PAAVAI ENGINEERING COLLEGE, NAMAKKAL – 637 018
(AUTONOMOUS)
B.E. – COMPUTER SCIENCE AND ENGINEERING

REGULATIONS 2019

CURRICULUM

(CHOICE BASED CREDIT SYSTEM)

(For the candidates admitted during the Academic Year 2019-2020)

SEMESTER I

S.no	Category	Course Code	Course Title	Course Mode	L	T	P	C
1	BS	MA19101	Matrices and Calculus	-	3	1	0	4
2	HS	EN19101	English Communication Skills I	Integrated Theory and Laboratory	2	0	2	3
3	BS	PH19101	Engineering Physics	Integrated Theory and Laboratory	2	0	2	3
4	BS	CH19101	Engineering Chemistry	Integrated Theory and Laboratory	2	0	2	3
5	ES	CS19101	Programming in C	Integrated Theory and Laboratory	2	0	2	3
6	ES	GE19101	Engineering Practices Laboratory	-	0	0	4	2
				TOTAL	**11**	**1**	**12**	**18**

SEMESTER II

S.no	Category	Course Code	Course Title	Course Mode	L	T	P	C
1	BS	MA19201	Complex Variables and Differential Equations	-	3	1	0	4
2	HS	EN19201	English Communication Skills II	Integrated Theory and Laboratory	2	0	2	3
3	BS	PH19202	Physics for Information Science	Integrated Theory and Laboratory	2	0	2	3
4	BS	CH19201	Material Chemistry	Integrated Theory and Laboratory	2	0	2	3
5	ES	CS19202	Data Structures and Algorithms	Integrated Theory and Laboratory	2	0	2	3
6	ES	EE19201	Basic Electrical Engineering	-	3	0	0	3
7	ES	ME19204	Engineering Graphics Laboratory	-	0	0	4	2
				TOTAL	**14**	**1**	**12**	**21**

MA19101 **MATRICES AND CALCULUS** **3 1 0 4**

(COMMON TO ALL BRANCHES)

OBJECTIVES

To enable the students to

- find the Eigenvalues and Eigenvectors of a real matrix and discuss their properties, reduce a real symmetric matrix from quadratic form to canonical form.
- acquire knowledge on single variable calculus.
- explain functions of several variables, Taylor's series expansion, Jacobians and compute the maximum & minimum values.
- acquaint the student with the concepts of basic integration and integration by parts.
- explain the double & triple integrals, discuss the change of order of integration and use multiple integrals to find the area & volume.

UNIT I MATRICES **12**

Characteristic equation - Eigenvalues and Eigenvectors of a real matrix - Properties – Statement and applications of Cayley-Hamilton theorem - Diagonalisation of a real symmetric matrix by orthogonal transformation - Quadratic form - Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II DIFFERENTIAL CALCULUS **12**

Limits and Continuity, properties of limit and classification of discontinuities - Tangent problems. Differentiation - Standard forms, Successive differentiation and Leibnitz theorem**.** Mean value theorem - Rolle’s theorem, Maxima and Minima, Concavity.

UNIT III FUNCTIONS OF SEVERAL VARIABLES **12**

Partial derivatives - Euler’s theorem for homogenous functions - Total derivatives - Differentiation of implicit functions - Jacobians - Taylor’s expansion - Maxima and Minima - Method of Lagrangian multipliers.

UNIT IV INTEGRAL CALCULUS **12**

Area Problem - Indefinite and definite integrals - Properties of integrals. Methods of integration - Substitution method, Integration by parts, Bernoulli’s formula - Reduction formulae involving exponential and trigonometric functions.

UNIT V MULTIPLE INTEGRALS **12**

Double integration - Cartesian and polar coordinates - Change of order of integration - Change of Variables. Triple integration in Cartesian co-ordinates - Area as double integral - Volume as triple integral.

TOTAL PERIODS: 60

OUTCOMES

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

- identify the solutions of the characteristic equations and to understand the technique of diagonalizing a matrix which would render the eigen solution procedure very simple.
- understand the concepts of calculus of single variate functions.
- know the functions of more than one variable, from the points of view of their differentiation, series expansions and extreme values, which are encountered in engineering studies.
- understand the basic solving techniques of integration.
- apply the methods of single, double and triple integration, which are needed in their studies in other areas and gain confidence to handle integrals of higher orders.

TEXT BOOKS

1. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi,(2011).
2. Dr.P.Jayakumar, and Dr.B.Kishokkumar "Matrices and Calculus", Global Publishers, Chennai.,(2015).
3. T. Veerarajan., "Engineering Mathematics", 3rd Edition, Tata McGraw Hill, (2011).

REFERENCE BOOKS

1. James Stewart, "Calculus ", 8th Edition, Cengage Learning, USA 2015 reprint.
2. Erwin Kreyszig., "Advanced Engineering Mathematics" 10th Edition, Wiley Publications.
3. Dass, H.K., and Er. Rajnish Verma, "Higher Engineering Mathematics", S. Chand Private Ltd.,(2011).
4. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education,(2012).
5. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2008).

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-strong, 2-Medium, 1-Weak														
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	-	-	-	-	-	-	-	3	2	3
CO2	3	3	3	3	-	-	-	-	-	-	-	3	2	3
CO3	3	3	3	3	-	-	-	-	-	-	-	3	2	3
CO4	3	3	3	3	-	-	-	-	-	-	-	3	2	3
CO5	3	3	3	3	-	-	-	-	-	-	-	3	2	3

EN19101 ENGLISH COMMUNICATIONSKILLS I 2 0 2 3

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To enable the students to

- impart knowledge about the importance of vocabulary andgrammar.
- help the students of engineering and technology develop a strong base in the use ofEnglish.
- improve the reading skills of the students so as to enable them to communicate with confidence inEnglish.
- develop their basic speaking skills in delivering impromptu talks and participating in conversations withconfidence.
- enable the students to write / draft effective essays and emails for effectivecommunication.

UNITI VOCABULARYANDGRAMMAR 9

General Vocabulary - Word Formation - Prefix and suffix - Synonyms - Antonyms - Spelling – Homophones - Homonyms - Word used as Nouns and Verbs - Comparative Adjectives - Phrasal verbs - Acronyms - Abbreviations - Tenses - Cause and Effect Expressions - Subject Verb Agreement - Wh questions - Yes or No questions - Articles - Sentence Structures - Discourse Markers - Single line definition.

UNITII LISTENING 6

Listening and transferring of information, listening to dialogues, listening to informal conversation-listening to short talks and answering questions- understanding the structure of conversations- telephone etiquette.

UNITIII READING 3

Reading - Sub-Skills of Reading - skimming-scanning – predicting - Reading Comprehension (Reading short passages and answering multiple choice and open-ended questions) - developing hints.

UNITIV WRITING 9

Writing - Describing - Defining - Classifying - Providing examples or evidence - Writing Introduction and Conclusion - Use of Cohesive devices and reference words - Writing essays (issue based, compare and contrast, Description, Narrative, Persuasive, Creative writing) - E-Mails (Business Correspondence, Letter Inviting delegates, Accepting, Declining) Instructions - Note-Making - Minutes of meeting - Jumbled Sentences - Interpreting visual information - Flow Chart, Pie Chart, Bar Chart(Transcoding).

UNITV SPEAKING 3

Introducing oneself - (personal information name, background, study details, areas of interest- speaking about one’s hobbies, strengths and weaknesses, role model and future ambition)- Role Play- impromptu talks.

TOTALPERIODS: 30

LIST OF EXERCISES

1. Me-chart
2. Roleplay
3. Informalchat
4. Formalconversation
5. Narration of a story, Narrating anincident
6. JAM
7. Turncourt
8. PresentationSkills

TOTALPERIODS: 30

COURSE OUTCOMES

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

- use suitable vocabulary and grammar with confidence and express their ideas both in speech and writing.
- listen and comprehend classroom lectures, short talks and conversations.
- read, interpret and analyze a given text effectively, and use cohesive devices in spokenand written English.
- understand English and converseeffectively.
- write flawless sentences, essays andletters.

TEXT BOOKS

1. N P Sudharshana, C.Savitha. English Technical Communication. Cambridge UniversityPress India Pvt.Ltd, NewDelhi.2016.
2. Mahalakshmi.S.N. English and Workbook for Engineers. V.K. Publications, Sivakasi.2017.

REFERENCE BOOKS

1. Raman, Meenakshi&Sangeetha Sharma. Technical Communication: Principles and Practice. Oxford University Press, New Delhi.2011.
2. Rizvi, Ashraf. M. Effective Technical Communication. Tata McGraw-Hill, New Delhi.2005
3. Rutherford, Andrea. J Basic Communication Skills for Technology. Pearson, New Delhi,2001.

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes (POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	-	-	-	-	-	-	-	2	1	2	2	1	-	-
CO2	-	-	-	-	2	3	2	3	1	3	1	-	-	-
CO3	-	-	-	3	-	2	-	2	2	2	2	2	-	-
CO4	-	-	-	-	-	2	2	2	2	3	1	1	-	-
CO5	-	-	-	2	-	-	-	3	3	3	3	1	-	-

PH19101 **ENGINEERING PHYSICS** **2 0 2 3**

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To enable the students to

- understand the basic concepts of properties of matter
- acquire the knowledge in the areas of ultrasonics and its applications
- describe the dual nature of matter and applications of Schrodinger wave equation
- categorize the types of laser and fiber optics
- identify the different types of crystal structures and crystal growth techniques

UNIT I PROPERTIES OF MATTER 6

Elasticity: Hooke's Law - Stress - Strain Diagram - Poisson's Ratio - Expressions for Poisson's ratio – Work done in stretching and twisting a wire - Twisting couple on a cylinder- Torsional pendulum - Rigidity modulus and moment of inertia.

Viscosity: Co-efficient of viscosity and its dimensions - Rate of flow of liquid in a capillary tube - Poiseuilles' formula - Experiment to determine co-efficient of viscosity of a liquid - Variation of viscosity of a liquid with temperature - Applications of viscosity.

UNIT II ULTRASONICS 6

Classification of Sound waves - Properties - Production of ultrasonic waves- Magnetostriction oscillator and piezoelectric oscillator - Determination of velocity of sound in liquid using acoustic grating - SONAR - Non destructive testing - Pulse echo system - Industrial Applications -Welding, drilling and cutting - Medical Applications - Sonogram.

UNIT III MODERN PHYSICS 6

Black body radiation - Planck’s theory (derivation) - Compton effect (derivation) - Matter waves - de-Broglie wavelength - Wave function - Physical significance of the wave function - Schrodinger’s time independent and time dependent equations - Applications: particle in one dimensional box-degenerate and non-degenerate states.

UNIT IV APPLIED OPTICS 6

Laser: Characteristics of laser - Stimulated absorption, spontaneous emission and stimulated emission - Population inversion - Pumping methods - Types of laser - Nd-YAG, CO_2 and semiconductor lasers (hetero junction) - Applications.

Optical fiber: Principle, propagation of light through optical fiber - expressions for numerical aperture and acceptance angle - Types of optical fibers - Fiber optical communication system (block diagram) - Applications.

UNIT V CRYSTAL PHYSICS 6

Crystalline solids and amorphous solids - Lattice - Unit cell - Crystal system - Bravais lattices - Lattice planes - Miller indices - Derivation of inter-planar spacing in cubic lattice - Calculation of number of

atoms per unit cell , atomic radius , coordination number and packing factor for SC, BCC, FCC and HCP structures. Crystal Growth Techniques - Bridgman and Czochralski techniques.

TOTAL PERIODS: 30

LIST OF EXPERIMENTS

1. Determination of Young's modulus by non- uniform bending method.
2. Determination of rigidity modulus - Torsion pendulum.
3. Determination of coefficient of viscosity of a liquid -Poiseuille's method.
4. Determination of velocity of sound and compressibility of liquid - Ultrasonic interferometer.
5. Determination of wavelength and particle size using Laser.
6. Determination of acceptance angle in an optical fiber.
7. Determination of lattice parameters using powder XRD.

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- assess the elastic properties of the materials.
- acquire the fundamental knowledge of ultrasonics.
- perceive the development of modern physics and its applications.
- recognize the uses of laser and the propagation of light through fiber optics.
- grasp the basics of crystals, its structures and different crystal growth techniques.

TEXT BOOKS

1. R.K. Gaur and Gupta. S.L, Engineering Physics, Dhanpat Rai Publishers, 2017.
2. Rajagopal, K, Engineering Physics, PHI learning Private Limited, 2015.

REFERENCE BOOKS

1. Avadhanulu M.N. & Murthy, Arun T.V.S, A Textbook of Engineering Physics, Volume-I, S.Chand and Company Limited, 2018.
2. M. Arumugam, Engineering Physics, Anuradha Publications, 2014.
3. V.Rajendran, Engineering Physics, Tata McGraw-Hill, New Delhi, 2014.
4. P K Palanisamy, Engineering Physics, 4th Edition, SciTech Publications, 2014.
5. A.Marikani, Engineering Physics, PHI, New Delhi, 2013.

	Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs		**Programmes Outcomes (POs)**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	3	2	-	-	-	3	1	-	-	-	2	-	-
CO2	2	3	3	-	-	-	3	1	-	-	-	2	-	-
CO3	-	2	2	2	-	-	2	1	-	-	-	2	-	-
CO4	3	3	3	-	-	-	3	2	-	-	-	3	-	-
CO5	2	3	3	1	2	-	3	1	-	-	-	2	-	-

PAAVAI ENGINEERING COLLEGE, NAMAKKAL
Approved
BOARD OF STUDIES
Physics
25/03/2019
AUTONOMOUS

CH19101 **ENGINEERING CHEMISTRY** **2 0 2 3**

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To enable the students to

- understand the water quality and its treatment methods.
- acquaint the students with the basics of surface chemistry, their properties and applications.
- predict the number of phases that exists in equilibrium for a system.
- evaluate the interrelation between heat and work within the confines of the laws of thermodynamics.
- identify the importance and preparation of nonmaterial recent developments.

UNIT I WATER AND ITS TREATMENT **6**

Hardness of water –types –expression of hardness –units –estimation of hardness of water by EDTA–boiler troubles (scale and sludge, priming and foaming) –boiler feed water –Treatments-Internal treatment (phosphate and calgon conditioning) external treatment –Ion exchange process–desalination-Reverse Osmosis- Disinfection-Break point chlorination.

UNIT II SURFACE CHEMISTRY AND CATALYSIS **6**

Adsorption: Types of adsorption –adsorption of gases on solids –adsorption of solute from solutions – adsorption isotherms –Freundlich's adsorption isotherm –Langmuir's adsorption isotherm –applications of adsorption on pollution abatement.

Catalysis: Catalyst –types of catalysis-Homogenous and Heterogeneous –autocatalysis –catalytic poisoning and catalytic promoters –enzyme catalysis–Michaelis –Menten equation.

UNIT III PHASE RULE AND ALLOYS **6**

Phase rule: Introduction, and explanation of terms with examples, One Component System: Water System- Reduced phase rule- Two Component Systems- Lead- Silver system. Alloys: Introduction – Definition – properties of Alloys- Functions - Ferrous alloys- Nichrome and Stainless Steel- Heat treatment of steel: Non Ferrous alloys; Brass and Bronze.

UNIT IV CHEMICAL THERMODYNAMICS **6**

Terminology of thermodynamics-First law- Second law: Entropy- Entropy change for a reversible and irreversible process; Free energy and work function: Helmholtz and Gibbs free energy functions- Criteria of spontaneity: Derivation of - Gibbs Helmholtz Equation -Maxwell Relations- Derivation of Vant Hoff Isotherm and Isochore.

UNIT V NANOMATERIALS **6**

Basics-distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nanoscale materials properties and uses of nanocluster, rods, tubes (CNT) and wires. Preparation of nanoparticles- thermolysis, hydrothermal, solvothermal, Preparation of Carbon nanotube by chemical vapour deposition, laser ablation; applications of nanomaterials.

TOTAL PERIODS: 30

LIST OF EXPERIMENTS

1. Determination of DO content of water sample by Winkler's method.
2. Determination of Calcium and Magnesium in water sample by a titration method.
3. Determination of strength of given hydrochloric acid by using pH meter.
4. Determination of strength of acids in a mixture using conductivity meter.
5. Conductometric titration of strong acid Vs Strong base.

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- gain practical experience in chemical process of water treatments.
- identify the particle size, and the application of surface chemistry in various fields
- classify the states in a equilibrium in a heterogeneous system.
- know the basic concepts of internal energy, enthalpy, entropy, free energy and chemical potential.
- get exposure in the recent trend in the nanofields.

TEXT BOOKS

1. Jain P.C. and Jain. M., Engineering Chemistry, 17/e, 2014 Dhanpat Rai Publishing Company, New Delhi, Reprint 2017.
2. B.K. Sharma – "Industrial Chemistry", 11th ed., (2015), Goel Publication, Meerut.

REFERENCE BOOKS

1. Puri B.R., Sharma L.R., Pathania, M.S. Principles of physical chemistry,15/e 2015 ,Vishal Publishing Co.,Meerut, Reprint 2017.
2. Atkins, P. and de Paula, J., Atkin's Physical Chemistry, 9th ed., Oxford Univ. Press,New Delhi. 2014.
3. Dara S.S. and Umare S.S., A text book of Engineering Chemistry,12/e,2014 S.Chand and Company Limited, New Delhi,Reprint 2016.
4. Engineering Chemistry, Wiley India Editorial Team, Wiley Eastern Pub, New Delhi 2018.
5. M.Mohan and G.Raja, Engineering Chemistry - I,2 nd edition Jai Tech Publication, Chennai (2017).
6. R,Ravikrishnan, Engineering Chemistry -I, 6 th edition, Revised Sri Krishna Publication, Chennai (2018).

Mapping of course outcome with Programme Outcomes
(S/M/W indicates strength of correlation) S-Strong-3, M-Medium=2 , W-Weak=1.

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

CS19101 **PROGRAMMING IN C** **2 0 2 3**

(COMMON TO CSE / IT)

COURSE OBJECTIVES

To enable the students to

- learn the organization of a digital computer.
- work with problem solving techniques and to learn the basics of C.
- solve problems using control statements.
- use strings, functions, pointers in C.
- learn structure, union and file handling in C.

UNIT I INTRODUCTION TO COMPUTERS **6**

Introduction – Characteristics of Computers – Evolution of Computers – Computer Generations –Classification of Computers – Basic Computer organization – Software –Types of Software – Software Development Lifecycle - Number System Conversion.

UNIT II PROBLEM SOLVING AND BASICS OF C LANGUAGE **6**

Problem Solving Techniques: Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudo code.

Overview of C: Structure of C programs, Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operations.

UNIT III CONTROL STATEMENTS AND ARRAYS **6**

Decision Making and Branching: Simple if statement – ifelse statement – nested ifelse statement - switch statement.

Decision Making and Looping: while statement - dowhile statement – for statement – nested forstatement.

Arrays: Introduction – One Dimensional array - Two Dimensional Array - Multidimensional array - Matrix operations.

UNIT IV STRINGS , FUNCTIONS AND POINTERS **6**

String: Declaring and Initializing string variables – string handling functions.

Functions: Function declaration – categories of function - parameter passing methods – call by value, callby reference, recursion - Library functions.

Pointers: Understanding pointers – Accessing address of variable – Declaring pointer variables –Initialization of pointer variables – Accessing a variable through its pointer – Pointers and functions – Operations on pointers.

UNIT V STRUCTURE, UNIONS AND FILE HANDLING **6**

Structures and Union: Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization - Structure assignment - Nested Structure - Array of Structure – Union –Enumerated data type.

File Handling: Introduction to file – Defining and opening a file – closing a file – File operations.

TOTAL PERIODS: 30

LIST OF EXPERIMENTS

a) Word Processing

1. Document creation, Text manipulation with Scientific notations
2. Table creation, Table formatting and Conversion.
3. Mail merge and Letter preparation.
4. 4. Drawing - flow Chart.

b) Spread Sheet

5. Chart - Line, XY, Bar and Pie.
6. Formula - formula editor.
7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
8. Sorting and Import / Export features.

c) C Programming

9. Data types, Expression Evaluation, Condition Statements
10. Arrays
11. Structures and Unions
12. Functions
13. File Handling
14. Pointers

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- gain knowledge about the organization of computer.
- understand basic concepts of C programs.
- program with various control statements.
- acquire knowledge for handling strings, functions, pointers in C.
- implement C programs using structure, union and file handling concepts.

TEXT BOOKS

1. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
2. Pradip Dey, Manas Ghosh, "Fundamentals of Computing and Programming in C", First Edition, Oxford University Press, 2009.

REFERENCES

1. Byron Gottfried, "Programming with C", 3rd Edition, (Indian Adapted Edition), TMH publications, 2010.
2. Stephen G.Kochan, "Programming in C", 5th Edition, Pearson Education India, (2011).
3. BrianW.Kernighan and Dennis M.Ritchie, "The C Programming Language", Pearson Education Inc., (2009).

Mapping of Course Outcomes with Programming Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes(POs)**												**Programme Specific Outcomes (PSOs)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	1	3	3	3	-	1	1	-	-	-	-	3	3	3
CO2	3	2	3	3	-	-	-	-	-	-	-	2	3	3
CO3	2	3	1	-	1	-	1	-	-	-	-	2	3	3
CO4	1	3	3	3	-	-	-	-	-	-	-	2	1	3
CO5	3	3	3	-	-	2	-	-	-	-	-	3	3	2

GE19101 ENGINEERING PRACTICES LABORATORY 0 0 4 2

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To enable the students to

- develop their knowledge in basic civil engineering practices such as plumbing, carpentry and its tool usages.
- practice some of mechanical basics such as welding, basic machining, sheet metal work, fitting.
- experience with basic electrical wiring circuits
- know about the electronic components, color coding signal generation, soldering practice..

GROUP A (CIVIL AND MECHANICAL)

I CIVIL ENGINEERING PRACTICE

BUILDINGS

- Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

PLUMBING WORKS

- Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows inhousehold fittings.
- Study of pipe connections requirements for pumps and turbines.
- Preparation of plumbing line sketches for water supply and sewage works.
- Hands-on-exercise:
- Basic pipe connections – Mixed pipe material connection – Pipe connections with different joiningcomponents. (e) Demonstration of plumbing requirements of high-rise buildings.

CARPENTRY USING POWER TOOLS ONLY

a) Study of the joints in roofs, doors, windows and furniture.

b) Hands-on-exercise:

Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

WELDING

- Preparation of arc welding of butt joints, lap joints and tee joints.
- Gas welding practice

BASIC MACHINING

- Simple Turning, Facing, Thread cutting and Taper turning
- Drilling Practice

SHEET METAL WORK

- Model making – Trays, funnels, etc.
- Different type of joints.

FITTING

- Square fitting
- Vee – fitting models

DEMONSTRATION ON

(a) Smithy operations, upsetting, swaging, setting down and bending. Example –

Exercise –Production of hexagonal headed bolt.

(b) Foundry operations like mould preparation for gear and step cone pulley.

TOTAL: 30 PERIODS

GROUP B (ELECTRICAL AND ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE

1. Study of electrical tools and safety measures
2. Basic wiring practices - Stair-case wiring, Fluorescent lamp wiring and Residential house wiring
3. Measurement of electrical parameters such as voltage, current, power & power factor in RLC circuit.
4. Measurement of energy using single phase energy meter.
5. Earthing Practices &Measurement of earth resistance using megger.
6. Study of electrical equipments such as iron box, induction heater.

IV ELECTRONICS ENGINEERING PRACTICE

1. Study of Electronic components and equipments – Resistor, color coding measurement of AC signalparameter (Peak-Peak, RMS, Period, and Frequency) using CRO.
2. Study of logic gates AND, OR, Ex-OR and NOT.
3. Generation of Clock Signal.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR.
6. Construction and verification of half adder circuit.
7. Construction and verification of half subtractor circuit.
8. Study of Telephone, F.M Radio and Cell Phone.

TOTAL: 30 PERIODS

COURSE OUTCOMES

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

- use the tools for plumbing and carpentry works
- prepare models by -welding, machining, sheet metal and fitting
- construct electrical wiring circuit and demonstrate practically
- analyse the signal generation, solder the electronic components based on the circuits

CO - PO Mapping

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes(POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	2	2	2	2	-	-	-	1	-	-	1	2	3
CO2	2	2	2	2	2	-	-	-	1	-	-	1	2	3
CO3	2	2	2	2	2	-	-	-	1	-	-	1	2	3
CO4	2	2	2	2	2	-	-	-	1	-	-	1	2	3

MA19201 COMPLEX VARIABLES AND DIFFERENTIAL EQUATIONS 3 1 0 4

(COMMON TO ALL BRANCHES)

OBJECTIVES

To enable the students to

- discuss a wide range of basic mathematical methods for solving different types of problems arising in the fields of Science, Mathematics and Engineering
- acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems
- understand the concepts of vector calculus, which is applied in all engineering disciplines
- know the standard techniques of complex variable
- learn the purpose of using transforms to create a new domain

UNIT I VECTOR CALCULUS 12

Gradient, Divergence and Curl - Directional derivative - Irrotational and solenoidal vector fields - Vector integration - Green's, Gauss divergence and Stokes' theorem - Statement, Verification and Simple applications.

UNIT II ANALYTIC FUNCTIONS 12

Functions of a complex variable - Analytic functions - Statement of Cauchy - Riemann equations - Harmonic functions and orthogonal properties - Harmonic conjugate - Construction of analytic functions - Conformal mapping : w= z+c, cz, 1/z and Bilinear transformation.

UNIT III COMPLEX INTEGRATION 12

Complex integration - Statement and applications of Cauchy's integral theorem and Cauchy's integral formula - Taylor and Laurent expansions - Singular points - Residues - Residue theorem – Contour integration - evaluation of circular and semicircular Contour.

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 12

Higher order linear differential equations with constant coefficients - Method of variation of parameters - Cauchy's and Legendre's linear equations - Simultaneous first order linear equations with constant coefficients.

UNIT V LAPLACE TRANSFORM 12

Laplace transform - Transform of elementary functions - Properties - Transform of periodic functions. Definition of Inverse Laplace transforms - Statement and applications of Convolution theorem - Initial and Final value theorems - Solution of linear ODE of second order with constant coefficients by Laplace transforms.

TOTAL PERIODS: 60

OUTCOMES

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

- ❖ study the basics of vector calculus comprising of gradient, divergence and curl and line, surface and volume integrals and the classical theorems.
- ❖ know the concept of analytic functions and its properties and apply it in conformal mapping.
- ❖ gain knowledge in the basics of complex integration and the concept of contour integration which is an important tool for evaluation of certain real integrals.
- ❖ solve differential equations.
- ❖ gain sufficient exposure to find solution of certain linear differential equations by Laplace transform.

TEXT BOOKS

1. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi,(2011).
2. Dr.P.Jayakumar, and Dr.B.Kishokkumar, "Differential Equations and Complex Analysis", GlobalPublishers, Chennai.,(2015).
3. Erwin Kreyszig., "Advanced Engineering Mathematics" 10th Edition, Wiley Publications.

REFERENCE BOOKS

1. Dass, H.K., and Er. Rajnish Verma, "Higher Engineering Mathematics", S. Chand Private Ltd.,(2011).
2. T. Veerarajan., "Engineering Mathematics", 3rd Edition, Tata McGraw Hill, 2011.
3. Peter V. O'Neil, "Advanced Engineering Mathematics", 7th Edition, Cengage learning, (2012).
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2008).

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes(POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	**3**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**3**
CO2	**3**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**
CO3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**
CO5	**3**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**

EN19201 ENGLISH COMMUNICATIONSKILLSII 2 0 2 3

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To help the students of engineering and technology to

- enhance their ability to listen, read, write and speakEnglish.
- comprehend and write essays and prepare short project reports related to their branches of specialization.
- enhance their ability to read and comprehend technicaltexts.
- make effective presentations on topics in engineering andtechnology.
- participate successfully in GroupDiscussions.

UNITI VOCABULARYANDGRAMMAR 9

General Vocabulary - Prefixes & Suffixes - One word substitutions - Active Voice and Passive Voice - Collocations - Fixed expressions (adhere to, on the part of etc.) - Idioms and Phrases - Compound Nouns - Numerical Expression - Preposition - Direct into Indirect Speech - If Conditionals - Purpose expression - Editing - Extended Definitions - Simple, Compound and ComplexSentences.

UNITII LISTENING 3

Listening to news and announcements, listening to a telephone conversation- Listening to model interviews - TED Talks.

UNITIII READING 6

Reading - Developing analytical skills, Deductive and inductive reasoning - Extensive reading - Critical reading- Reading articles in newspapers, journals.

UNITIV WRITING 9

Check list – Recommendation - Writing a job application - Resume (E-mail format) - Technical Report-Writing (Industrial Visit report, Accident report, Feasibility report, Survey report, Mini project proposal) - Paragraph Writing - Advertisement writing - Designing poster - Film Book review.

UNITV SPEAKING 3

Syllable - Stress - Intonation - Silent Letters - Presentations on a given topic - Mini presentation in small groups - Group discussion - Interview Techniques - mock interviews.

TOTALPERIODS: 30

LIST OF EXERCISES

1. ShipWreck
2. Introducing a product (SpotLight)
3. Vocabulary Buildinggames
4. Description of an event /Competition
5. Master of Ceremony (MC, Welcome Address, Vote of thanks, prizedistribution)
6. MC (Introducing a Guest, Feed back of theparticipant)
7. GD
8. MockInterview

TOTALPERIODS: 30

COURSE OUTCOMES

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

- speak with clarity and confidence.
- read, interpret and analyse a given text.
- write comprehensive reports, job applications and draft effective e-mails.
- make effective presentations using power point.
- participate successfully in GroupDiscussions.

TEXT BOOKS

1. N P Sudharshana, C.Savitha. English Technical Communication. Cambridge UniversityPress India Pvt.Ltd, NewDelhi.2016.
2. Mahalakshmi.S.N. English and Workbook for Engineers. V.K. Publications, Sivakasi.2017.

REFERENCE BOOKS

1. Raman, Meenakshi&Sangeetha Sharma. Technical Communication: Principles and Practice. Oxford University Press, New Delhi.2011.
2. Rizvi, Ashraf. M. Effective Technical Communication. Tata McGraw-Hill, New Delhi.2005
3. Rutherford, Andrea. J Basic Communication Skills for Technology. Pearson, New Delhi.2001.

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes (POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	-	-	-	-	-	-	-	2	-	3	2	1	-	-
CO2	-	-	2	-	-	3	2	3	1	3	-	-	-	-
CO3	-	-	-	3	-	2	-	2	2	2	2	2	-	-
CO4	-	-	-	-	-	2	2	2	3	3	-	-	-	-
CO5	-	-	-	2	-	-	-	3	3	3	3	-	-	-

PH19202 **PHYSICS FOR INFORMATION SCIENCE** **2 0 2 3**

(COMMON TO CSE/IT)

COURSE OBJECTIVES

To enable the students to

- develop knowledge about the conduction properties of metals
- correlate better understanding on carrier concentration and its variations with temperature in an intrinsic semiconductors
- recognize the optical properties of materials and its uses
- identify the different types of magnetic materials and its applications
- describe the quantum mechanical behavior of materials and its device applications

UNIT I CONDUCTING MATERIALS 6

Conductors - Types of conducting materials - Classical free electron theory of metals: Postulates - Derivation of electrical conductivity and thermal conductivity - Wiedemann-Franz law and its verifications - Lorentz number - Merits and demerits of classical free electron theory - Quantum free electron theory: Fermi-Dirac distribution function - Effect of temperature on Fermi function - Density of energy states-Carrier concentration in metals.

UNIT II SEMICONDUCTING MATERIALS 6

Types of semiconductors - elemental and compound semiconductor - Intrinsic semiconductor: Expressions for density of electrons, holes and carrier concentration - Fermi level -Variation of Fermi level with temperature - Electrical conductivity - Band gap determination - Extrinsic semiconductors: n-type and p-type semiconductors (Qualitative) - Hall effect - Determination of Hall coefficient - Applications.

UNIT III MAGNETIC MATERIALS 6

Types of magnetic materials - dia, para, ferro, antiferro and ferri magnetic materials - Domain theory of ferromagnetism - Hysteresis - Soft and hard magnetic materials – Ferrites - Applications- Spintronics and devices -Giant magneto resistance, Tunnel magneto resistance and Colossal magneto resistance-Magneto recording and storage devices.

UNIT IV OPTICAL PROPERTIES OF MATERIALS 6

Classification of optical materials- Absorption of light in metals, insulators and semiconductors-LED-Organic LED. LCD: properties -Twisted neamatic display -Dynamic scattering display-Comparison between LED and LCD- Photoconductive and photovoltaic materials: LDR and Solar cell.

UNIT V NANO DEVICES 6

Electron density in bulk material – Size dependence of Fermi energy – Quantum confinement – Quantum structures – Density of states in quantum well, quantum wire and quantum dot structure(qualitative) – Band gap of nanomaterials – Tunneling: single electron phenomena and single electron transistor – Quantum dot laser

TOTAL PERIODS: 30

LIST OF EXPERIMENTS

1. Determination of Hall coefficient of semiconductor material
2. Determination of band gap of a semiconductor.
3. Determination of thermal conductivity of a bad conductor - Lee's Disc method.
4. Determination of Hysteresis losses in a Ferromagnetic material.
5. To study the V-I characteristics of LDR
6. To study the Characteristics of LED under forward and reverse bias
7. To Study the V-I characteristics of solar cell

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- select the metals required for specific applications in the field of engineering and technology.
- acquire the knowledge of an intrinsic semiconductors and determinations of hall co-efficient.
- get knowledge on magnetic properties of materials and its applications in data storage.
- grasp the functioning of optical materials for optoelectronics.
- relate the different types of quantum structures and nanodevices

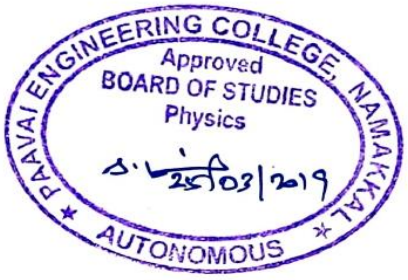
TEXT BOOKS

1. A.Marikani, Material Science, PHI, New Delhi, 2017.
2. Md Nazoor Khan, S. Panigrahi, Principles of Engineering Physics 2, Cambridge University Press, 2017.

REFERENCE BOOKS

1. Umesh K Mishra & Jasprit Singh, Semiconductor Device Physics and Design, Springer,2008.
2. P K Palanisamy, Material Science, SciTech Publications, 2015
3. Kasap, S.O. -Principles of Electronic Materials and Devices, McGraw-Hill Education, 2017.
4. S.O.Pillai, Solid State Physics. New Academic Science, Publishers, 2018.
5. Charles Kittel, Paul McEuen, Introduction to Solid State Physics, John Wiley & Sons, Limited, 2018.

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs		**Programmes Outcomes (POs)**												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	3	2	-	-	2	3	2	-	-	-	3	-	-
CO2	2	3	1	-	-	2	3	2	-	-	-	2	-	-
CO3	2	3	2	-	-	2	3	1	-	-	-	2	-	-
CO4	2	3	3	-	-	2	3	2	-	-	-	3	-	-
CO5	2	2	2	-	-	2	3	1	-	-	-	2	-	-



CH19201 **MATERIAL CHEMISTRY** **2 0 2 3**

(COMMON TO ECE/EEE/CSE/IT/ME/MCT)

COURSE OBJECTIVES

To enable the students to

- understand the preparation and properties of polymers and elastomers
- assess the reaction takes place in energy derivation.
- recognize and comprehend the relation of electrochemistry with corrosion.
- make conversant with combustion and calorific values of fuels.
- identify the importance and preparation of new materials recent development.

UNIT I POLYMERS AND ELASTOMERS 6

Introduction-Classification of polymer – polymerization-Mechanisms of polymerization (Free Radical and Ionic)–Plastics-Thermoplastics –Thermosetting plastics – Engineering plastics-preparation, properties and uses (Teflon, Lexan, Polyamides) - Advanced Polymeric materials–Liquid crystal polymers – Conductive polymers(Poly acetylene)- Elastomers - Applications.

UNIT II ENERGY STORAGE MATERIALS 6

Energy-Classification- Renewable energy-solar energy conversion-solar cells-solar heater-wind energy-Tidal energy-Ocean thermal energy-Fuels cells-hydrogen-oxygen fuel cell-Batteries-Types- alkaline batteries-lead acid-nickel cadmium and lithium ion batteries.

UNIT III ELECTROCHEMISTRY AND CORROSION 6

Electrochemical cells-types-reversible and irreversible cells –EMF–measurement of emf-Single electrode potential (oxidation and reduction) –Nernst Equation (derivation) –electrochemical series–significance. Corrosion-Types-Pilling-Bedworth rule – Mechanism of Dry corrosion and wet corrosion-Types of electrochemical corrosion.

UNIT IV FUELS AND COMBUSTION 6

Fuels: Introduction -classification of fuels -coal -analysis of coal (proximate and ultimate) -carbonization -manufacture of metallurgical coke (Otto Hoffmann method) -petroleum -knocking -octane number -diesel oil -cetane number -natural gas -compressed natural gas (CNG) -liquefied petroleum gases (LPG) -power alcohol. Combustion of fuels: Introduction -calorific value -higher and lower calorific values-theoretical calculation of calorific value-flue gas analysis (ORSAT Method).

UNIT V NEW MATERIALS AND APPLICATIONS 6

Introduction-composites classification-Particle- reinforced composites- Fiber- reinforced composites-Fiber-glass- reinforced composites- Reinforced plastic matrix –composites- metal matrix –fiber composites- hybrid composites-processing of fiber- reinforced composites-pultrution, prepeg production process -Structural composites- sandwich panels.

TOTAL PERIODS: 30

LIST OF EXPERIMENTS

1. Determination of molecular weight of a polymer by Oswald viscometer.
2. Determination of Calcium and magnesium in water by a titration method.
3. Estimation of copper content of the given solution by EDTA method.
4. Estimation of iron content of the given solution using potentiometer.
5. Determination of Cloud point, pour point and oiliness of fuels.

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- evaluate the importance of advanced polymers in engineering fields.
- know the basic concepts of renewable energy and its ecofriendlyl.
- indentify the control methods of corrosion on metals.
- estimate the high calorific value of fuels and its usage
- identify the composition and formation of reinforced materials.

TEXT BOOKS

1. Jain P.C. and Jain. M., Engineering Chemistry, 17th Edition, Dhanpat Rai Publishing Company, New Delhi, Reprint 2017.
2. Materials Science and Engineering, V.Raghavan, Prentice – Hall of India Pvt. Ltd., (2015)

REFERENCE BOOKS

1. Dara S.S. and Umare S.S., A text book of Engineering Chemistry, S.Chand and Company Limited, New Delhi, 2016.
2. Raghavan V., "Material Science and Engineering," 9 th edition,Wiley India.New Delhi. (2014).
3. Krishnamoorthy, P. Vallinayagan & K. Jaya Subramanian – "Applied Chemistry",4th ed., (2015), Tata MaGraw-Hill Publishing Co. Ltd., New Delhi.
4. Solid state chemistry and its application; Anthony.R. West, John Wiley & Sons,Newyork. (2015)
5. Materials Science; R.S.Khurmi and R.S.Sedha, S.Chand & Company Ltd, NewDelhi (2014).

Mapping of course outcome with Programme Outcomes
(S/M/W indicates strength of correlation) S-Strong-3, M-Medium=2 , W-Weak=1.

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

CS19202 **DATA STRUCTURES AND ALGORITHMS** **2 0 2 3**

(COMMON TO CSE / IT)

COURSE OBJECTIVES

The Students will be able to

- understand the basic concept of linked list ADT.
- understand the behavior of data structures such as stacks, queues.
- learn the concept of trees, search trees in C to solve problems.
- understand and analyze various hashing techniques and set ADT.
- apply various graph structures using C.

UNIT I LINKED LIST **6**

Abstract Data Types (ADT) - List ADT – Array based implementation - Linked list implementation - Cursor based linked list - Doubly linked list - Circularly linked list - Applications of list - Polynomial Manipulation.

UNIT II STACK AND QUEUE **6**

Stack ADT – Definition - Array and linked implementations – Applications - Infix to postfix conversion, Postfix expression evaluation - Recursion implementation - Queue ADT – Definition - Array and linked Implementations - Circular queue - Insertion and deletion operations.

UNIT III TREES **6**

Tree ADT- Tree traversals - Left child right sibling data structures for general trees - Binary Tree ADT – Expression trees - Applications of trees - Binary search tree ADT - AVL trees - binary heaps.

UNIT IV HASHING AND SETS **6**

Hashing - Separate Chaining - Open Addressing – Rehashing - Extendible Hashing - Disjoint Set ADT - Dynamic equivalence problem -Smart union algorithms - Path compression - Applications of Sets.

UNIT V GRAPHS **6**

Definition - Topological sort - Breadth-first traversal - Shortest-path algorithms - Weighted and Unweighted graph - Minimum spanning tree - Prim's and Kruskal's algorithms - Depth-first traversal - bi connectivity - Euler circuits - Applications of graphs.

TOTAL PERIODS 30

LIST OF EXPERIMENTS

1. Implement singly linked list with its operations.
2. Implement doubly linked list with its operations.
3. Represent a polynomial as a linked list and write functions for polynomial addition.
4. Implement stack and use it to convert infix to postfix expression.
5. Implement array-based circular queue and use it to simulate a producer-consumer problem.
6. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
7. Implement binary search tree.
8. Implementation AVL tree.

9. Implement priority queue using heaps.
10. Implement hashing technique.

TOTAL PERIODS: 30

COURSE OUTCOMES

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

- implement list ADT for linear data structures.
- design programs using a variety of data structures such as stacks, queues.
- analyze and implement various tree structures.
- review various hashing and collision resolution techniques.
- analyze and implementgraph traversalmethods.

TEXT BOOKS

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Fourth Edition, Pearson Education, 2013.
2. V. Aho, J. E. Hopcroft, and J. D. Ullman, 'Data Structures and Algorithms′, PearsonEducation, 2009.

REFERENCES

1. Reema Theraja, "Data Structures Using C", Second Edition, Oxford University Press, 2011.
2. R. F. Gilberg, B. A. Forouzan, 'Data Structures′, Second Edition, Thomson IndiaEdition, 2008.
3. M. Tenenbaum, Y. Langsam, and M. J. Augenstein, 'Data Structures using C′,Pearson Education, 2007.

Mapping of Course Outcomes with Programming Outcomes
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

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

EE19201 BASIC ELECTRICAL ENGINEERING 3 0 0 3

COURSE OBJECTIVES

To enable the students to

- analyze the various DC circuits and find the circuit parameters.
- introduce the AC fundamentals and three phase circuits.
- familiarize the various electrical machines and measuring instruments.
- study the basics of electrical wiring.
- learn the basics of electrical safety.

UNIT I DC CIRCUITS 9

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation ; Superposition, Thevenin and Norton Theorems.

UNIT II AC CIRCUITS 9

Representation of sinusoidal waveform- peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance; Three- phase balanced circuits, voltage and current relations in star and delta connections.

UNIT III FUNDAMENTALS OF ELECTRICAL MACHINES AND MEASURING INSTRUMENTS 9

Construction, principle of operation, characteristic and application - single phase transformer, single phase induction motor, and DC Motor; Types of electrical measurement, Construction and operating principles - Moving coil and moving iron instruments (ammeters and voltmeters), dynamometer type watt meters and energy meters.

UNIT IV ELECTRICAL INSTALLATIONS AND WIRING 9

Components of LT switchgear- Switch fuse unit (SFU), MCB, ELCB, types of wires and cables, systems of distribution of electrical energy, systems of wiring, choice of wiring systems, earthing; Batteries- Lead acid, Li-Ion.

UNIT V ELECTRICAL SAFETY PRACTICES AND STANDARDS 9

Indian electricity act and rules- general safety requirements as per IE rules, electrical safety equipment's- electrical installation, ground clearance, section clearance, earthing, specifications, earth resistance, earth pit maintenance.

TOTAL PERIODS : 45

COURSE OUTCOMES

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

- implement the basic knowledge about DC Electric circuits.
- apply the knowledge of AC fundamentals and AC circuits.
- understand the operation of electrical machines and measuring instruments and their usage
- analyze various electrical components and perform electrical wiring.
- follow the Indian electricity rules and apply in electrical installations

TEXT BOOKS

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering" , Tata McGraw Hill, 2011.
2. J.B.Gupta, "Basic Electrical Engineering", S.K.Kataria & Sons, 2015

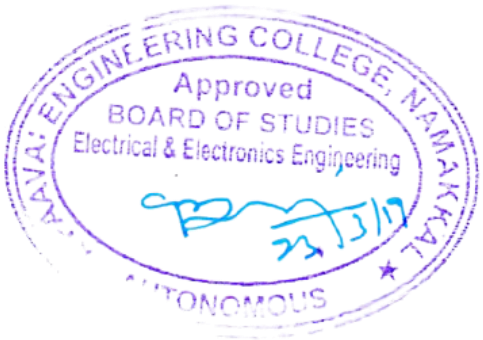
REFERENCES

1. V.K.Mehta and Rohit Mehta, "Principles of Electrical Engineering and Electronics", S.Chand, 2014.
2. R.Muthusubramanian and S.Salivahanan, "Basic Electrical and Electronics Engineering Fundamentals", Tata McGraw Hill, 2010.
3. G.Nagarajan, " Basics of Electrical Electronics and Computer Engineering", A.R.Publications, 2001.
4. B.L.Theraja and A.K.Theraja, "Electrical Technology Volume 1", S.Chand, 2010
5. "The Electricity Rules", Universal's Law Publishing, 2011.

CO-PO MAPPING

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's) and Programme Specific Outcomes PSO's
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

	PO's												PSO's	
CO's	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	-	-	3	3	-	-	-	3	-	3	3
CO2	3	3	3	-	3	-	-	-	3	-	3	-	3	3
CO3	3	3	3	-	3	-	-	-	3	-	3	-	3	3
CO4	3	3	3	-	3	-	-	-	3	-	3	-	3	3
CO5	3	3	3	-	-	-	-	-	3	-	3	-	3	3



ME19204 **ENGINEERING GRAPHICS LABORATORY** **0 0 4 2**

(COMMON TO ALL BRANCHES)

COURSE OBJECTIVES

To enable the students to

- introduce concepts like dimensioning, conventions and standards related to Engineering drawing and imbibe knowledge on plane curves and projection of points
- impart knowledge on projection of lines and plane surfaces
- develop the visualization skills for understanding the projection of solids
- illustrate on development of surfaces for simple solids
- understand the orthographic projection and isometric view

Concepts and Conventions (Not for Examination) **2**

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 PROJECTION OF POINTS **10**

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. Applications of above cited curves. Orthographic projection – Principles-Principal Planes - Projection of points in four quadrants.

UNIT II PROJECTION OF LINES AND PLANES **12**

Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by Change of Position method. Projection of Planes (Square, Pentagon, Hexagon and Circle) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS **12**

Projection of simple solids like Square Prism, Pentagonal Prism, Hexagonal Prism, Triangular Prism. Square Pyramid, Pentagonal Pyramid, Hexagonal Pyramid, Cylinder and Cone when the axis is inclined to one of the principal planes (either horizontal or vertical plane).

UNIT IV DEVELOPMENT OF SURFACES **12**

Development of lateral surfacesin simple vertical position when the cutting plane is inclined to one of the principal planes and perpendicular to the other – Prisms, pyramids cylinders and cones.

UNIT V ORTHOGRAPHIC AND ISOMETRIC PROJETIONS **12**

Representation of Three-dimensional objects – Introduction of Orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through multiple views from pictorial views of objects Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones - Conversion of Isometric view to orthographic projection.

TOTAL PERIODS: 60

COURSE OUTCOMES

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

- perform sketching of basic curves and projection of points in four quadrants
- draw the projections of straight lines and plane surfaces in given quadrant
- comprehend the projection of solids in various positions in first quadrant
- draw the development of surfaces.
- prepare orthographic and isometric projection of simple solids.

TEXT BOOKS

1. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.
2. Prabhakaran. S, Makesh. M, Subburam. V, "Engineering Graphics", Maruthi Publishers, Chennai, 2016

REFERENCE BOOKS

1. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
2. 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.
3. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson, 2nd Edition, 2009.
4. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
5. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008

CO - PO Mapping

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	**Programme Outcomes(POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	3	1	-	-	-	-	1	1	2	1
CO2	3	3	3	3	3	1	-	-	-	-	1	1	2	1
CO3	3	3	3	3	3	1	-	-	-	-	1	1	2	1
CO4	3	3	3	3	3	1	-	-	-	-	1	1	2	1
CO5	3	3	3	3	3	1	-	-	-	-	1	1	2	1