

# ANNA UNIVERSITY COIMBATORE

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

## SEMESTER I

S.NO	COURSE TITLE	L	T	P	M
<b>THEORY</b>					
1	Technical English - I	3	1	0	100
2	Mathematics - I	3	1	0	100
3	Engineering Physics - I	3	0	0	100
4	Engineering Chemistry - I	3	0	0	100
5	Engineering Graphics	2	0	3	100
6	Fundamentals of Computing and Computer Programming	3	0	0	100
<b>PRACTICAL</b>					
7	Computer Practice Laboratory –I	0	0	3	100
8	Engineering Practices Laboratory	0	0	3	100
9	Physics & Chemistry Laboratory	0	0	3	-
<b>TOTAL : 31 PERIODS</b>					

\*Laboratory classes on alternative weeks for Physics and Chemistry.  
The Lab examinations will be held only in the second semester.

**AIM:**

To help students acquire and develop communication skills for academic, social and professional purposes.

**OBJECTIVES:**

- To help students develop listening skills for academic and professional purposes.
- To help students acquire the ability to speak effectively in real life situations.
- To develop effective reading skills.
- To help students improve their vocabulary.
- To familiarize students with different aspects of technical English.
- To enable students write effectively in informal and business situations.

**SEMESTER I**

L - Listening, R - Reading, W - Writing, S - Speaking, LF - Language Focus

**UNIT I**

L	-	Types of Listening
R	-	Basic Reading Comprehension
W	-	Introduction to writing strategies
S	-	Conversational Skills
LF	-	Language Focus-Technical terms, collocations and Grammar

**SUGGESTED ACTIVITIES :**

L	-	Listening to conversations
R	-	Reading Instructions and Technical Manuals
W	-	Writing Definitions
S	-	Short Conversations through role play
LF	-	Activities relating to understanding and using active and passive general and technical vocabulary Basic sentence patterns; Exercises relating to technical terms, tenses (past, present, perfect and continuous tenses)

**UNIT II**

L	-	Types of Listening
R	-	Reading Comprehension
W	-	Introduction to writing strategies
S	-	Strategies for developing conversational skills
LF	-	Tenses and concord

**SUGGESTED ACTIVITIES:**

L	-	Listening to a lectures, listening to description of equipment.
R	-	Reading e-mails, Reading headlines, predicting content
W	-	Note making, writing descriptions
S	-	Asking questions, participating in discussions
LF	-	Exercises relating to special uses of tenses, Subject - verb agreement

### UNIT III

- L - Enhancing Listening Skills
- R - Intensive reading
- W - Effective writing strategies
- S - Improving fluency through oral practice
- LF - Form and Informal usage of words, Use of the passive forms

#### SUGGESTED ACTIVITIES:

- L - Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews)
- R - Reading passages for gist
- W - Informal writing -short e-mails (Focus on brevity, coherence and cohesion), Memos
- S - Role play and describing
- LF - Descriptive words, verbs to describe processes, informal language used in conversation, guessing meanings of unknown vocabulary, exercises related to the passive (conversion from active to passive, impersonal passive forms)

### UNIT IV

- L - Note taking
- R - Reading strategies
- W - Effective writing strategies - Informal
- S - Improving fluency through oral practice
- LF - Cause and Effect, Modals

#### SUGGESTED ACTIVITIES

- L - Taking down notes
- R - Reading passages for specific information
- W - Phone messages (Focus on brevity, coherence and cohesion)
- S - Pronunciation (Phonetic sounds - vowels, consonants and diphthongs)
- LF - Exercises relating to cause and effect (if - clauses and types), usage of modal verbs.

### UNIT V

- L - Listening for nuances of tone
- R - Reading for a purpose, information transfer
- W - Effective writing strategies - Formal
- S - Improving fluency through oral practice
- LF - Descriptive Vocabulary - Word building

#### SUGGESTED ACTIVITIES

- L - Activities relating to variation in tone, listening to welcome speeches
- R - Reading business documents, interpreting graphical representations
- W - Writing business e-mails
- S - Segmental and suprasegmental features-stress and intonation
- LF - Exercises relating to describing objects and aim usage of prefixes and suffixes, synonyms and antonyms

#### Text Book:

Norman Whitby - Business Benchmark Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2008.

**References:**

A Course in Communication Skills(Anna University, coimbatore edition) : Dutt, Rajeevan, Prakash. Cambridge University Press India Pvt.Ltd, 2007

Meenakshi Raman and Sangeeta Sharma-'Technical Communication English Skills for Engineers'; Oxford University Press, 2008.

**Extensive Reading**

A.P.J. Abdul Kalam with Arun Tiwari, 'Wings of Fire' An Autobiography, University Press India Pvt. Ltd., 1999, 30<sup>th</sup> Impression 2007.

Randy Pausch, The Last Lecture: July 2008. Also available on youtube.com

Edward De Bono :Six Thinking Hats, Little Brown & Co. 1999 Also available as e book on Google 192 pages

(The students can select any two of the above books)





1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, New Delhi(2003)
2. M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics' , S.Chand and company, Ltd., New Delhi, 2005.

**REFERENCES:**

1. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6<sup>th</sup> Edition, Thomson Brooks/Cole, Indian reprint (2007)
2. Rajendran, V and Marikani A, 'Engineering Physics' Tata Mc Graw Hill Publications Ltd, III Edition, New Delhi, (2004).
3. Palanisamy, P.K., 'Engineering Physics' Scitech publications, Chennai, (2007).
4. Jayakumar. S, 'Engineering Physics', R.K. Publishers, Coimbatore, (2003).
5. Chitra Shadrach and Sivakumar Vadivelu, 'Engineering Physics', Pearson Education, New Delhi, (2007).

**AIM**

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 water characterization and treatment of potable and industrial purposes.
- Principles of polymer chemistry and engineering applications of polymers
- Industrial applications of surface chemistry
- Conventional and non-conventional energy sources and energy storage devices and Chemistry of engineering materials

**UNIT I WATER TECHNOLOGY 9**

Characteristics – alkalinity – types of alkalinity and determination – hardness – types and estimation by EDTA method (problems); Domestic water treatment – disinfection methods (Chlorination, ozonation. UV treatment) – 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.

**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 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.

**UNIT IV 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 – fuel cells – hydrogen – oxygen fuel cell – batteries – alkaline batteries – lead-acid, nickel-cadmium and lithium batteries.

**UNIT V ENGINEERING MATERIALS 9**

Refractories – classification – acidic, basic and neutral refractories – properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) – manufacture of alumina, magnesite and zirconia bricks, Abrasives – natural and synthetic abrasives – quartz, corundum, emery, garnet, diamond, silicon carbide and boron carbide. Lubricants – mechanism of lubrication, liquid lubricants, - properties – viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants – graphite and molybdenum sulphide. Nanomaterials – introduction to nanochemistry – carbon nanotubes and their applications

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

**AIM**

To develop graphic skills in students.

**OBJECTIVES**

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

**Concepts and conventions (Not for Examination) 1**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

**UNIT I PLANE CURVES AND FREE HAND SKETCHING 15**

**Curves used in engineering practices:**

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – 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 14**

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 15**

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 15**

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 15**

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: 75 PERIODS**

**TEXT BOOKS:**

1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46<sup>th</sup> Edition, (2003).
2. Modeling software packages like solid edge, unigraphics and Auto CAD

**REFERENCES:**

1. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).
2. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).
3. K. R. Gopalakrishnana, "Engineering Drawing" (Vol. I & II), Subhas Publications (1998).
4. K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).

**Publication of Bureau of Indian Standards:**

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

***The mode of delivery is like practical.***

**AIM :**

- To provide an awareness to Computing and Programming

**OBJECTIVES :**

- To enable the student to learn the major components of a computer system
- To know the correct and efficient ways of solving problems
- To learn to use office automation tools
- To learn to program in C

**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”, 2<sup>nd</sup> 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 15**

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 15**

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.

**Simple C Programming \* 15**

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

**TOTAL: 45 PERIODS**

\* For programming exercises Flow chart and pseudocode are essential

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

**Hardware**

- LAN System with 33 nodes (OR) Standalone PCs – 33 Nos.
- Printers – 3 Nos.

**Software**

- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – C

**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 CIVIL ENGINEERING PRACTICE****9****Buildings:**

- (a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

**Plumbing Works:**

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

- (e) Demonstration of plumbing requirements of high-rise buildings.

**Demonstration on Carpentry using Portable Power Tools only:**

- (a) Study of the joints in roofs, doors, windows and furniture.
- (b) Hands-on-exercise:
  - Wood work, joints by sawing, planing and cutting.

**II MECHANICAL ENGINEERING PRACTICE****13****Welding:**

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

**Sheet Metal Work:**

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

**Machine assembly practice:**

- (a) Study of centrifugal pump
- (b) Study of air conditioner

**Demonstration on:**

- (a) Turning and drilling practices.
- (b) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
- (c) Foundry operations like mould preparation for gear and step cone pulley.
- (d) Fitting – Exercises – Preparation of square fitting and vee – fitting models.

**GROUP B (ELECTRICAL & ELECTRONICS)****III ELECTRICAL ENGINEERING PRACTICE****10**

- 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 an electrical equipment.

**IV ELECTRONICS ENGINEERING PRACTICE****13**

- 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 Telephone, F.M Radio and Cell Phone.

**TOTAL : 45 PERIODS****REFERENCES:**

- 1. K.Jeyachandran, S.Natarajan & S, Balasubramanian, “A Primer on Engineering Practices Laboratory” , Anuradha Publications, (2007).
- 2. T.Jeyapooan, 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. A. Rajendra Prasad & P.M.M.S. Sarma, “Workshop Practice”, Sree Sai Publication, (2002).
- 5. P.Kannaiah & K.L.Narayana, “Manual on Workshop Practice”, Scitech Publications, (1999).

## 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 session or in the AN session. The maximum marks for Group A and Group B lab examinations will be 50 each, totaling 100 for the Lab course. The candidates shall answer either I or II under Group A and either III or IV under Group B, based on lots.

### Engineering Practices Laboratory List of equipment and components (For a Batch of 30 Students)

#### CIVIL

1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. 5 Sets.
2. Carpentry vice (fitted to work bench) 5 Nos.
3. Standard woodworking tools 5 Sets.
4. Models of industrial trusses, door joints, furniture joints 5 each
5. Portable Power Tools:
  - (a) Rotary Hammer 2 Nos.
  - (b) Demolition Hammer 2 Nos.
  - (c) Circular Saw 2 Nos.
  - (d) Planer 2 Nos.
  - (e) Hand Drilling Machine 2 Nos.
  - (f) Jigsaw 2 Nos.

#### MECHANICAL

1. Arc welding transformer with cables and holders 5 Nos.
2. Welding booth with exhaust facility 5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc. 5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. 2 Nos.
5. Centre lathe 2 Nos.
6. Hearth furnace, anvil and smithy tools 2 Sets.
7. Moulding table, foundry tools 2 Sets.
8. Portable Power Tool: Angle Grinder 2 Nos
9. Study-purpose items: centrifugal pump, air-conditioner One each.

#### ELECTRICAL

1. Assorted electrical components for house wiring 5 Sets
2. Electrical measuring instruments 5 Sets
3. Study purpose items: Iron box, fan and regulator, emergency lamp 1 each
4. Megger (250V/500V) 1 No.
5. Power Tools: (a) Range Finder 2 Nos  
(b) Digital Live-wire detector 2 Nos

#### ELECTRONICS

1. Soldering guns 10 Nos.
2. Assorted electronic components for making circuits 50 Nos.
3. Small PCBs 10 Nos.
4. Multimeters 10 Nos.
5. Study purpose items: Telephone, FM radio and Cell Phone.

**PHYSICS LABORATORY – I**  
**LIST OF EXPERIMENTS**

**0 0 3 -**

1. (a) Particle size determination using Diode Laser  
(b) Determination of Laser parameters – Wavelength, and angle of divergence.  
(c) Determination of acceptance angle in an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method
3. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
4. Determination of wavelength of mercury spectrum – spectrometer grating.
5. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
6. Determination of Hysteresis loss in a ferromagnetic material

**LIST OF EXPERIMENTS**

1. Estimation of hardness of Water by EDTA
2. Estimation of Copper in brass by EDTA
3. Determination of DO in water ( Winkler's method)
4. Estimation of Chloride in Water sample (Argentometric)
5. Estimation of alkalinity of Water sample
6. Determination of molecular weight and degree of polymerization using viscometry.