

ANNA UNIVERSITY : : CHENNAI – 600 025

UNIVERSITY DEPARTMENTS

R - 2008

B.E. ELECTRONICS AND COMMUNICATION 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					
HS 9161	Technical English-II	2	0	2	3
MA 9161	Mathematics - II	3	1	0	4
PH 9168	Physics for Communication Engineering	3	0	0	3
GE 9261	Environmental Science and Engineering	3	0	0	3
GE 9151	Engineering Mechanics	3	1	0	4
EC 9151	Electron Devices	3	0	0	3
EC 9152	Circuit Analysis	3	1	0	4
PRACTICAL					
GE 9161	Unix Programming Lab	0	0	4	2
EC 9153	Devices and Circuit Analysis Lab	0	0	3	2
	TOTAL	20	3	9	28

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

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 L T 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 - | <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 |
|--|---|

10. Viscosity of liquid- Determination of co-efficient of viscosity of a liquid by Poiseuille's flow.

TOTAL: 30 PERIODS

CY9112 CHEMISTRY LABORATORY L T P C
(Common to all branches of Engineering and Technology) 0 0 2 1

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

REFERENCE BOOKS

1. A text of quantitative Inorganic Analysis, A. L. Vogel , ELBS London. 1995.
2. Experiments in physical chemistry, D.P. Shoemaker and C.W. Gardad, McGraw Hill, London, 2001.

GE 9113

ENGINEERING PRACTICES LABORATORY
(Common to all Branches of B.E. / B.Tech. Programmes)

L T P C
0 0 3 2

OBJECTIVE

To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE

12

Plumbing

Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

Laying pipe connection to the suction side of a pump – inlet.

Laying pipe connection to the delivery side of a pump – out let.

Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

Wood Work

Sawing, planning and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.

Study

Study of joints in door panels, wooden furniture

Study of common industrial trusses using models.

2.	ELECTRICAL ENGINEERING PRACTICE	9
	Basic household wiring using switches, fuse, indicator – lamp etc.,	
	Preparation of wiring diagrams	
	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

AIM:

To introduce the effective mathematical tools needed for solving engineering problems and to emphasize the underlying mathematical principles in specific situations confronting practicing engineers.

OBJECTIVES:

- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems
- To acquaint the student with the concepts of vector calculus, needed for problems in all engineering disciplines
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow the of electric current
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I DIFFERENTIAL EQUATIONS 9+3

Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of Simultaneous linear differential equations with constant coefficients.

UNIT II VECTOR CALCULUS 9+3

Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface Integral and Volume Integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and Application in evaluating line, surface and volume integrals.

UNIT III ANALYTIC FUNCTION 9+3

Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal Mapping – Mapping by functions $w = z + c$, az , $\frac{1}{z}$, z^2 - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9+3

Line Integral - Cauchy’s theorem and integral formula – Taylor’s and Laurent’s Series – Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis.

UNIT V LAPLACE TRANSFORMS 9+3

Existence conditions – Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and Final value theorems – Inverse

transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations with constant coefficients.

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

1. Grewal, B.S. “Higher Engineering Mathematics”, Khanna Publications (2007)
2. Ramana, B.V. “Higher Engineering Mathematics” Tata McGraw Hill (2007).

REFERENCES

1. Glyn James, “Advanced Modern Engineering Mathematics, Pearson Education (2007)
2. Jain R.K. and Iyengar S.R.K., Advanced Engineering Mathematics (3rd Edition) Narosa Publications, Delhi (2007).

PH9168

PHYSICS FOR COMMUNICATION ENGINEERING

(Common to Electronics and Communication Engg., Computer Science and Engg. and Information Technology)

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

OBJECTIVE:

To introduce the essential principles of physics for communication and related engineering applications.

UNIT I ELECTRICAL PROPERTIES OF METALS 9

Classical theory: Drude model - thermal conductivity, thermal resistance - electrical conductivity of nonmetals: semiconductors, ionic crystals and glasses - thin metal films: conductivity and resistivity - Schrödinger wave equation – particle in a box – degenerate states – Fermi-Dirac statistics – density of states: electron concentration and Fermi Level - band theory of solids: energy band formation – electron effective mass.

UNIT II SEMICONDUCTORS 9

Intrinsic semiconductors: energy band-diagram - direct and indirect band gap semiconductors - carrier concentrations and conductivity - extrinsic semiconductors: n, p-type doping, compensation doping - temperature dependence of conductivity - degenerate and nondegenerate semiconductors - recombination and minority carrier injection: direct and indirect recombination - minority carrier lifetime - diffusion and conduction equations and random motion - continuity equation: time-dependent continuity equation, steady-state continuity equation - optical absorption - Hall effect and devices - Ohmic contacts - Schottky diode and solar cell.

UNIT III DISPLAY DEVICES 9

Photoluminescence, cathodoluminescence, electroluminescence, injection luminescence – plasma displays - LED construction and working – organic LEDs – principles of

quantum well laser – liquid crystals and LCD construction and working – numeric displays

UNIT IV MAGNETIC/OPTICAL DATA STORAGE TECHNIQUES 9

Introduction – magnetic material parameters – magnetic disk memories – optical data storage – phase change recording – magneto-optical data storage – Hi-tech involved in system development – capacity of CD in normal use – advantages of CD – holographic storage – construction of a hologram – reconstruction of a hologram – photorefractive storage.

UNIT V FABRICATION PROCESS USING SEMICONDUCTORS AND DIELECTRIC 9

Bulk crystal growth, Epitaxial growth, masking and etching, Diffusion of impurities, selective diffusion, Formation of PN junction, resistors, capacitors, inductors, Isolation methods, metal semiconductor contact. Introduction to integrated circuit – Definition of LSI, MSI, VLSI circuits monolithic and hybrid circuits, Thin film and thick film technology.

TOTAL : 45 PERIODS

TEXT BOOKS

1. Palanisamy, P.K., Materials Science for Electronics Engineers, SCITECH, 2005.
2. Arumugam, M., Materials Science, Anirutha Publ., 2002.

REFERENCES

1. Jasprit Singh, Optoelectronics: An introduction to Materials and Devices, McGraw Hill, 1998.
2. Wilson, J and Hawkes, J.F.B, Optoelectronics, Printice Hall, 2002
3. Bhattacharya, B., Semiconductor optoelectronic devices, Printice Hall of India, 1995.
4. Kittel, C., Introduction to Solid State Physics, John Wiley, 1996
5. Kasap, S.O. Principles of Electronic Materials and Devices, Tata McGraw-Hill, 2007.

GE9261 ENVIRONMENTAL SCIENCE AND ENGINEERING L T P C
(Common to all branches) 3 0 0 3

AIM

To create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional endeavour that they participates.

OBJECTIVE

At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and

useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds

Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products –

environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL : 45 PERIODS

TEXT BOOKS

1. Gilbert M.Masters, “Introduction to Environmental Engineering and Science”, 2nd edition, Pearson Education (2004).
2. Benny Joseph, “Environmental Science and Engineering”, Tata McGraw-Hill, New Delhi, (2006).

REFERENCES

1. R.K. Trivedi, “Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards”, Vol. I and II, Enviro Media.
2. Cunningham, W.P. Cooper, T.H. Gorhani, “Environmental Encyclopedia”, Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, “Environmental law”, Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan, R, “Environmental Studies-From Crisis to Cure”, Oxford University Press (2005).

GE 9151 ENGINEERING MECHANICS

(Common to Civil, Geoinformatics and Agriculture & Irrigation Engineering)

L T P C
3 1 0 4

OBJECTIVE:

At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, the student should understand the principle of work and energy. The student should be able to comprehend the effect of friction on equilibrium. The student should be able to understand the laws of motion, the kinematics of motion and the interrelationship. The student should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

UNIT I BASICS & STATICS 12

Introduction - Units and Dimensions - Laws of Mechanics – Lame’s theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations on forces, dot product and cross product - Coplanar

Forces – Resolution and Composition of forces – Equilibrium of a forces – Forces in space - Equilibrium in space - Equivalent systems of forces – Principle of transmissibility – Single equivalent force

UNIT II EQUILIBRIUM OF RIGID BODIES 12

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem - Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

UNIT III PROPERTIES OF SURFACES AND SOLIDS 12

Determination of Areas and Volumes – First moment of area and the Centroid of standard sections – T section, I section, Angle section, Hollow section – second and product moments of plane area – Rectangle, triangle, circle - T section, I section, Angle section, Hollow section – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia - Mass moment of inertia – Derivation of mass moment of inertia for rectangular solids, prism, rods, sphere from first principle – Relation to area moments of inertia.

UNIT IV DYNAMICS OF PARTICLES 12

Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion – Newton’s law – Work Energy Equation of particles – Impulse and Momentum

UNIT V CONTACT FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS 12

Frictional force – Laws of Coloumb friction – simple contact friction – Rolling friction – Belt friction Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion – Impact of elastic bodies

L: 45+T=15 TOTAL : 60 PERIODS

TEXT BOOK

1. Beer,F.P and Johnson Jr. E.R, “Vector Mechanics for Engineers”, Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, 2007.

REFERENCES

1. Irving H. Shames, Engineering Mechanics - Statics and Dynamics, IV Edition – PHI / Pearson Education Asia Pvt. Ltd., 2003
2. Hibbeler, R.C., Engineering Mechanics, Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., 2000.
3. Ashok Gupta, Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM), Pearson Education Asia Pvt., Ltd., 2002
4. J.L. Meriam & L.G. Kraige, Engineering Mechanics Vol. I & Vol. II, V edition, John Wiley & Sons, 2006.
5. P. Boresi & J. Schmidt, Engineering Mechanics Statics & Dynamics, Micro Print Pvt. Ltec., Chennai, 2004.

UNIT I	SEMICONDUCTOR DIODE	9
PN junction, current equations, Diffusion and drift current densities, V-I characteristics, Forward and Reverse characteristics, Switching Times.		
UNIT II	BIPOLAR JUNCTION TRANSISTOR	9
NPN –PNP -Junctions-Early effect-Current equations – Input and Output characteristics of CE,CB CC-Hybrid pi model -h-parameter model —Eber Moll Model-Power BJT Gummel poon-model.		
UNIT III	FIELD EFFECT TRANSISTORS	9
JFETs – Drain and Transfer characteristics,-current equations-pinch off voltage and its significance MOSFET- characteristic-DMOSFET, EMOSFET-,current equation-model-parameters -, threshold voltage modifications by ion implantation-channel length modulation.-power MOSFET.		
UNIT IV	SPECIAL SEMICONDUCTOR DEVICES	9
Metal-Semiconductor Junction- Schottky barrier diode-Zener diode-Varacter diode – Tunnel diode- Gallium Arsenic device, LASER diode,LDR, and MESFETs		
UNIT V	POWER DEVICES AND DISPLAY DEVICES	9
UJT,SCR,Diac,Triac,DMOS,VMOS,FINFET,DUALGATE,MOSFET, LED, LCD, Photo transistor,Opto Coupler,Solar cell, CCD,MULTI EMITTER Transistor.		

TOTAL : 45 PERIODS

TEXT BOOKS

1. Donald A Neaman,“Semiconductor Physics and Devices”, Third Edition, Tata Mc GrawHill Inc. 2007.
- 2.. Streetman,“Solid State Electronic Devices “-Fifth Edition-Prentice Hall Of India-2004

REFERENCES

1. B.JAYANT BALIGA “Power semiconductor Devices”-THOMPSON-1996
2. H.TAUB DONAL SCHILLING “Digital Integrated Electronics” Mcgrawhill-2006
3. Yang, “Fundamentals of Semiconductor devices”, McGraw Hill International Edition, 1978.

UNIT I DC CIRCUIT ANALYSIS 9

Basic Components and electric Circuits, Charge, current, Voltage and Power, Voltage and Current Sources, Ohms Laws, Voltage and Current laws, Kirchoff's Current Law, Kirchoff's voltage law, The single Node – Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, voltage and current division, Basic Nodal and Mesh analysis, Nodal analysis, Mesh analysis.

UNIT II NETWORK THEOREM AND DUALITY 8

Useful Circuit Analysis techniques, Linearity and superposition, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion. Duals, Dual circuits.

UNIT III SINUSOIDAL STEADY STATE ANALYSIS 10

Sinusoidal Steady – State analysis , Characteristics of Sinusoids, The Complex Forcing Function, The Phasor, Phasor relationship for R, L, and C, impedance and Admittance, Nodal and Mesh Analysis, Phasor Diagrams, AC Circuit Power Analysis, Instantaneous Power, Average Power, apparent Power and Power Factor, Complex Power.

UNIT IV TRANSIENTS AND RESONANCE IN RLC CIRCUITS 9

Basic RL and RC Circuits, The Source- Free RL Circuit, The Source-Free RC Circuit, The Unit-Step Function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response, Parallel Resonance, Series Resonance, Quality Factor.

UNIT V COUPLED CIRCUITS AND TOPOLOGY 9

Magnetically Coupled Circuits, mutual Inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis.

TOTAL : 45 + 15 = 60 PERIODS

TEXT BOOKS

1. William H.Kayt, Jr.Jack E. Kemmerly, Steven M.Durbin, "Engineering Circuit Analysis", Sixth Edition, Tata McGraw-Hill Edition, 2006.
2. David A Bell, "Electric Circuits", PHI,2006

REFERENCES

1. Charles K. Alexander & Mathew N.O.Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw- Hill 2003.
2. Sudhakar and Shyammohan S. Palli, Tata Mc Graw –Hill, Third Edition, 2007.
3. D.R.Cunningham, J.A.Stuller, "Basic Circuit Analysis", Jaico Publishing House, 1996.
4. David E.Johnson, Johny R. Johnson, John L.Hilburn, "Electric Circuit Analysis", Second Edition, Prentice-Hall international Editions, 1997
5. K.V.V.Murthy, M.S.Kamath, "Basic Circuit Analysis", Jaico Publishing House, 1999.
6. Norman Balabanian, "Electric Circuits", International Edition,1994.

GE 9161

UNIX PROGRAMMING LAB

L T P C
0 0 4 2

AIM:

The aim is to introduce working in UNIX environment.

OBJECTIVES:

- To introduce the basic commands in UNIX.
 - To teach UNIX shell programming.
 - To introduce programming in C with UNIX system calls.
1. Basic Unix commands
 2. Simple editors for file operations.
 3. Filters-Grep, sed, awk
 4. Simple shell programming.
 5. Shell programming using complex control structures.
 6. C Programs using file system related system calls.
 7. C Programs using process related system calls.
 8. Programs for inter process communication using pipes, FIFOs.
 9. Programs using signals.
 10. Programs using shared memory.

TOTAL: 60 PERIODS

TEXT BOOK

1. Brain W. Kernighan and Rob Pike, "The programming Environment", PHI, 2002.

EC 9153

DEVICES AND CIRCUIT ANALYSIS LAB

L T P C
0 0 3 2

1. Verification of Kirchoff's Laws.
2. Verification of Thevenin's Theorem and Reciprocity Theorem
3. Verification of Super position Theorem and Maximum Power Transfer Theorem
4. Frequency Response of Series and Parallel resonance circuits
5. Transient analysis of RL and RC circuits.
6. Diode and Zener diode characteristics
7. Common Emitter and Common Base input-output characteristics
8. UJT Characteristics
9. FET Characteristics
10. SCR Characteristics

TOTAL: 45 PERIODS