

# ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

## CURRICULUM AND SYLLABI UNDER REGULATIONS 2008 FOR AFFILIATED INSTITUTIONS (with effect from the academic year 2008 – 2009)

(Common to all B.E. / B.Tech. Degree Programmes)

### SEMESTER II

Sino	Course Code	Course Title	L	T	P	M	C
		<b>THEORY</b>					
1	080020003	Technical English – II*	3	1	0	100	4
2	080030004	Mathematics – II*	3	1	0	100	4
3	080040002	Engineering Physics – II*	3	0	0	100	3
4	080010002	Engineering Chemistry –II*	3	0	0	100	3
5a	080120002	Engineering Mechanics <b>(For non-circuit branches)</b>	3	1	0	100	4
b	080280005	Circuit Theory <b>(For branches under Electrical Faculty)</b>	3	1	0	100	4
c	080290007	Electric Circuits and Electron Devices <b>(For branches under I &amp; C Faculty)</b>	3	1	0	100	4
6a	080280011	Basic Electrical & Electronics Engineering <b>(For non-circuit branches)</b>	4	0	0	100	4
b	080510002	Basic Civil & Mechanical Engineering <b>(For circuit branches)</b>	4	0	0	100	4
7	080230006	Computer Practice Laboratory-II *	0	1	2	100	2
8	080640001	Physics & Chemistry Laboratory*	0	0	3	100	2
9a	080120008	Computer Aided Drafting and Modeling Laboratory <b>(For non-circuits branches)</b>	0	1	2	100	2
b	080280008	Electrical Circuits Laboratory <b>(For branches under Electrical Faculty)</b>	0	0	3	100	2
c	080290004	Circuits and Devices Laboratory <b>(For branches under I &amp; C Faculty)</b>	0	0	3	100	2
<b>Total : 32 periods</b>							

\* Common to all BE/B.Tech Programmes

## **A. CIRCUIT BRANCHES**

### **I Faculty of Electrical Engineering**

1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

### **II Faculty of Information and Communication Engineering**

1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.E. Bio Medical Engineering
4. B.E. Medical Electronics
5. B.Tech. Information Technology

## **B. NON – CIRCUIT BRANCHES**

### **I Faculty of Civil Engineering**

1. B.E. Civil Engineering

### **II Faculty of Mechanical Engineering**

1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
4. B.E. Mechanical Engineering
5. B.E. Production Engineering
6. B.E. Mechatronics Engineering

### **III Faculty of Technology**

1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Textile Technology
4. B.Tech. Textile Technology (Fashion Technology)
5. B.Tech. Textile Chemistry

REGULATIONS 2008

080020003

II SEMESTER  
TECHNICAL ENGLISH II  
(with effect from academic year 2010-11)

L T P C  
3 1 0 4

**Aim:**

To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

**Objectives:**

1. To help students develop listening skills for academic and professional purposes.
2. To help students acquire the ability to speak effectively in English in real-life situations.
3. To inculcate reading habit and to develop effective reading skills.
4. To help students improve their active and passive vocabulary.
5. To familiarize students with different rhetorical functions of scientific English.
6. To enable students write letters and reports effectively in formal and business situations.

**UNIT I**

(12)

Technical Vocabulary – meanings in context, sequencing words, Articles – Prepositions, intensive reading and predicting content, Reading and interpretation, extended definitions, process description

**Suggested activities :**

1. Exercises on word formation using the prefix 'self' – Gap filling with preposition.
2. Exercises – Using sequence words.
3. Reading comprehension exercise with questions based on inference – Reading headings.
4. and predicting the content – Reading advertisements and interpretation.
5. Writing extended definitions – Writing descriptions of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future.

**UNIT II**

Phrases / Structures indicating use / purpose – Adverbs – Skimming – Non-verbal communication – Listening – correlating verbal and non-verbal communication – Speaking in group discussions – Formal Letter writing – Writing analytical paragraphs.

**Suggested activities :**

1. Reading comprehension exercises with questions on overall content – Discussions analyzing stylistic features (creative and factual description) – Reading comprehension exercises with texts including graphic communication – Exercises in interpreting non-verbal communication.
2. Listening comprehension exercises to categorize data in tables.
3. Writing formal letters, quotations, clarification, complaint – Letter seeking permission for Industrial visits – writing analytical paragraphs on different debatable issues.

### **UNIT III**

Cause and effect expressions – Different grammatical forms of the same word – speaking – stress and intonation, Group Discussions – Reading – Critical reading – Listening – Writing – using connectives, report writing – types, structure, data collection, content, form, recommendations.

#### **Suggested activities :**

1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different grammatical forms of the same word. (Eg : object – very / object – noun)
2. Speaking exercises involving the use of stress and intonation – Group discussions – analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, Multiple choice question
4. Sequencing of jumble sentences using connectives – Writing different types of reports like industrial accident report and survey report – Writing recommendations.

### **UNIT IV**

Numerical adjectives – Oral instructions – Descriptive writing – Argumentative paragraphs – Letter of application – content, format (CV / Bio-data) – Instructions, imperative forms – Checklists, Yes / No question form – E-mail communication.

#### **Suggested Activities :**

1. Rewriting exercises using numerical adjectives
2. Reading comprehension exercises with analytical questions on content – Evaluation of content
3. Listening comprehension – entering information in tabular form, intensive listening exercise and completing the steps of a process.
4. Speaking – Role play – group discussions – Activities giving oral instructions.
5. Writing descriptions, expanding hints – Writing argumentative paragraphs – Writing formal letters – Writing letter of application with CV/Bio-data – Writing general and safety instructions – Preparing checklists – Writing e-mail messages.

### **UNIT V**

Speaking – Discussion of Problems and solutions – Creative and critical thinking – writing an essay, writing a proposal.

#### **Suggested Activities:**

1. Case Studies on problems and solutions
2. Brain storming and discussion
3. Writing Critical essays
4. Writing short proposals of 2 pages for starting a project, solving problems, etc.
5. Writing advertisements.

**TOTAL : 60 periods**

**TEXT BOOK :**

1. Chapters 5-8, Department of Humanities & Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 & 2) Chennai : Orient Longman Pvt.Ltd.,206. Themes 5-8 (Technology, Communication, Environment, Industry)

**REFERENCES :**

1. P.K. Dutt, G. Rajeevan and C.L.N.Prakash, 'A Course in Communication Skills', Cambridge University Press, India 2007
2. Krishna Mohan and Meera Banerjee, 'Developing Communication Skills', Macmillan India Ltd. (Reprinted 1994 – 2007)
3. Edgar Thorpe, Showick Thorpe, 'Objective English', Second Edition, Pearson Education, 2007.

**Extensive Reading :**

1. Robin Sharma, 'The Monk Who Sold His Ferran', Jaico Publishing House, 207

**Note**

The book listed under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.



**UNIT I CONDUCTING MATERIALS 9**

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**

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 AND SUPERCONDUCTING MATERIALS 9**

Origin of magnetic moment – Bohr magneton – Dia and para magnetism – Ferro magnetism – Domain theory – 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 – BCS theory of superconductivity(Qualitative) - High T<sub>c</sub> superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation.

**UNIT IV DIELECTRIC MATERIALS 9**

Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarisation – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials (capacitor and transformer) – ferroelectricity and applications.

**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 – sol-gels – electrodeposition – ball milling - properties of nanoparticles and applications.  
Carbon nanotubes: fabrication – arc method – pulsed laser deposition – chemical vapour deposition - structure – properties and applications.

**TEXT BOOKS:**

1. Charles Kittel ‘ Introduction to Solid State Physics’, John Wiley & sons, 7<sup>th</sup> edition, Singapore (2007)
2. Charles P. Poole and Frank J.Ownen, ‘Introduction to Nanotechnology’, Wiley India(2007) (for Unit V)

**REFERENCES:**

1. Rajendran, V, and Marikani A, ‘Materials science’ TMH publications, (2004) New delhi.
2. Jayakumar, S. ‘Materials science’, R.K. Publishers, Coimbatore, (2008).
3. Palanisamy P.K, ‘Materials science’, Scitech publications(India) Pvt. LTd., Chennai, second Edition(2007)
4. M. Arumugam, ‘Materials Science’ Anuradha publications, Kumbakonam, (2006).

To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

### OBJECTIVES

- The student should be conversant with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
- Principles of corrosion control
- Chemistry of Fuels and combustion
- Industrial importance of Phase rule and alloys
- Analytical techniques and their importance.

### UNIT I ELECTROCHEMISTRY 9

Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – Single electrode potential – Nernst equation (problem) – reference electrodes – Standard Hydrogen electrode – Calomel electrode – Ion selective electrode – glass electrode and measurement of pH – electrochemical series – significance – potentiometer titrations (redox -  $\text{Fe}^{2+}$  vs dichromate and precipitation –  $\text{Ag}^+$  vs  $\text{Cl}^-$  titrations) and conductometric titrations (acid-base – HCl vs, NaOH) titrations,

### UNIT II 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 III FUELS AND COMBUSTION 9

Calorific value – 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 processes – Gaseous fuels- water gas, producer gas, CNG and LPG, Flue gas analysis – Orsat apparatus – theoretical air for combustion.

### UNIT IV 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 V ANALYTICAL TECHNIQUES 9

Beer-Lambert's law (problem) – UV-visible spectroscopy and IR spectroscopy – principles – instrumentation (problem) (block diagram only) – estimation of iron by colorimetry – flame photometry – principle – instrumentation (block diagram only) – estimation of sodium by flame photometry – atomic absorption spectroscopy – principles – instrumentation (block diagram only) – estimation of nickel by atomic absorption spectroscopy.

TOTAL: 45 PERIODS

**TEXT BOOKS:**

1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi (2002).
2. S.S.Dara "A text book of Engineering Chemistry" S.Chand & Co.Ltd., New Delhi (2006).

**REFERENCES:**

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

**OBJECTIVE**

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

**UNIT I BASICS & STATICS 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, (1997).

**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, (2001).
4. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
5. Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).

**UNIT I BASIC CIRCUITS ANALYSIS 12**

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits.

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

Network reduction: voltage and current division, source transformation – star delta conversion.

Thevenins and Norton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity 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 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 & unbalanced – 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", TMH publishers, 6<sup>th</sup> 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).

**080290007 ELECTRIC CIRCUITS AND ELECTRON DEVICES 3 1 0 100 4**  
**(For ECE, CSE, IT and Biomedical Engg. Branches)**

**UNIT I CIRCUIT ANALYSIS TECHNIQUES 12**

Kirchoff's current and voltage laws – series and parallel connection of independent sources – 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 and sinusoidal 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 – effect of temperature and breakdown mechanism – Zener diode and its characteristics.

**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 – thermal effect on MOSFET.

**UNIT V SPECIAL SEMICONDUCTOR DEVICES (Qualitative Treatment only) 12**

Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – 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", 2<sup>nd</sup> Edition, (2008).
3. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5<sup>th</sup> Edition, (2008).

**REFERENCES:**

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

**080280011 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING 4 0 0 100 4**  
(Common to branches under Civil, Mechanical and Technology faculty)

**UNIT I ELECTRICAL CIRCUITS & MEASUREMENTS 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.

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

**UNIT II ELECTRICAL MECHANICS 9**

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

**UNIT III 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 – Elementary Treatment of Small Signal Amplifier.

**UNIT IV 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)

**UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING 9**

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

TOTAL : 45 PERIODS

**TEXT BOOKS:**

1. V.N. Mittle "Basic Electrical Engineering", TMH Edition, New Delhi, 1990.
2. R.S. Sedha, "Applied Electronics" S. Chand & Co., 2006.

**REFERENCES:**

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", TMH, 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. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).

**080510002      BASIC CIVIL & MECHANICAL ENGINEERING      4 0 0 100 4**  
(Common to branches under Electrical and I & C Faculty)

**A – CIVIL ENGINEERING**

**UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS      15**

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      15**

Foundations: 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.

TOTAL : 30 PERIODS

**B – MECHANICAL ENGINEERING**

**UNIT III POWER PLANT ENGINEERING      10**

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

**UNIT IV I C ENGINES      10**

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

**UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM      10**

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.

TOTAL: 30 PERIODS

**REFERENCES:**

- 1 Shanmugam G and Palanichamy M S, "Basic Civil and Mechanical Engineering", TMH Publishing Co., New Delhi, (1996).
- 2 Ramamrutham. S, "Basic Civil Engineering", Dhanpat Rai Publishing Co. (P) Ltd. (1999).
- 3 Seetharaman S. "Basic Civil Engineering", Anuradha Agencies, (2005).
- 4 Venugopal K and Prahuraja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).
- 5 Shantha Kumar S R J., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, (2000).

**LIST OF EXPERIMENTS**

<b>1. UNIX COMMANDS</b>	15
Study of Unix OS - Basic Shell Commands - Unix Editor	
<b>2. SHELL PROGRAMMING</b>	15
Simple Shell program - Conditional Statements - Testing and Loops	
<b>3. C PROGRAMMING ON UNIX</b>	15
Dynamic Storage Allocation-Pointers-Functions-File Handling	
	<b>TOTAL : 45 PERIODS</b>

**HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS**

Hardware

■ UNIX Clone Server  
33 Nodes (thin client or PCs)  
Printer – 3 Nos.

Software

OS – UNIX Clone (33 user license or License free Linux)  
Compiler - C

**080640001**

**PHYSICS LABORATORY - II**

**0 0 3 100 2**

**LIST OF EXPERIMENTS**

1. Determination of Young's modulus of the material – non uniform bending.
  2. Determination of Band Gap of a semiconductor material.
  3. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
  4. Determination of viscosity of liquid – Poiseuille's method.
  5. Spectrometer dispersive power of a prism.
  6. Determination of Young's modulus of the material – uniform bending.
  7. Torsional pendulum – Determination of rigidity modulus.
- \* A minimum of FIVE experiments shall be offered.
  - \* Laboratory classes on alternate weeks for Physics and Chemistry.
  - \* The lab examinations will be held only in the second semester.

**CHEMISTRY LABORATORY**

**0 0 3 100 2**

**LIST OF EXPERIMENTS**

1. Conduct metric titration (Simple acid base)
  2. Conduct metric titration (Mixture of weak and strong acids)
  3. Conduct metric titration using  $\text{BaCl}_2$  vs  $\text{Na}_2\text{SO}_4$
  4. Potentiometric Titration ( $\text{Fe}^{2+}$  /  $\text{KMnO}_4$  or  $\text{K}_2\text{Cr}_2\text{O}_7$ )
  5. PH titration (acid & base)
  6. Determination of water of crystallization of a crystalline salt (Copper sulphate)
  7. Estimation of Ferric iron by spectrophotometry.
- \* A minimum of FIVE experiments shall be offered.
  - \* Laboratory classes on alternate weeks for Physics and Chemistry.
  - \* The lab examinations will be held only in the second semester.

**List of Exercises using software capable of Drafting and Modeling**

- I. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).
6. Drawing of a plan of residential building ( Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
9. Drawing isometric projection of simple objects.
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

**Note: Plotting of drawings must be made for each exercise and attached to the records written by students.**

**List of Equipments for a batch of 30 students:**

- I. Pentium IV computer or better hardware, with suitable graphics facility - 30 No.
2. Licensed software for Drafting and Modeling. – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 No.

**080280008**

**ELECTRICAL CIRCUIT LABORATORY**

0 0 3 100 2

(Common to EEE, EIE and ICE)

**LIST OF EXPERIMENTS**

1. 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

- 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 **11.**  
Characteristics of Diac and Triac.
- 12.** Characteristics of Photodiode and Phototransistor.

TOTAL : 45 PERIODS