

**M .KUMARASAMY COLLEGE OF ENGINEERING, KARUR
(AUTONOMOUS)**

Affiliated to Anna University - Chennai

R-2012

(Common to all B.E / B.TECH Degree Programmes)
I-II SEMESTERS CURRICULA & SYLLABI

I SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|----------------|---|----|----|-----|---|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12101(R) | Technical English- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 2 | UFY12102 | Engineering Mathematics- I | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12103 | Engineering Physics- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12104 | Engineering Chemistry- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12105CM | Basic Civil And Mechanical Engineering (<i>Common to ECE,EEE&EIE</i>) | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| | UFY12105FP | Fundamentals Of Computing And Programming (<i>Common to MECH, CIVIL, CSE&IT</i>) | | | | | | | |
| 6 | UFY12106EG | Engineering Graphics (<i>Common to ECE,EEE&EIE</i>) | 1 | 3 | 0 | 4 | 50 | 50 | 100 |
| | UFY12106EE (R) | Basic Electrical And Electronics Engineering (<i>Common to MECH, CIVIL, CSE&IT</i>) | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107EPP | Engineering Practices Laboratory (<i>Common to ECE,EEE&EIE</i>) | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| | UFY12107CPP | Computer Practice Laboratory (<i>Common to MECH, CIVIL, CSE&IT</i>) | | | | | | | |
| 8 | UFY12108PP | Physics Laboratory (<i>Common to ECE,EEE&EIE</i>) | 50 | 50 | 100 | | | | |
| | UFY12108CP | Chemistry Lab (<i>Common to MECH, CIVIL, CSE&IT</i>) | | | | | | | |

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I-II SEMESTERS CURRICULA & SYLLABI

II SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|--|---|---|---|---|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12201(R) | Technical English- II | 2 | 0 | 1 | 3 | 50 | 50 | 100 |
| 2 | UFY12202 | Engineering Mathematics- II | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12203 | Engineering Physics- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12204 | Engineering Chemistry- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12205EC | Electric Circuit And Electron Devices (<i>ECE Only</i>) | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| | UFY12205CA | Electric Circuit Analysis (<i>Common To EEE & EIE</i>) | | | | | | | |
| | UFY12205EM | Engineering Mechanics (<i>Common To MECH & CIVIL</i>) | | | | | | | |
| | UFY12205UC | Unix And C Programming (<i>Common To CSE & IT</i>) | | | | | | | |
| 6 | UFY12206FP | Fundamentals Of Computing And Programming (<i>Common to ECE,EEE&EIE</i>) | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| | UFY12206EG | Engineering Graphics (<i>Common to MECH, CIVIL, CSE&IT</i>) | 1 | 3 | 0 | 4 | | | |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12207EPP | Engineering Practices Laboratory (<i>Common to MECH, CIVIL, CSE&IT</i>) | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| | UFY12207CPP | Computer Practice Laboratory (<i>Common to ECE,EEE&EIE</i>) | | | | | | | |

| | | | | | | |
|---|-------------|---|---------|----|----|-----|
| 8 | UFY12208PP | Physics Laboratory (<i>Common to MECH,CIVIL,CSE&IT</i>) | 0 0 3 2 | 50 | 50 | 100 |
| | UFY12208CP | Chemistry Laboratory (<i>Common to ECE,EEE&EIE</i>) | | | | |
| 9 | UFY12209CMP | Computer Aided Drafting And Modeling Laboratory (<i>Common to MECH&CIVIL</i>) | 0 0 3 2 | 50 | 50 | 100 |
| | UFY12209UCP | Unix And C Programming Laboratory (<i>Common to CSE & IT</i>) | | | | |
| | UFY12209ECP | Electrical Circuit Lab (<i>Common to EEE & EIE</i>) | | | | |
| | UFY12209CDP | Circuits And Devices Lab (<i>For ECE only</i>) | | | | |

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(Common to B.E Electrical and Electronics Engineering & B.E Electronics and Instrumentation Engineering)

**I-II SEMESTERS CURRICULA & SYLLABI
I SEMESTER**

| S.NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|--|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12101(R) | Technical English- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 2 | UFY12102 | Engineering Mathematics- I | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12103 | Engineering Physics- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12104 | Engineering Chemistry- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12105CM | Basic Civil And Mechanical Engineering | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 6 | UFY12106EG | Engineering Graphics | 1 | 3 | 0 | 4 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107EPP | Engineering Practices Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12108PP | Physics Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 16 | 4 | 6 | 24 | | | |

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(Common to B.E Electrical and Electronics Engineering & B.E Electronics and Instrumentation Engineering)

II SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|---|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12201(R) | Technical English- II | 2 | 0 | 1 | 3 | 50 | 50 | 100 |
| 2 | UFY12202 | Engineering Mathematics- II | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12203 | Engineering Physics- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12204 | Engineering Chemistry- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12205CA | Electric Circuit Analysis | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 6 | UFY12206FP | Fundamentals Of Computing And Programming | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107CPP | Computer Practice Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12208CP | Chemistry Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 9 | UFY12209ECP | Electrical Circuit Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 18 | 2 | 9 | 26 | | | |

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**(For B.E Electronics & Communication Engineering)
I-II SEMESTERS CURRICULA & SYLLABI
I SEMESTER**

| S.NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|--|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12101(R) | Technical English- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 2 | UFY12102 | Engineering Mathematics- I | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12103 | Engineering Physics- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12104 | Engineering Chemistry- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12105CM | Basic Civil And Mechanical Engineering | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 6 | UFY12106EG | Engineering Graphics | 1 | 3 | 0 | 4 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107EPP | Engineering Practices Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12108PP | Physics Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 16 | 4 | 6 | 24 | | | |

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II SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|---|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12201(R) | Technical English- II | 2 | 0 | 1 | 3 | 50 | 50 | 100 |
| 2 | UFY12202 | Engineering Mathematics- II | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12203 | Engineering Physics- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12204 | Engineering Chemistry- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12205EC | Electric Circuits And Electron Devices | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 6 | UFY12206FP | Fundamentals Of Computing And Programming | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107CPP | Computer Practice Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12208CP | Chemistry Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 9 | UFY12209CDP | Circuits And Devices Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 18 | 2 | 9 | 26 | | | |

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I-II SEMESTERS CURRICULA & SYLLABI**

I SEMESTER

| S.NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|---------------|---|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12101(R) | Technical English- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 2 | UFY12102 | Engineering Mathematics- I | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12103 | Engineering Physics- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12104 | Engineering Chemistry- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12105FP | Fundamentals Of Computing And Programming | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 6 | UFY12106EE(R) | Basic Electrical And Electronics Engineering | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107CPP | Computer Practice Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12108CP | Chemistry Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 18 | 1 | 6 | 23 | | | |

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II SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|-----------------------------------|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12201(R) | Technical English- II | 2 | 0 | 1 | 3 | 50 | 50 | 100 |
| 2 | UFY12202 | Engineering Mathematics- II | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12203 | Engineering Physics- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12204 | Engineering Chemistry- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12205UC | Unix And C Programming | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 6 | UFY12206EG | Engineering Graphics | 1 | 3 | 0 | 4 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107EPP | Engineering Practices Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12208PP | Physics Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 9 | UFY12209UCP | Unix And C Programming Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 16 | 5 | 9 | 27 | | | |

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**(Common to B.E Mechanical & Civil Engineering)
I-II SEMESTERS CURRICULA & SYLLABI**

I SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|---------------|--|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12101(R) | Technical English- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 2 | UFY12102 | Engineering Mathematics- I | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12103 | Engineering Physics- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12104 | Engineering Chemistry- I | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12105FP | Fundamentals Of Computing And Programming | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 6 | UFY12106EE(R) | Basic Electrical And Electronics Engineering | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12107CPP | Computer Practice Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12108CP | Chemistry Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 18 | 1 | 6 | 23 | | | |

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**R-2012
(Common to B.E Mechanical & Civil Engineering)**

II SEMESTER

| S. NO | SUBJECT CODE | SUBJECT TITLE | L | T | P | C | Maximum Marks | | |
|------------------|--------------|---|----|---|---|----|---------------|-----|-----|
| | | | | | | | CIA | ESE | TOT |
| THEORY | | | | | | | | | |
| 1 | UFY12201(R) | Technical English- II | 2 | 0 | 1 | 3 | 50 | 50 | 100 |
| 2 | UFY12202 | Engineering Mathematics- II | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 3 | UFY12203 | Engineering Physics- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 4 | UFY12204 | Engineering Chemistry- II | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| 5 | UFY12205EM | Engineering Mechanics | 3 | 1 | 0 | 4 | 50 | 50 | 100 |
| 6 | UFY12206EG | Engineering Graphics | 1 | 3 | 0 | 4 | 50 | 50 | 100 |
| PRACTICAL | | | | | | | | | |
| 7 | UFY12207EPP | Engineering Practices Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 8 | UFY12208PP | Physics Lab | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| 9 | UFY12209CMP | Computer Aided Drafting And Modeling Laboratory | 0 | 0 | 3 | 2 | 50 | 50 | 100 |
| TOTAL | | | 16 | 5 | 9 | 27 | | | |

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Unit – I: Focus on Language

General vocabulary – collocation – Word formation – Nominal Compounds- Tenses – Preposition – articles – Adverbs – Adverb forms

Unit – II: Focus on Language

Science & Technology terms – Voices - Modal Verbs – Connectives – single line definition – Comparative Adjective – Numerical Adjectives.

Unit – III: Writing – I

Writing Message (Circular, Memo, Agenda, Minutes, Notice, Short Messages) – Checklist – Recommendation – Process description – Transfer of information - Report writing - Proposal writing.

Unit – IV: Writing – II

Instructions – E-Mail – Letter Writing (Formal letters – Job Application, Invitation letter (accepting & declining) Quotation, ordering, complaining, seeking clarification, permission – in-plant training).

Unit – V: Reading

Skimming & Scanning the text – understanding the gist of an argument – Inferring lexical & contextual meaning – Reading short stories – cloze test – Reading comprehension.

Extensive Reading:**Total Periods: 45**

Swami and Friends – R.K.Narayan

References:

Pusplatha and Sanjay Kumar, 'Communication skills', Oxford University Press, 2011.

Daniel G.RiovDav , 'Technical Communication', India Binding house, 2009.

Shiv K.Kumar and Dr.Hemalatha Nagarajan , 'Learn correct English',

Pearson Education (Singapore) pvt-Ltd, 2012.

Unit – I – Communication**9**

Communication – Verbal – Nonverbal – Soft skills (personality Development, Body language – Etiquette and manners).

Unit – II – Listening skill – I**9**

Listening and its process – Barriers to listening – Listening to pre-recorded video/audio cassettes - Listening to reading in the class - for vocabulary - for complete understanding – for better pronunciation.

Unit – III – Listening – II**9**

Listening for general content – listening to fill up information – Intensive listening for specific purpose – Extensive listening.

Unit – IV – Speaking – I**9**

Framing Yes/No and WH Questions – introducing oneself in various situations – Dialogues in various situations -Presentation– interview skills, Group Discussions.

Unit – V – Speaking – II**9**

Describing the objects, situation and people Asking questions-Narrating incidents- Just a minute sessions- Day- to- Day Conversations-Debates

Extensive Reading:**Total Periods: 45**

You Can Win – Shiv Kera

References:

Grant Taylor, 'English Conversation Practice' – Tata MC Craw Hill publishing company, 1997.

Puspalatha and Sanjay Kumar, 'Communication skills', Oxford University Press, 2011.

Sasi V. Kumar, 'Spoken English: A self – Learning Guide to Conversation Practice', Tata MC Graw Hill, 1st Edition, 2007.

UNIT I - MATRICES**12**

Characteristic equation – Eigen values and eigen vectors of a real matrix – Properties – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II - THREE DIMENSIONAL ANALYTICAL GEOMETRY**12**

Equation of a sphere – Plane section of a sphere – Tangent Plane – Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

UNIT III - DIFFERENTIAL CALCULUS**12**

Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals.

UNIT IV - FUNCTIONS OF SEVERAL VARIABLES**12**

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

UNIT V - MULTIPLE INTEGRALS**12**

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

TOTAL : 60 PERIODS**TEXT BOOK:**

Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Third edition, Laxmi Publications(p) Ltd.,(2008).

REFERENCES:

1. Grewal. B.S, "Higher Engineering Mathematics", 40th Edition, Khanna Publications, Delhi, (2007).
2. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).
3. Glyn James, "Advanced Engineering Mathematics", 7th Edition, Wiley India, (2007).
4. Jain R.K and Iyengar S.R.K," Advanced Engineering Mathematics", 3rd Edition, Narosa Publishing House Pvt. Ltd., (2007).
5. Veerarajan R., "Engineering Mathematics", fifth Edition, Tata Mc Graw-Hill Publishing Company, New Delhi, (2006).

UNIT I **ORDINARY DIFFERENTIAL EQUATIONS** **12**

Higher order linear differential equations with constant coefficients – Cauchy’s and Legendre’s linear equations – Simultaneous first order linear equations with constant coefficients – Method of variation of parameters in solution of ordinary differential equations.

UNIT II **VECTOR CALCULUS** **12**

Gradient Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green’s theorem in a plane, Gauss divergence theorem and Stokes’ theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepipeds.

UNIT III **ANALYTIC FUNCTIONS** **12**

Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy– Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Milne’s Method – Conformal mapping : $w = z+c$, cz , $1/z$, and bilinear transformation.

UNIT IV **COMPLEX INTEGRATION** **12**

Complex integration – Statement and applications of Cauchy’s integral theorem and Cauchy’s integral formula – Taylor and Laurent expansions – Singular points – Residues – Cauchy’s Residue theorem – Application of residue theorem to evaluate real integrals – Unit circle and semi-circular contour(excluding poles on boundaries).

UNIT V **LAPLACE TRANSFORM** **12**

Laplace transform – Conditions for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse functions – Transform of periodic functions – Inverse Laplace transform– Convolution theorem (excluding proof) – Initial and Final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

TOTAL: 60 PERIODS**TEXT BOOK:**

1. Bali N. P and Manish Goyal, “Text book of Engineering Mathematics”, 3rd Edition, Laxmi Publications (p) Ltd., (2008).

REFERENCES:

1. Grewal. B.S, “Higher Engineering Mathematics”, 40th Edition, Khanna Publications, Delhi, (2007).
2. Ramana B.V, “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, (2007).
3. Glyn James, “Advanced Engineering Mathematics”, 3rd Edition, Wiley India, (2007).
4. Erwin Kreyszig, “Advanced Engineering Mathematics”, 7th Edition, Wiley India, (2007).
5. Jain R.K and Iyengar S.R.K, “Advanced Engineering Mathematics”, 3rd Edition, Narosa Publishing House Pvt. Ltd., (2007).

UNIT-I**9****LASER AND FIBER OPTICS**

Introduction - Einstein's Co-efficients - Population inversion - Nd: YAG Laser- CO2 laser – semi conductor laser- Applications of Laser – Holography – Fiber Optics - Acceptance angle - Numerical aperture-modes of optical propagation-types of fibers - fabrication of fibers-application of optical fibers - fiber optic sensors – Numerical examples

UNIT-II**9****ACOUSTICS OF BUILDINGS & ULTRASONICS**

Introduction - Reverberation time –Sabine's law – Derivation - conditions for good acoustics-methods of design – Measurement of absorption coefficient - Problems. Ultrasonics - Piezoelectric effect- Magnetostriction effect- production of ultrasonic waves-Magnetostriction method- Piezoelectric method –Detection of ultrasonic waves- Acoustic diffraction method-Applications –A, B Scan - Flaws in metals (NDT method) -Medical-field -SONAR.

UNIT-III**9****MODERN PHYSICS**

Mosley's law in X-rays- Plank's law of black body radiation -Compton effect-Derivation-Photo electric effect- Laws of Photo electric effect- Photo electric equation - Dual nature of matter-De Broglie wavelength derivation- Heisenberg's uncertainty principle- Schrodinger's wave equation (Time-dependent & Time independent)- Particle in one dimensional box.

UNIT-IV**9****CRYSTAL PHYSICS**

Lattice – Unit cell – Bravais lattice – Lattice planes – 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 – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy – Crystal defects – point, line and surface defects- Burger vector – Numerical examples.

UNIT-V**9****ELECTRODYNAMICS AND THERMODYNAMICS**

Magnetization and magnetic intensity – Faraday's law of induction – generalization of Ampere's law – Maxwell's equation – electromagnetic wave equation – propagation of EM waves in free space- Thermodynamics - Concept of entropy-Entropy and second law of thermodynamics - Change in entropy in a reversible process (Carnot's cycle) and irreversible process-TE diagram- Entropy of a perfect gas problems – Numerical examples.

TOTAL : 45 PERIODS

TEXT BOOK:

1. A.S.Vasudeva-Modern Engineering Physics-S.Chand & Co, New Delhi-1998- Second edition 2003.
2. Gaur.R.K & Gupta S.L-Engineering Physics-Dhanpat Rai Publications Pvt Ltd- VII Edition, 1992.
3. Brij Lal & Subramaniam –Heat & Thermodynamics-S.Chand & Co-IV Edition-1996.
4. Dr.M.Arumugam-EngineeringPhysics-Anuradha Agencies, Kumbakonam-III Revised Edition 2002.

REFERENCE BOOKS:

1. Laser and Nonlinear Optics, B.B. Laud, 2nd Edition, Wiley Eastern 1991.
2. Heat and thermodynamics, Mark Zemansky, Richard Diffman, Tata McGrawHill, 2006
3. Introduction to electrodynamics, David J. Griffiths, Prentice Hall, 1999

UNIT I - ELECTRICAL CONDUCTIVITY OF METALS**9**

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

UNIT II - SEMICONDUCTING MATERIALS**9**

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

UNIT III - MAGNETIC, SUPERCONDUCTING AND DIELECTRIC MATERIALS**9**

Introduction - Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications – magnetic recording and readout – storage of magnetic data – tapes, floppy and magnetic disc drives. Superconductivity : properties - Types of super conductors - High T_c superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation – Dielectrics - Electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarisation – internal field – Clausius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials - ferroelectricity and applications.

UNIT IV - SPECTROSCOPY**9**

Introduction – Line spectrum – Band spectrum – Atomic spectrum (Emission spectrum) – Molecular Spectrum (IR, UV-VISIBLE) – UV-VIS Spectrophotometer – IR spectrometer – Raman spectrometer - NMR

UNIT V - MODERN ENGINEERING MATERIALS**9**

Metallic glasses: preparation, properties and applications. Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA Nanomaterials: synthesis –plasma arcing – chemical vapour deposition – solgels – electrodeposition – ball milling - properties of nanoparticles and applications. Carbon nanotubes: fabrication – arc method – pulsed laser deposition – chemical vapour deposition - structure – properties and applications.

TOTAL : 45 PERIODS

TEXT BOOKS:

- 1 M. Arumugam, 'Materials Science' Anuradha publications, Kumbakonam, (2006)
- 2 Palanisamy P.K, 'Materials science', Scitech publications(India) Pvt. LTd.,Chennai, second Edition(2007)

REFERENCES:

1. Concepts of Modern Physics, Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, 6th edition, Tata McGraw Hill Companies Inc. 2009
2. Solid State Physics, S. O. Pillai 6th edition, New Age International Private Ltd, 2005
3. Introduction to Nano Technology, Charles P. Pare and Frank J. Ownen, Wiley Publication India, 2007
4. Fundamental of Molecular Spectroscopy, Collin. C. Banwell, Mc Graw Hill, 1983.

LIST OF EXPERIMENTS

1. (i). Particle size determination using light diffraction method
(ii). Determination of Laser parameters – Wavelength, and angle of divergence using grating.
(iii). Determination of acceptance angle of the optical fiber.
2. Determination of velocity of sound and compressibility of liquid using Ultrasonic interferometer.
3. Determination of wavelengths of mercury spectrum using grating.
4. Lee's Disc - thermal conductivity of a bad conductor (card board).
5. Young's modulus of the material (wooden scale) – uniform and non uniform bending.
6. Determination of Band Gap of a semiconductor material.
7. Determination of viscosity of liquid – Poiseuille's method.
8. Torsional pendulum – Determination of rigidity modulus.

TOTAL: 45 PERIODS

UNIT I - WATER TECHNOLOGY**9**

Characteristics – Alkalinity – types of alkalinity and determination – hardness –types and estimation by EDTA method (problems); Boiler feed water– requirements - disadvantages of using hard water in boilers – Internal conditioning (phosphate, calgon and carbonate conditioning methods) – External conditioning – demineralization process – desalination and reverse osmosis. Domestic water treatment –disinfection methods (chlorination, ozonation, UV treatment)

UNIT II - POLYMERS AND COMPOSITES**9**

Polymers-definition – Polymerization –types – addition and condensation polymerization – free radical polymerization mechanism – Plastics, classification– preparation, properties and uses of PVC, Teflon, polycarbonate, polyurethane, nylon-6, 6, PET- Rubber -vulcanization of rubber, synthetic rubbers – butyl rubber, SBR, Composites – definition, types polymer matrix composites – FRP only.

UNIT III - NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES**9**

Nuclear energy – fission and fusion reactions and light water nuclear reactor for power generation (block diagram only) – Breeder reactor – Solar energy conversion – solar cells – Wind energy - Batteries – alkaline batteries – lead–acid, nickel–cadmium and lithium ion batteries- Fuel cells – hydrogen – oxygen fuel cell .

UNIT IV - ENGINEERING MATERIALS**9**

Lubricants – mechanism of lubrication, liquid Lubricants, - properties – viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants – graphite and molybdenum sulphide.

Refractories-classification- acidic, basic and neutral refractories-properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling)-manufacture of alumina, magnesite and zirconia bricks.Cements- composition, manufacturing process , properties.

UNIT V - POLLUTION**9**

Introduction-causes of pollution-BOD - COD-types of pollution-Causes, Effects & Control measures of Air pollution, Noise pollution, Water pollution, Radioactive pollution& Plastic pollution. Acid rain, Green house effect, Global warming, Ozone depletion,Environmental laws.

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co.,NewDelhi .(2012)
2. S.S. Dara “A Text book of Engineering Chemistry” S.Chand & Co.Ltd, NewDelhi(2006)
3. Masters, G.M., “Introduction to Environmental Engineering and Science”, Pearson Education Pvt., Ltd.(2004)

REFERENCES:

1. B.K.Sharma “Engineering Chemistry” Krishna Prakasan Media (P) Ltd., Meerut(2001)
2. B. Sivasankar “Engineering Chemistry” Tata McGraw-Hill Pub.Co.Ltd,NewDelhi (2008).

UNIT I - CORROSION AND CORROSION CONTROL**9**

Chemical corrosion – pitting – bedworth rule – Electrochemical corrosion –different types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – Corrosion control – sacrificial anode and impressed cathodic current methods – Corrosion inhibitors – Protective coatings – paints –constituents and functions – metallic coatings – electroplating (Au) and electroless (Ni) plating.

UNIT II - ELECTROCHEMISTRY**9**

Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – Single electrode potential – nernst equation – Reference electrodes –Standard Hydrogen electrode -Calomel electrode – Ion selective electrode – Glass electrode and measurement of pH (problems) – Electrochemical series –significance – Potentiometric titrations (Redox - Fe^{2+} Vs dichromate and Precipitation – Ag^+ Vs Cl^- titrations) and Conductometric titrations (acid-base – HCl Vs NaOH) titrations

UNIT III - PHASE RULE AND ALLOYS**9**

Statement and explanation of terms involved – One component system – water System – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead-silver system only) – Alloys – importance, ferrous alloys nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

UNIT IV - FUELS**9**

Fuel-classification –Coal – proximate and ultimate analysis Metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum Processing and fractions – cracking – catalytic cracking and methods- Knocking – Octane number and Cetane number –Synthetic petrol – Fischer Tropsch and Bergius process – Gaseous fuels- water gas, producer gas, CNG and LPG.

UNIT V - SURFACE CHEMISTRY**9**

Adsorption – types – adsorption of gases on solids – adsorption isotherms –Freundlich and Langmuir isotherms – adsorption of solutes from solution – role of adsorbents in catalysis, ion-exchange adsorption and pollution abatement.

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co.,NewDelhi (2012)
2. S.S. Dara “A Text book of Engineering Chemistry” S.Chand & Co.Ltd, NewDelhi (2006).

REFERENCES:

1. B.K.Sharma “Engineering Chemistry” Krishna Prakasan Media (P) Ltd., Meerut,2001
2. B. Sivasankar “Engineering Chemistry” Tata McGraw-Hill Pub.Co.Ltd,NewDelhi,2008

LIST OF EXPERIMENTS

1. Estimation of hardness of water by EDTA
2. Estimation of chloride in water sample (Argentometric method)
3. Estimation of alkalinity of water sample
4. Estimation of dissolved oxygen in water sample(Winkler's method)
5. Determination of molecular weight and degree of polymerization using Viscometry.
6. Conductometric titration (Strong Acid Vs Strong Base)
7. Potentiometric titration (Fe^{2+} / KMnO_4 or $\text{K}_2\text{Cr}_2\text{O}_7$)
8. Determination of strength of hydrochloric acid by sodium hydroxide (pH Metry)

TOTAL: 45 PERIODS

UNIT I - INTRODUCTION TO COMPUTERS 9

Introduction – Characteristics of Computers – Evolution of Computers - Computer Generations – Classification of Computers – Basic Computer organization – Number Systems

UNIT II - COMPUTER SOFTWARE 9

Computer Software –Types of Software – Software Development Steps – Internet Evolution - Basic Internet Terminology – Getting connected to Internet Applications.

UNIT III - PROBLEM SOLVING AND OFFICE AUTOMATION 9

Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode -Application Software Packages- Introduction to Office Packages (not detailed commands for examination).

UNIT IV - INTRODUCTION TO C 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making - Branching and Looping.

UNIT V - FUNCTIONS AND POINTERS 9

Handling of Character Strings – User-defined Functions – Definitions – Declarations - Call by reference – Call by value – Structures and Unions – Pointers – Arrays – The Preprocessor – Developing a C Program: Some Guidelines

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Ashok.N.Kamthane, “ Computer Programming”, Pearson Education (India) (2008).
2. Behrouz A.Forouzan and Richard.F.Gilberg, “A Structured Programming Approach Using C”, II Edition, Brooks-Cole Thomson Learning Publications, (2007).

REFERENCES:

1. Pradip Dey,Manas Ghoush, “Programming in C”, Oxford University Press.(2007).
2. Byron Gottfried, “Programming with C”, 2nd Edition, (Indian Adapted Edition), TMH publications, (2006). Unit II, III, IV, and V).
3. Stephen G.Kochan, “Programming in C”, Third Edition, Pearson Education India, (2005).
4. Brian W.Kernighan and Dennis M.Ritchie, “The C Programming Language”,Pearson Education Inc., (2005).
5. E.Balagurusamy, “Computing fundamentals and C Programming”, Tata McGRaw-Hill Publishing Company Limited, (2008).
6. S.Thamarai Selvi and R.Murugan, “C for All”, Anuradha Publishers, (2008).

LIST OF EXERCISES

a) **Word Processing**

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

Chart b) **Spread Sheet**

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

C) **Simple C Programming ***

9. Data types, Expression Evaluation, Condition Statements.
10. Arrays
11. Structures and Unions
12. Functions

* For programming exercises Flow chart and pseudocode are essential

TOTAL: 45 PERIODS

UNIT I – INTRODUCTION**9**

Unix Background – The Unix philosophy – Features of Unix – Understanding the Unix command – General Purpose Utilities – File Systems – Handling Ordinary Files - The Shell

UNIT II – THE Vi EDITOR**9**

The Vi Editor – Basic File Attributes – Filters – Regular Expression and the Grep Command – The Process

UNIT III – SHELL PROGRAMMING**9**

Shell Scripts – read Command – Command Line Arguments – Exit Status – Logical and Conditional Operators – exit Command – if Statement – case Statement – expn Computation – sleep and wait – while loop – until loop – for loop – set Command – trap Command – Example Programs

UNIT IV – C BASICS**9**

C Introduction – Fundamentals of C – Arrays and Strings – Pointers - Functions – Structures – Unions – Enumerations - typedef

UNIT V – IO AND FILE**9**

Reading and Writing Characters - Reading and Writing Strings – Formatted Console IO – scanf() and printf() functions – Streams and Files – File System Basics – fread() and fwrite() – fseek() and Random File Access – fprintf() and fscanf() – The Standard Streams – The Preprocessor and Comments

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. UNIX: Concepts and Applications by Sumitabha Das, Second Edition, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. The Complete Reference C by Herbert Schildt, Fourth Edition , Tata McGraw Hill Publishing Company Limited, New Delhi.

REFERENCE BOOKS:

1. The C Programming Language by Brian W.Kernighan& Dennis M.Ritchie, Second Edition, Prentice Hall of India Pvt Ltd, New Delhi.
2. Let Us C by Yashavant P.Kanetkar, Eleventh Edition, BPB Publication, New Delhi.
3. Programming in ANSI C by E.Balagurusamy, Third Edition, Tata McGraw Hill Publishing Company Limited, New Delhi.
4. Unix and Shell Programming-A Textbook by Behrouz A.Forouzan&Richard F.Gilberg, BROOKS/COLE Cengage Learning India Pvt Ltd, New Delhi.
5. Unix Shell Programming by Yashavant P.Kanetkar, BPB Publication, New Delhi.

LIST OF EXPERIMENTS

1. UNIX COMMANDS

Study of Unix OS - Basic Shell Commands - Unix Editor

2. SHELL PROGRAMMING

Simple Shell program - Conditional Statements - Testing and Loops

3. C PROGRAMMING ON UNIX

Dynamic Storage Allocation-Pointers-Functions-File Handling

TOTAL: 45 PERIODS

UNIT I BASIC CIRCUITS ANALYSIS AND NETWORK REDUCTION **12**

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits–Meshcurrentand node voltage method of analysis for D.C and A.C. circuits. Network reduction: voltage and current division, source transformation – star delta conversion

UNIT II NETWORK THEOREMS FOR DC AND AC CIRCUITS **12**

Thevenins and Norton Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem- Millman's theorem- Tellegen's theorem.

UNIT III RESONANCE AND COUPLED CIRCUITS **12**

Series and parallel resonance – their frequency response –Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits –Single tuned circuits.

UNIT IV TRANSIENT RESPONSE FOR DC & AC CIRCUITS **12**

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input.

UNIT V ANALYSING THREE PHASE CIRCUITS **12**

Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced –phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

TOTAL :60 PERIODS

TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", Tata McGraw Hill publishers, 6th edition, New Delhi, (2002).
2. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", Tata McGraw Hill, (2007).

REFERENCES:

1. Paranjothi SR, "Electric Circuits Analysis," New Age International Ltd., New Delhi, (1996).
2. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi (2001).
3. Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, (1999).
4. Charles K. Alexander, Mathew N.O. Sadik, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, (2003).

LIST OF EXPERIMENTS

- I. Verification of ohm's laws and kirchoff's laws.
2. Verification of Thevemin's and Norton's Theorem
3. Verification of superposition Theorem
4. Verification of maximum power transfer theorem.
5. Verification of reciprocity theorem
6. Measurement of self inductance of a coil
7. Verification of mesh and nodal analysis.
8. Transient response of RL and RC circuits for DC input.
9. Frequency response of series and parallel resonance circuits.
10. Frequency response of single tuned coupled circuits.

TOTAL: 45 PERIODS

UFY12106EE BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to B.E MECH,CIVIL,CSE/B.TECT IT)

L T P C 3 0 0 3

UNIT I ELECTRICAL CIRCUITS

9

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits.

UNIT III ELECTRICAL MACHINES

9

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

UNIT III ELECTRICAL MEASUREMENTS

9

Operating Principles of Moving Coil - Moving Iron Instruments (Ammeters and Voltmeters)- Instrument Transformer-Dynamometer type Watt meters – single phase induction type Energy meters. Measurement of resistance –wheatstone bridge , Kelvin's bridge -megger , Earth tester , Multimeter

UNIT IV SEMICONDUCTOR DEVICES AND APPLICATIONS

9

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics.

UNIT V DIGITAL ELECTRONICS

9

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops –Registers and Counters – A/D and D/A Conversion (single concepts)

L:45 T:0 TOTAL: 45 PERIODS

TEXT BOOKS

1. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).
- 2.Sawhney, A.K., A Course in Electrical & Electronic Measurements & Instrumentation, Dhanpat Rai and Co, 2004.

REFERENCE BOOKS

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
3. Mehta V K, "Principles of Electronics", S.Chand & Company Ltd, (1994).
4. Sedha R.S., "Applied Electronics", S. Chand & Co., 2006.

CHAIRMAN- B.O.S

OBJECTIVES

To develop in student's graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

UNIT I - PLANE CURVES AND FREE HAND SKETCHING**12**

Curves used in engineering practices: Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes – Drawing of tangents and normal to the above curves.

Free hand sketching: Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II - PROJECTION OF POINTS, LINES AND PLANE SURFACES**12**

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations

Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III - PROJECTION OF SOLIDS**12**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV - SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES**12**

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V - ISOMETRIC AND PERSPECTIVE PROJECTIONS**12**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective projection of prisms, pyramids and cylinders by visual ray method.

TOTAL:60 PERIODS**TEXT BOOKS:**

1. K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2010).
2. K. Venugopal & V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited (2008).

REFERENCES:

1. M.S. Kumar, "Engineering Graphics", D.D. Publications, (2009).
2. K. R. Gopalakrishnana, "Engineering Drawing" (Vol.I&II), Subhas Publications (2010).
3. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).
4. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).

OBJECTIVES

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

GROUP A CIVIL & MECHANICAL

I. Plumbing Works

- (a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, and elbows in household fittings.
- (b) Preparation of plumbing line sketches for water supply and sewage works.
- (c) Hands-on-exercise: Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.

II. Carpentry

- (a) Tools and Equipments - Planning practice, Making Joints - Half Lap, dovetail, Mortise & Tenon, etc
- (b) Making of Pen stand, Box, etc. from plywood. (Use of modern power tools for cutting)

III. Fitting Works

- (a) Tools & Equipments – Practice, Filing Works.
- (b) Preparation of square fitting, Vee fitting, dovetail fitting etc.

IV. Sheet Metal Work

- (a) Forming & bending operations
- (b) Model making – Trays, funnels, Box etc.
- (c) Different type of joints.

V. Welding

- (a) Preparation of arc welding of butt joints, lap joints and tee joints.
- (b) Gas welding practice

Demonstration on:

- (a) Smithy operations, upsetting, swaging, bending, Production of hexagonal headed bolt.
- (b) Foundry operations like mould preparation for gear, Cube and step cone pulley.

GROUP B ELECTRICAL & ELECTRONICS

I ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
4. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.
6. Measurement of resistance to earth of electrical equipment.

II ELECTRONICS ENGINEERING PRACTICE

1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR.
2. Study of logic gates AND, OR, EOR and NOT.
3. Generation of Clock Signal.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.
6. Study of FM Radio, Television, Phones.

TOTAL: 45 PERIODS

REFERENCES:

1. K.Jeyachandran, S.Natarajan & S, Balasubramanian, “A Primer on Engineering Practices Laboratory”, Anuradha Publications, (2007).
2. T.Jeyapoovan, M.Saravanapandian & S.Pranitha, “Engineering Practices Lab Manual”, Vikas Puplicing House Pvt.Ltd, (2006)
3. H.S. Bawa, “Workshop Practice”, Tata McGraw – Hill Publishing Company Limited, (2007).
4. Suyambazhahan, S, “Engineering Practices Laboratory Manual”, PHI Learning, NewDelhi, (2010).
5. P.Kannaiah & K.L.Narayana, “Manual on Workshop Practice”, Scitech Publications, (2006).
6. John, K. C., “Mechanical Workshop Practice”, Second Edition, PHI Learning, NewDelhi, 2009.

SEMESTER EXAMINATION PATTERN

The Laboratory examination is to be conducted for Group A & Group B, allotting 90 minutes for each group, with a break of 15 minutes. Both the examinations are to be taken together in sequence, either in the FN or AN session. The maximum marks for Group A and Group B lab examinations will be 50 each, totaling 100 for the Lab course.

OBJECTIVE

To make the students to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions.

To make the students to understand the effect of friction, laws of motion, the kinematics and dynamics of particles and rigid bodies.

UNIT I - BASICS & STATICS OF PARTICLES**12**

Introduction – Units and Dimensions – Laws of Mechanics – Lame’s theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

UNIT II - EQUILIBRIUM OF RIGID BODIES**12**

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

UNIT III - PROPERTIES OF SURFACES AND SOLIDS**12**

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

UNIT IV - DYNAMICS OF PARTICLES**12**

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

UNIT V - FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS**12**

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

TOTAL: 60 PERIODS**TEXT BOOK:**

1. Beer, F.P and Johnson Jr. E.R. “Vector Mechanics for Engineers”, Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (2007).
2. Rajasekaran, S, and Sankarasubramanian, G., “Fundamentals of Engineering Mechanics”, Vikas Publishing House, New Delhi, 2008.

REFERENCES:

1. Rajasekaran, S, Sankarasubramanian, G., “Fundamentals of Engineering Mechanics”, Vikas Publishing House Pvt. Ltd., (2000).
2. Hibbeler, R.C., “Engineering Mechanics”, Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).
3. Palanichamy, M.S., Nagam, S., “Engineering Mechanics – Statics & Dynamics”, Tata McGraw-Hill, (2007).
4. Irving H. Shames, “Engineering Mechanics – Statics and Dynamics”, IV Edition – Pearson Education Asia Pvt. Ltd., (2006).

A – CIVIL ENGINEERING**UNIT I - SURVEYING AND CIVIL ENGINEERING MATERIALS****9**

Surveying: Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel sections.

UNIT II - BUILDING COMPONENTS AND STRUCTURES**9**

Substructure: Selection of site for Building, Components of Buildings, Foundations- purpose and Types, Bearing capacity – Requirement of good foundations.

Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering, Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

B – MECHANICAL ENGINEERING**UNIT III - POWER PLANT ENGINEERING****9**

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits.

Pumps – working principle of Reciprocating pumps and Centrifugal Pump, Turbines – working principle of Impulse and reaction turbine.

UNIT IV - IC ENGINES AND ALTERNATE SOURCES OF ENERGY**9**

Internal combustion engine – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Automobiles – important components and its functions.

Alternate Energy sources – Solar energy, Wind energy, Tidal and Geothermal energy – power generation

UNIT V - REFRIGERATION AND AIR CONDITIONING SYSTEM**9**

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner – Calculation of COP.

TOTAL: 45 PERIODS**TEXT BOOK:**

1. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, (2010).

REFERENCES:

1. Ramamrutham. S, “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. (2010).
2. Seetharaman S. “Basic Civil Engineering”, Anuradha Agencies, (2005).
3. Venugopal K and Prahu Raja V, “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, (2007).
4. Shantha Kumar S R J., “Basic Mechanical Engineering”, Hi-tech Publications, Mayiladuthurai, (2008).

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Dimensioning and Hatching of Objects.
4. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.
5. Draw the projection of Planes with inclination to one reference plan.
6. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone with inclination to one reference plan.
7. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
8. Drawing development of prism, pyramid, cylinder, cone, etc,
9. Drawing front view, top view and side view of objects from the given pictorial views.
10. Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.)
11. Drawing of a simple steel truss.
12. Drawing isometric projection of simple objects.
13. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

TOTAL: 45 PERIODS

UNIT I - CIRCUIT ANALYSIS TECHNIQUES**12**

Kirchoff's current and voltage laws – series and parallel connection of R, L and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-delta conversion.

UNIT II - TRANSIENT RESONANCE IN RLC CIRCUITS**12**

Basic RL, RC and RLC circuits and their responses to pulse inputs– frequency response – Parallel and series resonances – Q factor – single tuned and double tuned circuits.

UNIT III - SEMICONDUCTOR DIODES**12**

Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation – space charge and diffusion capacitances — Zener diode and its characteristics- breakdown mechanism

UNIT IV - TRANSISTORS**12**

Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET.

UNIT V - SPECIAL SEMICONDUCTOR DEVICES**12**

Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, Photodiode, Phototransistor– LED, LCD.

TOTAL: 60 PERIODS**TEXT BOOKS:**

1. Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" – Shaum series, TMH, (2001)
2. S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "Electronic Devices and Circuits", 2nd Edition, (2008).
3. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, (2008).

REFERENCES:

1. Robert T. Paynter, "Introducing Electronics Devices and Circuits", Pearson Education, 7th Edition, (2006).
2. William H. Hayt, J.V. Jack, E. Kemmebly and Steven M. Durbin, "Engineering Circuit Analysis", TMH, 6th Edition, 2002.
3. J. Millman & Halkins, Satyabranta Jit, "Electronic Devices & Circuits", TMH, 2nd Edition, 2008.

- 1 Verification of KVL and KCL
- 2 Verification of Thevenin and Norton Theorems.
- 3 Verification of superposition Theorem.
- 4 Verification of Maximum power transfer and reciprocity theorems.
- 5 Frequency response of series and parallel resonance circuits.
- 6 Characteristics of PN and Zener diode
- 7 Characteristics of CE configuration
- 8 Characteristics of CB configuration
- 9 Characteristics of UJT and SCR
- 10 Characteristics of JFET and MOSFET II.
- 11 Characteristics of Diac and Triac.
- 12 Characteristics of Photodiode and Phototransistor.

TOTAL: 45 PERIODS