	-	-	2	-	-

SYLLABUS:

UNIT I: PROBLEM SOLVING APPROACHES AND C PROGRAMMING BASICS

10

Problem Solving Techniques: Problem Statement and Analysis – Problem Modelling – Identifying Input and Output Requirements – Algorithms – Flowcharts – Pseudocode for Solving Basic Scientific and Business Problems. Introduction to C: Characteristics of C – Structure of a C Program – Compiling and Executing C Program – Pre-processor Directives – Tokens – Character Set – Keywords – Identifiers – Constants – Variables – Operators – Data Types – Typecasting – Input/Output Statements in C

UNIT II: DECISION CONTROL AND LOOPING STATEMENTS

8

Conditional Statements: if Statement – if-else Statement – Nested if Statements – else-if Ladder – switch Statement. Looping Statements: while Loop – do-while Loop – for Loop – Nested Loops. Jump Statements: break Statement – continue Statement – goto Statement

UNIT III: ARRAYS AND STRINGS

9

Arrays: Declaration and Initialization – Accessing and Manipulating Array Elements – One-Dimensional Arrays – Two-Dimensional Arrays – Applications of Arrays. Strings: Declaration and Initialization of Strings – String Handling Functions – String Arrays

UNIT IV: FUNCTIONS AND POINTERS

9

Functions: Definition – Function Call – Function Prototype – Return Statement – Types of Functions – Recursive Functions – Command Line Arguments. Pointers: Declaration and Initialization – Pointer Arithmetic – Passing Arguments by Value and by Reference – Pointer to Pointer – Pointers and Arrays. Dynamic Memory Allocation: malloc(), calloc(), realloc(), free()

UNIT V: USER-DEFINED DATA TYPES AND FILE MANAGEMENT

9

Structures: Declaration and Initialization – Accessing Structure Members – Arrays of Structures – Nested Structures – Pointer to Structures. Unions – Storage Classes. Files: File Access Methods – File Modes – File Operations – File Pointers – Binary File Operations

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. Reema Thareja, "Computer Fundamentals and Programming in C", 3rd Edition, Oxford University Press, 2023
2. Brian W. Kernighan and Dennis Ritchie, "The C Programming Language", 2nd Edition, Pearson, 2015

REFERENCES:

1. Paolo Ferragina and Fabrizio Luccio, "Computational Thinking First Algorithms", Then Code", 1st Edition, Springer International Publishing, 2018
2. Paul Deitel and Harvey Deitel, "C How to Program", 7th Edition, Pearson Publication
3. Juneja, B. L and Anita Seth, "Programming in C", 1st Edition, Cengage Learning India Pvt. Ltd., 2011
4. Pradip Dey, Manas Ghosh, "Fundamentals of Computing and Programming in C", 1st Edition, Oxford University Press, 2009



U25RECG01	Introduction to Electrical And Electronics Engineering (Common to EC, EV)	Category: ESC				
		L	T	P	J	C
		3	0	0	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To learn the basic concepts of electric circuits
- To acquire the knowledge on constructional details of DC and AC machines
- To understand the working of measuring instruments and consumer electronic gadgets

COURSE OUTCOMES:

CO 1:	Outline the fundamental concepts of electric circuits	Understand
CO 2:	Summarize the construction and operation of DC machines	Understand
CO 3:	Explain the construction and operation of AC machines	Understand
CO 4:	Select the appropriate instruments to measure electrical parameters	Apply
CO 5:	Illustrate the working principles of consumer electronic gadgets	Understand

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	-	-	-	-	-	-	-	-
CO 2	2	1	-	-	-	-	-	-	-	-	-	-	-
CO 3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO 4	3	2	1	-	-	-	-	-	-	-	-	-	-
CO 5	2	1	-	-	-	-	-	-	-	-	-	-	-

SYLLABUS:**UNIT I: FUNDAMENTALS OF ELECTRIC CIRCUITS**

9

Basic terminology: Voltage, current, power, electromotive force – Resistors, capacitors and inductors: Types, characteristics and energy storage – AC and DC fundamentals – Three phase power supply – Line and phase voltages – Star and Delta connections

UNIT II: DC MACHINES

9

Construction – Operating principle – Types – Applications of DC generator and motor

UNIT III: AC MACHINES

9

Construction – Principle of operation – Types – Applications of transformers – Single and three phase induction motor – Stepper motor – Servo motor

UNIT IV: MEASURING INSTRUMENTS

9

Voltmeter – Ammeter – Wattmeter – Digital multimeter – Megger – CRO – Digital Storage Oscilloscope – Energy meter – Spectrum Analyzer

UNIT V: CONSUMER ELECTRONICS

Microphone – Loud speaker – Digital cameras – Smart TV – Washing machine – Microwave oven – Mobile phones

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. S.Salivahnan, R.Rengaraj, G R Venkatakrishnan., "Basic Electrical, Electronics and Measurement Engineering", 1st edition, Tata McGraw Hill Publishing Company Ltd, 2018
2. A.K.Sawhney, "A course in Electrical and Electronic Measurements and Instrumentation" 2nd edition, Dhanpat Rai & Sons, 2005

REFERENCES:

1. Bhattacharya S.K., "Electrical Machines", 4th edition, McGraw-Hill Education, New Delhi, 2017
2. Mitchel E Schultz, "Basic Electronics", 10th edition, McGraw Hill Publishers, 2017
3. Bali S P, "Consumer Electronics", 1st edition, Pearson Education Asia Pvt. Ltd., 2008

SEMESTER I & II

U25RGE01	Makerspace (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: ESC				
		L	T	P	J	C
		0	0	4	0	2

QP PATTERN: A

COURSE OBJECTIVES:

- Apply fundamental fabrication, electrical, electronics, programming, and digital manufacturing techniques for engineering applications
- Develop practical skills in prototyping, automation, robotics, and emerging technologies through experiential learning activities
- Design and construct interdisciplinary engineering prototypes by integrating concepts from multiple engineering domains

COURSE OUTCOMES:

CO 1:	Fabricate simple components using basic mechanical engineering tools and additive manufacturing	Apply
CO 2:	Carry out electrical wiring installations applying safety measures in domestic applications	Apply
CO 3:	Interface electronic devices to develop functional engineering solutions	Apply
CO 4:	Illustrate the role of automation and artificial intelligence in engineering applications	Apply
CO 5:	Develop interdisciplinary engineering prototype addressing specific problems through teamwork and innovation	Create

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	-	-	3	-	-	3	2	-	2	-	-
CO 2	3	2	-	-	3	-	-	3	2	-	2	-	-
CO 3	3	2	-	-	3	-	-	3	2	-	2	-	-
CO 4	2	-	-	-	3	-	-	-	-	-	2	-	-
CO 5	3	3	2	1	3	2	2	3	3	2	2	-	-

LIST OF EXPERIMENTS

MODULE 1: FABRICATION AND MAKING SKILLS (10 Hours)

1. Welding procedure, selection & safety Measures - Hands-on session for preparing base material and joining of steel materials using arc welding
2. Study on basic pipe connections with different joining components.
3. Demo on laser cutting of acrylic boards and wire arc welding

MODULE 2: DIGITAL DESIGN AND RAPID PROTOTYPING (10 Hours)

4. 3D Modelling of simple components using software's
5. Fabrication of simple components / parts using 3D printers
6. Demonstration of assembly modelling of components

MODULE 3: AUTOMATION AND ROBOTICS (8 Hours)

7. Demonstration on mechatronics components/systems
8. Demonstration on basic robotics system
9. Demonstration on automobiles, performance measures
10. Demonstration on programmable logic control circuit

MODULE 4: ELECTRICAL PRACTICES (10 Hours)

11. Study on basic electrical installation tools, equipment and safety measures
12. Basic electrical wiring and connections such as soldering, fuses, earthing, miniature circuit breakers and switch wiring
13. Hands-on session of electrical connections for lightings, fans, calling bells etc
14. Hands-on session of electrical connections for motors and uninterruptible power supply

MODULE 5: ELECTRONICS AND EMBEDDED SYSTEMS (8 Hours)

15. Electronic components, equipment and safety measures
16. Interfacing of sensors and actuator with microcontrollers (Arduino)
17. Integration of electronic circuits with IoT system
18. Interfacing of components with printed circuit board

MODULE 6: ARTIFICIAL INTELLIGENCE (4 Hours)

19. Demonstration on artificial intelligence technologies
20. Demonstration on AR/VR technologies

MODULE 7: INTERDISCIPLINARY PROTOTYPE CHALLENGE (10 Hours)

21. Students work in teams to develop and demonstrate an interdisciplinary product/prototype for the problem identified

CONTACT PERIODS:

Lecture: - Periods Tutorial: - Periods Practical: 60 Periods Project: - Periods Total: 60 Periods

TEXTBOOKS:

1. Mikell P. Groover, "Fundamentals of Modern Manufacturing: Materials, Processes and Systems", 7th Edition, Wiley, 2020
2. Simon Monk, "Programming Arduino: Getting Started with Sketches", 3rd Edition, McGraw-Hill Education, 2022
3. Richard H. Barnett, "Introduction to Mechatronics and Measurement Systems", 6th Edition, McGraw-Hill Education, 2023
4. Alasdair Gilchrist, "Industry 4.0: The Industrial Internet of Things", Apress, 2016

REFERENCES:

1. Arduino Documentation – <https://www.arduino.cc>
2. Tinkercad Learning Portal – <https://www.tinkercad.com>
3. FreeCAD Documentation – <https://www.freecad.org>
4. Ultimaker Cura Resources – <https://ultimaker.com/software/ultimaker-cura>
5. ESP32 Documentation – <https://docs.espressif.com>


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SEMESTER I

U25RCSG03	C Programming Laboratory (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: ESC				
		L	T	P	J	C
		0	0	2	0	1

QP PATTERN: A

COURSE OBJECTIVES:

- To provide hands-on experience in problem solving and structured programming using the C programming language
- To develop programming skills using control structures, arrays, strings, functions, pointers, and dynamic memory management techniques
- To enable students to design and implement applications using user-defined data types and file handling concepts for real-world problems

COURSE OUTCOMES:

- CO 1:** Demonstrate problem-solving techniques, algorithms, flowcharts, and basic C programming constructs in program development **Apply**
- CO 2:** Develop C programs using input/output operations, decision-making statements, and iterative constructs **Apply**
- CO 3:** Demonstrate the use of arrays and strings for data processing and manipulation **Apply**
- CO 4:** Develop modular applications using functions, recursion, pointers, and dynamic memory management techniques **Apply**
- CO 5:** Develop applications using structures, unions, storage classes, and file handling operations for data management **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	2	1	-	-	-	-	-	-	1	-	-
CO 2	3	2	2	1	-	-	-	-	-	-	1	-	-
CO 3	3	2	2	1	-	-	-	-	-	-	1	-	-
CO 4	3	2	2	1	-	-	-	-	-	-	1	-	-
CO 5	3	2	2	1	-	-	-	-	-	-	1	-	-

LIST OF EXPERIMENTS

1. Design and implementation of algorithms, flowcharts, and pseudo code for basic problem-solving applications
2. Development of C programs demonstrating data types, operators, and formatted input/output operations
3. Implementation of decision-making applications using conditional statements and switch-case constructs
4. Development of iterative applications using looping and loop control statements
5. Design and implementation of console-based applications for real-world mathematical and logical problem solving
6. Implementation of one-dimensional array operations for searching, sorting, and statistical analysis
7. Development of matrix manipulation applications using two-dimensional arrays
8. Design and implementation of string processing applications using standard string handling functions
9. Development of modular applications using user-defined functions and recursive techniques

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10. Implementation of applications demonstrating parameter passing mechanisms using call by value and call by reference
11. Development of applications using pointers, pointer arithmetic, and array-pointer relationships
12. Implementation of dynamic memory management applications using malloc(), calloc(), realloc(), and free()
13. Design and implementation of applications using structures, nested structures, unions, and storage classes
14. Development of file processing applications using text and binary file operations in C
15. Implementation of command-line and console-based applications integrating functions, pointers, structures, and file management concepts for real-world use cases

CONTACT PERIODS:

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

REFERENCES:

1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Pearson Education, 2015
2. Reema Thareja, "Computer Fundamentals and Programming in C", 3rd Edition, Oxford University Press, 2023
3. Yashavant Kanetkar, "Let Us C", 17th Edition, BPB Publications, 2023
4. Byron Gottfried, "Programming with C", 4th Edition, Schaum's Outline Series, McGraw Hill Education

BM
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SEMESTER I

U25RMNC01	Induction Program (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MNC				
		L	T	P	J	C
		3 Weeks				
						0

GUIDELINES:

Students come with diverse thoughts, backgrounds and preparations. It is important to assist them adjust in the new environment and inculcate in them the ethos of the institution with a sense of larger purpose. Keeping the above thought in mind AICTE proposes a 3-week induction program for the UG students entering the institution before the commencement of normal classes which will start only after the induction program is over. Its purpose is to make the students feel comfortable in their new environment, set a healthy daily routine, create bonding in the batch as well as between faculty, develop awareness, sensitivity and understanding of the self, society at large, and nature. The following are the activities under the induction program in which the student should be fully and actively engaged throughout the entire duration of the program.

Physical Activity: To inculcate team spirit, competitiveness, group cohesion and bonding as well as physical & mental health, physical activities like team sports, yoga, physical exercises should be conducted daily during early morning & evening. Activities like gardening may also be encouraged.

Creative Arts: Every student should choose one skill related to arts /visual arts/ performing arts like painting, sculpture, pottery, music, dance etc. to develop a sense of aesthetics and also to enhance creativity. The student should pursue it daily for the duration of the program.

Universal Human Values: Universal Human Values module will help the student to explore oneself and experience the joy of learning, stand up to peer pressure, take decisions with courage, create awareness about the relationship with colleagues and supporting staff in the hostel and department, etc.

Literary: Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

Proficiency Modules: To establish the command over skills like English, a computer familiarity etc. these modules can be taught earlier so that when norm

CONTACT PERIODS:

Lecture: - Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 0 Periods

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SEMESTER I

U25RMCC01	Universal Human Values (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		3	0	0	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To understand the significance of universal human values and their role in complementing technical, intellectual, and professional skills for holistic development.
- To apply a holistic perspective in addressing personal, societal, professional, and environmental challenges through ethical and value-based approaches.
- To demonstrate responsible citizenship, professional ethics, mutual respect, and sustainable practices that contribute positively to society, industry, and the environment.

COURSE OUTCOMES:

- CO 1:** Explain the significance of Universal Human Values and self-exploration in developing a holistic **Understand** perspective, enabling students to harmonize technical competence with ethical responsibility and value-based living.
- CO 2:** Differentiate the needs of the Self and the Body, and apply self-exploration to develop healthy habits, **Understand** value-based decision-making, and holistic well-being.
- CO 3:** Explain the concepts of natural acceptance, competence, and respect, and apply them to foster **Understand** harmonious relationships, resolve social conflicts, promote value education for children, and develop holistic perspectives for societal development.
- CO 4:** Demonstrate an understanding of the interconnectedness of existence and integrate holistic perspectives **Apply** into academic, professional, and societal contexts.
- CO 5:** Apply human values and professional knowledge to promote sustainable development, family harmony, **Apply** societal well-being, and responsible participation in nature.

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	-	-	-	-	-	3	3	-	-	-	3	-	-
CO 2	-	-	-	-	-	3	3	3	-	-	3	-	-
CO 3	-	-	-	-	-	3	3	-	-	-	3	-	-
CO 4	-	-	-	-	-	3	3	-	-	-	3	-	-
CO 5	-	-	-	-	-	3	3	3	-	-	3	-	-

SYLLABUS:

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UNIT I: INTRODUCTION TO VALUE EDUCATION

9

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) – Understanding Value Education – Self-exploration as the Process for Value Education – Continuous Happiness and Prosperity – the Basic Human Aspirations – Happiness and Prosperity: Current Scenario – Method to Fulfil the Basic Human Aspirations. Self-Exploration Activity Topics: Sharing about Oneself – Exploring Human Consciousness

UNIT II: HARMONY IN THE HUMAN BEING

9

Understanding Human being as the Co-existence of the Self and the Body – Distinguishing between the Needs of the Self and the Body – The Body as an Instrument of the Self – Understanding Harmony in the Self – Harmony of the Self with the Body – Programme to ensure self-regulation and Health. Self-Exploration Activity Topics: Exploring the difference of Needs of Self and Body – Exploring Sources of Imagination in the Self – Exploring Harmony of Self with the Body

UNIT III: HARMONY IN THE FAMILY AND SOCIETY

9

Harmony in the Family – the Basic Unit of Human Interaction – 'Trust': the Foundational Value in Relationship – 'Respect': as the Right Evaluation – Other Feelings, Justice in Human-to-Human Relationship – Understanding Harmony in the Society – Vision for the Universal Human Order. Self-Exploration Activity Topics: Exploring the Feeling of Trust – Exploring the Feeling of Respect – Exploring Systems to fulfil Human Goal

UNIT IV: HARMONY IN THE NATURE/EXISTENCE

9

Understanding Harmony in the Nature – Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders – Realizing Existence as Co-existence at All Levels – The Holistic Perception of Harmony in Existence. Self-Exploration Activity Topics: Exploring the Four Orders of Nature – Exploring Co-existence in Existence

UNIT V: HARMONY ON PROFESSIONAL ETHICS : HOLISTIC UNDERSTANDING

9

Natural Acceptance of Human Values – Definitiveness of (Ethical) Human Conduct – A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order – Competence in Professional Ethics – Holistic Technologies, Production Systems and Management Models: Typical Case Studies – Strategies for Transition towards Value-based Life and Profession. Self-Exploration Activity Topics: Exploring Natural Acceptance – Exploring Ethical Human Conduct – Exploring Humanistic Models in Education – Exploring Steps of Transition towards Universal Human Order

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. R R Gaur, R. Asthana, G P Bagaria, "A Foundation course in Human Values and Professional Ethics", 3rd Edition, Excel Books, New Delhi, 2024. ISBN 978-93-87034- 47-1
2. Prof. K. V. Subba Raju, "Success Secrets for Engineering Students", Smart Student Publications, 3rd Edition, 2013.
3. R R Gaur, R Asthana, G P Bagaria, "Teachers Manual for A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019 ISBN 978-93-87034-53-2

REFERENCES:

1. Ivan Illich, "Energy & Equity", The Trinity Press, Worcester, and HarperCollins, USA, 1974.
2. E. F. Schumacher, "Small is Beautiful: a study of economics as if people mattered.", Blond & Briggs, Britain, 1973.
3. A Nagraj, "Jeevan Vidya ek Parichay", Divya Path Sansthan, Amarkantak, 1998.


Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.



SEMESTER I

U25RMCC02	தமிழர் மரபு / Heritage of Tamils (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		1	0	0	0	1

QP PATTERN: A

COURSE OBJECTIVES:

- Learn the extensive literature of classical Tamil
- Review the fine arts heritage of Tamil culture
- Realize the contribution of Tamils in Indian freedom struggle

COURSE OUTCOMES:

CO 1:	Understand the extensive literature of Tamil and its classical nature	Understand
CO 2:	Understand the heritage of sculpture, painting and musical instruments of ancient people	Understand
CO 3:	Review on folk and martial arts of Tamil people	Understand
CO 4:	Realization of Thina concepts, trade and victory of Chozha dynasty	Understand
CO 5:	Understand the contribution of Tamils in Indian freedom struggle, Self-esteem movement and siddha medicine	Understand

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 2	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 3	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 4	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 5	-	-	-	-	-	-	3	3	-	2	-	-	-

SYLLABUS:

UNIT I: LANGUAGE AND LITERATURE

3

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

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

3

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

UNIT III: FOLK AND MARTIAL ARTS

3

Tattooing, basket weaving, Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyilattam, Leatherpuppetry, Silambattam, Valari, Tiger dance – Sports and Games of Tamils

UNIT IV: THINAI CONCEPT OF TAMILS**3**

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

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

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

CONTACT PERIODS:

Lecture: 15 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 15 Periods

TEXTBOOKS:

1. Jayanthi Ravikrishna K, Heritage of Tamils, Sri Krishna publications, First Edition, 2023
2. S. Priyadharshini, Heritage of Tamils, V. K. Publications

REFERENCES:

1. தமிழக வரலாறும் மக்களும் பண்பாடும் - கே. கே. பிள்ளை, உலகத் தமிழாராய்ச்சி நிறுவனம் (International Institute of Tamil Studies), C.P.T கேம்பஸ், சென்னை.
2. கணினித் தமிழ் - முனைவர். இல. சுந்தரம், விகடன் பிரசுரம், அண்ணொ சொல, .சன்னை, திசம்பர் 2016
3. கீழடி - 0வக நதிக்கரையில் சங்ககொல நகர நொகரிகம், .தொல்லியல் துறை .வளையீடு, தமிழ்நொடு அரசு, .சன்னை, ஆனொறாம் பதிப்பு 2020
4. Social Life of Tamils, Dr. K. K. Pillay, A joint publication of TNTB & ESC and RMRL (in print) University of Madras, Chennai, Second Edition 1975
5. The Contributions of the Tamils to Indian Culture, Dr.M.Valarmathi, International Institute of Tamil Studies, C.I.T Campus, Tharamani, Chennai, First Edition 1995


Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

SEMESTER I



U25RMCC06	Professional Skill Development - I (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		15 Hours				

COURSE OUTCOMES:

- CO 1:** Demonstrate technical skill competency through attainment of industry-relevant certifications, participation in competitions, internships, and project-based learning activities **Apply**
- CO 2:** Apply research, innovation, and problem-solving skills to develop impactful solutions through projects, publications, patents, and higher education preparation **Apply**
- CO 3:** Exhibit leadership, ethical responsibility, community engagement, and professional digital presence to enhance career readiness and lifelong learning **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	2	1	3	1	-	-	2	2	-	-	-
CO 2	3	2	2	1	2	2	-	-	1	1	-	-	-
CO 3	3	2	2	1	-	2	2	3	3	3	2	-	-

GUIDELINES:

- Certifications and Skill Credentials - Free awareness certs, NPTEL/Coursera, Associate-level, Professional-level, Expert-level
- Competitions, Hackathons, and Technical Challenges - Online, institution, state, national, international competitions and hackathons, Kaggle medals
- GATE Preparation and Performance - Study plan, mock tests, registration, appearing, score percentile
- Academic, Industry, and Innovation Projects - Mini-projects, intermediate projects, industry-grade deployed projects, funded or published projects
- Internships and Industrial Training - Virtual, on-site short, core role, CoE on-campus, PPO, PPO converted to offer
- Research Publications, Patents, Intellectual Property - Reading journals, survey papers, conference papers, Scopus/WoS, Q1/Q2 journals, patents from provisional to granted
- Leadership, Community, Digital Presence - Club membership, event roles, office bearer, president, outreach, LinkedIn, GitHub, portfolio, Google Scholar

CONTACT PERIODS:

Lecture: - Periods Tutorial: - Periods Practical: - Periods Project: - Periods Total: 0 Periods



SEMESTER II

U25REN201	Professional Communication - II (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: HSMC				
		L	T	P	J	C
		2	0	2	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To strengthen advanced communication and interpersonal skills required for academic and professional success
- To integrate AI-enabled communication tools for content creation, presentations and professional documentation
- To prepare students for modern workplace communication in global and digital environments

COURSE OUTCOMES:

CO 1:	Apply advanced verbal, written and digital communication strategies in professional contexts	Apply
CO 2:	Analyze technical information and produce effective workplace documents	Analyze
CO 3:	Demonstrate negotiation, leadership and collaborative communication skills	Understand
CO 4:	Deliver impactful technical presentations and communicate innovative ideas effectively	Apply
CO 5:	Utilize AI-assisted communication tools ethically for professional growth and workplace productivity	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 2	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 3	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 4	-	-	-	-	-	-	-	2	3	-	1	-	-
CO 5	-	-	-	-	-	-	-	2	3	-	1	-	-

SYLLABUS:

UNIT I: TECHNICAL WRITING AND DOCUMENTATION

6 + 6

Technical Reports - Proposal Writing - Meeting Agenda and Minutes - Technical Instructions and Process Description - AI-assisted Technical Documentation - Technical Vocabulary

UNIT II: COGNITIVE PROFESSIONALISM

6 + 6

Critical Thinking Strategies - Problem-solving Communication - Case Study - Brainstorming Techniques - Collaborative Decision Making - One-word Substitutions

UNIT III: CAREER PLANNING

6 + 6

Self-Assessment Techniques - SWOT Analysis - Goal Setting - AI-assisted Documentation - Digital Content Writing - Collocations

UNIT IV: CORPORATE COMMUNICATION AND NETWORKING**6 + 6**

Public Speaking - Welcome Address - Vote of Thanks - Anchoring and Event Hosting - Audience Engagement - Cloze tests -
Discourse markers - linkers and cohesive devices

UNIT V: CRITICAL THINKING AND COLLABORATIVE PROBLEM SOLVING**6 + 6**

Problem-solving Techniques - Mind Mapping - Negotiation Skills - Book Review / Film Review - Podcast and Media Analysis -
Critical Reading - Group Discussion

LIST OF EXPERIMENTS

1. Public Speaking
2. Group Discussion
3. Case Study
4. Blog Writing
5. Mind Mapping

CONTACT PERIODS:

Lecture: 30 Periods **Tutorial:** - Periods **Practical:** 30 Periods **Project:** - Periods **Total:** 60 Periods

TEXTBOOKS:

1. Ashraf Rizvi, Effective Technical Communication, 3rd Edition, McGraw Hill Education, 2023
2. Meenakshi Raman & Sangeeta Sharma, Technical Communication: Principles and Practice, 4th Edition, Oxford University Press, 2023
3. Sanjay Kumar & Pushp Lata, Communication Skills, 3rd Edition, Oxford University Press, New Delhi, 2018

REFERENCES:

1. Stephen E. Lucas, The Art of Public Speaking, 14th Edition, McGraw Hill Education, New York, 2023
2. Dale Carnegie, The Quick and Easy Way to Effective Speaking, Updated Edition, Simon & Schuster, New York, 2019
3. Matt Abrahams, Think Faster, Talk Smarter: How to Speak Successfully When You're Put on the Spot, Simon & Schuster, New York, 2024


 Head of the Department
 Electronics Engineering
 (VLSI Design and Technology)
 KPR Institute of Engineering and Technology
 Arasur, Coimbatore-641407.

SEMESTER II

U25RMA202	Linear Algebra and Complex Variables (Common to BM, EC, EV)	Category: BSC				
		L	T	P	J	C
		3	0	2	0	4

QP PATTERN: A

COURSE OBJECTIVES:

- To introduce the concepts of linear algebra and complex analysis relevant to engineering systems
- To impart in-depth theoretical concepts of matrix methods and complex techniques in solving engineering problems
- To develop analytical skills for modeling and analyzing engineering systems using linear algebra and complex variables

COURSE OUTCOMES:

CO 1:	Apply matrix operations and eigenvalue analysis to engineering systems	Apply
CO 2:	Apply the vector spaces and linear transformations in engineering contexts	Apply
CO 3:	Apply Gaussian elimination, Gauss–Jordan elimination and LU decomposition methods in solving systems of equations	Apply
CO 4:	Utilize complex variables and analytic functions in solving engineering problems	Apply
CO 5:	Apply complex integration and residue techniques in mathematical analysis	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	-	-	2	-	-	-	1	-	1	-	-
CO 2	3	2	-	-	2	-	-	-	1	-	1	-	-
CO 3	3	2	-	-	2	-	-	-	1	-	1	-	-
CO 4	3	2	-	-	2	-	-	-	1	-	1	-	-
CO 5	3	2	-	-	2	-	-	-	1	-	1	-	-

SYLLABUS:

UNIT I: SYSTEMS OF LINEAR EQUATIONS

9 + 6

Systems of linear equations – Gaussian elimination method – Gauss–Jordan elimination method – LU decomposition method – Consistency of linear systems and rank of a matrix

UNIT II: VECTOR SPACES

9 + 6

Definition and examples of vector spaces – Subspaces – Linear independence – Basis and dimension of vector spaces – Linear transformations and matrix representation

UNIT III: EIGENVALUES AND EIGENVECTORS

9 + 6

Eigenvalues and eigenvectors – Characteristic equation – Diagonalization of matrices – Cayley–Hamilton theorem – Applications of eigenvalues and eigenvectors

Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

UNIT IV: COMPLEX VARIABLES AND FUNCTIONS

9 + 6

Complex numbers – Functions of a complex variable – Analytic functions – Cauchy–Riemann equations – Bilinear Transformation – Conformal mapping– Harmonic functions

UNIT V: COMPLEX INTEGRATION

9 + 6

Complex integration – Cauchy's Integral theorem – Cauchy's Integral formula – Singular points – Classification of Singularities (Removable, Pole, Essential) – Laurent's series expansion – Residues and Cauchy's-Residue theorem

LIST OF EXPERIMENTS

1. Systems of Linear Equations – Solve systems of linear equations using Gauss–Jordan method – Implement LU decomposition method
2. Vector Space Computations – Determine linear independence and basis of vectors – Compute dimension and rank of matrices
3. Eigenvalue Analysis – Compute eigenvalues and eigenvectors of matrices – Perform diagonalization of matrix
4. Complex Variables and Functions – Verify Cauchy–Riemann equations for analytic functions – Bi-linear transformation for complex functions
5. Complex Integration – Expand functions using Laurent series – Compute residue integrals for complex functions

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** 30 Periods **Project:** - Periods **Total:** 75 Periods

TEXTBOOKS:

1. Howard Anton, Chris Rorres, Anton Haul "Elementary Linear Algebra", Wiley India, New Delhi, 2019
2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley India Pvt Ltd, New Delhi, 2018

REFERENCES:

1. David C. Lay, Linear Algebra and Its Applications, 5th Edition, Pearson Education, 2015
2. Gilbert Strang, Introduction to Linear Algebra, 5th Edition, Wellesley Cambridge Press, 2016
3. Dennis G. Zill and Patrick D. Shanahan, A First Course in Complex Analysis with Applications, 3rd Edition, Jones & Bartlett Learning, 2011
4. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 9th Edition, McGraw-Hill Education, 2013


Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.



SEMESTER I & II

U25RCY01	Engineering Chemistry (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: BSC				
		L	T	P	J	C
		2	0	2	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To introduce the fundamentals, properties, industrial applications of polymeric materials and advanced energy storage devices
- To impart knowledge about corrosion prevention, surface treatment methods and nanomaterials
- To provide a basic understanding of semiconductor materials, microelectronics, quantum, computational chemistry and their applications

COURSE OUTCOMES:

- CO 1:** Apply the concepts of polymer materials and their properties in solving industrial and technological challenges **Apply**
- CO 2:** Interpret the performance of batteries, solar cells, and supercapacitors for their effective energy storage applications **Apply**
- CO 3:** Utilize suitable corrosion prevention methods, surface treatment techniques and nanomaterials for industrial requirements **Apply**
- CO 4:** Apply suitable semiconductor materials, microfabrication processes and display technologies for specific applications **Apply**
- CO 5:** Utilize quantum chemistry principles and AI-assisted techniques to model, visualize, and predict material properties **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	1	-	1	-	-	1	1	-	1	-	-
CO 2	3	2	1	-	1	-	-	1	1	-	1	-	-
CO 3	3	2	1	-	1	-	-	1	1	-	1	-	-
CO 4	3	2	1	-	1	-	-	1	1	-	1	-	-
CO 5	3	2	1	-	1	-	-	1	1	-	1	-	-

SYLLABUS:

UNIT I: POLYMERIC MATERIALS

6 + 6

Polymers – Introduction – Compounding – Compression, Injection – Smart Polymers – Temperature responsive (PNIPAM), pH responsive (PAA), Light responsive (Azobenzene), 3D Printable (PLA), flexible and wearable polymers (PDMS – E-skin, RFID) – Conductive Polymers (PEDOT) – Synthesis, working and applications – Biopolymers – Classification, PEG, Alginate Hydrogel – Synthesis and applications

Head of the Department
Electronics Engineering
(VLSI Design and Technology)
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Arasur, Coimbatore-641407

UNIT II: ENERGY CONVERSION AND STORAGE**6 + 6**

Batteries – Classification, LiFePO_4 – Construction, working and applications – Fuel Cells – Proton Exchange Membrane(PEM), Solid Oxide Fuel Cells (SOFC) – Green Hydrogen – Classification, production method, electrolysis – Organic photovoltaics – P3HT and PCBM – Working and applications – Solar Cells – Dye-Sensitized Solar Cells (DSSC), Supercapacitors – Electrostatic Double Layer– Working and application

UNIT III: CORROSION AND NANO SCIENCE**6 + 6**

Types of corrosion – Factors influencing corrosion – Cathodic protection, Coatings – Galvanization, Epoxy, Polyurethane, Enamel, Superhydrophobic coatings – Process and applications. Surface treatments – Carburizing, Nitriding, Cyaniding – Process and applications. Nanomaterials – Introduction, 0D (Quantum dots), 1D (nanowire, nanorods and carbon nanotubes) 2D nanomaterials (MoS_2), Size effects and quantum confinement, Synthesis – Laser ablation and Chemical Vapour Deposition (CVD), Various applications of nanomaterials

UNIT IV: SEMICONDUCTOR AND DISPLAY TECHNOLOGY**6 + 6**

Semiconductors – Perfluoropentacene, GaN – Characteristics and applications, Neuromorphic Materials – Phase-Change Memory and Memristors – Working and applications – Liquid Crystal Displays, OLED, QLED – Working and applications – Wafer Manufacturing – Purification – Czochralski and Float Zone methods – Photolithography and microfabrication

UNIT V: QUANTUM AND COMPUTATIONAL CHEMISTRY**6 + 6**

Quantum Chemistry – Basics, quantum numbers, shapes of atomic orbitals, Molecular Orbital Theory – (H_2 , O_2 , N_2), Schrödinger equation (Derivation) – Qubits and Quantum Memory, Computational Chemistry – Molecular modeling – Basic Computational Methods – Software tools – iGemdock, Chem draw, Molview, Jmol – Introduction to AI and its role in the field of Chemistry

LIST OF EXPERIMENTS

1. Estimate the viscosity of a given polymer solution using an Ostwald viscometer and determine molecular weight of the given polymer
2. Synthesis of a polymer (Bakelite / polyaniline (PANI) and assess the physical properties of the polymer
3. Potentiometric determination and comparative study of EMF in different solutions
4. Determine maximum wavelength of absorption of a given solution to verify Beer's Law and to find unknown concentration of the given sample by Spectrophotometry / Colorimetry
5. Determination of corrosion rate of Iron and its prevention by electroplating / electroless plating
6. Synthesis of ZnO / TiO_2 / Ag nanoparticles and study of their photocatalytic degradation of Methylene Blue dye
7. Recovery of Copper from waste Printed Circuit Boards (PCBs) and quantitative determination of copper content
8. Measurement of electrical conductivity of solutions using a conductometric Sensor
9. Perform molecular docking using freely available online software to investigate the binding affinity a ligand with the protein
10. Construct the 2D structure of a given compound and generate its 3D molecular model using computational tools for visualization and structural analysis

CONTACT PERIODS:**Lecture:** 30 Periods**Tutorial:** - Periods**Practical:** 30 Periods**Project:** - Periods**Total:** 60 Periods**TEXTBOOKS:**

1. Wiley India Pvt. Ltd., "Engineering Chemistry", 2nd edition, Wiley India Pvt. Ltd., New Delhi, 2013
2. S.S. Dara and S.S. Umare, "A Textbook of Engineering Chemistry", 12th edition, Chand Publishing, New Delhi, 2024

3. R.V. Gadag and A. Nityananda Shetty, "Engineering Chemistry", 3rd edition, I.K. International Publishing House, New Delhi, 2014

REFERENCES:

1. Fred W Billmeyer, "Textbook of Polymer Science", 4th edition, John Wiley & Sons, New York, 1999
2. Buddy D. Ratner, Allan S. Hoffman, Frederick J. Schoen and Jack E. Lemons, "Biomaterials Science: An Introduction to Materials in Medicine", 4th edition, Academic Press, London, 2020
3. Kirby W Beard, Linden's "Handbook of Batteries", 5th edition, McGraw Hill, New York, 2019
4. John Larminie and Andrew Dicks, "Fuel Cell Systems Explained", 3rd edition, John Wiley & Sons, Chichester, 2012
5. Fontana M. G., "Corrosion Engineering", 3rd edition, McGraw-Hill Book Company, New York, 1986
6. V. Raghavan, "Materials Science and Engineering: A First Course", 6th edition, Prentice Hall of India, New Delhi, 2015
7. M.F. Ashby and D.R.H. Jones, "Engineering Materials" 2: An Introduction to Microstructures, Processing and Design, 4th edition, Elsevier, UK, 2012
8. Ira N Levine, "Quantum Chemistry", 7th edition, Pearson, Boston, 2013

B.M
Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

SEMESTER II

U25RCSG04	Python Programming (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: ESC				
		L	T	P	J	C
		3	0	0	0	3

QP PATTERN: A

COURSE OBJECTIVES:

- To introduce the fundamental concepts of Python programming; including syntax, data types, operators, and input/output operations
- To develop problem-solving skills through the use of control structures, functions, recursion, and modular programming techniques
- To provide proficiency in Python collections, file handling, exception handling, and program organization using modules and packages
- To familiarize students with basic object-oriented programming concepts and the use of Python libraries for data analysis applications

COURSE OUTCOMES:

- CO 1:** Explain Python programming fundamentals, including data types, operators, input/output operations, and **Understand** debugging techniques
- CO 2:** Develop Python programs using decision-making statements, iterative constructs, functions, recursion, and variable scope concepts **Apply**
- CO 3:** Implement string processing and Python collections such as lists, tuples, sets, and dictionaries to solve computational problems **Apply**
- CO 4:** Develop modular Python programs using file handling, exception handling, modules, and packages **Apply**
- CO 5:** Develop simple object-oriented programs and apply NumPy and Pandas libraries for basic data analysis applications **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	2	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 3	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 4	3	2	1	1	-	-	-	-	-	-	2	-	-
CO 5	3	2	1	1	-	-	-	-	-	-	2	-	-

SYLLABUS:

UNIT I: PYTHON FUNDAMENTALS

9

Introduction to Python – Features and Applications of Python – Installing Python – Python Interpreter – Script and Interactive Modes – Identifiers and Keywords – Variables – Data Types – Type Conversion – Operators and Expressions – Input and Output Operations – Comments and Documentation – Error Types – Testing and Debugging Basics

UNIT II: CONTROL STRUCTURES AND FUNCTIONS

9

Conditional Statements – Nested Conditional Statements – Iterative Statements: while Loop and for Loop – Loop Control Statements – Functions – Function Definition and Invocation – Function Arguments and Return Values – Scope of Variables – Recursive Functions – Applications of Functions in Problem Solving

UNIT III: STRINGS AND PYTHON COLLECTIONS

9

Strings and String Operations – Lists and List Operations – List Comprehensions – Tuples and Tuple Operations – Sets and Set Operations – Dictionaries and Dictionary Operations – Packing and Unpacking

UNIT IV: FILE HANDLING, MODULES AND EXCEPTION HANDLING

9

Modules and Packages – Importing Modules – Built-in Functions – File Handling – Opening and Closing Files – Reading and Writing Files – File Methods – Exception Handling – try, except, else and finally Blocks – User Defined Exceptions

UNIT V: OBJECT-ORIENTED PROGRAMMING AND DATA ANALYSIS

9

Classes and Objects – Creating Classes and Objects – Constructors – Instance Variables and Methods – Introduction to NumPy – Creating Arrays – Array Operations – Indexing and Slicing – Introduction to Pandas – Series and DataFrames – Reading and Displaying Data – Simple Data Analysis Applications.

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. Reema Thareja, "Python programming: Using problem solving approach", 1st Edition, Oxford Press, 2017
2. William McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd Edition, Shroff/O'Reilly Publication, 2017

REFERENCES:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
2. Ashok Namdev Kamthane and Amit Ashok Kamthane, "Programming and Problem Solving with Python", 2nd Edition, McGrawHill Education, 2018
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach", 1st Edition, Pearson India Education Services Pvt. Ltd., 2016


 Head of the Department
 Electronics Engineering
 (VLSI Design and Technology)
 KPR Institute of Engineering and Technology
 (Arasur, Coimbatore-641407)

SEMESTER II

U25REV201	Circuit and Network Theory	Category: PCC				
		L	T	P	J	C
		3	0	0	0	3

COURSE OBJECTIVES:

- To learn the basic concepts of circuit analysis and network topology
- To apply network theorems and analyze transient response
- To study the basic concepts of resonance circuits and two port network parameters

COURSE OUTCOMES:

CO 1:	Illustrate the basic concepts of electrical circuits	Understand
CO 2:	Solve the given circuits using mesh current and node voltage methods	Apply
CO 3:	Apply network theorems to simplify complex networks	Apply
CO 4:	Analyze the transient and steady state responses of RL, RC and RLC circuits	Analyze
CO 5:	Summarize the parameters of series RLC circuits and two port networks	Understand

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	-	-	-	-	-	1	-	-
CO 2	3	2	1	-	-	-	-	-	-	-	1	-	-
CO 3	3	2	1	-	-	-	-	-	-	-	1	-	-
CO 4	3	3	2	-	-	-	-	-	-	-	1	-	-
CO 5	2	1	-	-	-	-	-	-	-	-	1	-	-

SYLLABUS:

UNIT I: FUNDAMENTALS OF CIRCUITS AND NETWORK TOPOLOGY

9

Fundamental concepts – Passive elements – Series and parallel circuits – Independent and dependent sources – Basic laws – Simple circuit analysis using KCL and KVL – Network terminology – Incidence matrix – Trees – Cutsets

UNIT II: NETWORK ANALYSIS

9

Mesh current and node voltage methods of analysis for DC and AC circuits – Supermesh and supernode analysis – Source transformation techniques – Star delta conversion

UNIT III: NETWORK THEOREMS

9

Network theorems for DC circuits – Superposition theorem, Thevenin's theorem, Norton's theorem, Reciprocity theorem, Maximum power transfer theorem

Head of the Department
 Electronics Engineering
 (VLSI Design and Technology)
 KPR Institute of Engineering and Technology
 Arasur, Coimbatore-641407.

UNIT IV: TRANSIENT ANALYSIS

9

Phasor relationship for R, L, and C – Phasor diagram – Steady-state and transient analysis of RL, RC, RLC circuits using Laplace transform

UNIT V: RESONANCE AND NETWORK PARAMETERS

9

Impedance and admittance concepts – Frequency response – Resonance in RLC circuits – Series and parallel resonance – Introduction to network parameters

CONTACT PERIODS:

Lecture: 45 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. William H. Hayt, Jr. Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuit Analysis", 8th edition, McGraw Hill, 2018
2. Joseph Edminister and Mahmood Nahvi, "Electric Circuits", Schaum's Outline Series, 5th edition, Tata McGraw Hill, New Delhi, 2018

REFERENCES:

1. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", 6th edition, McGraw Hill, 2019
2. A. Bruce Carlson, "Circuits: Engineering Concepts and Analysis of Linear Electric Circuits", 2nd edition, 2017
3. Sudhakar, A and Shyammoohan S Palli, "Circuits and Networks: Analysis and Synthesis", 5th edition, McGraw Hill, 2015
4. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", 5th edition, Cengage Learning, 2013


Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

SEMESTER I & II



U25RECG02	Electronic Devices and Circuits (Common to BM, EC, EV)	Category: PCC				
		L	T	P	J	C
		3	0	2	0	4

QP PATTERN: A

COURSE OBJECTIVES:

- To learn the fundamentals of semiconductor devices
- To familiarize the application of diode and transistor
- To analyze the performance of transistor amplifier

COURSE OUTCOMES:

CO 1:	Explain the fundamentals of semiconductor devices	Understand
CO 2:	Construct electronic circuits using the PN junction diode for various applications	Apply
CO 3:	Demonstrate the input and output characteristics of BJT and JFET	Apply
CO 4:	Apply suitable biasing methods for amplifier	Apply
CO 5:	Analyze the frequency response of CE amplifier	Analyze

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	-	-	-	-	-	1	1	-
CO 2	3	2	1	1	1	-	-	2	2	-	1	1	-
CO 3	3	2	1	1	1	-	-	2	2	-	1	1	-
CO 4	3	2	1	1	-	-	-	2	2	-	1	1	-
CO 5	3	3	2	2	1	-	-	2	2	-	1	1	-

SYLLABUS:

UNIT I: SEMICONDUCTOR FUNDAMENTALS

9 + 6

Introduction to semiconductors – Energy band theory – Carrier concentration in intrinsic and extrinsic semiconductors – Law of mass-action – Conductivity of semiconductors – Drift and diffusion current – Temperature effects – PN junction diode – Zener diode – Carrier lifetime

UNIT II: DIODES AND ITS APPLICATIONS

9 + 6

Rectifiers – Half wave and full wave rectifier circuits – L,C ,LC and CLC filters – Voltage regulators – Positive and Negative Clippers – Clampers – LED, Photodiode

UNIT III: BJT AND FET

9 + 6

Construction and operation of NPN and PNP Transistors – CE, CB and CC configurations – Input and output characteristics – Early effect – JFET construction, operation and characteristics – Enhancement and depletion MOSFETs – Characteristics of MOSFET

UNIT IV: BIASING AND COMPENSATION TECHNIQUES

9 + 6

DC and AC load line – Bias stabilization – Fixed bias, Collector to base bias, voltage divider bias –Stability factor – Bias compensation using diode, thermistor and sensistor

UNIT V: FREQUENCY ANALYSIS OF BJT AMPLIFIERS

9 + 6

h-parameter model –re model – Hybrid π model – Small signal analysis of CE amplifier – Fre-quency response – Miller effect – High frequency analysis of CE amplifier

LIST OF EXPERIMENTS

1. VI characteristics of PN diode and Zener diode
2. Applications of PN diode and Zener diode
3. Characteristics of BJT and JFET
4. Frequency response of CE and CS amplifiers using simulation tool
5. Design of wave shaping circuits using simulation tool
6. Design of DC regulator power supply using simulation tool
7. Characteristics of MOSFET using simulation tool

CONTACT PERIODS:

Lecture: 45 Periods Tutorial: - Periods Practical: 30 Periods Project: - Periods Total: 75 Periods

TEXTBOOKS:

1. Donald A Neaman, "Semiconductor Physics and Devices", 4th edition, Tata McGraw–Hill Inc. 2012
2. S. Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and Circuits", 3rd edition, Tata McGraw–Hill Inc., 2010

REFERENCES:

1. Yang, "Fundamentals of Semiconductor devices", 1st edition, McGraw Hill International, 2017
2. Jacob Millman, Christos C Halkias, Satyabrata Jit, "Electronic Devices and Circuits", 4th edition, McGraw Hill India, 2015
3. Robert Boylestad and Louis Nashelsky, "Electron Devices and Circuit Theory", 11th edition, Pearson Prentice Hall, 2014
4. R.S.Sedha, "A Text Book of Applied Electronics", 3rd edition, S. Chand Publications, 2006


 Head of the Department
 Electronics Engineering
 (VLSI Design and Technology)
 KPR Institute of Engineering and Technology
 Arasur, Coimbatore-641407.



U25RCSG06	Python Programming Laboratory (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: ESC				
		L	T	P	J	C
		0	0	2	0	1

QP PATTERN: A

COURSE OBJECTIVES:

- To understand the fundamental concepts of Python programming and problem-solving using Python language constructs
- To apply control structures, functions, strings, and Python collections for developing efficient applications
- To develop modular applications using file handling, exception handling, modules, and packages.
- To implement basic object-oriented programming concepts and utilize Python libraries for data analysis applications

COURSE OUTCOMES:

CO 1: Implement Python programs using basic language constructs, data types, operators, and input/output operations	Apply
CO 2: Develop Python programs using decision-making statements, looping constructs, functions, and recursion	Apply
CO 3: Implement applications using strings, lists, tuples, sets, and dictionaries for data processing and problem solving	Apply
CO 4: Develop modular applications using file handling, exception handling, modules, and packages	Apply
CO 5: Design applications using basic object-oriented programming concepts and Python libraries such as NumPy and Pandas	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	1	1	-	-	-	-	-	-	-	-	-
CO 2	3	2	1	1	-	-	-	-	-	-	-	-	-
CO 3	3	2	1	1	-	-	-	-	-	-	1	-	-
CO 4	3	2	1	1	-	-	-	-	-	-	1	-	-
CO 5	3	2	1	1	-	-	-	-	-	-	1	-	-

LIST OF EXPERIMENTS

1. Development of Python programs demonstrating variables, data types, operators, and input/output operations
2. Implementation of applications using conditional statements and nested conditional constructs
3. Development of iterative applications using for loops, while loops, and loop control statements
4. Design and implementation of console-based applications for mathematical and logical problem solving
5. Development of applications using user-defined functions and recursive functions
6. Implementation of string processing applications using Python string operations and methods
7. Development of applications using lists, tuples, sets, and dictionaries
8. Implementation of applications using list comprehensions and collection-based problem solving
9. Development of modular applications using built-in and user-defined modules
10. Implementation of file handling applications for reading, writing, and appending data

11. Development of robust applications using exception handling and user-defined exceptions
12. Design and implementation of applications using classes, objects, constructors, and instance methods
13. Development of applications demonstrating inheritance and method overriding
14. Implementation of numerical computing applications using NumPy arrays and array operations
15. Development of simple data analysis applications using Pandas Series and DataFrames

CONTACT PERIODS:

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

REFERENCES:

1. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd Edition, O'Reilly Media, 2016
2. Ashok Namdev Kamthane and Amit Ashok Kamthane, Programming and Problem Solving with Python, 2nd Edition, McGraw Hill Education, 2018

Bm

Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.



SEMESTER I & II

U25RMCC03	Design Thinking (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		1	0	2	0	2

QP PATTERN: A

COURSE OBJECTIVES:

- To Understand the basics of Design Thinking, its principles, processes, and tools used
- To empathize with stakeholders and frame problems using structured tools and techniques
- To generate ideas and present solutions effectively using design tools

COURSE OUTCOMES:

CO 1: Explain purpose and features of design thinking process	Understand
CO 2: Use required tools to empathize with the stockholders to identify the problem	Apply
CO 3: Comment the identified problem elaborately and clearly	Apply
CO 4: Develop a conceptual solution for a societal problem	Apply
CO 5: Present the identified solution to all the stakeholders	Apply

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	1	1	-	1	1	2	-	-
CO 2	2	1	-	-	-	1	1	-	1	1	2	-	-
CO 3	2	1	1	-	-	1	1	3	1	1	2	-	-
CO 4	3	3	2	-	-	1	1	3	1	1	2	-	-
CO 5	3	2	-	-	-	1	1	3	3	1	2	-	-

SYLLABUS:

UNIT I: FUNDAMENTALS OF DESIGN THINKING

5 + 10

Introduction to Design Thinking: Definition, relevance, and applications – Design The Thinking – Personal Visualization, The Wheel of Life, and Balancing Priorities – Understanding and appreciating the concept of 'Design' – The 3 Laws of Design Thinking

UNIT II: THE EMPHATHIZE AND DEFINE STAGE

5 + 10

Understanding Stakeholders – Role of Empathy in Design Thinking – Tools: Persona, Journey Mapping, Stakeholder Mapping, CATWOE, Cartographic Perspective (LO), and Empathy Map – Case Study. Problem Framing and Reframing – Role of a Design Thinker – Tools: Five Whys, Anti-Pattern, Problem Paraphrasing, Introduction to LORD Skillset – Case Study

UNIT III: THE DIVERGENCE AND CONVERGENCE AND COMMUNICATION STAGE**5 + 10**

Ideation through Divergent and Convergent Thinking – Tools: Brainstorming, 10gm – 100gm–1000gm. Presenting Design Outcomes – Tools: 4Cs Framework – Case Study

LIST OF EXPERIMENTS

1. Design a solution for a societal problem that can be in line with sustainable development, thrust areas, industrial problems etc. under various themes like Health & Wellness: MedTech, Biotech, and HealthTech Agriculture & Rural: Agriculture, FoodTech, and Rural Development Green Energy: Renewable/Sustainable Energy and Clean and Green Technology Advanced Tech: Blockchain and Cyber Security, Robotics and Drones, and Space Technology Smart Infrastructure: Smart Automation, Smart Education, Smart Vehicles, Transportation and Logistics Daily Utility & Leisure: Fitness and Sports, Tourism, Disaster Management, Games, and Toys Sustainability & Smart Cities: waste-to-wealth, disaster management, or digital twin models for resource management

CONTACT PERIODS:

Lecture: 15 Periods **Tutorial:** - Periods **Practical:** 30 Periods **Project:** - Periods **Total:** 45 Periods

TEXTBOOKS:

1. Tim Brown, "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation", 1st edition, New York, HarperCollins Publishers Ltd, New York, 2018
2. Idris Mootee, "Design Thinking for Strategic Innovation", 1st edition, John Wiley & Sons Inc, 2013

REFERENCES:

1. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, 2009
2. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
3. Liedtka, Andrew King, Kevin Bennett, Book – "Solving Problems with Design Thinking – Ten Stories of What Works", Columbia Business School Publishing, 2013
4. Maurício Vianna, Ysmar Vianna, Isabel K. Adler, Brenda Lucena, Beatriz Russo, "Design thinking: Business Innovation", MJV Press, 2011
5. Burgelman, Christensen, and Wheelwright, "Strategic Management of Technology and Innovation", 5th Edition, McGraw Hill Publications, 2017

SEMESTER I & II

U25RMCC04	Environmental Governance and Sustainability (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		2	0	0	0	2

QP PATTERN: A

COURSE OBJECTIVES:

- To provide basic concepts of ecosystem, biodiversity, atmospheric and hydrological processes
- To inculcate knowledge on the lithosphere, waste management practices, environmental laws and disaster management strategies
- To apply the principles of sustainable living and green technologies in alignment with the UN Sustainable Development Goals

COURSE OUTCOMES:

- CO 1: Explain the role of biodiversity conservation and wildlife protection in addressing environmental issues **Understand**
- CO 2: Apply pollution control methods, environmental laws, and water management practices for environmental protection **Apply**
- CO 3: Implement sustainable waste management practices for efficient resource utilization **Apply**
- CO 4: Explain the role of disaster management, governance, and IT tools in environmental and health sustainability **Understand**
- CO 5: Employ sustainable practices and national environmental initiatives for sustainable development **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	2	1	-	-	-	3	2	-	1	-	1	-	-
CO 2	2	1	-	-	-	3	2	-	1	-	1	-	-
CO 3	2	1	-	-	-	3	2	-	1	-	1	-	-
CO 4	2	1	-	-	-	3	2	-	1	-	1	-	-
CO 5	3	1	-	-	-	3	2	-	1	-	1	-	-

SYLLABUS:

UNIT I: ENVIRONMENT AND BIODIVERSITY

6

Scope of Environmental Science – Ecology – Ecosystem – Classification, structure, productivity – Energy flow and nutrient cycles – Nitrogen cycle – Ecological succession – Biodiversity – Types and values of biodiversity – Biodiversity at Global, National and Local Levels – Bio-geographical Classification of India – India as a Mega-diversity Nation – Red Data Book – Hotspots of Indian Biodiversity – Endangered and endemic species – Conservation of biodiversity

Self - Learning & Case Studies – Species conservation projects in India – Species Reintroduction – National Biodiversity Action Plan 2015 – Role of International Union for Conservation of Nature (IUCN)

UNIT II: ATMOSPHERE AND HYDROSPHERE

6

Atmosphere – Structure and composition – Earth's Albedo – Carbon cycle and oxygen cycle – Air Quality Standards – Air Pollution – Sources, effects and control measures – Indian Environmental Laws – Air Act 1981. Hydrosphere – Hydrosphere – Hydrological Cycle, Water Quality Parameters, Water Pollution – Sources, effects, and control measures - Water conservation – Rainwater harvesting, Dams, and watershed Management – Wastewater treatment, Ocean acidification, Blue economy, Water Act, 1974 and Environment Protection Act, 1986

Self - Learning & Case Studies – Clean Development Mechanism (CDM) – Greenhouse Gas Protocol – ISO 14064 – Jal Shakti Abhiyan – Implementation of CNG in NCT of Delhi – Taj Trapezium Case – Narmada River – Sardar Sarovar Project

UNIT III: LITHOSPHERE AND SOLID WASTE MANAGEMENT

6

Lithosphere – Structure of the lithosphere – Continental drift – Forest resources – Deforestation – Causes and effects – Agriculture – Effects of modern agriculture – Soil Pollution – Causes, effects and control measures. Solid Waste Management – Solid Waste – Sources, classification, and effects, Waste reduction strategies – Circular Economy and 5R Principles, Solid waste treatment, Disposal techniques, Refuse-Derived Fuel and Waste-to-Energy technologies, Biomedical, E-Waste and Hazardous waste management, Resource recovery – Environmental Standards and Waste Management Regulations (ISO 14001 and Waste Rules)

Self - Learning & Case Studies – Solid Waste Management rules, 2024 – Plastic Waste Management Rules (PWMR) – Degradation of Soil in Rajasthan – Indore's Waste Management System

UNIT IV: GLOBAL ISSUES, HUMAN WELFARE AND ROLE OF TECHNOLOGY

6

EIA- Concepts, stages – Land clearing projects – Environmental and social Impacts, Resettlement and Rehabilitation – Concepts and challenges – Disaster management – Floods, Landslides, Disaster management cycle and mitigation – Environmental Governance, Global Governance and Fundamental Human Rights – Importance. Human Population – Population growth, explosion and its challenges – Trends and variation among nations – Role of IT – Remote sensing, GIS and Google earth engine – Disease tracking and prediction using big data and AI (e.g., COVID-19 apps)

Self - Learning & Case Studies – Mission Amrit Sarovar – Beti Bachao Beti Padhao mission – Kerala Flood (2018) – Sterlite Copper Plant Case – Thoothukudi

UNIT V: SUSTAINABLE DEVELOPMENT AND GREEN PRACTICES

6

Sustainable Development – Concept, significance of sustainability – UN Sustainable Development Goals (UN SDGs) – Sustainability assessment – Carbon footprint, accounting, Carbon Neutrality – Net Zero Emissions – Carrying Capacity of the Earth – Carbon Sequestration and Carbon Capture – Blue Carbon and Green Carbon. Green Practices – Sustainable Agriculture – Green Energy – Biofuels, Green Hydrogen, Solar, wind and biomass Energy – Sustainable Transport – Electric Vehicles (EVs)

Self - Learning & Case Studies – National Solar Mission, Green India Mission – Ambikapur, Chhattisgarh – Zero Waste Model – Delhi Metro – Energy Efficiency and Sustainable Transport

CONTACT PERIODS:

Lecture: 30 Periods

Tutorial: - Periods

Practical: - Periods

Project: - Periods

Head of the Department

Electronic Engineering

(VLSI Design and Technology)

KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

TEXTBOOKS:

1. E. Bharucha, "Environmental Studies for Undergraduate Courses", 2nd edition, Hyderabad, University Press (India) Pvt. Ltd, 2005
2. R. Rajagopalan, "Environmental Studies: From Crisis to Cure", 3rd edition, New Delhi, Oxford University Press, 2016
3. R. R. Hiremath, "Sustainable Development", 1st edition, New Delhi, Himalaya Publishing House, 2008

REFERENCES:

1. Anubha Kaushik and C.P. Kaushik, "Environmental Studies" 6th edition, New Age International Publishers, New Delhi, 2018
2. Benny Joseph, "Environmental Studies", 3rd edition, New Delhi, McGraw Hill Education, 2017
3. M. Anji Reddy, "Textbook of Environmental Science and Technology", 3rd edition, BS Publications, 2019
4. R. B. Singh, "Disaster Management", 1st edition, New Delhi, Rawat Publications, 2006
5. .V. Desai, "Environment and Sustainable Development" 1st edition, Mumbai, Himalaya Publishing House, 2009



SEMESTER II

U25RMCC05	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		1	0	0	0	1

QP PATTERN: A

COURSE OBJECTIVES:

- To learn weaving, ceramic and construction technology of Tamils
- To understand the agriculture, irrigation and manufacturing technology of Tamils
- To realize the development of scientific Tamil and Tamil computing

COURSE OUTCOMES:

CO 1: Understand the weaving and ceramic technology of ancient Tamil people nature	Understand
CO 2: Understand the construction technology, building materials in Sangam period and case studies	Understand
CO 3: Infer the metal process, coin and beads manufacturing with relevant archeological evidence	Understand
CO 4: Realize the agriculture methods, irrigation technology and pearl diving	Understand
CO 5: Apply the knowledge of scientific Tamil and Tamil computing	Understand

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 2	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 3	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 4	-	-	-	-	-	-	3	3	-	2	-	-	-
CO 5	-	-	-	-	-	-	3	3	-	2	-	-	-

SYLLABUS:

UNIT I: WEAVING AND CERAMIC TECHNOLOGY

3

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

UNIT II: DESIGN AND CONSTRUCTION TECHNOLOGY

3

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

UNIT III: MANUFACTURING TECHNOLOGY

3

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

Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

UNIT IV: AGRICULTURE AND IRRIGATION TECHNOLOGY**3**

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

UNIT V: SCIENTIFIC TAMIL & TAMIL COMPUTING**3**

Development of Scientific Tamil – The role of journals in the development of scientific Tamil – Scientific Tamil vocabulary – Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project

CONTACT PERIODS:

Lecture: 15 Periods **Tutorial:** - Periods **Practical:** - Periods **Project:** - Periods **Total:** 15 Periods

TEXTBOOKS:

1. Tamils and Technology, K. Jayanthi Ravikrishna, Sri Krishna publications, Mahalakshmi Nagar, Velappanchavadi, First Edition 2023
2. Tamils and Technology, S. Priyadharshini, V. K. Publications

REFERENCES:

1. The Contributions of the Tamils to Indian Culture, Dr. M. Valarmathi, International Institute of Tamil Studies, C.I.T Campus, Tharamani, Chennai, First Edition 1995
2. Studies in the History of India with Special Reference to Tamil Nadu, Dr. K. K. Pillay, 1979

B-3

Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arasur, Coimbatore-641407.

SEMESTER II

U25RMCC07	Professional Skill Development - II (Common to AD, AM, BM, CB, CE, CH, CS, EC, EE, EV, IT, ME, MI, SC)	Category: MCC				
		L	T	P	J	C
		15 Hours				1

COURSE OUTCOMES:

- CO 1:** Demonstrate technical skill competency through attainment of industry-relevant certifications, participation in competitions, internships, and project-based learning activities **Apply**
- CO 2:** Apply research, innovation, and problem-solving skills to develop impactful solutions through projects, publications, patents, and higher education preparation **Apply**
- CO 3:** Exhibit leadership, ethical responsibility, community engagement, and professional digital presence to enhance career readiness and lifelong learning **Apply**

CO - PO MAPPING:

Particular	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	2	-	3	1	-	-	2	2	-	-	-
CO 2	2	3	3	3	2	2	-	-	1	1	-	-	-
CO 3	-	-	3	-	-	2	2	3	3	3	2	-	-

GUIDELINES:

- Certifications and Skill Credentials - Free awareness certs, NPTEL/Coursera, Associate-level, Professional-level, Expert-level
- Competitions, Hackathons, and Technical Challenges - Online, institution, state, national, international competitions and hackathons, Kaggle medals
- GATE Preparation and Performance - Study plan, mock tests, registration, appearing, score percentile
- Academic, Industry, and Innovation Projects - Mini-projects, intermediate projects, industry-grade deployed projects, funded or published projects
- Internships and Industrial Training - Virtual, on-site short, core role, CoE on-campus, PPO, PPO converted to offer
- Research Publications, Patents, Intellectual Property - Reading journals, survey papers, conference papers, Scopus/WoS, Q1/Q2 journals, patents from provisional to granted
- Leadership, Community, Digital Presence - Club membership, event roles, office bearer, president, outreach, LinkedIn, GitHub, portfolio, Google Scholar

CONTACT PERIODS:

Lecture: - Periods Tutorial: - Periods Practical: - Periods Project: - Periods Total: 0 Periods


Head of the Department
Electronics Engineering
(VLSI Design and Technology)
KPR Institute of Engineering and Technology
Arakon, Coimbatore-641407.

