

ANNA UNIVERSITY : : CHENNAI – 600 025

UNIVERSITY DEPARTMENTS

R - 2008

B.E.ELECTRICAL AND ELECTONICS ENGINEERING

]

I & II SEMESTERS CURRICULUM AND SYLLABI

SEMESTER - I

CODE NO.	COURSE TITLE	L	T	P	C
THEORY					
HS9111	Technical English - I	3	1	0	4
MA9111	Mathematics - I	3	1	0	4
PH9111	Engineering Physics	3	0	0	3
CY9111	Engineering Chemistry	3	0	0	3
GE9111	Engineering Graphics	2	0	3	4
GE9112	Fundamentals of Computing	3	0	0	3
PRACTICAL					
PH9112	Physics Laboratory	0	0	2	1
CY9112	Chemistry Laboratory	0	0	2	1
GE9113	Engineering Practices Laboratory	0	0	3	2
GE9114	Computer Practices Laboratory	0	0	3	2
	TOTAL	17	2	13	27

SEMESTER II

CODE NO	COURSE TITLE	L	T	P	C
THEORY					
HS9161	Technical English - II	2	0	2	3
MA9161	Mathematics – II	3	1	0	4
PH9167	Physics of Electrical and Electronics Materials	3	0	0	3
GE9151	Engineering Mechanics	3	1	0	4
EE9151	Electric Circuit Analysis	3	0	0	3
ME9153	Power Plant Engineering	3	0	0	3
EE9152	Object Oriented Programming	3	0	0	3
PRACTICAL					
EE9153	Electric Circuits Laboratory	0	0	3	2
EE9154	Computer Programming Laboratory	0	0	3	2
	TOTAL	20	2	8	27

HS 9111	TECHNICAL ENGLISH I	L T P C
	(Common to all branches of B.E. / B.Tech. Programmes)	3 1 0 4

AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students improve their vocabulary and employ the words appropriately in different academic and professional contexts.
- To make students comprehend classroom lectures and technically oriented passages.
- To enable students develop suitable reading strategies that could be adopted while reading science related texts.
- To enable students acquire the ability to speak effectively in English in real life situations and work-related situations.
- To train students in academic and professional writing.

UNIT I 9+3

Vocabulary - using words in context - use of suffixes to form nouns from verbs and adjectives – adjectives, adverbs - matching words with meanings - Active and passive voices – tenses - simple present, present continuous - comparative adjectives – adverbial forms - Reading text: skimming for general information - specific details - note making - cloze reading – Listening and transferring of information from text to graphic forms - bar charts, flow-charts - Paragraph writing - descriptions using descriptive words and phrases - organising information - Role play - conversational techniques – discussions - oral reporting.

UNIT II 9+3

Vocabulary items - words with prefixes (“multi-“, “under-“) - Asking and answering questions, error correction - spelling and punctuation - Reading Comprehension - scanning for information – inferring meaning from context - Listening and guided note-taking - paragraph writing - using notes – giving suitable headings / subheadings for paragraphs – Comparing and contrasting using expressions of comparison - Discussion using creative ideas

UNIT III 9+3

Compound nouns - negative prefixes – antonyms – Use of modal verbs – making sentences using phrases – tenses – simple past and present perfect - Reading and guessing meanings in context - Listening and note taking - Channel conversion from text to chart - Writing comparisons - making recommendations - coherence using discourse markers - Discussion - role-play (explaining and convincing)

UNIT IV 9+3

Expanding nominal compounds – words with multiple meanings – Error correction - prepositions - use of the prefix “trans-“ - compound adjectives - modal verbs to express probability - simple past and present perfect - Reading – prediction of content - understanding advertisements - scanning the text and comprehension check - Listening

for details - Writing definitions – expression of use and purpose - Role-play – discussion
- speculating about the future

UNIT V

9+3

Formation of nouns, verbs and adjectives from root words – some useful phrases and expressions - cloze exercises - 'If' conditional clauses – gerunds (verbal nouns) - Reading for comprehension - intensive reading - Accuracy in listening – listening to discussion on specific issues - Group discussion - role-play (stating, discussing problems and proposing solutions) - Planning a tour - Writing an itinerary - Writing formal letters - letter to the editor

LECTURE – 45 TUTORIAL – 15 TOTAL – 60 PERIODS

TEXTBOOKS

1. Department of Humanities and Social Sciences, Anna University, **English for Engineers and Technologists**, Vol. I and II (Combined Edition), Orient Longman, Pvt. Ltd., 2006. Themes 1 to 4.

REFERENCES

1. Day, R.A, Scientific English, Second Edition, Hyderabad: Universities Press, 2000.
2. Mitra, B.K, Effective Technical Communication: A Guide for Scientists & Engineers, New Delhi: Oxford University Press, 2006.
3. Website: www.uefap.co.uk

MA 9111

MATHEMATICS – I

L T P C

(Common to all branches of B.E. / B.Tech. Programmes) 3 1 0 4

AIM:

To make available the basic concepts of engineering mathematics, to prepare the student for new concepts to be introduced in the subsequent semesters and to provide the necessary mathematical skills that are needed in modeling physical processes by an engineer.

OBJECTIVES:

- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling
- To familiarize the student with functions of several variables which is needed in many branches of engineering
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage

TEXT BOOKS:

1. Palanisamy, P.K., Engineering Physics, Scitech Publications (P) Lt, 2006.
2. Arumugam, M., Engineering Physics, Anuradha Publ., 2000.

REFERENCES:

1. Gaur R.K., and Gupta, S.L Engineering Physics, Dhanpat Raj Publ., 2003.
2. Sankar B.N., Pillai.S.O., Engineering Physics, New age International (P) Ltd, 2007

CY9111	ENGINEERING CHEMISTRY	L T P C
	(Common to all branches of Engineering and Technology)	3 0 0 3

AIM:

To gain a sound knowledge of thermodynamics, phase rule, surface chemistry and catalysis, basic organic reaction mechanisms and principles and applications of spectroscopy and nanochemistry.

OBJECTIVES:

To make the student conversant with the

- Applications of second law of thermodynamics.
- Phase rule and various types of alloys
- Surface chemistry and its importance in adsorption and catalysis.
- Basic principles in organic reaction mechanisms and principles and applications of spectroscopy
- Nanochemistry and its applications

UNIT I THERMODYNAMICS 9

Statement of second law of thermodynamics – Clausius and Kelvin – definition of entropy – entropy change for a reversible process – entropy change for flow of heat in an irreversible process – entropy change for an isothermal expansion of an ideal gas – problems – entropy of phase transitions- problems – definition of free energy and work function – Gibbs Helmholtz equation – applications – problems – derivation of Maxwell relations – van't Hoff isotherm and isochore – applications – problems – chemical potential – variation of chemical potential with temperature and pressure - significance.

UNIT II PHASE RULE 9

Phase rule – statements and explanation of the terms involved – condensed phase rule – construction of phase diagram – water system – sulphur system – phase rule for two component alloy systems- thermal analysis – eutectic system - Lead-Silver system – simple eutectic formation – Zinc-Magnesium alloy system – Iron-Carbon alloy system- solved examples.

UNIT III SURFACE CHEMISTRY AND CATALYSIS 9

Adsorption – types of adsorption – adsorption of gases on solids – adsorption isotherm – Freundlich and Langmuir isotherms – adsorption of solutes from solutions – applications

– role of adsorption in catalytic reactions – ion exchange adsorption – basic principles in adsorption chromatography – Catalysis – classification – characteristics of catalysis - auto catalysis – enzyme catalysis – Michaelis – Menton equation – solid acid catalysis.

UNIT IV ORGANIC REACTIONS AND SPECTROSCOPY 9

Electrophilic and nucleophilic, substitution and elimination reactions mechanisms – SN^1 , SN^2 , E^1 , E^2 reactions – Electromagnetic spectrum – absorption of radiation – electronic transition – vibrational transition – rotational transition – intensities of spectral lines – Beer-Lambert's law – type of instrument used for absorption measurements – UV & visible spectroscopy, IR spectroscopy – principles of instrumentation and applications.

UNIT V NANOCHEMISTRY 9

Introduction to nanochemistry – preparations and properties of nanomaterials - nanorods – nanowires – nanotubes – carbon nanotubes and their applications – nanocomposites – sensors and electronic devices – nanochemistry in biology and medicines – nanocatalysis.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Puri B.R., Sharma L.R. and Madhan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co. Jalandar –2000.
2. Jain P.C. and Renuka Jain, Physical Chemistry for Engineers, Dhanpet Rai & Sons, New Delhi, 2001.

REFERENCES

1. Bahl B.S., Tuli G.D., and Arun Bahl, Essentials of Physical Chemistry, S. Chand & Company Ltd., New Delhi, 2004.
2. Morrison R.T., & Boyd R.N., Organic chemistry, Prentice-Hall of India Private Limited, New Delhi, 1992.
3. Sanyal S.N., Reactions, Rearrangements and Reagents Bharati Bhawan Publishers & Distributors New Delhi, 2006.
4. G. B. Sergeev, Nanochemistry, Elsevier Science, New York, 2006

GE 9111 ENGINEERING GRAPHICS LT P C
(Common to All branches of B.E. / B.Tech. Programmes) 2 0 3 4

OBJECTIVES:

To develop in students the graphic skills that would enable them to communicate the concepts, ideas and design of engineering products

To provide an exposure to the national/international standards related to technical drawings

INTRODUCTION 2

Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions – size, layout and folding of drawing sheets – lettering and dimensioning

UNIT I FREE HAND SKETCHING OF ENGG OBJECTS AND CONSTRUCTION OF PLANE CURVE 3+9=12

Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.

Polygons & curves used in engineering practice– methods of construction– construction of ellipse, parabola and hyperbola by eccentricity method – Cycloidal and involute curves- construction - drawing of tangents to the above curves.

UNIT II ORTHOGRAPHIC PROJECTION: PROJECTION OF POINTS, LINES AND PLANE SURFACES 6+9=15

General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – determination of true lengths of lines and their inclinations to the planes of projection – traces – projection of polygonal surfaces and circular lamina inclined to both the planes of projection

UNIT-III ORTHOGRAPHIC PROJECTION: PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS 6+9=15

Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to one plane of projection –change of position & auxiliary projection methods- sectioning of above solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other and above solids in inclined position with cutting planes parallel to one reference plane – true shapes of sections

UNIT IV DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS 6+9=15

Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes. Intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 4+9=13

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – principles of perspective projections – projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY) 3

Introduction to computer aided drafting software packages and demonstration of their use.

L=30 P=45 TOTAL: 75 PERIODS

TEXT BOOKS

1. Bhatt,N.D, “Engineering Drawing”, Charotar Publishing House, 46th Edition-2003
2. Natarajan,K.V, “ A Textbook of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2006 .

REFERENCES

1. Shah,M.B and Rana,B.C.,”Engineering Drawing”, Pearson Education,2005,
2. Gopalakrishnan.K.R,. “Engineering Drawing I & II”, Subhas Publications 1998.
3. Dhananjay,A.J., “Engineering Drawing with Introduction to AutoCAD”, Tata McGraw-Hill Publishing Company Ltd., 2008.
4. Venugopal,K. and Prabhu Raja, V., “Engineering Graphics”, New Age International(P) Ltd.,2008.

Codes from Bureau of Indian Standards

1. IS 10711-2001: Technical Products Documentation – Size and Layout 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
IS 15021(Parts 1 to 4)-2001: Technical Drawings-Projection Methods

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions one from each unit covering all units of the syllabus
2. All questions will carry equal marks of 20 each making a total of 100
3. Answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solutions within A3 size
4. The examination will be conducted in appropriate sessions on the same day

GE 9112 FUNDAMENTALS OF COMPUTING L T P C
(Common to all branches of B.E. / B.Tech. Programmes) 3 0 0 3

AIM:

To introduce the basics of computing and the fundamentals of C programming.

OBJECTIVES:

- To introduce the fundamentals of computing systems.
- To introduce the concepts of internet and WWW.
- To teach programming in C.

UNIT I

9

Computer systems – Exploring computers – Inside the system – Processing data – CPUs – Types of storage devices - Operating systems basics – Networking basics.

UNIT II

9

The internet and the WWW – Internet services – connecting to the internet - Working with applications software – productivity software – graphics and multimedia – Data base Management systems – Creating computer program.

UNIT III	9
C programming fundamentals – compilation process – variables – Data types – Expressions – looping – decisions.	
UNIT IV	9
Arrays - Working with functions – structures – character strings – pre processor.	
UNIT V	9
Pointers – Dynamic memory allocation – linked list - Applications	

TOTAL: 45 PERIODS

TEXT BOOKS

1. Peter Norton, “Introduction to Computers”, Sixth Edition, Tata McGraw Hill, 2007.
2. Stephen G. Kochan, “Programming in C”, Third Edition, Pearson Education, 2007.

REFERENCES

1. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2006
2. Ashok N. Kamthane, “Computer programming”, Pearson Education, 2007.
3. Kenneth A. Reek, “Pointers on C”, Pearson Education, 2007.
4. Dromey,R.G, “How to solve it by Computer”, Pearson Education, 2007.

PH 9112	PHYSICS LABORATORY	L T P C
	(Common to ALL Branches of B.E. / B.Tech. Programmes)	0 0 2 1

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Torsional Pendulum- 2. Non-uniform bending - 3. Lees' disc- 4. Potentiometer 5. Air wedge- 6. i. Optical fibre ii. Compact disc - 7. Acoustic grating - 8. Post office box - 9. Spectrometer - 10. Viscosity of liquid- | <ul style="list-style-type: none"> - Determination of rigidity modulus of wire and moment of Inertia of disc. - Determination of Young's modulus. - Determination of thermal conductivity of a bad conductor. - Determination of thermo e.m.f of thermocouple - Determination of thickness of a thin sheet of paper. - Determination of Numerical Aperture and acceptance angle - Determination of width of the groove using laser. - Determination of velocity of ultrasonic waves in liquids. - Determination of Band gap - Determination of wavelength using grating - Determination of co-efficient of viscosity of a liquid by Poiseuille's flow. |
|--|---|

TOTAL: 30 PERIODS

I. WEIGHING AND PREPARATION OF STANDARD SOLUTIONS

- i) Preparation of molar and normal solutions of the following substances oxalic acid, sodium carbonate, sodium hydroxide, and hydrochloric acid.
- ii) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

2. WATER ANALYSIS

- i) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
- i) Determination of DO content by Winkler's method.
- ii) Determination of alkalinity in a water sample.
- iii) Determination of chloride content of water sample by argentometric method.

3. PH-METRY

To find out the strength of given hydrochloric acid by sodium hydroxide.

4. CONDUCTOMETRY

- i) Conductometric titration of mixture of acids
- ii) Conductometric precipitation titration using BaCl_2 - Na_2SO_4

5. POTENTIOMETRY

- i) Redox titration – Iron Vs. dichromate

6. SPECTROPHOTOMETRY

- i) To determine λ_{max} of a colored solution such as potassium permanganate.
- ii) To determine the iron content of an unknown solution (1,10- phenanthroline/ thiocyanate method)

7. FLAME PHOTOMETRY

- i) To determine sodium and potassium in water.

8. VISCOMETRY

- i) Determination of molecular weight of a polymer

9. WATER POLLUTION

- i) COD analysis of a waste water by dichromate method.

10. KINETICS

- i) Determination of reaction rate constant of acid catalyzed hydrolysis of ester.

11. ADSORPTION

- i) Adsorption of acetic acid on activated charcoal.

TOTAL: 30 PERIODS

Stair case light wiring

Tube – light wiring

Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

15

3. MECHANICAL ENGINEERING PRACTICE

Welding

Arc welding of butt joints, lap joints, tee joints

Gas welding Practice.

Basic Machining

Simple turning, drilling and tapping operations.

Machine assembly Practice.

Study and assembling the following:

Centrifugal pump, mixies and air conditioners.

Demonstration on

(a) Smithy operations like the production of hexagonal bolt.

(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE

9

Soldering simple electronic circuits and checking continuity.

Assembling electronic components on a small PCB and testing.

Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

AIM:

The aim is to teach the use of computer applications related to office automation and to teach implementation of C programs.

OBJECTIVES:

- To introduce office automation software packages.
 - To teach the fundamentals in C programming.
1. Simple OS commands and simple editors for file operations.
 2. Word processors for more complex operations, like formatting documents, creating tables and so on.
 3. Simple data base packages for creating and manipulating databases.
 4. Spread sheet packages for data preparation and analysis.
 5. Preparation of reports involving mathematical functions (Income Tax Statement, Mark sheets, Payroll etc.,)
 6. C Programs using one dimensional arrays.
 7. C Programs using multi-dimensional arrays and pointer data types.
 8. Programs using structures, nested structures and union.
 9. Programs using functions- recursive, non-recursive and Library functions.
 10. Programs for passing aggregate data types as parameters between functions.
 11. Programs for dynamic memory allocation / deallocation.
 12. Programs for self-referential structure – Implementing linked list.

TOTAL: 45 PERIODS

HS 9161

TECHNICAL ENGLISH II
(For all branches of B.E. / B.Tech. Programmes)

L T P C
2 0 2 3

AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students develop their critical thinking skills.
- To enable students develop higher order reading skills such as interpreting, evaluating and analysing.
- To enable students develop their active listening skills.
- To enable students participate successfully in Group Discussions.

UNIT I **6**
Word formation using prefixes 'self' – modified cloze – contextual meanings - Sequencing words - future simple passive form - Predicting content – Intensive reading – interpreting advertisements – Listening and completing table – Writing extended definition – describing a process using sequence words – developing ideas into paragraphs – writing about the future.

UNIT II **6**
Identifying objects and their use – word puzzles using words with suffixes – Prepositions – adverbs – structures that express purpose - adjectives – group discussion – Reading - skimming for content and analysis of style – modes of non verbal communication – Listening and categorising data in tables – Writing formal letter – writing paragraphs on various issues.

UNIT III **6**
Stress and intonation - Cause and effect expressions - Tense forms - simple past and past continuous - Different grammatical forms of the same word - Critical reading - guided note-making and evaluating content - Listening – guided note-taking – completing a table – Role-play – group discussion techniques - discussing an issue – offering suggestions – Sequencing jumbled sentences using coherence markers– Writing a report – Writing recommendations – Writing a letter of complaint.

UNIT IV **6**
Numerical adjectives - Prepositions – use of intensifying prefixes – phrasal verbs - different grammatical forms of the same words – cloze exercise - Reading a text and evaluating the content - advertisements – analysing style and language - Listening and entering classified information – Intensive listening and completing the steps of a process - Role-play - Group discussion expressing opinions and convincing (agreeing and disagreeing) - Giving oral instructions – Descriptive writing - writing based on hints – writing argumentative paragraphs – formal letter writing – letter of application with biodata / CV Writing safety instructions - warnings and notices – preparing checklist – email communication.

UNIT V **6**
Identifying problems, their causes and finding solutions using case studies – creative and critical thinking – levels of thinking – thinking strategies – brainstorming - analytical reasoning skills – evaluative essay – decision making – conflict resolution

English Language Lab

(30 Periods)

1. Listening:

(10)

Recognising English sounds – accents - listening & answering questions - gap filling - listening & note making - listening to telephonic conversations - listening to speeches.

2. Speaking:

(10)

Pronouncing words & sentences correctly - word stress - conversation practice.

3. Reading:

(5)

Cloze test - Reading and answering questions - sequencing of sentences.

4. Writing:

(5)

Correction of errors - Blogging.

TOTAL : 60 PERIODS

TEXTBOOK

1. Department of Humanities & Social Sciences, Anna University. English for Engineers and Technologists, Combined edition Vols. I & II. Chennai: Orient Longman, Pvt. Ltd. 2006, Themes 5 to 8 (for Units 1 – 4)
2. Sunita Mishra & C. Muralikrishna, Communication Skills for Engineers, Pearson Education, Second Impression, 2007. (for Unit 5)

REFERENCES

1. Ashraf, R.M, Effective Technical Communication, New Delhi: Tata McGraw Hill, 2007.
2. Thorpe, E & Thorpe, S, Objective English, New Delhi : Pearson Education, 2007.
3. Joan Van, Emden, A Handbook of writing for Engineers, Cambridge University Press, 1997
4. Website: www.englishclub.com

LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders

5. P. Boresi & J. Schmidt, Engineering Mechanics Statics & Dynamics, Micro Print Pvt. Ltec., Chennai, 2004.

EE 9151

ELECTRIC CIRCUIT ANALYSIS

L T P C
3 0 0 3

AIM

To introduce the concepts and investigate the behavior of electric circuits by analytical techniques

OBJECTIVES

- To introduce the basic concepts of single phase, three phase and DC Electrical circuits
- To study the transient and steady state response of the circuits subjected to step and sinusoidal excitations.
- To introduce the methods of circuit analysis using Network theorems

UNIT I BASIC CIRCUIT CONCEPTS

9

Lumped circuits – circuit elements, ideal sources (independent and dependent), linear passive parameter R, L and C, V-I relationship of circuit elements – Sinusoidal voltage and current : RMS value, form factor – Kirchoff's laws – analysis of series and parallel circuits – network reduction : voltage and current division, source transformation, star / delta transformation.

UNIT II TRANSIENT ANALYSIS OF FIRST AND SECOND ORDER CIRCUITS

9

Source free response of RL, RC and RLC circuits – forced (step and sinusoidal) response of RL, RC and RLC circuits – Time constant and natural frequency of oscillation – Laplace Transform application to the solution of RL, RC and RLC circuits - initial and final value theorems and their applications – concept of complex frequency – driving point and transfer impedance – poles and zeros of network function.

UNIT III SINUSOIDAL STEADY STATE ANALYSIS

9

Concept of phasor and complex Impedance / Admittance – Analysis of simple series and parallel circuits – active power, reactive power, apparent power (volt ampere), power factor and energy calculations - concept of complex power – phasor diagram, impedance triangle and power triangle –series and parallel resonance circuits – Q factor, half-power frequencies and bandwidth of resonant circuits.

UNIT IV MULTIDIMENSIONAL CIRCUIT ANALYSIS & NETWORK THEOREMS

9

Node-voltage analysis of multi node circuit with current sources – rules for constructing nodal admittance matrix $[Y] V = I$ – Mesh-current analysis of multi node circuits with voltage sources – rules for constructing mesh impedance matrix $[Z]$ for solving matrix equation $[Z] I = V$ – Superposition theorem – Thevenin's theorem – Norton's theorem – Reciprocity theorem – Compensation theorem – Tellegen's Theorem – Millman's

theorem – maximum power transfer theorem for variable resistance load, variable impedance load and variable resistance and fixed reactance load.

UNIT V COUPLED CIRCUITS AND THREE PHASE CIRCUITS 9

Coupled circuits : mutual inductance – coefficient of coupling – dot convention – analysis of simple coupled circuits . Three phase circuits : three phase balanced / unbalanced voltage sources – 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 and power factor measurements in three phase circuits.

TOTAL : 45 PERIODS

TEXT BOOKS

1. Van Valkenburg,” Network Analysis”, Prentice –Hall of India Private limited, New Delhi, 3rd Edition, 1991.
2. Joseph A.Edminister , Mahmood Nahvi, “ Electric Circuits:, Schaum’s Series, Tata McGraw-Hill, New Delhi 2001.

REFERENCES

1. R.C.Dorf, “Introduction to Electric Circuits “ John Wiley & Sons Inc, New York, Second Edition, 1993
2. Charles K. Alexender, Mathew N.O.Sadiku, “ Fundamentals of Electric circuit “, McGraw-Hill, N.Y, 2003.
3. Wiliam H.Hayt Jr, Jack E.Kemmerly and Steven M. Durbin, “ Engineering Circuit Analysis”, Tata McGraw-Hill Publishing Co Ltd, New Delhi, 2002.

ME 9153

POWER PLANT ENGINEERING

L T P C

3 0 0 3

AIM

To learn the basics of various power plants so that they will have the comprehensive idea of power system operation.

OBJECTIVES

To become familiar with operation of various power plants.

UNIT I THERMAL POWER PLANTS 10

Basic thermodynamic cycles, various components of steam power plant-layout-pulverized coal burners- Fluidized bed combustion-coal handling systems-ash handling systems-Forced draft and induced draft fans- Boilers-feed pumps-super heater-regenerator-condenser-dearearators-cooling tower

UNIT II HYDRO ELECTRIC POWER PLANTS 9

Layout-dams-selection of water turbines-types-pumped storage hydel plants

UNIT III NUCLEAR POWER PLANTS 8

Principles of nuclear energy- Fission reactions-nuclear reactor-nuclear power plants

UNIT II	CLASSES AND OBJECTS	8
Introduction to Classes and objects – Member Functions and Member Data – Objects and Functions – Objects and Arrays – Name Spaces – Nested Classes – Dynamic Memory Allocation and Deallocation – Constructors and Destructors.		
UNIT III	INHERITANCE AND POLYMORPHISM	9
Introduction – Base Class and Derived Class Pointers – Function Overriding – Base Class Initialization – Protected Access Specifier – Deriving by Different Accessing specifiers – Different Kinds of Inheritance – Order of Invocation of Constructors and Destructors – Virtual Functions – Mechanism of Virtual Functions – Pure Virtual Functions – Virtual Destructors and Constructors.		
UNIT IV	OPERATOR OVERLOADING, TEMPLATES	9
Operator Overloading – Overloading various Operators – Type Conversion – New Style Casts and the typed Operator – Function Templates – Class Templates – The Standard Template Library (STL).		
UNIT V	EXCEPTION HANDLING AND CASE STUDIES	9
Introduction – C-Style Handling of Error-generating Code – C++-Style Solution-the try/throw/catch Construct – Limitations of Exception Handling. Case Studies: String Manipulations – Building classes for matrix operations.		
		TOTAL : 45 PERIODS

TEXT BOOKS

1. Sourav Sahay, "Object Oriented Programming with C++", Oxford University Press, 2006.
2. Balagurusamy E., "Object Oriented Programming with C++", 3rd Edition, Tata McGraw Hill, 2007.

REFERENCES

1. Bhushan Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.
2. Ira Pohl, "Object Oriented Programming using C++", Pearson Education, 2nd Edition, 2003.
3. Deittel and Deittel, "C++ - How to Program", 2nd Edition, Prentice Hall of India.

EE 9153	ELECTRIC CIRCUITS LABORATORY	L T P C
		0 0 3 2

AIM

To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics and simulation of time response.

OBJECTIVES

- Simulation and real time Verification of theorems.
- Study of CRO and measurement of Sinusoidal Voltage, frequency and Power factor.
- Simulation and real time Frequency response of RLC circuits.

- Study of resonance and filter circuits.
- Simulation and real time Power measurement.
- Study of circuit transients by Digital Simulation.

LIST OF EXPERIMENTS

1. Simulation and real time Verification of Kirchhoff's Voltage and current laws
2. Simulation and real time Verification of Network Theorems (Thevenin, Norton, Superposition and Milman's Theorems).
3. Study of CRO and measurement of Sinusoidal Voltage, frequency and Power factor.
4. Simulation and real time measurement of time constant of Series R-C electric circuits.
5. Simulation and real time Frequency response of RC and RL circuits.
6. Simulation and real time Frequency measurement of resonant Frequency and Frequency response of Series RLC Circuit.
7. Study of the effect of Q on frequency response and bandwidth of series resonant circuits.
8. Study of the characteristics of parallel resonant circuits.
9. Study of Low Pass and High Pass filters.
10. Simulation and real time Power measurement by 3 ammeters and 3 voltmeters.
11. Simulation and real time Power measurement by two-watt meters.
12. Study of first and second order circuit transients by Digital Simulation.

TOTAL : 45 PERIODS

LIST OF LABORATORY EQUIPMENTS

S.No.	Description	Quantity
1.	Regulation Power Supply : 0 – 15 V D.C	6 Nos.
2.	SPST Switch	6 Nos.
3.	SPDT Switch	6 Nos.
4.	Oscilloscope	8 Nos.
5.	Function Generator	8 Nos.
6.	(0-10) m.A – Moving Coil Ammeter	4 Nos.
7.	(0-100) m.A – Moving Coil Ammeter	6 Nos.
8.	(0-100) m.A – Moving Iron Ammeter	6 Nos.
9.	(0-500) m.A - Moving Coil Ammeter	6 Nos.
10.	(0-500) m.A – Moving Iron Ammeter	6 Nos.
11.	(0-5) A – Moving Coil Ammeter	4 Nos.
12.	Voltmeter (0-30) V- Moving Coil Voltmeter	10 Nos.
13.	Voltmeter (0-30) V - Moving Iron Voltmeter	6 Nos.

14.	Wattmeter 500 V, 15 A UPF	6 Nos.
15.	Ohm Meter	1 Nos.
16.	Digital Multimeter	3 Nos.
17.	3 phase loading rheostat	1 Nos.
18.	3 phase introduction motor load	1 Nos.
19.	Resister: 68E, 100E, 330E, 390E, 470E, 560E, 680E, 820E, 1KE, 1.2KE	Each 6 Nos.
20.	Decade Resistance Box, Decade Inductance Box, Decade Capacitance Box	Each 6 Nos.
21.	Circuit Connection Boards	10 Nos.
22.	Simulation of Electrical Circuits Using Circuits Simulation Tools (MATLAB / SIMULINK or Pspice	2 Nos.

EE 9154

COMPUTER PROGRAMMING LABORATORY

**L T P C
0 0 3 2**

AIM

To learn the concepts like Unix Shell programming and Object Oriented Programming

LIST OF EXPERIMENTS

1. Shell Commands, Wild Cards, Escaping and Redirection.
2. Pipes, Tees and Command Substitution.
3. Shell Variables, Simple program using Shell Scripting.
4. Shell Programs using Loops.
5. Simple Shell Programs using File I/O.
6. Advanced Shell Programs using File I/O.
7. Directories and inodes.
8. Programs for application of Stack.
9. Heap Sort
10. Recursive Quick Sort
11. Simple programs using classes for understanding objects, member function, constructions and destructors.
12. Programs using operator overloading including unary operators, new and delete
13. Programs using inheritance concepts
14. Programs using virtual functions and dynamic polymorphism
15. Programs using templates.

TOTAL : 45 PERIODS

S.No.	Hardware / Software Requirements	Quantity
1.	UNIX Clone Server	1
2.	Nodes (thin client or PCs)	70
3.	Printer	1
4.	UNIX Clone Os (70 user license or Licenses free Linux)	70
5.	Compiler – C and C++	1 each