UNIVERSITY DEPARTMENTS

ANNA UNIVERSITY, CHENNAI – 600 025

R - 2012

CURRICULUM & SYLLABUS
(Common to all branches of B.E. / B. Tech. Programmes)

SEMESTER I

CODE NO	COURSE TITLE	L	T	P	C
THEORY					
HS8151	Technical English -I	3	1	0	4
MA8151	Mathematics -I	3	1	0	4
PH8151	Engineering Physics	3	0	0	3
CY8151	Engineering Chemistry	3	0	0	3
GE8151	Computing Techniques	3	0	0	3
GE8152	Engineering Graphics	2	0	3	4
PRACTICAL					
PH8161	Physics Laboratory	0	0	2	1
CY8161	Chemistry Laboratory	0	0	2	1
GE8161	Computer Practices Laboratory	0	0	3	2
GE8162	Engineering Practices Laboratory	0	0	3	2
	TOTAL	**17**	**2**	**13**	**27**

HS8151   **TECHNICAL ENGLISH I**   **L T P C**
(For all branches of B.E / B.Tech programmes)   **3 1 0 4**

OBJECTIVES

- To enable all students of engineering and technology develop their basic communication skills in English.
- To give special emphasis to the development of speaking skills amongst the students of engineering and technology students.
- To ensure that students use the electronic media such as interne and supplement the learning materials used in the classroom.
- To inculcate the habit of reading for pleasure.

UNIT I

Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds); **Speaking -** Speaking about one's place, important festivals etc. – Introducing oneself, one's family / friend; **Reading -** Skimming a reading passage – Scanning for specific information - Note-making; **Writing -** Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one's leisure time activities, hometown, etc.); **Grammar -** Prepositions - Reference words - Wh-questions - Tenses (Simple); **Vocabulary -** Word formation - Word expansion (root words / etymology); **E-materials -** Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II

Listening - Listening and responding to video lectures / talks; **Speaking -** Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette; **Reading –** Critical reading - Finding key information in a given text - Sifting facts from opinions; **Writing -** Biographical writing (place, people) - Lab descriptions (general/specific description of laboratory experiments) - Definitions - Recommendations; **Grammar -** Use of imperatives - Subject-verb agreement; **Vocabulary -** Compound words - Word Association; **E-materials -** Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

UNIT III

Listening - Listening to specific task - focused audio tracks; **Speaking -** Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners); **Reading -** Reading and interpreting visual material; **Writing -** Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause & effect / compare & contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) - Paraphrasing; **Grammar -** Tenses (Past) - Use of sequence words - Adjectives; **Vocabulary -** Different forms and uses of words, Cause and effect words; **E-materials -** Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme and follow up exercises - Pictures of flow charts and tables for interpretations.

UNIT IV

Listening - Watching videos / documentaries and responding to questions based on them; **Speaking -** Responding to questions - Different forms of interviews - Speaking at different types of interviews; **Reading -** Making inference from the reading passage - Predicting the content of a reading passage; **Writing -** Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; **Grammar -** Adverbs **–** Tenses – future time reference; **Vocabulary -** Single word substitutes - Use of abbreviations & acronyms; **E-materials -** Interactive exercises for Grammar and Vocabulary - Sample interviews - film scenes - dialogue writing.

UNIT V
Listening - Listening to different accents, Listening to Speeches / Presentations, Listening to broadcast & telecast from Radio & TV**; Speaking -** Giving impromptu talks, Making presentations on given topics**; Reading -** Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email **Writing -** Creative writing, Poster making**; Grammar -** Direct and indirect speech**; Vocabulary -** Lexical items (fixed / semi fixed expressions); **E-materials -** Interactive exercises for Grammar & Vocabulary - Sending emails with attachment – Audio / video excerpts of different accents, - Interpreting posters

TEXT BOOKS:
1. Mindscapes: English for Technologists and Engineers, Department of English, Anna University, Chennai, 2012 .
2. S.P.Dhanavel, English and Communication skills for students of science and Engineering, Orient Black Swan, Chennai, 2011.

REFERENCE BOOKS:
1. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. **Technical English: Writing, Reading and Speaking.** New York: Longman, 2001.
2. Bailey, Stephen. **Academic Writing: A practical guide for students.** New York: Rutledge, 2011.
3. Morgan, David and Nicholas Regan**. Take-Off: Technical English for Engineering.** Reading: Garnet Publishing Limited, 2008.
4. Thorn, Michael and Alan Badrick. **An Introduction to Technical English.** Harlow**:** Prentice Hall Europe, 1993.
5. Rizvi, M.Ashraf. **Effective Technical Communication.** New Delhi: Tata McGraw-Hill PublishingCompany, 2007.

EXTENSIVE READERS
1. Murthy, Sudha. **Wise & Otherwise**. New Delhi: Penguin Books India, 2006.
2. Gates, Bill and Collins Hemingway. **Business @ the Speed of Thought: Succeeding in the Digital Economy.** New York: Warner Business Books, 2000.

WEBSITE RESOURCES
1. www.uefap.com
2. www.eslcafe.com
3. www.listen-to-english.com
4. www.owl.english.purdue.edu
5. www.chompchomp.com

MA8151   **MATHEMATICS – I**   **L T P C**
(Common to all branches of B.E. / B.Tech. Programmes)   **3 1 0 4**

OBJECTIVES:
- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling.

- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I   MATRICES   9+3
Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of eigenvalues and eigenvectors – Cayley-Hamilton Theorem – Diagonalization of matrices – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms.

UNIT II   INFINITE SERIES   9+3
Sequences – Convergence of series – General properties – Series of positive terms – Tests of convergence (Comparison test, Integral test, Comparison of ratios and D'Alembert's ratio test) – Alternating series – Series of positive and negative terms – Absolute and conditional convergence – Power Series – Convergence of exponential, logarithmic and Binomial Series.

UNIT III   FUNCTIONS OF SEVERAL VARIABLES   9+3
Limits and Continuity – Partial derivatives – Homogeneous functions and Euler's theorem – Total derivative – Differentiation of implicit functions – Change of variables –Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Errors and approximations – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT IV   IMPROPER INTEGRALS   9+3
Improper integrals of the first and second kind and their convergence – Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions – Properties – Evaluation of integrals using Beta and Gamma functions – Error functions.

UNIT V   MULTIPLE INTEGRALS   9+3
Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of Solids – Change of variables in double and triple integrals – Area of a curved surface.

TOTAL : 60 PERIODS

TEXT BOOKS:
1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition, 2011.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.

REFERENCES:
1. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 3rd Edition, 2007.
2. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
3. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
4. Peter V.O'Neil, "Advanced Engineering Mathematics", Cengage Learning India Pvt., Ltd, New Delhi, 2007.

PH8151   **ENGINEERING PHYSICS**   **L T P C**
                (Common to all Branches of B.E./B.Tech.Programmes)   **3 0 0 3**

OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology.

UNIT I   PROPERTIES OF MATTER   9
Elasticity - Poisson's ratio and relationship between moduli (qualitative) - Stress-strain diagram - factors affecting elasticity - bending of beams - cantilever - bending moment - theory and experiment of Young's modulus determination - Uniform and non-uniform bending - I shaped girders - twisting couple - hollow cylinder - shaft - torsion pendulum - determination of rigidity modulus- moment of inertia of a body (regular and irregular).

UNIT II   ACOUSTICS AND ULTRASONICS   9
Classification of sound - loudness and intensity - Weber-Fechner Law - standard intensity and intensity level - decibel - reverberation - reverberation time - rate of growth and decay of sound intensity - derivation of Sabine's formula - absorption coefficient and its determination - factors affecting acoustics of buildings : focussing, interference, echo, Echelon effect, resonance - noise and their remedies. Ultrasonics - production – magnetostriction and piezoelectric methods - detection of ultrasound - acoustic grating - industrial applications - NDT - Ultrasonic method: scan modes and practice.

UNIT III   THERMAL PHYSICS   9
Thermal expansion - thermal stress - expansion joints - bimetallic strips - thermal conductivity - conductions in solids - Forbe's and Lees' disc methods - Rectilinear flow of heat through a rod - flow of heat through a compound materials - radical flow of heat through a spherical shell - thermal insulation of buildings – Laws of blackbody radiation: Kirchoffs law, Stephens law, Wiens law, Raleigh-Jean law and Planks law (derivation). Laws of thermodynamics - Otto and diesel engines and their efficiency - entropy - entropy of Carnot's cycle - reverse Carnot's cycle - refrigerator.

UNIT IV   APPLIED OPTICS   9
Interference - Michelson interferometer: construction, working, determination of wave length and thickness - anti-reflection coating - air wedge and its application - Lasers - Einstein's coefficients - CO_2, Nd:YAG and semiconductor lasers - homo junction and hetro junction - construction and working - applications - Optical fibres - classification (index & mode based) - principle and propagation of light in optical fibres - acceptance angle and numerical aperture - fibre optic communication system - active and passive sensors.

UNIT V   SOLID STATE PHYSICS   9
Nature of bonding - growth of single crystals (qualitative) - crystal systems - crystal planes and directions - expressions for interplanar distance - coordination number and packing factor for simple structures: SC, BCC, FCC and HCP - structure and significance of NaCl, ZnS, diamond and graphite - crystal imperfections: point defects, dislocations and stacking faults - unit cell, Bravais space lattices - miller indices.

                                                                    TOTAL : 45 PERIODS

TEXT BOOKS:
1. Gaur R.K., and Gupta, S.L., Engineering Physics, Dhanpat Raj Publications,2003.
2. Palanisamy, P.K., Engineering Physics, Scitech Publications (P) Ltd, 2006.
3. Arumugam, M., Engineering Physics, Anuradha Publications, 2000.

REFERENCES:
1. Sankar, B.N., Pillai.S.O., Engineering Physics, New Age International (P) Ltd., 2007.
2. Rajendran.V Engineering Physics, Tata McGraw-Hill, 2009.

CY8151	**ENGINEERING CHEMISTRY**	**L**	**T**	**P**	**C**
	(Common to all branches of B.E. / B. Tech. Programmes)	**3**	**0**	**0**	**3**

UNIT I   CHEMICAL THERMODYNAMICS   9
Second law: Entropy - entropy change for an ideal gas, reversible and irreversible processes; entropy of phase transitions; Clausius inequality. Free energy and work function: Helmholtz and Gibbs free energy functions; Criteria of spontaneity; Gibbs-Helmholtz equation; Clausius-Clapeyron equation; Maxwell relations – Van't Hoff isotherm and isochore. Chemical potential; Gibbs-Duhem equation – variation of chemical potential with temperature and pressure.

UNIT II   POLYMER CHEMISTRY   9
Introduction: Classification of polymers – Natural and Synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerisation. Types and mechanism of polymerisation: Addition (Free Radical, cationic, anionic and living); condensation and copolymerisation. Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerisation: Bulk, emulsion, solution and suspension.

UNIT III   KINETICS AND CATALYSIS   9
Introduction – reaction velocity, factors affecting reaction velocity, rate constant, order of reaction, molecularity, pseudo molecular reactions, zero, first, second and third order reactions, reactions of fractional orders, determination of order of reactions. Catalysis: Auto catalysis - Enzyme Catalysis: Michaelis-Menton equation; factors affecting enzyme catalysis. Heterogeneous Catalysis: Types of adsorption isotherms: Langmuir–Hinselwood and Rideal–Eley Mechanism.

UNIT IV   PHOTOCHEMISTRY AND SPECTROSCOPY   9
Photochemistry: Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert-Beer Law. Photoprocesses - Internal Conversion, Inter-system crossing, Fluorescence, Phosphorescence, Chemiluminescence and Photo-sensitisation. Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. Width and intensities of spectral lines. Spectrophotometric estimation of iron. UV-visible and IR spectroscopy – principles, instrumentation (Block diagram) and applications.

UNIT V   NANOCHEMISTRY   9

Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nanoparticles: Nanocluster, nanorod, nanotube and nanowire. Synthesis: Precipitation, thermolysis, hydrothermal, solvothermal, electrodeposition, chemical vapour deposition, laser ablation; Properties and Applications. Risk discussion and Future perspectives.

TOTAL : 45 PERIODS

TEXT BOOKS:
1. P. Kannan and A. Ravikrishnan, "Engineering Chemistry", Sri Krishna Hitech Publishing Company Pvt. Ltd. Chennai, 2009.
2. S. Vairam, P. Kalyani and Suba Ramesh, "Engineering Chemistry", Wiley India, 2011

REFERENCE BOOKS:
1. P.W. Atkins and de Paula Julio, "Physical Chemistry", Oxford University Press, 8th Ed., (Indian Student Edition) (2009).
2. K. K. Rohatgi-Mukherjee, "Fundamental of Photochemistry" New Age International (P) Ltd., New Delhi, 1986.
3. G.A. Ozin and A.C. Arsenault, "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.
4. V.R.Gowariker, N.V.Viswanathan and Jayadev Sreedhar, "Polymer Science", New Age International P (Ltd.,), Chennai, 2006

GE8151   **COMPUTING TECHNIQUES**   **L T P C**
            (Common to all branches of B.E. / B. Tech. Programmes)   **3 0 0 3**

UNIT I   INTRODUCTION   8

Generation and Classification of Computers- Basic Organization of a Computer –Number System – Binary – Decimal – Conversion – Problems. Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.

UNIT II   C PROGRAMMING BASICS   10

Problem formulation – Problem Solving - Introduction to ' C' programming –fundamentals – structure of a 'C' program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in 'C' – Managing Input and Output operations – Decision Making and Branching – Looping statements – solving simple scientific and statistical problems.

UNIT III   ARRAYS AND STRINGS   9

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String-String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

UNIT IV   FUNCTIONS AND POINTERS   9

Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion – Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays-Example Problems.

UNIT V   STRUCTURES AND UNIONS   9
Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives.

TOTAL: 45 PERIODS

TEXTBOOKS
1.   Pradip Dey, Manas Ghosh, "Fundamentals of Computing and Programming in C", First Edition, Oxford University Press, 2009
2.   Ashok N. Kamthane, "Computer programming", Pearson Education, 2007.
3.   Yashavant P. Kanetkar. " Let Us C", BPB Publications, 2011.
REFERENCES
1.   Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006
2.   Byron S Gottfried, " Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006.
3.   R.G. Dromey, "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007

GE8152	ENGINEERING GRAPHICS	L T P C
	(Common to all branches of B.E. / B. Tech. Programmes)	2 0 3 4

OBJECTIVES
To develop in students, graphic skills 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   14

Basic Geometrical constructions, 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, **Scales:** Construction of Diagonal and Vernier scales.

Visualization concepts and Free Hand sketching: Visualization principles –Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACES   14

Orthographic projection- principles-Principal planes-First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces

Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III   PROJECTION OF SOLIDS   14

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT IV   PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF
**   SURFACES   14**

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   15

Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and   cylinders by visual ray method and vanishing point method.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY)   3

Introduction to drafting packages and demonstration of their use.

**   TOTAL: 75 PERIODS**

TEXT BOOKS:
1. N.D.Bhatt and V.M.Panchal, "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010
2. K. V.Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.

REFERENCES:
1. K.R.Gopalakrishna., "Engineering Drawing" (Vol I&II combined) Subhas Stores, Bangalore, 2007
2. Luzzader, Warren.J., and Duff,John M.,'' Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production", Eastern Economy Edition, Prentice Hall of India Pvt Ltd, New Delhi, 2005
3. M.B.Shah and B.C.Rana, "Engineering Drawing", Pearson, 2nd Edition, 2009
4. K.Venugopal and V.Prabhu Raja, "Engineering Graphics", New Age International (P) Limited ,2008.
5. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi,2008.

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.

Special points applicable to University Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day

PH8161   **PHYSICS LABORATORY**   **L T P C**
                 (Common to all branches of B.E./B.Tech. Programmes)   **0 0 2 1**

1. Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc
2. Non – uniform bending – Determination of young's modulus
3. Lee's disc – Determination of thermal conductivity of a bad conductor
4. Potentiometer– Determination of thermo e.m.f. of thermocouple
5. Air wedge – Determination of thickness of a thin sheet of paper
6. i. Optical fibre- Determination of Numerical Aperture and acceptance angle
   ii. Compact disc – Determination of width of the groove using laser
7. Acoustic grating – Determination of velocity of ultrasonic waves in liquids
8. Post office box – Determination of Band gap of a semiconductor
9. Spectrometer – Determination of wavelength using grating
10. Viscosity of liquids– Determination of co-efficient of viscosity of a liquid by Poiseuille's flow

TOTAL : 30 PERIODS

CY8161   **CHEMISTRY LABORATORY**   **L T P C**
              (Common to all branches of B.E. / B.Tech. Programmes)   **0 0 2 1**

1.   Estimation of HCl using Na_2CO_3 as primary standard and Determination of alkalinity in water sample.
2.   Determination of total, temporary & permanent hardness of water by EDTA method.
3.   Determination of DO content of water sample by Winkler's method.
4.   Determination of chloride content of water sample by argentometric method.
5.   Estimation of copper content of the given solution by Iodometry.
6.   Determination of strength of given hydrochloric acid using pH meter.
7.   Determination of strength of acids in a mixture of acids using conductivity meter.
8.   Estimation of iron content of the given solution using potentiometer.
9.   Estimation of iron content of the water sample using spectrophotometer (1,10- phenanthroline / thiocyanate method).
10.   Estimation of sodium and potassium present in water using flame photometer.
11.   Determination of molecular weight of poly vinyl alcohol using Ostwald viscometer.
12.   Pseudo first order kinetics – ester hydrolysis.
13.   Corrosion experiment – weight loss method.
14.   Determination of CMC.
15.   Phase change in a solid.

                                                        TOTAL : 30 PERIODS

REFERENCES:
1.   A text of quantitative inorganic analysis, A. L. Vogel , ELBS London. 1995.
2.   Experiments in physical chemistry, D.P. Shoemarker and C.W. Gardad, McGraw Hill, London, 2001,
3.   American Public Health Association.

GE8161   **COMPUTER PRACTICES LABORATORY**   **L T P C**
              (Common to all branches of B.E. / B.Tech. Programmes)   **0 0 3 2**
LIST OF EXPERIMENTS:
1.   Search, generate, manipulate data using MS office/ Open Office
2.   Presentation and Visualization – graphs, charts, 2D, 3D
3.   Problem formulation, Problem Solving and Flowcharts
4.   C Programming using Simple statements and expressions
5.   Scientific problem solving using decision making and looping.
6.   Simple programming for one dimensional and two dimensional arrays.
7.   Solving problems using String functions
8.   Programs with user defined functions
9.   Program using Recursive Function and conversion from given program to flow chart.
10. Program using structures and unions.

                                                        TOTAL: 45 PERIODS

GE8162 **ENGINEERING PRACTICES LABORATORY** **L T P C**
(Common to all branches of B.E. / B.Tech. Programmes) **0 0 3 2**

OBJECTIVES:
To expose the students with practical knowledge by hand practice on various basic engineering practices in Civil, Mechanical, Electronics, Electrical Engineering.

Group – A (Civil & Electrical)
1.   CIVIL ENGINEERING PRACTICE   **12**

Plumbing Practice:
1. Study of pipe joints & functions and house hold fitting such as valves, taps, couplings, unions, reducers, elbows
2. Study of plumbing requirements for pumps
3. Preparation of line sketches for domestic water supply
4. Hands on practical exercise in
    a. Basic pipe connections with different pipe fittings
    b. Pipe connections with mixed components

Wood Work Practice:
 1. Study of joints for door panels, door frames, furniture and trusses
 2. Hands on practice in making wooden joints, lap, mortise & Tennon and Dovetail joint

2.   ELECTRICAL ENGINEERING PRACTICE   **9**

1. Study of house wiring using switches, fuse, lamp and energy meter
2. Preparation of wiring diagram and wiring of
    a. Stair case wiring
    b. Fluorescent lamp wiring
3. Measurement of energy and resistance to earth of an electrical equipment

Group B (Mechanical & Electronics)   **15**
 3.   MECHANICAL ENGINEERING PRACTICE

    1. Welding:
            a. Preparation of butt, lap, tee joints by arc welding
            b. Gas welding practice
    2. Basic Machining
            a. Simple turning and taper turning operations
            b. Drilling and tapping practice
    3. Sheet Metal work
            a. Study of various sheet metal joints and applications
            b. Preparation of simple models – Trays, funnels
    4. Machine Assembly practice
            Study and assembly of Machine Vice
    5. Demonstration on
            a. Smithy operations
                    i. upsetting, Swaging, Bending
                    ii. Production of hexagonal headed bolt
            b. Foundry operations
                    i. Preparation of Sand mould for spur gear / cone pulley
            c. Fitting Practice – Square fitting

ELECTRONICS ENGINEERING PRACTICE 9

a) Study of Electronic components – Resistor, color coding, capacitors etc
b) Soldering practice – components soldering in simple electric circuit & testing continuity
c) Generation of Clock Signal

TOTAL: 45 PERIODS