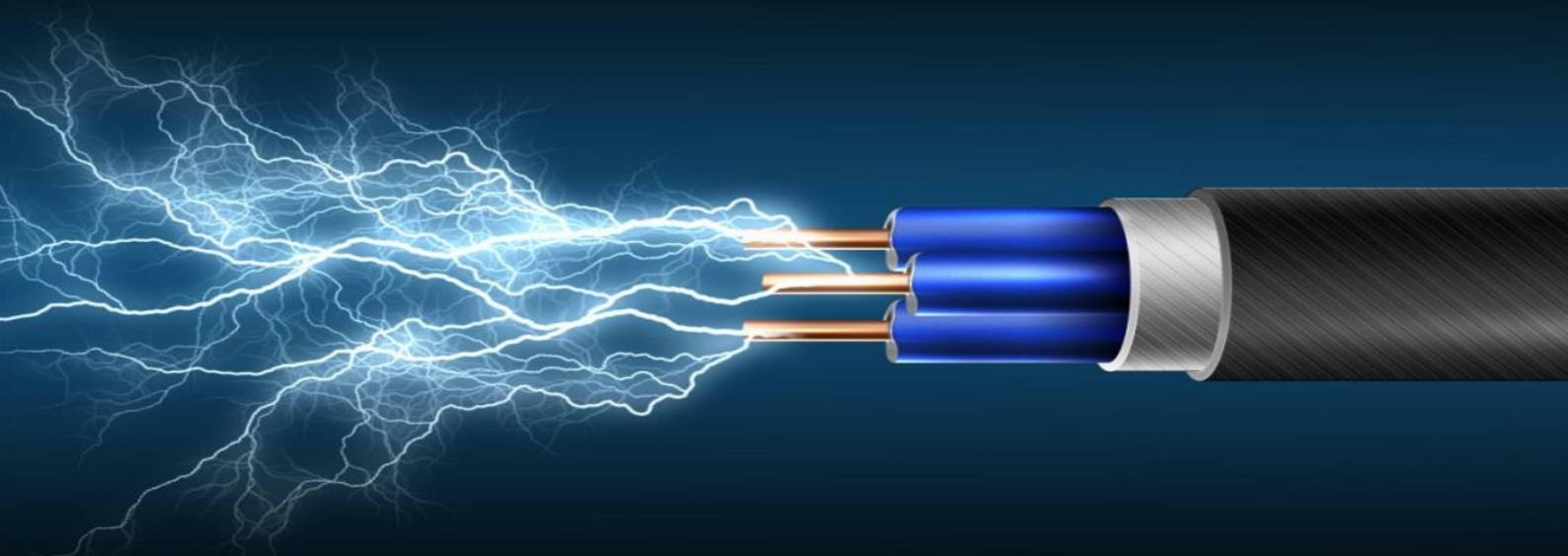# M.I.E.T. ENGINEERING COLLEGE
(Autonomous)

Curriculum & Syllabus

(First year)

(Regulations 2024)

B.E. Electrical and Electronics Engineering

M.I.E.T. ENGINEERING COLLEGE NBA
(AUTONOMOUS)
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
Accredited by NBA (CIVIL, CSE, ECE & MECH)
Accredited with 'A+' grade by NAAC
(An ISO 9001:2015 Certified Institution)
(Recognized by UGC under section 2(f) & 12(B) of UGC Act, 1956)
TRICHY - PUDUKKOTTAI MAIN ROAD, TRICHY - 620 007

REGULATIONS 2024
CHOICE BASED CREDIT SYSTEM
B. E. ELECTRICAL AND ELECTRONICS ENGINEERING
CURRICULUM AND SYLLABI FOR SEMESTER I & II

SEMESTER - I

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK L	PERIODS PER WEEK T	PERIODS PER WEEK P	TOTAL CONTACT PERIODS PER WEEK	CREDITS
1.	24IP1101	Induction Programme	-	-	-	-	-	0
2.	24HS1101	Professional English	HSMC	3	0	2	5	4
3.	24MU1101	Matrices and Calculus	BSC	3	1	0	4	4
4.	24PH1101	Engineering Physics	BSC	3	0	2	5	4
5.	24CY1101	Engineering Chemistry	BSC	3	0	2	5	4
6.	24GE1101	Problem Solving and Python Programming	ESC	3	0	2	5	4
7.	24GE1102	Heritage of Tamils – தமிழர் மரபு	HSMC	1	0	0	1	1
8.	24GE1201	Professional Development	ESC	0	0	4	4	2
			TOTAL	16	1	12	29	23

SEMESTER - II

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK L	PERIODS PER WEEK T	PERIODS PER WEEK P	TOTAL CONTACT PERIODS PER WEEK	CREDITS
1.	24HS2101	Writing Skills for Professionals / Language Elective	HSMC	3	0	0	3	3
2.	24MU2101	Statistics and Numerical Methods	BSC	3	1	0	4	4
3.	24PH2101	Material Science	BSC	3	0	0	3	3
4.	24GE2101	Engineering Graphics	ESC	2	0	4	6	4
5.	24GE2102	Fundamentals of Building and Mechanical Sciences	ESC	3	0	2	5	4
6.	24EE2101	Circuit Analysis	PCC	3	0	2	5	4
7.	24GE2103	Tamils and Technology தமிழரும் தொழில்நுட்பமும்	HSMC	1	0	0	1	1
8.	24GE2201	Engineering Practice Laboratory	ESC	0	0	4	4	2
			TOTAL	18	1	12	31	25

24HS1101   **PROFESSIONAL ENGLISH**   **L T P C**
                                                                                3 0 2 4

COURSE OBJECTIVES
- To enable the students to learn the fundamentals of English grammar.
- To develop the ability to write complex texts and essays that are relevant to authentic contexts.
- To present their opinions through letters and reports that will be relevant for their future endeavours.

UNIT I   FUNDAMENTALS & SUMMATION   9
Grammar & Vocabulary: Parts of Speech, Articles, Pronoun, Homonyms & Homophones, Word Formation (Prefix and Suffix). **Listening:** Telephonic Conversations - different viewpoints on a topic. **Speaking:** Self-Introduction Conversation - politeness strategies; asking for information to fill details in a form **Reading:** Reading biographies, travelogues, newspaper reports. **Writing**: Report writing (Accident report, Survey Report), Checklist.

UNIT II   PROBLEM SOLVING & RECOMMENDATIONS   9
Grammar & Vocabulary: Abbreviations & Acronyms, Tenses, Subject -Verb Agreement, Active, Passive and Impersonal Passive Voice. **Listening:** Listening to anecdotes, stories & event narration. **Speaking:** Narrating personal experiences/ events, Extempore, Story-Telling. **Reading:** Reading Editorials; and Opinion Blogs. **Writing**: Letter Writing (Complaint Letter, Response to complaint), Recommendations.

UNIT III   DESCRIPTION OF A PROCESS OR PRODUCT AND USAGE OF IMPERATIVE   9
Grammar & Vocabulary: Adjective, Degrees of Comparison, Imperative and Gerund, One Word Substitution. **Listening:** Classroom Lecture, advertisements about products. **Speaking –** Picture description; giving instruction to use the product; presenting a product. **Reading:** Reading advertisements, gadget reviews; user manuals. **Writing**: Instructions, Process and Product Description.

UNIT IV   DRAFTING AND RESUME MAKING   9
Grammar & Vocabulary: Collocations, Conjunction, Framing Question Tags/ "Wh" questions. **Listening:** TED talks, educational videos. **Speaking –** Small Talk; Mini presentations and making recommendations. **Reading**: Reading brochures (technical context). **Writing:** Email writing and Email etiquette- Job Application Letter and Resume.

UNIT V   EXPRESSING IDEAS   9
Grammar & Vocabulary: Discourse Markers, Cause and Effect words, Modal verbs, Spotting Errors. **Listening:** Panel Discussions, listening to debates.**Speaking:** Group discussions, Debates and Expressing opinions & Role play. **Reading:** Reading Newspaper articles; Journal reports. **Writing:** Essay writing (Narrative, Descriptive), Reading Comprehension, Transcoding (Bar chart, Pie chart, Table).

TOTAL: 45 PERIODS

LIST OF ACTIVITIES
1. Self-Introduction-Politeness Strategies.
2. Extempore.
3. Story Telling.
4. Picture Description.
5. Product Description.
6. Presentations.
7. Group Discussion.

8. Role-Play.
9. Debates and Expressing Opinions.
10. Narrating Personal Experiences.
11. Reading Biographies, Travelogues.
12. Reading Advertisements, User Manuals.

TOTAL: 30 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

CO1: Understand the basic grammatical structures and use them in right context.
CO2: Write complaint letters and recommendations with utmost accuracy.
CO3: Describe about products and processes clearly.
CO4: Write a job application letter and resume without flaws.
CO5: Speak fluently and interpret information presented in tables, charts and other graphic forms.

TEXT BOOKS

1. English for Engineers & Technologists Orient Blackswan Private Ltd. Department of English, Anna University, 2020.
2. Dr S Gunasekaran, "A Workbook of Professional English", Vishnu Prints Media, 2021.
3. Meenakshi Raman & Sangeeta Sharma, "Technical Communication – Principles and Practices", Oxford Univ. Press, 2022.

REFERENCE BOOKS

1. Raymond Murphy, "Essential English Grammar", 2nd Edition, Cambridge University Press, 2024.
2. Brain Chanen, "IB English A: Language and Literature", Oxford Publications, 2019.
3. Phil Williams, "Advanced Writing Skills for Students of English", Goodwill Publishing House, 2022.
4. Stella Cortrell, "The Study Skills Handbook", Red Globe Press, 2019.
5. Adrian Wall, "English for Academic Correspondence and Socializing", Springer Publications, 2017.

24MU1101	MATRICES AND CALCULUS	L T P C
		3 1 0 4

COURSE OBJECTIVES

- To familiarize the students with Eigen values and Eigen vectors to reduce the quadratic form to canonical form.
- To familiarize the students with differential calculus and functions of several variables.
- To make the students to solve the problems on integration and multiple integration.

UNIT I   MATRICES   9+3

Eigen values and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigen values and Eigenvectors – Cayley-Hamilton theorem(without proof) – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms .

UNIT II   DIFFERENTIAL CALCULUS   9+3

Limit of a function – Continuity – Derivatives – Differentiation rules (sum, product, quotient, chain rules) – Implicit differentiation – Logarithmic differentiation – Applications: Maxima and Minima of functions of one variable.

UNIT III   FUNCTIONS OF SEVERAL VARIABLES   9+3

Partial differentiation – Homogeneous functions and Euler's theorem (without proof) – Jacobians – Taylor's series for functions of two variables – Applications: Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.

UNIT IV   INTEGRAL CALCULUS   9+3

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

UNIT V   MULTIPLE INTEGRALS   9+3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals.

TOTAL: 60 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

  CO1: Apply matrix algebra methods for solving various application problems.

  CO2: Apply differential calculus methods in solving various application problems.

  CO3: Apply the differential calculus ideas on several variable functions.

  CO4: Apply different methods of integration in solving practical problems.

  CO5: Apply multiple integral methods in solving areas, volumes and other practical problems.

TEXT BOOKS

1. T. Veerarajan, "Engineering Mathematics (Volume I & II)", McGraw Hill Education, New Delhi, 2018.
2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 45th Edition, 2024.
3. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India Pvt Ltd., New Delhi, 2015.

REFERENCE BOOKS

1. B.V .Ramana, "Higher Engineering Mathematics ", McGraw Hill Education Pvt. Ltd., New Delhi, 2016.
2. John Bird, "Bird's Higher Engineering Mathematics", 9th Edition, Routledge Taylor and Fransis Group, 2021.
3. H.Anton, I.Bivens. I and S. Davis, "Calculus ", Wiley, 10th Edition, 2016.
4. R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.
5. G.B.Thomas, J.Hass and M.D.Weir, "Thomas Calculus ", 14th Edition, Pearson India, 2018.

24PH1101	ENGINEERING PHYSICS	L T P C
		3 0 2 4

COURSE OBJECTIVES

- To make the students to understand the properties of matter.
- To analysis the ultrasonic wave and laser with applications.
- To get knowledge on optical fibers and the importance of quantum theory.

UNIT I   PROPERTIES OF MATTER   9

Introduction – Elasticity – Hooke's Law – Stress –strain diagram – Types of modulus of elasticity –bending of beams – bending moment – cantilever : theory and experiment – uniform and non-

uniform bending: theory and experiment – twisting couple – torsion pendulum: theory and experiment – I – shaped girders.

UNIT II ULTRASONICS AND BIO MEDICAL APPLICATIONS 9

Introduction – Production of ultrasonics: magnetostriction effect and piezo electric effect – Velocity measurement: acoustic grating – Industrial applications: drilling, welding, soldering and cleaning –SONAR – Non Destructive testing – pulse echo system through transmission and reflection modes- A, B and C – scan displays, Clinical Applications -Sonograms.

UNIT III LASERS 9
Introduction – Einstein's theory – Population inversion, pumping – Types of lasers; Nd-YAG Laser, He-Ne Laser,Semiconductor lasers (homo junction & hetero junction) – Industrial Applications-Lasers in welding, heat treatment, cutting.

UNIT IV FIBER OPTICS 9
Principle and propagation of light in optical fibres – Acceptance angle and Numerical aperture- Types of optical fibres (material, refractive index, mode) – Optical Loss in optical fibre – attenuation, dispersion, bending – Fibre optical communication system (Block diagram) – Endoscope.

UNIT V QUANTUM PHYSICS 9
Black body radiation – Planck's theory (derivation) – Compton effect – Theory and experimental verification – Matter waves – Schrodinger's wave equation – Time independent and time dependent equations – Physical significance of wave function–Transmission Electron microscope –Scanning electron microscope.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS
1. Determination of rigidity modulus – Torsion pendulum.
2. Determination of unknown mass of a body for known rigidity modulus – Torsion pendulum.
3. Determination of Young's modulus by non – uniform bending method.
4. Determination of unknown mass of a body for known Young's modulus by non – uniform bending method.
5. Determination of Young's modulus by uniform bending method.
6. Determination of unknown mass of a body for known Young's modulus by uniform bending method.
7. Determination of wavelength of Laser by diffraction grating method.
8. Determination of thickness of material using Air wedge.
9. Determination of width of the groove in a CD using Laser Diffraction.
10. Determination of Compressibility of given liquid using Ultrasonic interferometer.
11. Simple harmonic oscillations of cantilever.
12. Determination of unknown mass of a body for known Young's modulus by cantilever simple harmonic oscillations.

TOTAL: 30 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to

CO1: Gain knowledge on basics of properties of matter.

CO2: Acquire knowledge on magnetic ultrasonic waves and its applications.

CO3: Demonstrate the strong fundamental knowledge in Laser.

CO4: Acquire knowledge on function of fiber optical devices and its applications.

CO5: Understand the concepts of quantum physics.

TEXT BOOKS
1. Bhattacharya D K & Poonam T, "Engineering Physics", Oxford University Press,2015.
2. Gaur R K & Gupta S L, "Engineering Physics", Dhanpat Rai Publishers, 2018.
3. Arthur Beiser, Shobhit Mahajan Sand Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill (Indian Edition), 2017.

REFERENCE BOOKS
1. Serway R A & Jewett J W, "Physics for Scientists and Engineers", Cengage Learning, 2016.
2. Tipler P A & Mosca G, "Physics for Scientists and Engineers with Modern Physics", W.H.Freeman, 2017.
3. K Thyagarajan & A Ghatak, "Lasers: Fundamentals and Applications", Laxmi Publications, (Indian Edition), 2019.
4. D. Halliday, R. Resnick and J Walker, "Principles of Physics", Wiley (Indian Edition), 2015.
5. Pandey B K & Chaturvedi S "Engineering Physics", Cengage Learning India, 2012.

24CY1101	ENGINEERING CHEMISTRY	L T P C
		3 0 2 4

COURSE OBJECTIVES
- To familiarize students about the treatment of boiler feed water.
- To gain the knowledge about the various types of batteries and fuels.
- To understand the properties of Engineering materials and Nanomaterials.

UNIT I   WATER TECHNOLOGY   9
Hardness of water - Types - Boiler troubles - Scale - Sludge - Caustic embrittlement - Priming and Foaming - Softening of boiler feed water - Internal conditioning (phosphate, calgon and carbonate conditioning) - External conditioning - Ion Exchange process - Zeolite process.

UNIT II   ENERGY STORAGE   9
Batteries - Types of batteries - Primary battery - Dry cell, Secondary battery - Lead acid battery and Lithium- ion-battery - Fuel cells - H_2-O_2 fuel cell- E-Vehicles - Advantages of E-Vehicles.

UNIT III   ENGINEERING MATERIALS   9
Refractories - classification - properties and applications of refractories - Abrasives - properties and Applications of abrasives - Cement - composition of cement - setting and hardening of cement - Glass - Manufacture - Types of glass and its uses.

UNIT IV   NANOCHEMISTRY   9
Nanomaterials - Distinction between Nanoparticles, Molecules and Bulk materials - Types of Nanomaterials - Nanoparticle - Nanowire and Nanotube - Preparation of Nanomaterials - sol-gel- solvothermal Methods and Applications of Nanomaterials in Agriculture and Medicine field.

UNIT V   FUELS   9
Fuels - Coal - Analysis of coal (Proximate Analysis)-Refining of Petroleum - Fractional Distillation - Manufacture of metallurgical coke (Otto Hoffmann method) - Manufacture of synthetic petrol (Bergius process) - Power alcohol – Biodiesel.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

1. Estimation of total, temporary and permanent Hardness of the sample water by EDTA method.
2. Estimation of strength of given Hydrochloric acid using pH meter.
3. Estimation of strength of given Hydrochloric acid using conductivity meter.
4. Determination of strength of acids in a mixture of acids using conductivity meter.
5. Estimation of amount of $BaCl_2$ present in the given solution using Std.Na_2SO_4 using conductivity meter.
6. Estimation of iron content of the given solution using potentiometer.
7. Estimation of amount of Cl^- ion present in the given solution by Argentometric method.
8. Determination of alkalinity of the water sample using HCl with Na_2CO_3 as the primary standard.
9. Prepare Na_2CO_3 as primary standard and using it to estimate the acidity present in the given water sample.
10. Estimation of copper content of the given solution by EDTA method.
11. Determination of Dissolved oxygen content of water sample by Winkler's method.
12. Preparation of Biodiesel by using vegetable oil.

TOTAL: 30 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

CO1: Assess water impurities, determining hardness and eliminating substances responsible for hardness.

CO2: Identify diverse energy resources and effectively apply them in various sectors of the energy industry.

CO3: Assess engineering materials that meet industry specifications and requirements.

CO4: Identify and apply basic concepts of Nano science and technology in designing the synthesis of Nanomaterials for Engineering and Technology.

CO5: Recommend suitable fuels for engineering processes and applications.

TEXT BOOKS

1. P C Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing Company(P) Ltd, New Delhi , 17th Edition, 2022.
2. Friedrich Emich, "Engineering Chemistry", Scientific International Pvt. Ltd., New Delhi, 2017.
3. S S Dara, "A text book of Engineering Chemistry", S Chand Publishing, 12th Edition, 2018.

REFERENCE BOOKS

1. Hammer Sr and Hammer Jr, "Water and waste water technology", Pearson Education India, 7th Edition, 2015.
2. Nihal Kularatna and Kosala Gunawardane," Energy Storage Devices for Renewable Energy-based Systems, Academic Pr, 2nd Edition, 2021.
3. Kenneth G Budinski, Michael K Budinski, "Engineering Materials", Pearson, 9th Edition, 2016.
4. Chattopadhyay K K, "Introduction to Nanoscience and Nanotechnology", Prentice Hall India Learning Private Limited, 2021.
5. James G Speight, "Handbook of Natural Gas Analysis", Wiley, 1st Edition, 2018.

24GE1101　　　PROBLEM SOLVING AND PYTHON PROGRAMMING　　L T P C
**　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3 0 2 4**

COURSE OBJECTIVES
- To understand the basics of algorithmic problem solving.
- To learn to solve problems using Python conditionals and loops.
- To define Python functions and use function calls to solve problems.

UNIT I　　　COMPUTATIONAL THINKING AND PROBLEM SOLVING　　　9
Fundamentals of Computing – Identification of Computational Problems – Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flowchart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guessan integer number in a range, Towers of Hanoi.

UNIT II　　　DATA TYPES, EXPRESSIONS, STATEMENTS　　　9
Python interpreter and interactive mode, debugging; values and types: int, float, Boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III　　　CONTROL FLOW, FUNCTIONS, STRINGS　　　9
Conditionals: Boolean values and operators, conditional (if), alternative (if – else), chained conditional (if el if – else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV　　　LISTS, TUPLES, DICTIONARIES　　　9
Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNITV　　　FILES, MODULES, PACKAGES　　　9
Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

**　　　　　　　　　　　　　　　　　　　　　　　　　　　　TOTAL: 45 PERIODS**
LIST OF PROGRAMS

1. Calculate the GCD of two numbers.
2. Find the square root of an integer using Newton's method.
3. Find power of a number using Exponential operator.
4. Find the maximum of a list of numbers.
5. Develop a program to search the given numbers using linear search and binary search.
6. Develop a program that sorts a list by implementing selection sort, insertion sort.
7. Develop a program that sorts a list by implementing mergesort.
8. Program to print n prime numbers.
9. Find multiplication of two matrix.
10. Programs that take command line arguments (word count).

11. Find the most frequent words in a text read from a file.
12. Simulate elliptical orbits and bouncing ball using Py game.

TOTAL: 30 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

CO1: Develop algorithmic solutions to simple computational problems.

CO2: Write simple Python programs using conditionals, loops and functions for solving problems.

CO3: De compose a Python program into functions.

CO4: Represent compound data using Python lists, tuples, and dictionary e set c.

CO5: Read and write data from / to files in Python programs.

TEXT BOOKS

1. Allen B Downey, '''Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, '''Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited,2017.
3. Eric Matthes, "Python Crash Course: Python for beginners", 3rd Edition, No Strach Press Limited, 2024.

REFERENCE BOOKS

1. Paul Deitel and Harvey Deitel, '''Python for Programmers, Pearson Education", 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund,''' Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021.
4. Eric Matthes, "Python Crash Course, A Hands – on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. Martin C Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

24GE1101	தமிழர் மரபு	L T P C
		1 0 0 1

பாடத்தின் நோக்கங்கள்

- மாணவர்கள் மொழி மற்றும் இலக்கியம் பற்றி கற்றறிதல்.
- தமிழர்களின் பாரம்பரிய மரபு மற்றும் நாட்டுப்புற கலைகளை அறிந்து கொள்ளுதல்.
- தமிழர்களின் திணைக்கோட்பாடுகள் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு பற்றி அறிந்து கொள்ளுதல்.

அலகு I மொழி மற்றும் இலக்கியம் 3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் -திருக்குறளில்

மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள் - தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் -சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வரலாற்றில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு II   மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை– சிற்பக்கலை   3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரி முனையில் திருவள்ளுவர் சிலை - இசைக் கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு III   நாட்டுப்புறக் கலைகள் மற்றும் வீரவிளையாட்டுகள்   3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு IV   தமிழர்களின் திணைக்கோட்பாடு   3

தமிழகத்தின் தாவரங்களும் விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்க காலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் - சங்க கால நகரங்களும் துறைமுகங்களும் - சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு V   இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு   3

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப் படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL: 15 PERIODS

பாடநெறி முடிவுகள்
பாடதிட்டத்தை முடித்த பிறகு, மாணவர்கள் செய்ய கூடியவை:

CO1:செம்மொழி மற்றும் சமகால படைப்புகளில் கவனம் செலுத்தி, மொழிப்புலமை மற்றும் இலக்கிய பகுப்பாய்வின் முக்கியத்துவத்தை கற்றறிந்தனர்.

CO2:தமிழ் இலக்கியத்தின் பாரம்பரிய மரபு கலைகளை மாணவர்கள் அறிந்து கொண்டனர்.

CO3:சங்ககால இலக்கியங்களையும் இக்கால இலக்கிய கவிஞர்களின் தமிழையும் மாணவர்கள் அறிந்து கொண்டனர்.

CO4:தமிழ் இலக்கியத்தின் கலாச்சார மற்றும் சமூக தாக்கங்களை அறிந்து கொண்டனர்.

CO5:பண்டைக்கால மக்களின் தமிழ் அடையாளம் மற்றும் கலாச்சார பாரம்பரியத்தைப் பற்றி கற்றறிந்தனர்.

பாட புத்தகங்கள்

1. **கே கே பிள்ளை** "தமிழக வரலாறு - மக்களும் பண்பாடும்" தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் கழகம், 2004.

2. முனைவர் இல சுந்தரம், "கணினித் தமிழ்" , விகடன் பிரசுரம், 2015.

3. டாக்டர். எஸ் வி சுப்ரமணியன், டாக்டர். கே டி திருநாவுக்கரசு, "தமிழர்களின் வரலாற்றுப் பாரம்பரியம்", சர்வதேச தமிழாய்வு நிறுவனம்.

குறிப்பு புத்தகங்கள்

1. டாக்டர். சிங்காரவேலு, "தமிழர்களின் சமூக வாழ்க்கை", சர்வதேச தமிழாய்வு நிறுவனம்.

2. கீழடி "வைகை ஆற்றின் கரையில் உள்ள சங்க நகர நாகரிகம் கூட்டு" தொல்லியல் துறை, தமிழ்நாடு பாடநூல் மற்றும் கல்வி சேவைகள் கழகம், தமிழ்நாடு, 2015.

3. டாக்டர். கே கே பிள்ளை, "இந்திய வரலாறு" வெளியீடு ஆசிரியர்.

4. "பொருணை நாகரிகம்", தொல்லியல்துறை & தமிழ்நாடு பாடநூல் மற்றும் கல்வி சேவைகள் கழகம்.

5. ஆர் பாலகிருஷ்ணன், "வைகை, சிந்து நாகரிகத்தின் பயணம்" வெளியீடு – EMRL.

| 24GE1201 | PROFESSIONAL DEVELOPMENT | L T P C |
| | | 0 0 4 2 |

COURSE OBJECTIVES

- To be proficient in important Microsoft Office tools: MS WORD, EXCEL, POWER POINT.
- To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the present ability and overall utility value of content.
- To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize, interlink, and utilizing many more critical features offered

MS WORD   15

- ➢ Create and format a document.
- ➢ Working with tables.
- ➢ Working with Bullets and Lists.
- ➢ Working with styles, shapes, smart art, charts.
- ➢ Inserting objects, charts and importing objects from other office tools.
- ➢ Creating and Using document templates.
- ➢ Inserting equations, symbols and special characters.
- ➢ Working with Table of contents and References, citations.
- ➢ Insert and review comments.
- ➢ Create bookmarks, hyperlinks, endnotes footnote.

- ➢ Viewing document in different modes.
- ➢ Working with document protection and security.
- ➢ Inspect document for accessibility.

MS EXCEL 15

- ➢ Create worksheets, insert and format data.
- ➢ Work with different types of data: text, currency, date, numeric etc.
- ➢ Split, validate, consolidate, Convert data.
- ➢ Sort and filter data.
- ➢ Perform calculations and use functions: (Statistical, Logical, Mathematical, date, Time etc.,).
- ➢ Work with Lookup and reference formulae.
- ➢ Create and Work with different types of charts.
- ➢ Use pivot tables to summarize and analysis data.
- ➢ Perform data analysis using own formulae and functions.
- ➢ Combine data from multiple worksheets using own formulae and built-in functions to generate results.
- ➢ Export data and sheets to other file formats.
- ➢ Working with macros.
- ➢ Protecting data and Securing the workbook.

MS POWERPOINT 15

- ➢ Select slide templates, layout and themes.
- ➢ Formatting slide content and using bullets and numbering.
- ➢ Insert and format images, smart art, tables, charts.
- ➢ Using Slide master, notes and handout master.
- ➢ Working with animation and transitions.
- ➢ Organize and Group slides.
- ➢ Import or create and use media objects: audio, video, animation.
- ➢ Perform slideshow recording and Record narration and create presentable videos.

TOTAL: 45 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to

CO1: Use MS Word to create quality documents, by structuring and organizing content.

CO2: Use MS Word for their day to day technical and academic requirements.

CO3: Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements.

CO4: Use MS EXCEL to visualize data for ease of understanding.

CO5: Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

24HS2101	WRITING SKILLS FOR PROFESSIONALS	L T P C
		3 0 0 3

COURSE OBJECTIVES
- • To use appropriate language structures to write letters.
- • To write reports and emails with ease.
- • To think critically and write different types of essays.

UNIT I   SELF EXPRESSION   9

Grammar: Punctuation-Direct and Indirect Questions - Adverbs- Prepositions.**Vocabulary:** Commonly confused words. **Writing:** Extended Definitions- Letter to the Editor.

UNIT II   FORMAL EXPRESSION   9

Grammar: Phrasal Verbs, Adverbs, Simple, Compound and Complex Sentences.**Vocabulary:** Synonyms & Antonyms. **Writing:** Email Writing (formal & informal) –Report Writing (Industrial Visit & Field Visit).

UNIT III   CREATIVE EXPRESSION   9

Grammar: Prepositional Phrases, Numerical Adjectives, Compound Nouns.**Vocabulary:** British and American words. **Writing:** Compare and Contrast Essay, SOP.

UNIT IV   EXPRESSION OF IDEAS   9

Grammar: Direct and Indirect Speech, Relative Pronoun.**Vocabulary:** Idioms & phrases. **Writing:** Asking for information and making suggestions- Report Writing on College Event.

UNIT V   PROFESSIONAL EXPRESSIONS   9

Grammar: Fixed and Semi- fixed - Content vs Function words. **Vocabulary:** Jumbled Sentences. **Writing:** Accepting/ Declining an Offer/ invitation-Note- Making, Argumentative Essay.

TOTAL: 45 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to
- CO1: Enhance their grammatical competency for flawless writing.
- CO2: Write reports, emails meeting professional expectations.
- CO3: Use grammar to form correct sentences with maximum accuracy.
- CO4: Present their ideas and opinions in a planned and logical manner.
- CO5: Write essays on various topics.

TEXT BOOKS
1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2020.
2. English for Science & Technology Cambridge University Press, 2021.
3. Communication Skills for Professionals, Nira KonarSecond Edition, PHI Learning Pvt.Ltd, 2021.

REFERENCE BOOKS
1. William Zinsser Paperback, "On Writing Well", Harper Perennial Publishers, 2016.
2. D S Paul, "Advanced Writing Skills", Good will Publishing House, 2022.
3. Matthew T Zakaria, "Successful Writing Skills", Commonwealth Publishers, 2022.
4. G S Hook, "Effective Communication" (Updated version 2nd edition), Sannainvest Ltd., 2021.
5. Alan Baker, "Improve Your Communication Skills" (How to Build Trust, Be Heard and Communicate with Confidence), Kogan Page Publishers, 2019.

24MU2101   **STATISTICS AND NUMERICAL METHODS**   **L T P C**
                                                                    3 1 0 4

COURSE OBJECTIVES

- To understand the concept of Correlation, Regression, Testing of hypothesis and design of experiments.
- To introduce the basic concepts of solving algebraic and transcendental equations.
- To understand the concept of numerical methods for solving differentiation and integration equations.

UNIT I   CORRELATION AND REGRESSION   9+3

Correlation – Coefficient of Correlation – Rank Correlation – Regression – Estimation of Regression lines.

UNIT II   TESTING OF HYPOTHESIS & DESIGN OF EXPERIMENTS   9+3

Sampling distributions – Small samples – t-test – Tests for single mean and difference of means – F-test – Tests for single variance and equality of variances – One way and two-way classifications – Completely randomized design – Randomized block design – Latin square design.

UNIT III   SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS   9+3

Solution of Algebraic and Transcendental equations – Newton Raphson method – Solution of linear system of equations – Gauss elimination method – Pivoting – Gauss Jordan method – Inverse of Matrix by Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel – Eigen values of a matrix by Power Method.

UNIT IV   INTERPOLATION, NUMERICAL DIFFERENTIATION AND
**   NUMERICAL   INTEGRATION   9+3**

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivatives using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNIT V   NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS
**   9+3**

Single step methods : Taylor's series method – Euler's method – Modified Euler's method – Fourth order Runge-Kutta method for solving first order differential equations – Multi step methods: Milne's and Adam's – Bash forth predictor corrector methods for solving first order differential equations.

TOTAL: 60 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

  CO1: Apply the correlation and regression equations for engineering problems.
  CO2: Apply the concept of testing of hypothesis for small samples in real life problems and classifications of design of experiments in the field of agriculture.
  CO3: Apply the numerical methods to solve the algebraic, transcendental and linear system of equations.
  CO4: Apply interpolation techniques and numerical methods to solve the derivatives and integrals.
  CO5: Apply various numerical methods for solving ordinary differential equations.

TEXT BOOKS
1. Gupta S.C., and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020.
2. Gupta S.P., "Statistical Method", Sultan Chand & Sons, New Delhi, 46th Edition, 2019.
3. Grewal B. S., and Grewal J. S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.

REFERENCE BOOKS
1. Spiegel M.R., Schiller J., and Srinivasan R.A., "Schaum's easy Outlines on Probability and Statistics ", Tata McGraw Hill Edition, 4th Edition, 2020.
2. Devore J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 9th Edition, 2020.
3. Johnson R. A., Miller I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, 9th Edition, 2020.
4. Burden R.L and Faires J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.
5. Jain M.K., Iyengar S.R.K. and Jain R.K., "Numerical Methods", New International Publishers, 8th Edition, 2022.

24PH2101	MATERIALS SCIENCE	L T P C
		3 0 0 3

COURSE OBJECTIVES
- To understand the properties of conducting and semiconducting materials.
- To acquire knowledge on magnetic and dielectric materials with their applications.
- To get an idea of nano structures and basics of quantum computing.

UNIT I   CONDUCTINGMATERIALS   9

Conductors – classical free electron theory of   metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

UNIT II   SEMICONDUCTINGMATERIALS   9

Intrinsic semiconductor – intrinsic carrier concentration derivation – Fermi level – electrical conductivity – band gap determination – derivation of carrier concentration in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – Hall effect –Determination of Hall coefficient – Applications.

UNIT III   MAGNETIC MATERIALS   9

Origin of magnetic moment – Bohr magneton – properties of Dia, Para and Ferro magnetic materials – Domain theory – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites and its applications.

UNIT IV   DIELECTRIC MATERIALS   9

Electrical susceptibility – dielectric constant– electronic, ionic, orientational and space charge polarization–frequency and temperature dependence of polarization – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – ferro electricity and applications.

UNIT V   NANO DEVICES AND QUANTUM COMPUTING   9

Introduction – quantum confinement – quantum structures: quantum wells, wires and dots – Tunneling – Coulomb blockade – Single electron phenomena: single electron transistor – Quantum system for information processing – quantum states – classical bits – quantum bits – CNOT gate – advantage of quantum computing over classical computing.

TOTAL: 45 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

CO1: Gain knowledge on electrical and thermal properties of conducting materials.

CO2: Get adequate knowledge on charge carrier's distribution in different types of semiconductors.

CO3: Get the necessary understanding of functioning of Magnetic materials.

CO4: Get the necessary understanding of functioning of dielectric materials.

CO5: Gain knowledge on new engineering materials and their preparation methods.

TEXT BOOKS

1. S.O. Kasap, "Principles of Electronic Materials and Devices", Mc-Graw Hill, 2018.
2. Jasprit Singh, "Semiconductor Optoelectronics: Physics and Technology", Mc-Graw Hill India, 2019.
3. Parag K. Lala, "Quantum Computing: A Beginner's Introduction", McGraw-Hill Education, Indian Edition, 2020.

REFERENCE BOOKS

1. R. Balasubramaniam, Callister's, "Materials Science and Engineering". Wiley Indian Edition, 2015.
2. Wendelin Wright and Donald Askeland, "Essentials of Materials Science and Engineering", CL Engineering, 2015.
3. Charles Kittel, "Introduction to Solid State Physics", Wiley India Edition, 2019.
4. Mark Fox, "Optical Properties of Solids", Oxford Univ.Press, 2021.
5. B.Rogers, J.Adams and S.Pennathur, "Nanotechnology: Understanding Small Systems", CRC Press, 2017.

24GE2101   **ENGINEERING GRAPHICS**   **L T P C**

                                                               2 0 4 4

COURSE OBJECTIVES

- Drawing engineering curves, freehand sketch of simple objects and orthographic projections.
- Drawing Projection, section and development of solids.
- Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT I   PLANE CURVES AND FREEHAND SKETCHING   6+12

Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves. Visualization concepts and Free Hand sketching: Visualization principles –Representation of

Three Dimensional objects – Layout of views- Freehand sketching of multiple views from pictorial views of objects.

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACE   6+12

Orthographic projection – principles – Principal planes – First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes – Determination of true lengths and true inclinations by rotating line method. Projection of planes (polygonal and circular surfaces) inclined to one principal plane by rotating object method.

UNIT III   PROJECTION OF SOLIDS   6+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.

UNIT IV   PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF
SURFACES   6+12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones.

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   6+12

Principles of isometric projection — isometric scale - isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method .

TOTAL: 90 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to
   CO1:Construct the conic curves, involutes and cycloid.
   CO2:Solve practical problems involving projection of line and plane surfaces.
   CO3:Understand the orthographic, isometric and perspective projections of simple solids
   CO4:Understand the development of section of solids and development of surfaces.
   CO5:Understand the isometric and perspective projections.

Publication of Bureau of Indian Standards
   1. IS 10711 — 2001: Technical products Documentation — Size and lay out of drawing sheets.
   2. IS 9609 (Parts 0 & 1) — 2001: Technical products Documentation —Lettering.
   3. IS 10714 (Part 20) — 2001 & SP 46 — 2003: Lines for technical drawings.
   4. IS 11669 — 1986 & SP 46 —2003: Dimensioning of Technical Drawings.
   5. IS 15021 (Parts 1 to 4) — 2001: Technical drawings — Projection Methods.

TEXT BOOKS
   1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.
   2. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.
   3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015.

REFERENCE BOOKS
1. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
2. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
3. Gopalakrishna K.R., "Engineering Drawing" (Vol. I & II combined), Subhas Stores, Bangalore, 2007.
4. Luzzader, Warren J and Duff, John M, "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
5. Shah M B, and Rana B C, "Engineering Drawing", Pearson, 2nd Edition, 2009.

24GE2102	FUNDAMENTALS OF BUILDING AND MECHANICAL SCIENCES	L T P C
		3 0 2 4

COURSE OBJECTIVES
- To provide the basic knowledge, concepts and specialized sub-disciplines of Civil and Mechanical Engineering.
- To introduce fundamental principles of surveying, building materials, and construction techniques.
- To impart knowledge on power plants, internal combustion engines, refrigeration, and air conditioning systems.

UNIT I   OVERVIEW OF CIVIL ENGINEERING   5

Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation and Water Resources Engineering – National building code – terminologists: Plinth area, Carpet area, Floor area, Buildup area, Floor space index - Types of buildings: Residential buildings, Industrial buildings.

OVERVIEW OF MECHANICAL ENGINEERING   4

Overview of Mechanical Engineering - Mechanical Engineering Contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering – Manufacturing, Automation, Automobile and Energy Engineering - Interdisciplinary concepts in Mechanical Engineering.

UNIT II   SURVEYING AND CIVIL ENGINEERING MATERIALS   9
Surveying: Objects – Classification – Principles – Measurements of Distances and angles – Leveling – Determination of areas– Contours. Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel - Timber – Modern Materials, Thermal and Acoustic Insulating Materials, Decorative Panels, Water Proofing Materials. Modern uses of Gypsum, Pre-fabricated Building component (brief discussion only).

UNIT III   BUILDING COMPONENTS AND INFRASTRUCTURE   9
Building plans – Setting out of a Building - Foundations: Types of foundations - Bearing capacity and settlement – Brick masonry – Stone Masonry – Beams – Columns – Lintels – Roofing – Flooring – Plastering. Types of Bridges and Dams – Water Supply Network - Rain Water Harvesting – Solid Waste Management - Introduction to Highways and Railways - Introduction to Green Buildings.

UNIT IV   INTERNAL COMBUSTION ENGINES AND POWER PLANTS   9
Classification of Power Plants- Working principle of steam, Gas, Diesel, Hydro -electric and Nuclear Power plants- Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines. Working principle of Boilers-Turbines, Reciprocating Pumps

(single acting and double acting) and Centrifugal Pumps, Concept of hybrid engines. Industrial safety practices and protective devices.

UNIT V   REFRIGERATION AND AIR CONDITIONING SYSTEM   9
Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner. Properties of air - water mixture, concepts of psychometric and its process.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

Basic Mechanical Laboratory: **15**
1. Study of IC Engines, Components.
2. Study of Steam Generators and Turbines.
3. Valve Timing and Port Timing Diagrams.
4. Determination of Viscosity –Red Wood Viscometer.
5. Determination of Flash Point and Fire Point.
6. Izod Impact Test.
7. Rockwell Hardness Test.

Basic Civil Laboratory: **15**

I. TESTS ON CEMENT
  a. Determination of fineness of cement.
  b. Determination of consistency of cement.
  c. Determination of specific gravity of cement.
  d. Determination of initial and final setting time of cement.

II. TESTS ON FINE AGGREGATE AND COURSE AGGREGATE
  a. Determination of specific gravity and water absorption of fine aggregate.
  b. Determination of grading of fine aggregate.
  c. Determination of aggregate crushing value of coarse aggregate.
  d. Determination of specific gravity and water absorption of coarse aggregate.

III. TESTS ON BRICKS
  a. Determination of compressive strength of bricks.
  b. Determination of water absorption of bricks.
  c. Determination of efflorescence of bricks.

TOTAL: 30 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to
  CO1: Understand the role of Civil and Mechanical Engineering in societal development.
  CO2: Recognize different types of building materials and their modern applications.
  CO3: Comprehend the principles and methods used in surveying and leveling.
  CO4: Explain the working principles of internal combustion engines and power plants.
  CO5: Understand the refrigeration, air conditioning systems, and psychrometric processes.

TEXT BOOKS
1. 1 Satheesh Gopi, "Basic Civil Engineering", Pearson India, 2009.
2. Pravin Kumar, "Basic Mechanical Engineering", Pearson Education India, 2013.
3. G Shanmugam and M S Palanichamy, "Basic Civil and Mechanical Engineering", McGraw Hill Education; First edition, 2018.

REFERENCE BOOKS
1. Palanikumar K, "Basic Mechanical Engineering", ARS Publications, 2018.
2. Ramamrutham S, "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013.
3. Seetharaman S, "Basic Civil Engineering", Anuradha Agencies, 2005.
4. Shantha Kumar SRJ, "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.
5. D Natarajan, Basic Civil and Mechanical Engineering, Anuradha Publications, 2013.

24EE2101   **CIRCUIT ANALYSIS**   **L T P C**
                                                              3 0 2 4

COURSE OBJECTIVES
- To impart knowledge on solving circuits using network theorems.
- To introduce the concepts of resonance and transient response in circuits.
- To analyze the three phase AC circuits.

UNIT I   **BASIC CIRCUITS ANALYSIS**   **9**
Fundamentals concepts of R, L and C Elements-Energy Sources- Ohm's Law -Kirchhoff 's Laws – DC Circuits – Resistors in series and parallel circuits - A.C Circuits – Average and RMS Value -Mesh current and node voltage methods of analysis D.C and A.C Circuits. Network reduction: voltage and current division, source transformation – star-delta conversion

UNIT II   **NETWORK REDUCTION AND THEOREMS**   **9**
Network Theorems – Superposition, Thevenin's and Norton's Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem.

UNIT III   **TRANSIENT RESPONSE ANALYSIS**   **9**
Introduction – Laplace transforms and inverse Laplace transforms- standard test signals – Transient response of RL, RC and RLC circuits using Laplace transform for Source free, Step input and Sinusoidal input.

UNIT IV   **RESONANCE AND COUPLED CIRCUITS**   **9**
Series and parallel resonance –frequency response – Quality factor and Bandwidth – Self and mutual inductance – Coefficient of coupling – Dot rule-Analysis of coupled circuits– Single Tuned circuits.

UNIT V   **THREE PHASE CIRCUITS**   **9**
Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced and unbalanced – phasor diagram of voltages and currents – power measurement in three phase circuits– Power Factor Calculations.

                                                     TOTAL: 45 PERIODS

LIST OF EXPERRIMENTS
1. Simulation and experimental verification of finding equivalent resistance.
2. Simulation and experimental verification of DC electrical circuit problems using Kirchoff's law.
3. Simulation and experimental verification of AC electrical circuit problems using Kirchoff's law.
4. Simulation and experimental verification of electrical circuit problems using Thevenin's theorem.
5. Simulation and experimental verification of electrical circuit problems using Norton's theorem.
6. Simulation and experimental verification of electrical circuit problems using Superposition theorem.

7. Simulation and experimental verification of electrical circuit problems using Reciprocity theorem.
8. Simulation and experimental verification of electrical circuit problems using Maximum Power transfer theorem.
9. Simulation and Experimental validation of transient response of RLC circuits.
10. Simulation and Experimental validation of frequency response of RLC circuits.
11. Simulation and experimental verification of three phase balanced and unbalanced star connected circuits.
12. Simulation and experimental verification of three phase balanced and unbalanced delta connected circuits.

TOTAL: 30 PERIODS

COURSE OUTCOMES

On successful completion of this course, the students will be able to

CO1: Analyze the circuit parameters using circuit laws.

CO2: Apply network theorems for solving simple DC and AC circuits.

CO3: Analyze the transient behavior of RLC circuits.

CO4: Analyze the frequency response of series and parallel RLC circuits.

CO5: Compute power, line/phase voltage and currents of the given three phase circuits.

TEXT BOOKS
1. Sudhakar A and Shyam Mohan SP, "Circuits and Networks Analysis and Synthesis", McGraHill, 2015.
2. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai& Sons, New Delhi, 2020.
3. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2019.

REFERENCE BOOKS
1. William H. HaytJr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, 9th edition, New Delhi, 2020.
2. Joseph A. Edminister, Mahmood Nahvi, "Electric circuits", Schaum's series, McGraw-Hill, First Edition, 2019.
3. M E Van Valkenburg, "Network Analysis", Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
4. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley Sons, Inc. 2018.
5. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

24GE2101 தமிழரும் தொழில்நுட்பமும் **L T P C**
1 0 0 1

பாடத்தின் நோக்கங்கள்

• மாணவர்கள்நெசவுமற்றும்பானைத்தொழில்நுட்பத்தைக்கற்றறிதல்
• கட்டிட மற்றும் உற்பத்தித் தொழில்நுட்பத்தை அறிந்து கொள்ளுதல்
• வேளாண்மை நீர்பாசனம் மற்றும் அறிவியல் தமிழ் கணினித் தமிழ் தொழில்நுட்பத்தை அறிந்து கொள்ளுதல்

அலகு I   நெசவு மற்றும் பானைத் தொழில்நுட்பம்   3

சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்.

அலகு II   வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்   3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் - சங்க காலத்தில் வீட்டுப்பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும் கோயில்களும் - சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபட்டுத் தலங்கள்- நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல் - மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சரோசெனிக் கட்டிடக்கலை.

அலகு III   உற்பத்தித் தொழில்நுட்பம்   3

கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல் - எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத் துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு VI   வேளாண்மை மற்றும் நீர்பாசனத் தொழில்நுட்பம்   3

அணை, ஏரி, குளம், மதகு - சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவு சார் சமூகம்.

அலகு V   அறிவியல் தமிழ் மற்றும் கணித்தமிழ்   3

அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.

TOTAL: 15 PERIODS

பாடநெறி முடிவுகள்

பாடதிட்டத்தை முடித்த பிறகு, மாணவர்கள் செய்ய கூடியவை:

CO1: மாணவர்கள் நெசவு மற்றும் பானைத் தொழில்நுட்பத்தைக் கற்றறிந்தனர்.

CO2: கட்டிடத் தொழில்நுட்ப முக்கியத்துவத்தை அறிந்து கொண்டனர்.

CO3: உற்பத்தித் தொழில்நுட்பத்தை கற்றறிந்தனர்.

CO4: வேளாண்மை மற்றும் நீர்பாசனம் தொழில்நுட்பங்களை தெரிந்துகொண்டனர்.

CO5: அறிவியல் தமிழ் மற்றும் கணித் தமிழ் தொழில்நுட்பத்தை அறிந்துகொண்டனர்.

பாட புத்தகங்கள்

1. கே கே பிள்ளை "தமிழக வரலாறு - மக்களும் பண்பாடும்", தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் கழகம், 2004.
2. முனைவர் இல சுந்தரம், "கணினித் தமிழ்", விகடன் பிரசுரம், 2015.
3. டாக்டர். எஸ் வி சுப்ரமணியன், டாக்டர். கே டி திருநாவுக்கரசு, "தமிழர்களின் வரலாற்றுப் பாரம்பரியம்", சர்வதேச தமிழாய்வு நிறுவனம்.

குறிப்பு புத்தகங்கள்

1. டாக்டர் சிங்காரவேலு, "தமிழர்களின் சமூக வாழ்க்கை", சர்வதேச தமிழாய்வு நிறுவனம்.
2. கீழடி - "வைகை ஆற்றின் கரையில் உள்ள சங்க நகர நாகரிகம் கூட்டு" தொல்லியல் துறை & தமிழ்நாடு பாடநூல் மற்றும் கல்வி சேவைகள் கழகம், தமிழ்நாடு, 2015.
3. டாக்டர். கே கே பிள்ளை, "இந்திய வரலாறு" வெளியீடு ஆசிரியர்.
4. "பொருநை நாகரிகம்", தொல்லியல் துறை, தமிழ்நாடு பாடநூல் மற்றும் கல்வி சேவைகள் கழகம்.
5. ஆர். பாலகிருஷ்ணன், "வைகை, சிந்து நாகரிகத்தின் பயணம்" வெளியீடு (EMRL).

24GE2201	ENGINEERING PRACTICES LABORATORY	L T P C
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COURSE OBJECTIVES

- To develop practical skills in handling and assembling various components used in household plumbing, woodworking, welding, and electronic circuits.
- To provide hands-on experience in operating basic tools and equipment essential for engineering practices.
- To provide hands-on experience in domestic wiring procedures practically.

GROUP – A (CIVIL & ELECTRICAL)

PART I   CIVIL ENGINEERING PRACTICES   15

PLUMBING WORK:

a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in-household.
b) Preparing plumbing line sketches.
c) Laying pipe connection to the suction side of a pump, delivery side of a pump and pipes of different materials: Metal, plastic and flexible pipes used in house hold appliances.

WOOD WORK EXCERSIES:

a) Excises on sawing and planning of woods
b) Prepare joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.
c) Studying joints in door panels, wooden furniture and common industrial trusses using models.

PART II   ELECTRICAL ENGINEERING PRACTICES   15

a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin sockets
b) Staircase wiring

c) Fluorescent Lamp wiring with introduction to CFL and LED types.
d) Energy meter wiring and related calculations/ calibration
e) Study of Iron Box wiring and assembly
f) Study of Fan Regulator (Resistor type and Electronic type)

GROUP – B (MECHANICAL & ELECTRONICS)

PART III   MECHANICAL ENGINEERING PRACTICES   15

WELDING WORK:
   a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
   b) Practicing gas welding.

BASIC MACHINING WORK:
   a) Turning(simple).
   b) Drilling and Tapping.

SHEET METAL WORK:
   a) Making of a square tray

STUDY AND ASSEMBLE THE FOLLOWING:
   a) Assembling a centrifugal pump.
   b) Assembling a household mixer.
   c) Assembling an air conditioner.

FOUNDRY WORK:
   a) Demonstrating of basic foundry operations.

PART IV   ELECTRONIC ENGINEERING PRACTICES   15
   a) Soldering simple electronic circuits and checking continuity.
   b) Assembling and testing electronic components on a small PCB.
   c) Study an element of smart phone.
   d) Assembly and dismantle of LED TV.
   e) Assembly and dismantle of computer.
   f) Assembly and dismantle of laptop.

TOTAL: 60 PERIODS

COURSE OUTCOMES
On successful completion of this course, the students will be able to
   CO1: Proficiently connect and troubleshoot plumbing systems using various pipe fittings and materials.
   CO2: Demonstrate competence in woodworking techniques including sawing, planing and joint preparation.
   CO3: Understand and execute electrical wiring tasks, including switchboard installations and appliance connections.
   CO4: Gain practical skills in welding, machining, sheet metal work, and foundry operations.
   CO5: Assemble and test electronic devices such as PCBs, smartphones, LED TVs, and computers, enhancing their understanding of electronic assembly and testing procedures.

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