

BOARD OF STUDIES IN BASIC SCIENCES 2016-17

B.TECH.INFORMATION TECHNOLOGY

CBCS 2016 REGULATIONS

FIRST SEMESTER

| Sl. No. | Course Code | Course Title | Category | Continuous Assessment Marks | End Sem Marks | Total Marks | Credits | | | |
|---------|-------------|--|----------|-----------------------------|---------------|-------------|---------|---|---|----|
| | | | | | | | L | T | P | C |
| | | THEORY | | | | | | | | |
| 1 | 16IHS1Z1 | Communication Skills in English | HS | 50 | 50 | 100 | 2 | 2 | 0 | 3 |
| 2 | 16IBS1Z2 | Engineering Mathematics I | BS | 50 | 50 | 100 | 3 | 2 | 0 | 4 |
| 3 | 16IBS103 | Engineering Physics | BS | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 4 | 16IBS104 | Applied Chemistry | BS | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 5 | 16IES105 | Fundamentals of Electrical and Electronics Engineering | ES | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| | | PRACTICAL | | | | | | | | |
| 6 | 16IBS106 | Chemistry Lab | BS | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| 7 | 16IES107 | Workshop Practice | ES | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| | | TOTAL | | 350 | 350 | 700 | | | | 20 |

SECOND SEMESTER

| Sl. No. | Course Code | Course Title | Category | Continuous Assessment Marks | End Sem Marks | Total Marks | Credits | | | |
|---------|-------------|---------------------------------------|----------|-----------------------------|---------------|-------------|---------|---|---|----|
| | | | | | | | L | T | P | C |
| | | THEORY | | | | | | | | |
| 1 | 16IHS2Z1 | Technical English | HS | 50 | 50 | 100 | 2 | 2 | 0 | 3 |
| 2 | 16IBS2Z2 | Engineering Mathematics II | BS | 50 | 50 | 100 | 3 | 2 | 0 | 4 |
| 3 | 16IBS2Z3 | Materials Science | BS | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 4 | 16IHS2Z4 | Environmental Science and Engineering | HS | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 5 | 16IES2Z5 | Programming in C | ES | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| | | PRACTICAL | | | | | | | | |
| 6 | 16IBS206 | Physics Lab | BS | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| 7 | 16IES207 | Engineering Graphics | ES | 50 | 50 | 100 | 2 | 0 | 4 | 4 |
| 8 | 16IES2Z8 | Programming in C Lab | ES | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| | | TOTAL | | 400 | 400 | 800 | | | | 24 |


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 COIMBATORE - 641 013

16IHS1Z1

COMMUNICATION SKILLS IN ENGLISH

Common to all branches

Category : HS

L T P C

2 2 0 3

Course Objectives:

- To make the learners understand the usage of basic grammar in English.
- To enhance the learner's speaking skills through appropriate listening practice.
- To instill reading habits to practice communicative tasks and comprehension
- To improve the learner's writing skills through various means
- To enrich the vocabulary of learners for speaking and writing

UNIT I

6+6 Periods

Listening - Listening to practice basic pronunciation at phonemic and word level, Listening to informal conversations of exchanging greetings and introducing oneself/others; **Speaking**- Introducing oneself, one's family / friend, speaking about one's place; **Reading**-Reading to practice stress and pause; **Writing**-Autobiographical writing, Letter to seek permission, Letter to issue certificates; **Grammar**- Use of Auxiliary Verbs, Adjectives and Adverbs; **Vocabulary**- Word formation, Synonyms and Antonyms of High frequency words.

UNIT II

6+6 Periods

Listening-Listening to Telephone Conversations for taking and leaving messages, making enquiries; **Speaking**—Role-play activities based on real life situations, Narrating daily routines; **Reading**– skimming and scanning, Reading for comprehension with exercises; **Writing**-Advertisements and slogan writing, Imperative instructions, Definitions; **Grammar** – Tenses, Prepositions; **Vocabulary**- Commonly confused words

UNIT III

6+6 Periods

Listening -Listening to give instructions, Making requests and responding to requests, Thanking someone and responding to thanks; **Speaking** -Group Discussion on chosen topics, Describing a simple process; **Reading**-Reading and interpreting visual material, Critical reading; **Writing** –Letter to the Editor of a Newspaper, Recommendations; **Grammar**- Impersonal Passive, Subject-verb agreement; **Vocabulary**- Collocation, Word Association

UNIT IV

6+6 Periods

Listening-Listening to accept/refuse invitation, Listening to apologize, Listening to congratulate; **Speaking** – Debates on current social affairs; **Reading** –Reading to make inference, Paraphrasing; **Writing**- Personal letter (Inviting your friend to a function, congratulating someone on his / her success, thanking one's friends / relatives); **Grammar** – 'Wh'-questions, Modal verbs; **Vocabulary** -Single word substitutes -Use of abbreviations & acronyms

UNIT V

6+6 Periods

Listening -Video Listening to different accents, Viewing Speeches, Viewing English songs, Viewing short films; **Speaking** -Giving impromptu talks, Making presentations on given topics; **Reading** –Extensive reading; **Writing** – Writing General Article, Writing Short Stories; **Grammar** - Common Errors in English; **Vocabulary** –Word Pairs with Repetitive meaning.

LECTURE: 30 PERIODS

TUTORIAL:30 PERIODS

PRACTICAL: 0 PERIODS

TOTAL: 60 PERIODS

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,****YEAR OF PUBLICATION**

Department of English, Anna
University. Mindscapes
Sadanand, Kamlesh & Punitha,
Susheela

English for Technologists and
Engineers
Spoken English: A Foundation
Course (Part 1)

Orient Blackswan, Chennai. 2012
Orient Blackswan, Hyderabad. 2014

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REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|---|--|
| <i>Raman, Meenakshi & Sangeetha Sharma</i> | <i>Technical Communication: Principles and Practice</i> | <i>Oxford University Press, New Delhi. 2011</i> |
| <i>Vijay, Anbazhagan.J, & Jaishree.N</i> | <i>Technical English-I</i> | <i>Global Publishers, Chennai, 2016</i> |
| <i>Rizvi, Ashraf. M.</i> | <i>Effective Technical Communication</i> | <i>Tata McGraw-Hill, New Delhi. 2005</i> |
| <i>Rutherford, Andrea. J Basic</i> | <i>Communication Skills for Technology</i> | <i>Pearson, New Delhi. 2001</i> |
| <i>Redston, Chris, Cunningham, Gillie</i> | <i>Face 2 Face: Elementary Student's Book</i> | <i>Cambridge University Press, New Delhi. 2009</i> |

EXTENSIVE READING

(Not for Examination)

Kalam, Abdul. A.P.J. Wings of Fire. Universities Press, Hyderabad. 1999.

Websites

1. <http://www.usingenglish.com>
2. <http://www.uefap.com>

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** The learner will be able to understand basic grammar and the learner will have sufficient command over language by training his tongue and tuning his ear through apt listening tasks.
- CO2:** Reading tasks will enable the learner practice phonological and linguistic aspect of learning, help comprehend and create interest in extensive reading.
- CO3:** The learner shall be able to write appropriately for a given context and use the right word at the right place.

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16IBS1Z2

ENGINEERING MATHEMATICS I
Common to all branches

Category : BS

L T P C
3 2 0 4

Course Objectives:

- To familiarize techniques of matrix algebra including properties of eigen values and eigen vectors.
- To gain the knowledge of hyperbolic functions and application problems in differential calculus.
- To familiarize with functions of several variables and Functions of two variables including extremum problems, Jacobian and Leibnitz rule of integration.
- To perform double and triple integration with relevant to surface area and volume of solid.

UNIT I**MATRICES****9+6 Periods**

Eigen values and Eigen vectors of a real matrix-Characteristic equation-Properties of Eigen values and eigen vectors-Cayley Hamilton theorem - Diagonalization of matrices-Reduction of a quadratic form to canonical form by orthogonal transformation-Nature of quadratic forms.

UNIT II**HYPERBOLIC FUNCTIONS AND DIFFERENTIAL CALCULUS****9+6 Periods**

Hyperbolic and Inverse Hyperbolic functions-Identities- Real and Imaginary parts-Solving Problems using Hyperbolic functions.

Curvature and radius of curvature-Cartesian and polar coordinates- center of curvature and Evolutes- Envelopes and Evolute as envelope of normal.

UNIT III**FUNCTIONS OF SEVERAL VARIABLES****9+6 Periods**

Functions of two variables- Taylor's theorem (statement only) and expansions-Maxima and Minima-Constrained extremum by Lagrange's multiplier method-Jacobians-Differentiation under integral sign

UNIT IV**INTEGRAL CALCULUS****9+6 Periods**

Definite and Indefinite integrals-Substitution rule-Techniques of Integration-Integration by parts-Trigonometric substitutions-Integration of rational function by partial fractions-Integration of irrational functions-Improper integrals.

UNIT V**MULTIPLE INTEGRALS****9+6 Periods**

Beta and Gamma integrals and properties. Double Integrals-Change of order of integration-Double integrals in polar coordinates-Area enclosed by plane curves-Triple integrals-Volume as a triple integral-Transformation to Polar, Cylindrical and Spherical polar coordinates.

LECTURE: 45 PERIODS TUTORIAL:30 PERIODS PRACTICAL: 0 PERIODS TOTAL: 75 PERIODS

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,****YEAR OF PUBLICATION**

Veerarajan T

*Engineering Mathematics for
Semesters I and II*

*Tata McGraw Hill Publishing Co.,
New Delhi, 2015.*

Kandasamy P, Thilagavathy K and
Gunavathy K

*Engineering Mathematics for I year
B.E/B.Tech.*

*S.Chand & Co, Ramnagar, New Delhi,
Reprint 2013.*

S. Narayanan and Manicavachagom
Pillai T.K.

Calculus, Vol.I, II and III,

*S. Viswanathan, Printers and
Publishers Pvt. Ltd, Chennai, 2009.*

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Government College of Technology
COIMBATORE - 641 014

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---------------------------------------|---|--|
| <i>Erwin Kreyszig</i> | <i>Advanced Engineering Mathematics</i> | <i>Wiley & sons (Asia) Ltd, 10th Edition, 2015.</i> |
| <i>Ray Wylie.C and Louis Barrett</i> | <i>Advanced Engineering Mathematics</i> | <i>Tata McGraw Hill Company, New Delhi, 2004.</i> |
| <i>Grewal B. S</i> | <i>Higher Engineering Mathematics</i> | <i>Khanna Publishers, New Delhi, 43rd Edition, 2014.</i> |
| <i>Ramana B V</i> | <i>Higher Engineering Mathematics</i> | <i>Tata McGraw Hill Co. Ltd, NewDelhi, 11th Print, 2010.</i> |
| <i>Bali N., Goyal M and Watkins C</i> | <i>Advanced Engineering Mathematics</i> | <i>Firewall Media (An Imprint of Laxmi Publications Pvt Ltd), New Delhi, 7th Edition, 2009.</i> |
| <i>Bali N.P and Goyal M</i> | <i>A text book of Engineering Mathematics</i> | <i>University Science Press (An Imprint of Laxmi Publications Pvt Ltd), New Delhi,2014</i> |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

CO1: Acquire knowledge of eigen values and eigen vectors including properties through matrix theory.

CO2: Understand the hyperbolic functions and applications of differential calculus.

CO3: Acquire fluency in partial differentiation and solving problems related to maxima and minima for more independent variables.

CO4: Understand the standard types of integration and solution to various integrals.

CO5: Understand the multiple integrals and their applications to engineering problems.

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COIMBATORE - 641 013

16IBS103 /

ENGINEERING PHYSICS /
Common to EEE, ECE, CSE, EIE & IT branches

Category : BS /
L T P C
3 0 0 3 /

Course Objectives:

To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology. Upon completion of this course the students will be familiar with:

- Concepts, types of lasers and its applications, fibre optic principles and its applications.
- Basics of properties of matter & thermal physics
- Origin of quantum physics, Schrödinger's equation and applications.
- Principles of acoustics, ultrasonics and their industrial applications.
- Fundamentals of crystal Physics and its packing factor calculations.

UNIT I**LASERS & FIBRE OPTICS****9 Periods**

Introduction- Principle of laser action - characteristics of laser - Spontaneous emission and Stimulated emission –Einstein's coefficients - population inversion – methods of achieving population inversion –Optical Resonator -Types of Lasers – Principle, construction and working of Nd-YAG, CO₂, Semiconductor laser - applications of laser-Hologram

Introduction – Basic Principles involved in fiber optics- Total internal reflection – Structure of optical fiber – Propagation of light through optical fiber –Derivation for Numerical Aperture and acceptance angle - fractional index change - Classification of optical fiber based on materials, refractive index profile and Modes - Fiber optical communication links-Fiber optic sensors- displacement.

UNIT II**PROPERTIES OF MATTER & THERMAL PHYSICS****9 Periods**

Elasticity- Hooke's law- stress-strain diagram - Factors affecting elasticity - Bending moment - Depression of a cantilever - Young's modulus by uniform bending - I shaped girders.

Thermal expansion - thermal stress - thermal conductivity - heat conduction in solids - flow of heat through compound media - Forbe's and Lee's disc method: theory and experiment.

UNIT III**QUANTUM PHYSICS AND APPLICATIONS****9 Periods**

Limitations of classical Physics - Introduction to Quantum theory - Dual nature of matter and radiation- de-Broglie wavelength in terms of voltage, energy and temperature –Heisenberg's Uncertainty principle – verification – physical significance of a wave function- Schrödinger's Time independent and Time dependent wave equations – Particle in a one dimensional potential well–Scanning Electron Microscope (SEM)- Transmission Electron Microscope (TEM).

UNIT IV**ACOUSTICS & ULTRASONICS****9 Periods**

Classification of sound - loudness and intensity - Weber-Fechner law - standard intensity and intensity level - decibel - reverberation - reverberation time - sound absorbing materials - Determination of absorption coefficient - factors affecting acoustics of buildings.

Introduction - properties of ultrasonic waves - production of ultrasonic waves; Magnetostriction effect- Magnetostriction generator- Piezoelectric effect- Piezoelectric generator- Acoustic grating - Determination of wavelength and velocity of ultrasonics-cavitation - applications- ultrasonic drilling- ultrasonic welding- ultrasonic soldering and ultrasonic cleaning-Non- destructive Testing- Pulse echo system.

UNIT V**CRYSTAL PHYSICS****9 Periods**

Introduction – Crystalline and amorphous materials –Lattice – Unit Cell –Crystal system - Bravais lattices – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC, and HCP structures – Crystal defects – Point, line and surface defects.

LECTURE: 45 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 0 PERIODS TOTAL: 45 PERIODS

Controller of Examinations
Government College of Technology
COIMBATORE - 641 013

TEXT BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|-----------------------|----------------------------|---|
| <i>Arumugam M</i> | <i>Engineering Physics</i> | <i>Anuradha Publishers, 2010. (Unit I, Unit III & Unit IV)</i> |
| <i>P.K.Palanisamy</i> | <i>Engineering Physics</i> | <i>Scitech Publications(India) Pvt.Ltd, 2015 (Unit II & Unit V)</i> |

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|--|---|
| <i>Avadhanulu M N and Kshirsagar P G</i> | <i>A Textbook of Engineering Physics</i> | <i>S.Chand and Company Ltd, New Delhi, 2010.</i> |
| <i>Gaur R.K. and Gupta S.L</i> | <i>Engineering Physics</i> | <i>Dhanpat Rai Publishers, 2009.</i> |
| <i>K.Rajagopal</i> | <i>Engineering Physics</i> | <i>PHI Learning Private Ltd, New Delhi, 2015.</i> |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Analyze the construction and working of Nd-YAG, CO₂, Semiconductor lasers. Explain fiber optics and classify fibers based on index profiles and modes. [Familiarity]
- CO2:** Acquire knowledge in properties of matter and thermal physics [Application]
- CO3:** Analyze the dual nature of matter using Heisenberg's Uncertainty principle, Schrodinger's time independent and dependent wave equations. [Assessment]
- CO4:** Apply piezoelectric detector method for industrial applications. [Usage and Assessment]
- CO5:** Compare crystalline and non-crystalline materials and describe the lattice structure, coordination number and packing factor for crystals. [Usage and Assessment]

Controller of Examinations
Government College of Technology
COIMBATORE - 641 013

16IBS104

APPLIED CHEMISTRY
Common to EEE, ECE, EIE, CSE & IT branches

Category : BS
L T P C
3 0 0 3

Course Objectives:

- The course is aimed at inculcating knowledge of applied chemistry topics which would be useful for students to understand Chemistry relevant to circuitry Engineering subjects.

UNIT I ELECTROCHEMICAL CELLS 9 Periods
Galvanic cells – redox reactions- electrodes - metal and metal ion, hydrogen electrode and calomel electrode – electrode potentials – standard oxidation and reduction potentials - Nernst equation and problems - EMF series and significance – Application of EMF measurements – equilibrium constant, solubility of sparingly soluble salt, potentiometric titration of a redox system (Fe^{2+} Vs Cr^{6+}), pH measurement using glass electrode and fluoride measurement by ISE.

UNIT II BATTERIES 9 Periods
Batteries - components, characteristics - voltage, current, current capacity, power density, energy density, cycle life, shelf life and self - discharge. Types of batteries - Primary - Zn/MnO_2 , Zn/HgO , $\text{Zn/Ag}_2\text{O}$, Li/SOCl_2 - construction, function and performance comparison – Secondary- Pb/ acid, Ni/Cd, and Lithium ion battery - construction, function and performance comparison.

UNIT III CORROSION 9 Periods
Corrosion - Spontaneity - Chemical corrosion- mechanism, nature of oxides – Pilling Bedworth rule - electrochemical corrosion – mechanism - types – galvanic and differential aeration – Galvanic series and importance – Prevention methods - design of materials, cathodic protection techniques (sacrificial anode and impressed current cathode), Inhibitors - Protective coatings - Inorganic coating - electroplating – surface preparation and plating method applied to Cr and Ni and galvanising – Organic coating- paints - constituents and functions.

UNIT IV POLYMER TECHNOLOGY 9 Periods
Polymers - definitions of monomer, polymer, functionality, degree of polymerisation – Free radical mechanism - Individual polymers - PVC, PMMA, Teflon, polyamide, poly carbonate, epoxy, polyurethane - preparation, properties and their end-uses - compounding of plastics - components and functions - fabrication techniques - compression, injection, extrusion and blow moulding - Conducting polymers - structures of polypyrrole, polyaniline and poly acetylene - conduction mechanism of polyacetylene only - Biodegradable polymers – polylactide, starch and cellulose.

UNIT V SILICON WAFER TECHNOLOGY 9 Periods
Silicon for IC chips - single crystal – preparation by Czochralsky and float zone processes - wafer preparation, P-N junction formation – Ion implantation, Diffusion and epitaxial growth techniques - Insulator layer by oxidation - Printing of circuits by photolithography – masking and electron beam methods - etching by chemical and electrochemical methods - metal coatings.

LECTURE: 45 PERIODS / TUTORIAL: 0 PERIODS / PRACTICAL: 0 PERIODS / TOTAL: 45 PERIODS /

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,****YEAR OF PUBLICATION**

Vairam S, Subha Ramesh
Jain. P.C. and Monica Jain

Engineering Chemistry
Engineering Chemistry

Wiley India, 2015.
Dhanpat Rai Publications Pvt Ltd, New Delhi,
16th Edition, 2004.

Controller of Examinations
Government College of Technology
COIMBATORE - 641 013

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---------------------------------------|---|--|
| <i>Dara. S.S, Umarae</i> | <i>Text book of Engineering Chemistry</i> | <i>S. Chand Publications, 2004.</i> |
| <i>M.S.Tyagi</i> | <i>Introduction to semiconductor materials and devices</i> | <i>Wiley India, 2011.</i> |
| <i>Kuriakose, J.C., and Rajaram J</i> | <i>"Chemistry in Engineering and Technology", Vol.1 &II Engineering Chemistry</i> | <i>Tata Mc Graw Hill Publishing company, Pvt.Ltd, New Delhi, 2001.</i> |
| <i>P. Aggarwal, Avinash Aggarwal</i> | | <i>Khanna Publishers, 2010.</i> |
| <i>David Linden and Thomas Reddy</i> | <i>Hand book of batteries and fuel cells", Vol.1 &II</i> | <i>Tata Mc Graw Hill, 2001.</i> |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Understand the principles of electrochemical principles such as EMF measurements, electrode potentials and apply them in experimental techniques useful for electrochemical instrumentation.
- CO2:** Know the knowledge about different types of batteries with the functions which find use in their society including engineering fields.
- CO3:** Be familiar with corrosion of the instruments and equipment they use in their field and also to learn the mechanisms and the preventive measures by various techniques.
- CO4:** Know about the different types of polymeric materials, properties and fabrication which match the specific applications.
- CO5:** Gain the knowledge about the silicon chips and their fabrication methods and to apply in preparation of in electrical and electronic instruments.

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COIMBATORE - 641 013**

Category : ES /
L T P C
3 0 0 3 /

- Analysing simple circuits and networks
- Principles of transformers, ac and dc machines
- Basic concepts of semiconductors, amplifiers and linear integrated circuits
- Inverters and electronic measurements

Introduction to Electrical Systems – Simple DC Circuits – Network Theorems: Kirchoff's Laws, Mesh analysis, Nodal analysis, Superposition, Thevenin's, Norton and Maximum Power Transfer Theorems, Delta-Star and Star-Delta Transformations.

Alternating Voltage and Current – Single phase series circuits and Parallel networks – Power in AC Circuits – Resonance in AC Circuits - Multiphase Systems – Transformers – AC Synchronous Machines – Induction Motors – DC Machines – DC Motors.

Basic Electronic Systems – Passive filters – Amplifier Equivalent Circuits – Semiconductor Materials – Rectifiers – Junction Transistor Amplifiers – FET Amplifiers.

Operational Amplifiers – Inverting, Non-inverting, Summing and Differential Amplifiers – Common Mode Rejection Ratio – Digital and Analog Systems – Linear ICs Applications: Voltage Regulators, Timers and Phase Locked Loops.

Thyristor-ac/dc converter-ac/dc inversion-switching devices in inverters- Electronic Measuring Instruments – Digital voltmeters, Ammeters and wattmeters-Graphical Display Devices – Cathode Ray Oscilloscope

LECTURE: 45 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 0 PERIODS TOTAL: 45 PERIODS

AUTHOR NAME

TITLE OF BOOK

PUBLISHER,

YEAR OF PUBLICATION

Edward Hughes

Electrical and Electronics
Technology

Revised by John Hiley, Keith Brown and Ian McKenzie Smith, 12th Edition, Pearson Education Ltd., 2016.

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Government College of Technology
COIMBATORE - 641 013

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|--|---|
| <i>Vincent Del Toro</i> | <i>Electrical Engineering Fundamentals</i> | <i>Second Edition, PHI, 2011.</i> |
| <i>Robert L. Boylestad and Louis Nashelsky</i> | <i>Electronic Devices and Circuit Theory</i> | <i>Eleventh Edition, Pearson Education, 2013.</i> |

COURSE OUTCOMES:

Upon completion of this course, students will be able to

CO1: Analyse and solve DC and AC circuits

CO2: Appraise the significance of transformers in electric circuits

CO3: Investigate the operational principles of motors and generators

CO4: Use amplifier equivalent circuits to estimate operating and performance characteristics

CO5: Assess the significance of D/A and A/D converters

CO6: Describe the working principles of Electronic measuring instruments.

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16IBS106

CHEMISTRY LAB
Common to *EEE, ECE, EIE, CSE & IT branches*

Category : BS
L T P C
0 0 4 2

Course Objectives:

- The course is aimed at imparting knowledge of experimental techniques which would be useful for students to apply the practical principles relevant conventional engineering field.

LIST OF EXPERIMENTS

1. Estimation of hardness by EDTA method
2. Estimation of chloride by Argentometric method
3. Determination of dissolved oxygen by Winkler's method
4. Conductometric titration of mixture of strong acid and weak acid using strong base
5. Potentiometric titration of ferrous iron by dichromate
6. Estimation of copper in brass by EDTA method
7. Estimation of Iron by Spectrophotometry
8. Estimation of HCl by pH titration.

LECTURE: 0 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 60 PERIODS TOTAL: 60 PERIODS

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|---|---|
| <i>A.O. Thomas</i> | <i>Practical Chemistry</i> | <i>Scientific Book Centre, Cannanore, 2003.</i> |
| <i>Jeffery G H, Basset J. Menthom J, Denney R.C.</i> | <i>Vogel's Text book of quantitative analysis, 5th Edition</i> | <i>EBS, 1988.</i> |

COURSE OUTCOMES:

Upon completion of this practical classes, the students will be able to

CO1: Understand the nature of hardness, chloride level, pollution level using dissolved oxygen content, iron present in water and analyse them in water.

CO2: Apply the EMF and conductometric measurements in quantitative analysis of substances.

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Government College of Technology
COIMBATORE - 641 013

16IES107

WORKSHOP PRACTICE*Common to EEE, ECE, EIE, CSE & IT branches***Category : ES****L T P C****0 0 4 2****Course Objectives:**

- To make various basic prototypes in the carpentry trade such as Lap joint, Lap Tee joint, Dove tail joint, Mortise & Tenon joint and Cross-Lap joint.
- To make various welding joints such as Lap joint, Lap Tee joint, Edge joint, Butt joint and Corner joint.

LIST OF EXPERIMENTS

1. Introduction to use of tools and equipments in Carpentry, Welding, Foundry and Sheet metal
2. Safety aspects in Welding, Carpentry and Foundry
3. Half lap Joint and Dovetail Joint in Carpentry
4. Welding of Lap joint, Butt joint and T-joint
5. Preparation of Sand mould for cube, conical bush, pipes and V pulley
6. Fabrication of parts like tray, frustum of cone and square box in sheet metal
7. Electrical wiring – simple house wiring
8. Plumbing

LECTURE: 0 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 60 PERIODS TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon completion of this practical classes, the students will be able to

CO 1: Use tools and equipments used in Carpentry, Welding, Foundry and Sheet metal.**CO 2:** Make half lap joint and dovetail joint in carpentry.**CO 3:** Make welded lap joint, butt joint and T-joint.**CO 4:** Prepare sand mould for cube, conical bush, pipes and V pulley.**CO 5:** Fabricate parts like tray, frustum of cone and square box in sheet metal**CO 6:** Carry out minor works/repair related to electrical wiring and plumbing.

Controller of Examinations
Government College of Technology
COIMBATORE - 641 013

16IHS2Z1 /

TECHNICAL ENGLISH /
Common to all branches

Category : HS /
L T P C
2 2 0 3 /

Course Objectives:

- To make learners acquire guided listening and speaking skills in both formal and informal contexts.
- To help them develop reading skills by familiarizing them with different types of reading tasks and strategies
- To make them understand advance level of grammar and equip them with writing skills needed for academic as well as workplace contexts.
- To explore the learner to Technical English and Technical Vocabulary.

UNIT I

6+6 Periods

Listening - Listening to ask for/ give opinions, Listening to persuade/dissuade people, Listening to make complaints, Listening to transfer information; **Speaking** –Role play activities on a formal/corporate context, Delivering Welcome Address- **Reading** – Reading to infer lexical and contextual meaning; **Writing** - Effective use of SMS on Whatsapp/ Hike/ Messenger, Writing E-mails on a business context, Technical style; **Grammar** – Use of relative / reflexive pronouns, Discourse Markers; **Vocabulary**- Homonyms and Homophones

UNIT II

6+6 Periods

Listening - Listening to express regrets/sympathy/condolences, Listening and Note-taking; **Speaking** – Addressing at an official meeting to deal with problems/ sensitive issues, Discussion on a movie with a poignant social message/ or on a recently read book; **Reading** - Reading a short story or an article from newspaper; **Writing** - Writing a review of a book/movie/music concert/sports event, Graph Description; **Grammar** – Noun/Adjective/Adverbial phrases, Cause and effect expressions; **Vocabulary** - Using phrasal verbs in sentences, Jargon

UNIT III

6+6 Periods

Listening - Listening to a talk about using quantities, Listening to describe manner and frequency, Listening to expressions of assumptions/inference, Listening to make comparisons; **Speaking** –Making conversation to practice stress, pause, pronunciation and intonation, Introducing the chief-guest; **Reading** - Speed reading – reading passages with time limit - **Writing** – Notice, Agenda and Minutes of meetings; - Elements of Writing Technical articles –**Grammar** - Numerical expressions, Conditional clauses; **Vocabulary** - Same word used as different parts of speech, Register

UNIT IV

6+6 Periods

Listening - Listening to talks about future events/plans, Listening to a talk about making arrangements, Listening to language of reporting, Viewing a model discussion; **Speaking** – Discussion on a formal/corporate context, Proposing vote of thanks; **Reading** - Reading the job advertisements and the profile of the company concerned; **Writing** - Process Description, Applying for a job with résumé; **Grammar** - Direct and indirect speech; **Vocabulary** - Idioms

UNIT V

6+6 Periods

Listening – Listening to expressions of possibility, Listening to expressions of obligations, Listening to expressions of ability, Viewing model interviews; **Speaking** - Mock interview; **Reading** - Note making, Intensive reading; **Writing** – Checklist, - Feasibility / Project report; **Grammar** – Time Statements and Contracted Time Statements; **Vocabulary** – Nominal Compounds

LECTURE: 30 PERIODS TUTORIAL: 30 PERIODS PRACTICAL: 0 PERIODS TOTAL: 60 PERIODS

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,****YEAR OF PUBLICATION**

Department of English, Anna
University. Mindscapes
Sadanand, Kamlesh &
Punitha, Susheela

English for Technologists and
Engineers.
Spoken English: A Foundation
Course (Part 2).

Orient Blackswan, Chennai. 2012
Orient Blackswan, Hyderabad. 2014

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REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|---|---|
| <i>Raman, Meenakshi & Sangeetha Sharma</i> | <i>Technical Communication: Principles and Practice</i> | <i>Oxford University Press, New Delhi. 2011</i> |
| <i>Vijay, Anbazhagan.J, & Jaishree.N</i> | <i>Technical English-II</i> | <i>Global Publishers, Chennai, 2016</i> |
| <i>Rizvi, Ashraf. M.</i> | <i>Effective Technical Communication</i> | <i>Tata McGraw-Hill, New Delhi. 2005</i> |
| <i>Herbert, A.J</i> | <i>Structure of Technical English</i> | <i>The English Language Society, London. 1971</i> |
| <i>Michigan, E.A</i> | <i>Word Power and Speed Reading: English Improvement Series</i> | <i>Infinity Books, New Delhi, 2007</i> |
| <i>Rajendrapal & Korlahalli. J.S</i> | <i>Essentials of Business Communication</i> | <i>Sultan Chand & Sons</i> |

WEBSITES

1. <http://www.usingenglish.com>
2. <http://www.uefap.com>

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** The learners will be able to speak convincingly at work place and social contexts through guided listening tasks and different genres and strategies of reading.
- CO2:** The learner will understand advance level of grammar and write professionally to a larger Extent for workplace and general contexts.
- CO3:** The learners will familiarize themselves with Technical Vocabulary and Technical English.

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Pre-Requisites: Basics of - trigonometry- differential and integral formulae.

Course Objectives:

- To acquire knowledge of techniques of ordinary differential equations leading to engineering problems.
- To acquire knowledge of vector Calculus with engineering applications.
- To gain standard techniques of complex variable applicable to fluid dynamics, heat conduction, and elasticity.
- To develop skill of solving transforms leading to engineering applications.

| | | |
|--------|---------------------------------|--------------|
| UNIT I | ORDINARY DIFFERENTIAL EQUATIONS | 9 +6 Periods |
|--------|---------------------------------|--------------|

Second and Higher order Differential Equations, Method of variation of parameters- Method of undetermined coefficients-Homogeneous equations of Euler's and Legendre's type-System of Simultaneous first order Linear equations with constant coefficients - Method of reduction of order.

| | | |
|---------|-----------------|--------------|
| UNIT II | VECTOR CALCULUS | 9 +6 Periods |
|---------|-----------------|--------------|

Gradient and directional derivative, Divergence and Curl – Irrotational and Solenoidal fields- Vector identities - Line, Surface and Volume Integrals – Green’s Theorem in a Plane , Gauss Divergence and Stoke’s Theorems (Statements only) –Verifications and Applications.

| | | |
|----------|-------------------------|--------------|
| UNIT III | COMPLEX DIFFERENTIATION | 9 +6 Periods |
|----------|-------------------------|--------------|

Functions of a Complex variable-Analytic functions- Cauchy Riemann equations and sufficient conditions (excluding proof)-Harmonic conjugates-Construction of analytic functions-Conformal mappings: $w=z+a$, az , $1/z$, z^2 , e^z , $\sin z$, $\cos z$ and Bilinear Transformation.

| | | |
|---------|---------------------|--------------|
| UNIT IV | COMPLEX INTEGRATION | 9 +6 Periods |
|---------|---------------------|--------------|

Cauchy's integral theorem, Cauchy's integral formula -Taylor's and Laurent's theorems (Statements only) and expansions – Poles and Residues – Cauchy's Residue theorem – Contour integration – Circular and semi circular contours with no pole on real axis.

| | | |
|--------|-------------------------|--------------|
| UNIT V | LAPLACE TRANSFORMATIONS | 9 +6 Periods |
|--------|-------------------------|--------------|

Laplace transforms- Properties and standard transforms-Transforms of unit step, unit Impulse and error functions – Transforms of periodic functions- Inverse Laplace transforms- Initial and Final value theorems- Convolution theorem (Statement only) and applications - Applications to Solution of Linear differential equations of second order with constant coefficients.

LECTURE: 45 PERIODS TUTORIAL: 30 PERIODS PRACTICAL: 0 PERIODS TOTAL: 75 PERIODS

TEXT BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|--|---|
| <i>Veerarajan T</i> | <i>Engineering Mathematics" for Semesters I and II</i> | <i>Tata McGraw Hill Publishing Co., New Delhi, 2015.</i> |
| <i>Kandasamy P, Thilagavathy K and Gunavathy K</i> | <i>Engineering Mathematics" for I year B.E/B.Tech</i> | <i>S.Chand& Co, Ramnagar, New Delhi,Reprint2013.</i> |
| <i>S. Narayanan and Manicavachagom Pillai T.K.</i> | <i>Calculus-Vol.III</i> | <i>S. Viswanathan, Printers and Publishers Pvt. Ltd, Chennai, 2009.</i> |

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---------------------------------------|---|---|
| <i>Erwin Kreyszig</i> | <i>Advanced Engineering Mathematics</i> | <i>Wiley & sons(Asia) Ltd, 10th Edition, 2015.</i> |
| <i>Ray Wylie.C and Louis Barrett</i> | <i>Advanced Engineering Mathematics</i> | <i>Tata McGraw Hill Company, New Delhi, 2004.</i> |
| <i>Grewal B. S</i> | <i>Higher Engineering Mathematics</i> | <i>Khanna Publishers, New Delhi, 43rd Edition, 2014.</i> |
| <i>Ramana B V</i> | <i>Higher Engineering Mathematics</i> | <i>Tata McGraw Hill Co. Ltd, NewDelhi, 11th Print, 2010.</i> |
| <i>Bali N., Goyal M and Watkins C</i> | <i>Advanced Engineering Mathematics</i> | <i>Firewall Media (An Imprint of Laxmi Publications Pvt Ltd), New Delhi, 7th Edition,2009.</i> |
| <i>Bali N.P and Goyal M</i> | <i>A text book of Engineering Mathematics</i> | <i>University Science Press (An Imprint of Laxmi Publications Pvt Ltd), New Delhi,2014.</i> |

COURSE OUTCOMES:

Upon completion of this course, the student will be able to

- CO1:** Understand the kinds of differential equations and their solutions in the field of engineering.
CO2: Evaluate gradient, divergence and curl and also line, surface and volume integrals in cartesian form and simple coordinate systems and calculate integrals applying Greens, stokes and Gauss theorems.
CO3: Understand the concepts of analytic functions and conformal mappings.
CO4: Evaluate contour integrals using calculus of residues.
CO5: Apply Laplace transform methods to solve differential equations.

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16IBS2Z3

MATERIALS SCIENCE
Common to all branches

Category : BS
L T P C
3 0 0 3

Course Objectives:

To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology. Upon completion of this course the students will be familiar with:

- The properties of conducting materials.
- The application of magnetic and super conducting materials.
- Application and properties of dielectric and ferro electric materials.
- Applications and properties of Modern engineering materials.
- Nano materials and its properties.

UNIT I CONDUCTING MATERIALS 9 Periods
Introduction to Conductors – classical free electron theory of metals – Draw backs of classical theory – quantum theory - Electrical and Thermal conductivity of Metals – Derivation for Wiedeman – Franz law – Lorentz number – Fermi distribution function - effect of temperature – density of energy states – calculation of Fermi energy-carrier concentration in metals.

UNIT II SEMICONDUCTING MATERIALS AND DEVICES 9 Periods
Introduction – Properties – elemental and compound semiconductors - Intrinsic and extrinsic semiconductors – properties - Carrier concentration in intrinsic Semiconductor - variation of Fermi level with temperature and carrier concentration - Electrical Conductivity – band gap determination - extrinsic semiconductors - Carrier concentration in P- type and N-type semiconductors – variation of Fermi level with temperature and impurity concentration – Hall effect- Determination of Hall Co-efficient in N type and P type Semiconductor - Applications.

UNIT III MAGNETIC AND SUPER CONDUCTING MATERIALS 9 Periods
Introduction - Origin of magnetic moment - Bohr magneton - Dia, Para, and Ferro magnetic materials - Domain theory of ferromagnetism - Hysteresis - Hard and Soft magnetic materials. Ferrites - structure and applications. - Magneto optical recording and readout – Superconductivity - Types of superconductors - BCS theory of superconductivity (qualitative) - properties- High Tc superconductors, Applications of superconductors- SQUID, Cryotron, Magnetic levitation.

UNIT IV DIELECTRICS AND FERROELECTRICS 9 Periods
Introduction to dielectric materials – Electric polarization and Dipole moment - Electrical susceptibility – dielectric constant – Various polarization mechanisms in dielectrics - electronic, ionic, orientational and space charge polarization– frequency and temperature dependence of polarization – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – Applications of dielectric materials - Ferro electricity –Ferro electric materials -BaTiO₃ – Applications- Ferro electric energy converter.

UNIT V MODERN ENGINEERING MATERIALS 9 Periods
Metallic glasses- preparation of metallic glasses - properties – applications of the metallic glasses - Shape Memory Alloys (SMA) - Characteristics, properties of NiTi alloy - applications of the Shape memory alloys - advantages and disadvantages of SMA - Nanomaterials-synthesis –chemical vapour deposition – Sol Gel – ball Milling – properties of nanoparticles and applications of nanoparticles – Carbon Nanotubes (CNT) – structure – properties – applications of CNTs.

LECTURE: 45 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 0 PERIODS TOTAL: 45 PERIODS

TEXT BOOKS
AUTHOR NAME
TITLE OF BOOK
PUBLISHER,
YEAR OF PUBLICATION

| | | |
|------------------------|-------------------------------|---|
| <i>P.K.Palanisamy</i> | <i>Engineering Physics–II</i> | <i>Scitech Publications (India) Pvt. Ltd 2015 (Unit I, Unit III & Unit IV)</i> |
| <i>Dr.Jayakumar .S</i> | <i>Materials science</i> | <i>R.K.Publishers,2008.(Unit II & IV)</i> |
| <i>Dr.V.Rajendran</i> | <i>Material Science</i> | <i>Tata McGraw Hill Publications, NewDelhi, 2011.</i> |

REFERENCE BOOKS
AUTHOR NAME
TITLE OF BOOK
PUBLISHER,
YEAR OF PUBLICATION

| | | |
|---|---------------------------------------|---|
| <i>Charles P.Poole, Jr; Frank J.Owens</i> | <i>Introduction to Nanotechnology</i> | <i>Wiley India, 2012.</i> |
| <i>Gaur R.K. and Gupta S.L</i> | <i>Engineering Physics</i> | <i>Dhanpat Rai Publishers, 2009.</i> |
| <i>K.Rajagopal</i> | <i>Engineering Physics</i> | <i>PHI Learning Private Ltd, New Delhi, 2015.</i> |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Analyze the properties of conducting materials. [Familiarity]
- CO2:** List and analyze the properties of Semiconducting materials and Devices. [Familiarity]
- CO3:** Identify, analyze the properties and applications of magnetic & super conducting materials. [Familiarity]
- CO4:** List and analyze the properties of dielectric Ferro electric materials. [Familiarity & Application]
- CO5:** List the properties and applications of modern engineering materials. [Familiarity & Application]

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16IHS2Z4

ENVIRONMENTAL SCIENCE AND ENGINEERING*Common to all branches*

Category : HS

L T P C

3 0 0 3

Course Objectives:

- o The course is aimed at creating awareness among students and also to inculcate the critical ideas of preserving environment.

UNIT I**ENVIRONMENTAL RESOURCES****9 Periods**

Natural resources -Forest – benefits, over exploitation, deforestation & consequences – Water - unique features, hydrological cycle & over exploitation – Food -effect of modern agriculture, fertilizers, pesticides, eutrophication & biomagnifications - Energy resources - renewable & non-renewable resources - wind, solar and tidal - harnessing methods.

UNIT II**ECO SYSTEM AND BIODIVERSITY****9 Periods**

Ecology - ecosystem, physical and chemical components of ecosystem, biological components of ecosystem - forest ecosystem, desert ecosystem and pond ecosystem, Energy flow in ecosystem, nitrogen cycle and carbon dioxide cycle, food pyramid, ecological succession, Biodiversity - types, values of biodiversity, hot spots of biodiversity, endangered and endemic species, conservation of biodiversity – in situ – ex situ conservation.

UNIT III**ENVIRONMENTAL POLLUTION****9 Periods**

Air pollution, classification of air pollutants – sources, effects and control of gaseous pollutants SO₂, NO_x, H₂S, CO, CO₂ and particulates, control methods - cyclone separator and electrostatic precipitator - Water pollution - classification of water pollutants, organic and inorganic pollutants, sources, effects and control of water pollutants Soil pollution - sources, effects and control - Noise pollution - decibel scale, sources, effects and control.

UNIT IV**ENVIRONMENTAL THREATS****9 Periods**

Acid rain, greenhouse effect, global warming and ozone depletion, disaster management, flood, drought, earthquake and tsunami; Threats to biodiversity - destruction of habitat, habitat fragmentation - hunting, over exploitation and man - wildlife conflicts, The IUCN red list categories, status of threatened species.

UNIT V**SOCIAL ISSUES AND ENVIRONMENT****9 Periods**

Sustainable development - sustainable technologies, need for energy and water conservation, rain water harvesting, water shed management, waste land reclamation, Pollution control Act, Wild life protection act, Forest conservation act, population growth - exponential and logistic growth, variation in population among nations, population policy, women and child welfare programs, role of information technology in human and health, HIV/AIDS - effects and preventive measures.

LECTURE: 45 PERIODS

TUTORIAL: 0 PERIODS

PRACTICAL: 0 PERIODS

TOTAL: 45 PERIODS

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,****YEAR OF PUBLICATION***Sharma J.P**"Environmental Studies",
3rd Edition**University Science Press, New Delhi 2009.**Anubha Kaushik and C.P. Kaushik**"Environmental Science and
Engineering", 3rd Edition**New age International Publishers,
New Delhi, 2008.*

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REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---------------------------|--|--|
| <i>R.K. Trivedi</i> | <i>Hand book of Environmental laws, Rules, Guidelines, Compliances and Standards", Vol.I&II,</i> | <i>Environ Media, 2006.</i> |
| <i>G. Tyler Miller Jr</i> | <i>"Environmental Science", 10th Edition</i> | <i>Thomson Brooks/Cole Publishing, 2004.</i> |
| <i>Gilbert M. Masters</i> | <i>Introduction to Environmental Engineering and Science, 2nd Edition</i> | <i>Pearson Education, 2004.</i> |

COURSE OUTCOMES:

Upon the completion of this course, the students will be able to

- CO1:** To know about the various environmental resources, the effective utility and problems accompanied in over exploitation.
- CO2:** To acquire knowledge about the interaction of biosphere with environment and conservation methods of bio diversity.
- CO3:** To be aware of the source of various types of pollution, their ill effects and preventive methods.
- CO4:** To understand the environmental threats, Acid rain, Green house effect and Ozone depletion and natural disasters.
- CO5:** To create an idea about sustainable development and social issues.

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Category : ES
L T P C
3 0 0 3 ✓

Upon completion of the course, the students will be familiar with,

- | UNIT I | COMPUTER AND PROGRAMMING FUNDAMENTALS | 9 Periods |
|---|---------------------------------------|-----------|
| Computer fundamentals – Evolution, classification, Anatomy of a computer: CPU, Memory, I/O – Introduction to software – Generation and classification of programming languages – Compiling – Linking and loading a program – Translator – loader – linker – develop a program – software development – Introduction to OS –Types of OS – Algorithms – Structured programming concept. | | |

| | | |
|---|--|------------------|
| UNIT III | FUNCTIONS, ARRAYS, POINTERS AND STRINGS | 9 Periods |
| <p>Functions and storage classes.- 1D Arrays – Pointers – Call by reference – Relationship between Arrays and Pointers – Pointer arithmetic and element size – Arrays as function argument – Dynamic memory allocation – Strings – String handling functions – Multidimensional Arrays.</p> | | |

| | | |
|---|---|------------------|
| UNIT V | STRUCTURES AND UNIONS, I/O AND FILE OPERATIONS | 9 Periods |
| Structures and Unions – Operator precedence and associativity – Bit fields – Accessing bits and bytes - Input and Output functions – File Processing Functions – Environment variables – Use of make and touch. | | |

LECTURE: 45 PÉRIODS TUTORIAL: 0 PÉRIODS PRACTICAL: 0 PERIODS TOTAL: 45 PERIODS

AUTHOR NAME

TITLE OF BOOK

PUBLISHER,
YEAR OF PUBLICATION
Oxford University Press, 2013.

Addison Wesley, 2001.

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---------------------------------------|--|---|
| Stephen G. Kochan | <i>Programming in C-A complete introduction to the C programming language, Third Edition</i> | Sams Publication, 2004. |
| Yashavant P. Kanetkar | <i>Let Us C, 13th edition</i> | BPB Publications, 2013. |
| Brian W. Kernighan and Dennis Ritchie | <i>The C Programming Language”, Second Edition</i> | Prentice Hall Software Series, 1988. |
| Stephen Prata | <i>C Primer Plus, Fifth Edition</i> | Sams Publishing, 2005. |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Articulate the programming environment [Familiarity]
- CO2:** Write algorithm for solving the given problem statement [usage]
- CO3:** Use right data types and flow control statement [Assessment]
- CO4:** Write programs using functions, arrays, pointers and strings [Usage]
- CO5:** Use right storage classes, preprocessor directives, bitwise operators in programs [Assessment]
- CO6:** Use structures, unions and files [Usage]

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16IBS206

PHYSICS LAB*Common to EEE, ECE, CSE, EIE & IT branches***Category : BS**L T P C
0 0 4 2**Course Objectives:**

- To have a practical knowledge about the concepts behind physics and the need to apply in the emerging technology.

LIST OF EXPERIMENTS

1. Spectrometer - Diffraction Grating Normal Incidence Method
2. Air Wedge –Determination of thickness of a paper
3. Young's Modulus – Cantilever Bending - Koenig's Method
4. a. Laser - Particle size Determination
b. Optical fiber - Determination of NA & Acceptance angle
5. Ammeter and Voltmeter Calibration – Low Range
6. Resistance Of The Given Coil Of Wire – Carey Foster's Bridge
7. Determination of Band gap Energy of Semiconductor
8. Ultrasonic Interferometer - Velocity of sound & Compressibility of liquids.
9. Transistor Characteristics
10. Torsional pendulum –Determination of Rigidity Modulus & Moment of Inertia

LECTURE: 0 PERIODS TUTORIAL:0 PERIODS PRACTICAL: 60 PERIODS TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon completion of this practical classes, the students will be able to

CO1: Determinate of all physical properties of any matter, basic idea of calibrating electrical measuring instruments and thereby effectively using it for particular applications.**CO2:** Experiment intrinsic characteristic features of electronic devices for electrical and electronic applications.

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16IES207 / **ENGINEERING GRAPHICS** /
Common to EEE, ECE, EIE, CSE & IT branches

Category : ES /
L T P C
2 0 4 4 /

Course Objectives:

- Geometrical constructions
- Orthographic projections.
- Performing section of solids and development of the same.
- Interpretation of solids.
- Pictorial view of solids

UNIT I GEOMETRICAL CONSTRUCTIONS 15 Periods

Dimensioning-Lettering-Types of Lines-Scaling conventions-Dividing a given straight line in to any number of equal parts- Bisecting a given angle- Drawing a regular polygon given one side-Special methods of constructing a pentagon and hexagon- Construction of curves like ellipse, parabola, cycloid and involute using one method.

UNIT II ORTHOGRAPHIC PROJECTIONS 25 Periods

Introduction to Orthographic Projection-Projection of points-Projection of straight lines with traces-Projection of planes-Conversion of pictorial views to orthographic views-Projection of solids - Auxiliary projections.

UNIT III SECTION OF SOLIDS AND DEVELOPMENT 20 Periods

Section of solids- Development of surfaces

UNIT IV INTERPENETRATION OF SOLIDS AND PICTORIAL VIEWS 20 Periods

Cylinder and cylinder, cone and cylinder only Isometric projections - Conversion of orthographic views to pictorial views (simple objects).

UNIT V INTRODUCTION TO AUTOCAD 10 Periods

Object Construction : Page layout – Layers and Line types – Creating, Editing and selecting the Geometric Objects. Viewing, Annotating, Hatching and Dimensioning the drawing –Creating Blocks and Attributes

LECTURE: 30 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 60 PERIODS TOTAL: 90 PERIODS

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|-----------------------------|---|---|
| K.Venugopal | Engineering Graphics | New Age International (P) Limited, 2015. |
| Dhananjay.A.Jolhe | Engineering Drawing | Tata McGraw Hill Publishing Co., 2007. |
| K.V.Natarajan | A text book of Engineering Graphics | Dhanalakshmi Publishers, Chennai, 2006. |
| M.B.Shah and B.C. Rana | Engineering Drawing | Pearson Education, 2005. |
| Luzadder and Duff | Fundamentals of Engineering Drawing | Prentice Hall of India Pvt Ltd, XI th Edition, 2001. |
| K.L.Narayana and P.Kannaiah | Text book on Engineering Drawing, 2 nd Edition | SciTech Publications (India) Pvt. Ltd, Chennai, 2009. |

COURSE OUTCOMES:

Upon completion of this practical classes, the students will be able to

CO1: Represent planes and solids as per international standards.

CO2: Generate and interpret multiple views through development, interpretation and sectional views.

CO3: Generate and interrupt orthographic views.

CO4: Generate and interrupt pictorial views and interpenetration.

CO5: Generate and interrupt perspective views.

CO6: Apply the concept of AUTOCAD in engineering graphics.

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16IES2Z8

PROGRAMMING IN C LAB
Common to all branches

Category : ES
L T P C
0 0 4 2

Course Objectives:

- o Data types in C and Flow control statements
- o Functions, Arrays, Pointers And Strings
- o Dynamic memory allocation and command line arguments
- o Bitwise Operators, Preprocessor Directives, Structures and Unions
- o Structures, List Processing, Input And Output

PRACTICALS**EXERCISES ILLUSTRATING THE FOLLOWING CONCEPTS:**

1. Operators , Expressions and IO formatting
2. Decision Making and Looping
3. Arrays and Strings
4. Functions and Recursion
5. Pointers
6. Dynamic Memory Allocation
7. Structures
8. Unions
9. Files
10. Command line arguments
11. Mini Project

LECTURE: 0 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 60 PERIODS TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon completion of this practical classes, the students will be able to

- CO1:** Use appropriate data types and flow control statements [Usage]
CO2: Write programs using functions, arrays, pointers and strings [Usage]
CO3: Write programs using dynamic memory allocation [Usage]
CO4: Implement programs using right storage classes, preprocessor directives, bitwise operators [Usage]
CO5: Work with command line arguments, structures, unions and files [Usage]
CO6: Develop applications using C [Usage]

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Course Objectives:

- Essential complementarity between ‘values’ and ‘skills’ to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- The development of a Holistic perspective among students towards life, profession and happiness based on a correct understanding of the Human reality and the rest of existence, which forms the basis of Value based living in a natural way.
- The plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with nature.

| | | |
|--------|---------------------------------|-----------|
| UNIT I | INTRODUCTION TO VALUE EDUCATION | 5 Periods |
|--------|---------------------------------|-----------|

Introduction- Need, Basic Guidance, Content and Process for Value Education- Basic human Aspirations – Prosperity and happiness – Methods to fulfill human aspirations - Understanding and living in harmony at various levels.

UNIT II **HARMONY IN THE HUMAN BEING** **5 Periods**

Coexistence – Happiness and convenience – Appraisal of Physical needs – Mental and Physical health – Human relationship – Mutual Trust and Respect.

| | | |
|----------|--------|-----------|
| UNIT III | ETHICS | 5 Periods |
|----------|--------|-----------|

Morals, Values and Ethics - Integrity - Work Ethics - Service Learning - Civic Virtue – Caring – Sharing - honesty- Courage – Empathy – Self Confidence -Ethical Human Conduct- Basis for humanistic Education, Constitution and universal order – Competence in professional ethics – Strategy for transition from the present state to Universal human order.

LECTURE: 15 PERIODS TUTORIAL: 0 PERIODS PRACTICAL: 0 PERIODS TOTAL: 15 PERIODS

TEXT BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|--|--|--|
| <i>R.R. Gaur, R. Singal, G.P. Bangaria</i> | <i>"Foundation Course in Human Values and Professional Ethics", 2009</i> | <i>Excel Book Private Ltd., New Delhi.</i> |

REFERENCE BOOKS

| AUTHOR NAME | TITLE OF BOOK | PUBLISHER, YEAR OF PUBLICATION |
|---|---|---|
| <i>S. K. Chakraborty and Dabangshu Chakraborty</i> | <i>Human Values and Ethics: Achieving Holistic Excellence</i> | ICFAI University Press, 2006. |
| <i>A.N. Tripathy</i> | <i>Human Values</i> | New Age International publishers, 2003. |
| <i>M. Govindarajan, S. Natarajan and V.S. Senthil kumar</i> | <i>Engineering Ethics(including human values)</i> | Eastern Economy Edition, Printice Hall of India Ltd., 2004. |
| <i>E.G. Seebauer and Rober. L. Berry</i> | <i>Fundamentals of Ethics for Scientists and Engineers</i> | Oxford University Press, 2000. |

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Start exploring themselves, get comfortable to each other and to the teacher and start finding the need and relevance for the course.
- CO2:** See that their practice in living is not in harmony with their natural acceptance most of the time and able to refer to their natural acceptance to remove this disharmony.
- CO3:** Aware of their activities like understanding, desire, thought and selection and start finding their focus of attention at different moments.
- CO4:** Able to see that respect is right evaluation and only right evaluation leads to fulfillment in relationship.
- CO5:** Develop an understanding of the whole existence and interconnectedness in nature.

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COIMBATORE - 641 013

16IOC202

HUMAN VALUES AND PROFESSIONAL ETHICS*Common to all branches***Category : OC****L T P C****1 0 0 1****Course Objectives:**

- Engineering Ethics and Human Values
- Social responsibility of an Engineer
- Ethical dilemma while discharging duties in Professional life.

UNIT I**ENGINEERING ETHICS****5 Periods**

Senses of Engineering Ethics -variety of moral issues – types of inquiry – moral dilemmas – moral autonomy – Kohlberg's Theory – Gilligen's Theory – Consensus and controversy – Models of Professional roles – theories about right actions – Self interest – customs and religion – uses of ethical theories – Valuing time-cooperation-commitment.

UNIT II**ENGINEERING AS SOCIAL EXPERIMENTATION****5 Periods**

Engineering as experimentation – engineers as responsible experimenters – codes of ethics – a balanced outlook on law – the challenger case study - engineers as managers – consulting engineers - Moral leadership .

UNIT III**SAFETY, RESPONSIBILITIES, RIGHTS AND GLOBAL ISSUES****5 Periods**

Safety and risk – assessment of safety and risk – risk benefit analysis and reducing risk – the three mile island and chernobyl case studies.– Environmental ethics – computer ethics – weapons development- Multinational corporations - engineers as expert witnesses and advisors.

LECTURE:15 PERIODS TUTORIAL:0 PERIODS PRACTICAL: 0 PERIODS TOTAL: 15 PERIODS

TEXT BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,
YEAR OF PUBLICATION**

*Mike Martin and Roland
Schinzinger*

Ethics in Engineering

McGraw Hill, New York, 1996.

*M. Govindarajan, S. Natarajan and
V.S. Senthil kumar*

*Engineering Ethics (including
human values)*

*Eastern Economy Edition,
Printice Hall of India Ltd., 2004.*

REFERENCE BOOKS**AUTHOR NAME****TITLE OF BOOK****PUBLISHER,
YEAR OF PUBLICATION**

Charles D. Fleddermann

Engineering Ethics

Pearson Education, 2004.

*Edmund G Seebauer and Robert L.
Berry*

*Fundamentals of Ethics for
Scientists and Engineers, 2001*

Oxford University Press

Charles E. Harris, Michael S.

*Engineering Ethics – Concepts
and Cases*

Thomson Learning, 2000.

Protchard and Michael J. Rabins

Ethics and Conduct of Business

Pearson Education, 2003.

John R. Boatright

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

- CO1:** Understand and appreciate Human values, exhibit self confidence and develop good character
- CO2:** Sense engineering ethics, professional roles and valuing time, co-operation and commitment
- CO3:** Understand and practise code of ethics.
- CO4:** Assess safety and risk and capable of doing risk benefit analysis.
- CO5:** Develop and exhibit moral leadership qualities in exercising Engineering Consultations without compromising environmental, legal and ethical issues

Controller of Examinations
Government College of Technology
COIMBATORE - 641 013

GOVERNMENT COLLEGE OF TECHNOLOGY, COIMBATORE – 641 013

OFFICE OF THE CONTROLLER OF EXAMINATIONS

BRANCH: INFORMATION TECHNOLOGY

CURRICULAM: III SEMESTER

| S. No. | Course Code | Course Title | Maximum Marks | | | | Hours/Week | | | |
|--------------|-------------------------|---|---------------|-----|-----|-------|------------|---|----|----|
| | | | Category | INT | EXT | Total | L | T | P | C |
| SEMESTER III | | | | | | | | | | |
| | THEORY | | | | | | | | | |
| 1 | 16IBS3Z1 | Engineering Mathematics –III | BS | 50 | 50 | 100 | 3 | 2 | 0 | 4 |
| 2 | 16IES302 | Engineering Mechanics | ES | 50 | 50 | 100 | 3 | 2 | 0 | 4 |
| 3 | 16IES303 | Digital Logic Design | ES | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 4 | 16IES304 | Elements of Communication Engineering | ES | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 5 | 16IPC305 | Data Structures and Applications | PC | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| 6 | 16IES306 | Computer Organization and Architecture | ES | 50 | 50 | 100 | 3 | 0 | 0 | 3 |
| | PRACTICAL | | | | | | | | | |
| 7 | 16IES307 | Digital logic Design Laboratory | ES | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| 8 | 16IPC308 | Data Structures and Applications Laboratory | PC | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| 9 | 16IEE309 | Professional English | EEC | 50 | 50 | 100 | 0 | 0 | 4 | 2 |
| | Total No. of Hours/Week | | 34 | 450 | 450 | 900 | 18 | 4 | 12 | 26 |



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Course Objectives:

- To gain the knowledge of formation of Fourier series.
- To familiarize with Infinite and finite Fourier transforms functions.
- To be familiar with solution of first and second order differential equations.
- To acquire knowledge of techniques to solve one and two dimensional partial differential equations concerning to engineering applications.

UNIT- I **FOURIER SERIES** **9+6 Periods**
Dirichlet's conditions-Full range Expansions- Odd and even functions- Half range sine and cosine series –Parseval's identity on a Fourier series- Harmonic analysis.

UNIT- II **FOURIER TRANSFORMS** **9+6 Periods**
Fourier integral theorem (statement only)-Infinite Fourier transform pair-Fourier sine and cosine transform pair- Properties-Transforms of simple functions- Parseval's identity on a Fourier transform-Finite Fourier transforms.

UNIT- III **PARTIAL DIFFERENTIAL EQUATIONS** **9+6 Periods**
Formation of partial differential equations-First order PDE -Standard types and Lagrange's type-Linear partial differential second and higher order with constant coefficients-Homogeneous and Nonhomogeneous types.

UNIT -IV **BOUNDARY VALUE PROBLEMS** **9+6 Periods**
Method of separation of variables and Fourier series solution: One dimensional wave equation, one and two dimensional heat flow.

UNIT -V **Z TRANSFORMS** **9+6 Periods**
Z transforms-properties-Inverse Z transforms-Initial and final value theorems- Convolution theorem- Formation of difference equations- Solution to difference equations of second order difference equations with constant coefficients with Z transform.

LECTURE: 45 PERIODS TUTORIAL:30 PERIODS PRACTICAL: 0 PERIODS TOTAL: 75 PERIODS

TEXT BOOKS

- 1.Veerarajan T, *Transforms and Partial Differential Equations*, Tata McGraw Hill Publishing Co., New Delhi, 2015.
- 2.Kandasamy, Thilagavathy and Gunavathy, *Engineering Mathematics for III Semester B.E/B.Tec*, S.Chand & Co, Ramnagar, New Delhi, 2013.

REFERENCE BOOKS

- 1.Grewal B .S, *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 43rd Edition, 2014.
2. Ramana B. V, *Higher Engineering Mathematics*, Tata McGraw Hill Co. Ltd., New Delhi, 11th Edition, Reprint, 2010.
3. Bali N., Goyal M, *Transforms and Partial differential equations*, University Science Press, New Delhi, 2010.
4. Ray Wylie C and Louis C Barrett, *Advanced Engineering Mathematics*, McGraw Hill Education(India) Pvt Ltd, New Delhi, 6th Edition, Reprint, 2014.
5. Donald.A. McQuarrie, *Mathematical Methods for Scientists and Engineers*, Viva Books Pvt Ltd, New Delhi, 1st Edition, Reprint 2015.

COURSE OUTCOMES: Upon Completion of this Course student will be able to,

- CO1:** Understand the concepts of Fourier series and its construction when discrete and continuous form is known
- CO2:** Acquire fluency in Fourier transforms in order to solve improper integrals. *[Understand]* *[Understand]*
- CO3:** Understand the standard and special types of partial differential equations. *[Understand]*
- CO4:** Gain fluency in solving boundary value problems. *[Analyze]*
- CO5:** Understand the Z transform methods to find solutions of difference equations. *[Understand]*

Course Articulation Matrix for 16IBS3Z1 ENGINEERING MATHEMATICS III

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3.... |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|----------|
| CO | | | | | | | | | | | | | | | |
| CO1 | H | H | H | | | | | | | H | | | H | L | |
| CO2 | M | H | M | | | | | | | M | | | M | L | |
| CO3 | H | M | | | | | | | | L | | | L | L | |
| CO4 | H | H | M | | | M | | | | M | M | | H | M | |
| CO5 | M | M | M | | | | | | | | | | M | | |
| 16IBS3Z1 | H | H | M | | | L | | | | M | L | | M | L | |

[Signature] 04/07/2018

| | | | |
|---|---|---|---|
| L | T | P | C |
| 3 | 2 | 0 | 4 |

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * To understand the force systems, geometrical properties and frictions in real life applications. ✓
- * To understand the dynamics behaviour of particles and impulse momentum principle.

| | |
|---|-----------------------------|
| UNIT – I : INTRODUCTION TO MECHANICS AND FORCE CONCEPTS | (9+6Periods) |
| Principles and Concepts – Laws of Mechanics – system of forces – resultant of a force system – resolution and composition of forces – Lami's theorem – moment of a force – physical significance of moment-Varignon's theorem – resolution of a force into force and couple – forces in space – addition of concurrent forces in space – equilibrium of a particle in space. | |
| UNIT – II : FRICTION | (9+6 Periods) |
| Frictional resistance – classification of friction- laws of friction – coefficient of friction-angle of friction – angle of repose – cone of friction – free body diagram-advantages-equilibrium of a body on a rough inclined plane – non-concurrent force system – ladder friction – rope friction – wedge friction. | |
| UNIT – III : GEOMETRICAL PROPERTIES OF SECTION | (9+6 Periods) |
| Centroids – Determination by integration – centroid of an area – simple figures - composite sections – bodies with cut parts - moment of inertia – theorems of moment of inertia – moment of inertia of composite sections – principal moment of inertia of plane areas - radius of gyration. | |
| UNIT – IV : BASICS OF DYNAMICS | (9+6 Periods) |
| Kinematics and kinetics – displacements, velocity and acceleration - Equations of motion – Rectilinear motion of a particle with uniform velocity, uniform acceleration, varying acceleration – motion curves – motion under gravity – relative motion – curvilinear motion of particles – projectiles – angle of projection – range – time of flight and maximum height. Newton's second law of motion – linear momentum – D'Alembert's principle, Dynamics equilibrium – work energy equation of particles– law of conservation of energy – principle of work and energy. | |
| UNIT – V : IMPULSE MOMENTUM AND IMPACT OF ELASTIC BODIES | (9+6 Periods) |
| Principle of impulse and momentum – Equations of momentum – Laws of conservation of momentum. Impact – Time of compression, restitution, collision – Co-efficient of restitution – types of impact – collision of elastic bodies by direct central impact and oblique impact – collision of small body with a massive body – Kinetic energy of a particle. | |
| CONTACT PERIODS: | |
| Lecture: 45 Periods | Tutorial: 30 Periods |
| Practical: 0 Periods | Total: 75 Periods |

Text Books:

1. S.S. Bhavikatti and K.G. Rajasekarappa, "Engineering Mechanics", New Age International (P) Ltd. 1999.
2. S.C. Natesan, "Engineering Mechanics", Umesh Publications, 5-B north market, Naisarak, Delhi, 2002.
3. Domkundwar V.M and Anand V. Domkundwar, "Engineering Mechanics (Statics and Dynamics)", Dhanpat Rai and Co. Ltd, 1st Edition, 2006.

Reference Books:

1. F.B. Beer and E.R. Johnson, "Vector Mechanics for Engineers", Tata Mc.Graw Hill Pvt.Ltd, 10th Edition, 2013.
2. S. Timoshenko and Young, "Engineering Mechanics", Mc.Graw Hill, 4th Edition, 1995.
3. Irving Shames and Krishna Mohana Rao, "Engineering Mechanics", Prentice Hall of India Ltd, Delhi, 2006.
4. R.C. Hibbeler, "Engineering Mechanics", Prentice Hall of India Ltd, 13th Edition, 2013.
5. Vela Murali, "Engineering Mechanics", Oxford university Press, 1st Edition, 2010.

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

CO 1: Know the concept of mechanics and system of forces. [Familiarize]

CO 2: Calculate the frictional properties at different bodies. [Understand]

CO3: Identify the locations of centre of gravity and moment of inertia for different sections. [Understand]

CO4: Understand the basics of dynamics of particles. [Understand]

CO5: Know the impulse and momentum principle and impact of elastic bodies. [Familiarize]

COURSE ARTICULATION MATRIX:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 |
|----------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| CO | | | | | | | | | | | | | | |
| CO1 | H | M | L | L | | | | | | L | | | M | L |
| CO2 | H | M | L | L | | | | | | | | | M | |
| CO3 | L | H | M | L | | | | | | | | | M | |
| CO4 | M | M | L | L | | | | | | L | | | M | L |
| CO5 | L | L | M | H | L | | | | | | | | M | |
| 16IES302 | M | M | M | M | L | | | | | L | | | M | L |

L-Low, M-Moderate (Medium) and H-High

16IES303 ✓

DIGITAL LOGIC DESIGN ✓

CATEGORY: ES ✓

| L | T | P | C |
|---|---|---|-----|
| 3 | 0 | 0 | 3 ✓ |

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * Foundations in Number systems and Boolean algebra
- * Gate level minimization using map reduction
- * Designing simple combinational circuits
- * Synchronous sequential circuits
- * Asynchronous sequential circuits

| | |
|---|---|
| UNIT – I : BOOLEAN ALGEBRA AND LOGIC GATES | (9 Periods) |
| Binary Numbers, Number Conversions-binary-octal-decimal, Hexadecimal, Complements, Signed Binary Numbers, Introduction to Boolean algebra and Logic Gates –Boolean functions - Canonical and Standard Forms-Digital Logic gates. | |
| UNIT – II : GATE LEVEL MINIMIZATION | (9 Periods) |
| Introduction, K Map Method, Four Variable Map, Five Variable Map, Product of Sums, Sum of Product Simplification, Don't Care Conditions, NAND and NOR implementation, Hardware Description Language. | |
| UNIT – III : COMBINATIONAL AND PROGRAMMABLE LOGIC | (9 Periods) |
| Combinational circuits- Analysis and Design Procedure- Binary Adder- Subtract or- Decimal Adder – Binary Multiplier – Magnitude Comparator – Decoders- Encoders- Multiplexers-De-Multiplexer- RAM-ROM- Programmable Logic Array – Programmable Array Logic. HDL for Combinational Circuits. | |
| UNIT – IV : SYNCHRONOUS SEQUENTIAL LOGIC | (9 Periods) |
| Sequential circuits- Latches – Flip flops – Analysis of Clocked Sequential Circuits – State Reduction and Assignment- Design Procedure- Shift Registers, Ripple counters, Synchronous Counters, HDL for Synchronous sequential circuits | |
| UNIT – V : ASYNCHRONOUS SEQUENTIAL LOGIC | (9 Periods) |
| Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race - free State Assignment –Hazards. | |
| CONTACT PERIODS: | |
| Lecture: 45 Periods | Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods |

Text Books:

1. Morris Mano, "Digital Design Introduction to the Verilog HDL", Prentice Hall of India Private Ltd, 5th Edition, 2013

Reference Books:

1. Charles H.Roth, "Fundamentals of Logic Design", Fifth Edition, Jaico Publishing House, 2003
2. Donald D. Givone "Digital Principles and Design", Tata McGraw Hill, 2003
3. John F. Wakerly "Digital Design Principles and Practices", Fourth Edition, Pearson Education, 2007

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

- CO1:** Perform number conversions and binary arithmetic for signed and unsigned numbers. **[Understand]**
CO2: Simplify Boolean expression using Karnaugh map, Boolean laws and representing POS and SOP using hardware. **[Understand]**
CO3: Design and Analyse the combinational logic circuits **[Analyze]**
CO4: Design and Analyse the Synchronous sequential circuits. **[Analyze]**
CO5: Design and Analyse the Asynchronous sequential circuits **[Analyze]** .

COURSE ARTICULATION MATRIX:

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | H | M | M | M | L | | | L | | | | | M | L |
| CO2 | H | M | M | M | L | | | | | | | | M | L |
| CO3 | H | H | H | H | M | | | L | | | | | H | L |
| CO4 | H | H | H | H | M | | | L | | | | | H | L |
| CO5 | H | H | H | H | M | | | L | | | | | H | L |
| 16IES303 | H | H | H | H | M | | | L | | | | | H | L |

L-Low, M-Moderate (Medium) and H-High

16IES304

ELEMENTS OF COMMUNICATION
ENGINEERING

CATEGORY: ES

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * Mathematical concepts used in analog and digital communication
- * modulation techniques and other basic concepts used in analog communication systems
- * Various pulse modulation techniques.
- * Basic digital modulation techniques and signaling
- * Broadband communication and fiber optic technology

| | |
|---|----------------------------|
| UNIT – I : FUNDAMENTAL CONCEPTS AND MATHEMATICAL PRELIMINARIES | (9 Periods) |
| Introduction - Elements of an electrical communication system need for modulation - Characteristics of communication channel and their mathematical modeling - Signal models - deterministic and random - signal classification - Convolution Integral and response of LTI system - Fourier series representation - Parseval's theorem - Random Process - mean, correlation and covariance - stationary and ergodic processes - Gaussian Process. | |
| UNIT – II : ANALOG COMMUNICATION SYSTEMS | (9 Periods) |
| Analog communication systems -Amplitude modulation theory – Generation of AM – Supression of carrier – Suppression of unwanted sideband – Theory of frequency and phase modulation – Generation of frequency modulation – Receiver types – AM receivers – Communication receivers – FM receivers – internal noise – external noise – noise figure. | |
| UNIT – III : PULSE MODULATION | (9 Periods) |
| Pulse Modulation - Sampling process - sampling theorem for band limited signals - pulse amplitude modulation (PAM) - pulse width modulation (PWM) - pulse position modulation (PPM) - pulse code modulation (PCM) - line coding - differential pulse code modulation - delta modulation and adaptive delta modulation - Basics of time division multiplexing | |
| UNIT – IV : DIGITAL MODULATION SCHEMES | (9 Periods) |
| Basic digital modulation schemes and signaling - Overview of geometric representation of signals - Gram-Schmidt Orthogonalization procedure - Phase shift keying (PSK) - amplitude shift keying (ASK) - frequency shift keying (FSK) and Quadrature amplitude modulation (QAM) - coherent demodulation and detection | |
| UNIT – V : BROADBAND, FIBER OPTIC TECHNOLOGY | (9 Periods) |
| Multiplexing, short, medium and long haul systems – elements of long distance telephony – introduction to fiber optics – optical fiber and fiber cables – fiber optic components and systems. | |
| CONTACT PERIODS: | |
| Lecture: 45 Periods | Tutorial: 0 Periods |
| Practical: 0 Periods | Total: 45 Periods |

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COIMBATORE 641 013.

Text Books: ✓

1. Simon S. Haykin, Michael Moher, Michael Moher, "Communication Systems", 5th Edition, Wiley publications, 2010.
2. G Kennedy, B Davis and S R M Prasanna, "Electronic communication systems", Tata Mc-Graw Hill, Fifth Edition 2011

Reference Books: ✓

1. B.P.Lathi, Zhi Ding, "Modern Analog And Digital Communication systems", 4/e, Oxford University Press, 2009
2. Wayne Tomasi, Electronic Communication Systems: Fundamentals Through Advanced, Pearson Education, Fifth edition
3. H.Taub, D L Schilling, G.Saha, Principles of Communication systems, Tata Mc-Graw Hill, fourth edition, 2013
4. Martin S.Roden, Analog and Digital Communication System, fifth Edition, Shroff Publishers & Distributors Pvt. Limited, 2006.
5. B.Sklar, Digital Communication: Fundamentals and Applications, third edition, Pearson Education 2014.

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

CO1: Represent the communication system using mathematical models [Understand]

CO2: Compare and explain various analog modulation schemes. [Understand]

CO3: Compare and explain various pulse modulation schemes. [Understand]

CO4: Compare and explain various digital modulation schemes. [Understand]

CO5: Explain the functioning of broadband systems and fiber optic technology [Familiarity]

COURSE ARTICULATION MATRIX:

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | H | | | | | | | | | | | | L | |
| CO2 | H | L | | | | | | | | | | | L | |
| CO3 | H | M | | M | | | | | | | | | M | |
| CO4 | H | L | | | | | | | | | | | L | |
| CO5 | H | L | | | | | | | | | | | L | |
| 16IES304 | H | L | L | L | | | | | | | | | L | |

L-Low, M-Moderate (Medium) and H-High

16IPC305 ✓

DATA STRUCTURES AND APPLICATIONS

CATEGORY: PC ✓

L T P C

3 0 0 3 ✓

PRE-REQUISITE:

NIL ✓

COURSE OBJECTIVES:

Upon completion of this course the students will be Familiar with:

- * Representation, operations and the use of basic linear data structures and their variants in ✓ diverse applications.
- * Representation, operations and the use of basic non-linear data structures in ✓ diverse applications.
- * Sorting, Searching and Hashing techniques

| | |
|---|--|
| UNIT – I : LINEAR DATA STRUCTURES – ARRAY and LIST | (9 Periods) |
| Abstract Data Types (ADTs) – List ADT – array - based implementation – linked list implementation— singly linked lists - circularly linked lists - doubly - linked lists – applications of lists – Polynomial Manipulation - All operation (Insertion- Deletion- Find) | |
| UNIT – II : LINEAR DATA STRUCTURES – STACKS, QUEUES | (9 Periods) |
| Stack ADT – array and linked list implementation- Evaluating arithmetic expressions - Infix to postfix conversion- balancing symbols - Queue ADT – circular queue implementation –Double ended Queues– applications of queues. | |
| UNIT – III : NON - LINEAR DATA STRUCTURES – TREES, HEAPS | (9 Periods) |
| Binary Search trees-insertion-deletion-find -Traversal - AVL trees – B - Trees – Red -Black trees – Splay trees - Heaps - Heap creation - Binomial Heaps –Fibonacci Heaps. | |
| UNIT – IV : NON - LINEAR DATA STRUCTURES - GRAPHS | (9 Periods) |
| Representation of Graphs – Breadth first search– Depth first search – Topological sort – Minimum Spanning Trees – Kruskal's and Prim's algorithm –Shortest path algorithm – Dijkstra's and Bellman Ford algorithm - Graph coloring problem- Biconnected- Articulation point. | |
| UNIT – V : SORTING, SEARCHING AND HASH TECHNIQUES | (9 Periods) |
| Sorting algorithms- Insertion sort - Selection sort - Shell sort - Bubble sort - Quick sort - Merge sort - Radix sort – Heap sort – Searching- Linear search – Binary Search. Hashing - Hash Functions – Separate Chaining – Open Addressing– Rehashing – Extendible Hashing | |
| CONTACT PERIODS: | |
| Lecture: 45 Periods | Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods ✓ |

Text Books:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd Edition, 2011
2. Robert Kruse, C.L.Tondo, Bruce Leung, ShashiMogella, "An Introduction to Data Structures with Applications", Tata McGraw Hill Publishing Book Company, 2007.

Reference Books:

1. Jean-Paul Tremblay & Paul G.Sorenson, "An Introduction to Data Structures with Applications", Tata McGraw Hill Publishing Book Company, 2007.

COURSE OUTCOMES:

Upon completion of this course the students will be able to:

CO 1: Analyze the arrangement of data elements in a list. [Analyze]

CO 2: Analyze the arrangement of data elements in stack and queue and study its applications. [Analyze]

CO 3: Use binary tree, binary search tree and AVL tree. [Understand]

CO 4: Apply graph algorithms. [Understand]

CO 5: Perform different sorting, searching and hashing techniques. [Understand]

COURSE ARTICULATION MATRIX:

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | L | | L | | | | L | L | | | L | | L | L |
| CO2 | L | | L | | | | L | L | | | M | | L | L |
| CO3 | M | M | M | M | M | M | | | | | H | | M | L |
| CO4 | M | M | M | M | M | M | | | | | H | | M | L |
| CO5 | M | M | M | M | M | M | | | | | H | | M | L |
| 16IPC305 | M | M | M | M | M | M | L | L | | | H | | M | L |

L-Low, M-Moderate (Medium) and H-High

| | | | |
|---|---|---|----|
| L | T | P | C |
| 3 | 0 | 0 | 3✓ |

PRE-REQUISITE:

NIL ✓

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * Basic structure, operations and addressing modes of computer. ✓
- * Representation of Fixed point and floating point operations. ✓
- * Basic Organization and operations of data path, control path and pipelining ✓
- * Memory organization, Cache Optimization and I/O data transfer. ✓
- * Parallel processing architectures. ✓

| | |
|---|----------------------|
| UNIT – I : ARCHITECTURE: AN OVERVIEW ✓ | (9 Periods) |
| Functional Units of a Digital Computer – Translation from a High Level Language to Hardware Language – Technology – Performance – Power wall – Uniprocessors to multiprocessors; Instructions: Operations and Operands– Representing instructions – Logical and Control Operations – Addressing modes | |
| UNIT – II : COMPUTER ARITHMETIC ✓ | (9 Periods) ✓ |
| Number and Character Representation - Addition/Subtraction Logic Unit – Design of Fast Adder: Ripple-carry adder, carry-look ahead adder – Multiplication: Array and sequential circuit – Booth Algorithm – Fast Multiplication – Division – Restoring and Non-Restoring methods – Floating point numbers and operations. | |
| UNIT – III : PROCESSOR DESIGN ✓ | (9 Periods) ✓ |
| Processor and Register Organization – Instruction Cycle - Logic Design Conventions - Building a Data path and Control - Micro-programming and Hard-wired Control – RISC Vs CISC Characteristics - Pipelining – Pipelining Hazards - Pipelined Data path and Control - Exceptions Handling. | |
| UNIT – IV : MEMORY AND I/O INTERFACING ✓ | (9 Periods) ✓ |
| Memory Technologies – Basics of Caches – Measuring and Improving Cache Performance –Virtual Machines and Memory - Memory Hierarchy – RAID – Accessing I/O devices – Interrupts – Buses and bus arbitration – DMA - Interface Circuits – Standard I/O interfaces. | |
| UNIT – V : PARALLEL PROCESSING ✓ | (9 Periods) ✓ |
| Classification of Parallel Structures – Challenges and Benefits – SISD, MIMD, SIMD,SPMD and Vector – Hardware Multithreading – Multicore and other Shared memory Multiprocessors – Interconnection Networks – Performance Considerations. | |
| CONTACT PERIODS: | |
| Lecture: 45 Periods Tutorial: 0 Periods Practical: 0 Periods Total: 45 Periods ✓ | |

Text Books:

1. David. A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software Interface", ARM Edition, Morgan-Kaufmann Publishers Inc. 2016
2. V. Carl Hamacher, Zvonko G. Varanasic and Safat G. Zaky, "Computer Organisation", VI edition, McGraw-Hill Inc, 2012.

Reference Books:

1. Andrew S. Tenenbaum, "Structured Computer Organization", 6th Edition, Pearson Education, 2012.
2. William Stallings, "Computer Organization and Architecture: Designing for Performance", Pearson Education, 8th Edition, 2009.
3. Mostafa Abd-El-Barr and Hesham El-Rewini, "Fundamentals of Computer Organization and Architecture", John Wiley & Sons Inc., 2005
4. Morris Mano. M, "Computer system Architecture", PHI publication, 3rd edition, 2008.

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

- CO1:** Describe the functioning of computer hardware and instruction set. [Familiarize]
CO2: Perform fixed point and floating point arithmetic operations. [Understand]
CO3: Design data path, control path and pipelining. [Understand]
CO4: Evaluate the performance of caches and interface I/O devices. [Analyze]
CO5: Elaborate parallel structure classification. [Analyze]

COURSE ARTICULATION MATRIX:

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | M | L | | | | | | | | | | | H | M |
| CO2 | L | | H | M | | | | | | | | | | |
| CO3 | H | | H | | | | | | | | | | L | H |
| CO4 | M | | H | | | | | | | | | | L | H |
| CO5 | M | | | | | | | | | | | | H | |
| 16IES306 | H | L | H | M | | | | | | | | | H | H |

L-Low, M-Moderate (Medium) and H-High

16IES307 ✓

DIGITAL LOGIC DESIGN LABORATORY

CATEGORY: ES ✓

| | | | |
|---|---|-----|-----|
| L | T | P | C |
| 0 | 0 | 4 ✓ | 2 ✓ |

PRE-REQUISITE:

NIL ✓

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * Various logic gates and flip-flops.
- * Various Combinational and sequential circuits.
- * Coding of HDL

LIST OF EXPERIMENTS

1. Boolean laws and truth table Verification using Gates
2. Half/Full Adder/Subtractor
3. Design code convertors
4. Implementation of Multiplexer and de-multiplexer
5. Implementation of Encoder and decoder
6. Two bit magnitude comparator
7. Verification of Flip-flop's truth table
8. Implementation of Shift registers
9. Design of Counters
10. Coding Combinational/Sequential Circuits using HDL

CONTACT PERIODS:

| | | | |
|--------------------|---------------------|-----------------------|-------------------|
| Lecture: 0 Periods | Tutorial: 0 Periods | Practical: 60 Periods | Total: 60 Periods |
|--------------------|---------------------|-----------------------|-------------------|

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

- CO1: Design and verify the truth tables of different logic gates [Understand]
 CO2: Identify, analyze and design combinational circuits [Analyze]
 CO3: Understand the operation of different types of flip-flops [Understand]
 CO4: Design different types of shift register and counters [Analyze]
 CO5: Implement combinational/sequential circuits using HDL [Analyze]

COURSE ARTICULATION MATRIX:

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | H | M | M | M | L | | | L | | | | | M | L |
| CO2 | H | M | M | M | L | | | | | | | | M | L |
| CO3 | H | H | H | H | M | | | L | | | | | H | L |
| CO4 | H | H | H | H | M | | | L | | | | | H | L |
| CO5 | H | H | H | H | M | | | L | | | | | H | L |
| 16IES307 | H | H | H | H | M | | | L | | | | | H | L |

L-Low, M-Moderate (Medium) and H-High

16IPC308 ✓

**DATA STRUCTURES AND
APPLICATIONS LABORATORY**

CATEGORY: PC ✓

| L | T | P | C |
|---|---|---|-----|
| 0 | 0 | 4 | 2 ✓ |

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * The operations of linear and non-linear data structures.
- * Sorting and searching techniques.
- * Hashing techniques.

LIST OF EXPERIMENTS

1. Implementation of List (array and linked list)
2. Implementation of Stack and Queue and its applications
3. Implementation of Binary tree operations
4. Implementation of Heaps
5. Implementation of Graph traversal algorithms
6. Implementation of Topological sorting
7. Implementation of Minimum Spanning Tree
8. Implementation of Shortest Path Algorithms
9. Implementation of Sorting and searching techniques
10. Implementation of Hashing techniques

CONTACT PERIODS:

| | | | |
|---------------------------|----------------------------|------------------------------|--------------------------|
| Lecture: 0 Periods | Tutorial: 0 Periods | Practical: 60 Periods | Total: 60 Periods |
|---------------------------|----------------------------|------------------------------|--------------------------|

COURSE OUTCOMES:

Upon completion of this course the students will be able to:

CO1: Implement linear data structures like stack, queue, linked list and its operations. [Analyze]**CO2:** Implement non-linear data structures tree, heaps and graph and its operations. [Analyze]**CO3:** Sort an array's elements using insertion, selection and quick sort algorithms. [Analyze]**CO4:** Search an element in an array using linear and binary search algorithms. [Analyze]**CO5:** Index a table using different hashing techniques. [Analyze]**COURSE ARTICULATION MATRIX:**

| | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| CO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| CO1 | H | H | M | M | M | M | M | M | | | M | | M | M |
| CO2 | H | H | M | M | M | M | M | M | | | M | | M | M |
| CO3 | H | H | M | M | M | M | M | M | | | M | | M | M |
| CO4 | H | H | M | M | M | M | M | M | | | M | | M | M |
| CO5 | H | H | M | M | M | M | M | M | | | M | | M | M |
| 16IPC308 | H | H | M | M | M | M | M | M | | | M | | M | M |

L-Low, M-Moderate (Medium) and H-High

16IEE309 /

PROFESSIONAL ENGLISH /

CATEGORY: EEC /

| | | | |
|---|---|---|---|
| L | T | P | C |
| 0 | 0 | 4 | 2 |

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

Upon completion of this course, the students will be familiar with,

- * Usage of English language.
- * Correct pronunciation of English words.
- * Different methods of presentation needed for doing GD, Debate & Mock Interview.
- * Steps for writing good resume and general articles.
- * Reading for Comprehension.
- * Grooming soft skills.
- * Appropriacy in nonverbal communication

LIST OF EXPERIMENTS

1. Listening to American accent
2. Listening to British accent
3. Practising pronunciation
4. Practising stress and intonation
5. Watching & doing Presentation and GD
6. Watching and doing Debate and Mock Interviews
7. Writing resume
8. Writing articles in English
9. Reading for Comprehension and pleasure
10. Reading technical texts
11. Developing nonverbal communication
12. Developing soft skills

CONTACT PERIODS:

| | | | |
|--------------------|---------------------|-------------------------|---------------------|
| Lecture: 0 Periods | Tutorial: 0 Periods | Practical: 60 Periods / | Total: 60 Periods / |
|--------------------|---------------------|-------------------------|---------------------|

COURSE OUTCOMES:

Upon completion of this course, the students will be able to,

- CO1:** Listen to and understand spoken English [Familiarize]
- CO2:** Use correct pronunciation and speak English with proper stress and intonation. [Familiarize]
- CO3:** Do presentation, GD, Debate & Mock interview confidently. [Familiarize]
- CO4:** Write good resume and articles in English. [Familiarize]
- CO5:** Read books in English with confidence. [Familiarize]
- CO6:** Develop body language and soft skills. [Familiarize]

Controller of Examinations
Government College of Technology
COIMBATORE 641 013

COURSE ARTICULATION MATRIX:

| CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 |
|----------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| CO1 | | | | | | H | | | H | H | | H | | H |
| CO2 | | | | | | H | | | H | H | | H | | H |
| CO3 | | | | | | H | | | H | H | H | H | H | L |
| CO4 | | | | | | H | | | H | H | H | H | H | M |
| CO5 | | | | | | H | H | M | H | H | M | H | H | H |
| CO6 | | | | | | H | | | H | H | H | H | H | M |
| 16IEE309 | | | | | | M | H | L | H | H | H | M | H | H |

L-Low, M-Moderate (Medium) and H-High