

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR (Established by Govt. of A.P., Act. No. 30 of 2008) ANANTHAPURAMU – 515 002 (A.P) INDIA

Course Structure & Syllabus for B.Tech. (Regular) R13 Regulations

COMPUTER SCIENCE & ENGINEERING

B.Tech. I Year

S.No	Course code	Subject	Th	Tu/	Lab.	Credits
1.	13A52101	Communicative English	2	-		3
2.	13A56101	Engineering Physics	2	-	-	3
3.	13A51101	Engineering Chemistry	2	-	-	3
4.	13A54101	Mathematics - I	3	1	-	5
5.	13A05101	Problem Solving & Computer	3	1	-	5
		Programming				
6.	13A54102	Mathematics - II	3	1	-	5
7.	13A99101	Basic Electrical & Electronics	3	1	-	5
		Engineering				
8.	13A05102	Computer Programming Lab	-	-	3	4
9.	13A99102	Engineering Physics &	-	-	3	4
		Engineering Chemistry Lab *				
10.	13A99103	Engineering & IT Workshop #	-	-	3	4
11.	13A52102	English Language Comm. Skills	-	-	3	4
		Lab				
				Total	Credits	45

Th = Theory; Tu = Tutorial & Lab = Laboratory:

* The students shall attend the Physics lab and Chemistry lab in alternate weeks. The end exam shall be conducted separately and average of the two exams shall be recorded by the University exam section.

The students shall attend Engineering and IT work shop as a single lab every week and the end exam is conducted as a single lab. Sharing the Maximum marks and time for one task each from Engineering workshop and IT workshop. The sum of the marks awarded shall be recorded.

B.Tech. I Year	Th	Tu	С
	2	0	3

Common to All Branches

(13A52101) COMMUNICATIVE ENGLISH

Preamble:

English is an international language as well as a living and vibrant one. People have found that knowledge of English is a passport for better career and for communication with the entire world. As it is a language of opportunities in this global age, English is bound to expand its domain of use everywhere. The syllabus has been designed to enhance communication skills of the students of Engineering and Technology. The prescribed books serve the purpose of preparing them for everyday communication and to face global competitions in future.

The first text prescribed for detailed study focuses on LSRW skills and vocabulary development. The teachers should encourage the students to use the target language. The classes should be interactive and student-centered. They should be encouraged to participate in the classroom activities keenly.

The text for non-detailed study is meant for extensive reading/reading for pleasure by the students. They may be encouraged to read some selected topics on their own, which could lead into a classroom discussion. In addition to the exercises from the texts done in the class, the teacher can bring variety by using authentic materials such as newspaper articles, advertisements, promotional material etc.

Course Objective:

- To enable the students to communicate in English for academic and social purpose.
- To enable the students to acquire structure and written expressions required for their profession.
- To develop the listening skills of the students.
- *To inculcate the habit of reading for pleasure.*
- To enhance the study skills of the students with emphasis on LSRW skills.

Learning Outcome:

• The students will get the required training in LSRW skills through the prescribed texts and develop communicative competence.

UNIT I

Chapter entitled 'Humour' from "Using English"

Chapter entitled 'Biography - (Homi Jehangir Bhabha)' from "New Horizons"

Listening - Techniques - Importance of phonetics

L- Meet & Greet and Leave taking, Introducing Oneself and Others (Formal and Informal situations)

R- Reading Strategies -Skimming and Scanning

W- Writing strategies- sentence structures

G-Parts of Speech - Noun-number, pronoun-personal pronoun, verb- analysis

V-Affixes-prefix and suffix, root words, derivatives

UNIT II

Chapter entitled 'Inspiration' from "Using English"

Chapter entitled 'Biography - (Jagadish Chandra Bose)' from "New Horizons"

- L-Listening to details
- S- Apologizing, Interrupting, Requesting and Making polite conversations
- R- Note making strategies
- W- Paragraph-types- topic sentences, unity, coherence, length , linking devices
- G-Auxiliary verbs and question tags
- V- synonyms-antonyms, homonyms, homophones, homographs, words often confused

UNIT III

Chapter entitled 'Sustainable Development' from "Using English"

Chapter entitled 'Short Story - (The Happy Prince)' from "New Horizons"

L-Listening to themes and note taking

S- Giving instructions and Directions, making suggestions, Accepting ideas, fixing a time and Advising

R- Reading for details -1

- W- Resume and cover letter
- G- Tenses Present tense, Past tense and Future tense

V-Word formation and One-Word Substitutes

UNIT IV

Chapter entitled 'Relationships' from "Using English"

Chapter entitled 'Poem - (IF by Rudyard Kipling)' from "New Horizons"

L-Listening to news

- S- Narrating stories, Expressing ideas and opinions and telephone skills
- R-Reading for specific details and Information
- W- Technical Report writing-strategies, formats-types-technical report writing
- G- Voice and Subject–Verb Agreement
- V- Idioms and prepositional Phrases

UNIT V

Chapter entitled 'Science and Humanism' from "Using English"

Chapter entitled 'Autobiography - (My Struggle for an Education by Booker T.Washington)' from "New Horizons"

- L-Listening to speeches
- S- Making Presentations and Group Discussions
- R- Reading for Information
- W- E-mail drafting
- G- Conditional clauses and conjunctions
- V- Collocations and Technical Vocabulary and using words appropriately

Text Books:

- 1. Using English published by Orient Black Swan.
- 2. New Horizons published by Pearson.

- 1. Raymond Murphy's English Grammar with CD, Murphy, Cambridge University Press, 2012.
- 2. English Conversation Practice Grant Taylor, Tata McGraw Hill, 2009.
- 3. Communication Skills, Sanjay Kumar & Pushpalatha Oxford University Press, 2012.
- 4. A Course in Communication Skills- Kiranmai Dutt & co. Foundation Books, 2012.
- 5. Living English Structures- William Standard Allen-Pearson, 2011.
- 6. Current English Grammar and Usage, S M Guptha, PHI, 2013.
- 7. Modern English Grammar-Krishna SWAMI, McMillan, 2009.
- 8. Powerful Vocabulary Builder- Anjana Agarwal, New Age International Publishers, 2011.

B.Tech. I Year

Th	Tu	С
2	0	3

Common to All Branches

(13A56101) ENGINEERING PHYSICS

Preamble:

There has been an exponential growth of knowledge in the recent past opening up new areas and challenges in the understanding of basic laws of nature. This helped to the discovery of new phenomena in macro, micro and nano scale device technologies. The laws of physics play a key role in the development of science, engineering and technology. Sound knowledge of physical principles is of paramount importance in understanding new discoveries, recent trends and latest developments in the field of engineering.

To keep in pace with the recent scientific advancements in the areas of emerging technologies, the syllabi of engineering physics has been thoroughly revised keeping in view of the basic needs of all engineering branches by including the topics like optics, crystallography, ultrasonics, quantum mechanics, free electron theory. Also new phenomenon, properties and device applications of semiconducting, magnetic, superconducting and nano materials along with their modern device applications have been introduced.

Course Objective:

- To evoke interest on applications of superposition effects like interference and diffraction, the mechanisms of emission of light, achieving amplification of electromagnetic radiation through stimulated emission, study of propagation of light through transparent dielectric waveguides along with engineering applications.
- To enlighten the periodic arrangement of atoms in crystals, direction of Bragg planes, crystal structure determination by X-rays and also to understand different types of defects in crystals adnoun-destructive evaluation using ultrasonic techniques.
- To get an insight into the microscopic meaning of conductivity, classical and quantum free electron model, the effect of periodic potential on electron motion, evolution of band theory to distinguish materials and to understand electron transport mechanism in solids.
- To open new avenues of knowledge and understanding on semiconductor based electronic devices, basic concepts and applications of semiconductor and magnetic materials have been introduced which find potential in the emerging micro device applications.
- To give an impetus on the subtle mechanism of superconductors in terms of conduction of electron pairs using BCS theory, different properties exhibited by them and their fascinating applications. Considering the significance of microminiaturization of electronic devices and significance of low dimensional materials, the basic concepts of nanomaterials, their synthesis, properties and applications in modern emerging technologies are elicited.

Learning Outcome:

- The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics.
- The important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with defects in crystals and ultrasonic non-destructive techniques.
- The discrepancies between the classical estimates and laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world.
- The electronic and magnetic properties of materials were successfully explained by free electron theory and focused on the basis for the band theory.
- The properties and device applications of semiconducting and magnetic materials are illustrated.

• The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

UNIT 1

PHYSICAL OPTICS, LASERS AND FIBRE OPTICS:

Physical Optics: Introduction - Interference in thin films by reflection – Newton's Rings – Fraunhofer diffraction due to single slit, double slit and diffraction grating.

Lasers: Introduction - Characteristics of laser – Spontaneous and stimulated emission of radiation – Einstein's coefficients - Population inversion – Excitation mechanisms and optical resonator - Ruby laser - He-Ne laser – Applications of lasers.

Fibre optics: Introduction– Construction and working principle of optical fiber –Numerical aperture and acceptance angle – Types of optical fibers – Attenuation and losses in fibers - Optical fiber communication system – Applications of optical fibers in communications, sensors and medicine.

UNIT II

CRYSTALLOGRAPHY AND ULTRASONICS:

Crystallography: Introduction – Space lattice –Unit cell – Lattice parameters –Bravias lattice – Crystal systems – Packing fractions of SC, BCC and FCC - Structures of NaCl and Diamond – Directions and planes in crystals – Miller indices – Interplanar spacing in cubic crystals – X-ray diffraction - Bragg's law –Laue and Powder methods – Defects in solids: point defects, line defects (qualitative) - screw and edge dislocation, burgers vector.

Ultrasonics: Introduction – Production of ultrasonics by piezoelectric method – Properties and detection – Applications in non-destructive testing.

UNIT III

QUANTUM MECHANICS AND FREE ELECTRON THEORY:

Quantum Mechanics: Introduction to matter waves – de'Broglie hypothesis - Heisenberg's uncertainty principle and its applications - Schrodinger's time independent and time dependent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well - Eigen values and Eigen functions.

Free electron theory: Classical free electron theory – Sources of electrical resistance - Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution –Kronig-Penny model(qualitative) – Origin of bands in solids – Classification of solids into conductors, semiconductors and insulators.

UNIT IV

SEMICONDUCTORS AND MAGNETIC MATERIALS:

Semiconductor Physics: Introduction – Intrinsic and extrinsic semiconductors – Drift & diffusion currents and Einstein's equation – Hall effect - Direct and indirect band gap semiconductors – Working principle of p-n junction diode, LED, laser diode and photodiode.

Magnetic materials: Introduction and basic definitions – Origin of magnetic moments – Bohr magneton – Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials – Hysteresis - Soft and hard magnetic materials and applications.

UNIT V

SUPERCONDUCTIVITY AND PHYSICS OF NANOMATERIALS:

Superconductivity: Introduction – Meissner effect - Properties of superconductors – Type I and type II superconductors – Flux quantization – London penetration depth – ac and dc Josephson effects – BCS theory(qualitative) – High T_c superconductors - Applications of superconductors.

Physics of Nanomaterials: Introduction - Significance of nanoscale - Surface area and quantum confinement – Physical properties: optical, thermal, mechanical and magnetic properties – Synthesis of nanomaterials: ball mill, chemical vapour deposition, sol-gel, plasma arcing and thermal evaporation – Properties of Carbon nanotubes – High strength applications – Properties of graphene – Graphene based Field Effect Transistor - Applications of nanomaterials.

Text Books:

- 1. Engineering physics S. ManiNaidu, Pearson Education, I Edition, 2012.
- 2. Engineering Physics V. Rajendran, MacGraw Hill Publishers, I Edition, 2008.

- 1. Engineering Physics V. Rajendran, K.Thyagarajan Tata MacGraw Hill Publishers, III Edition, 2012.
- 2. Engineering Physics RV.S.S.N. Ravi Kumar and N.V. Siva Krishna, Maruthi Publications , 2013
- 3. Engineering Physics Sanjay D. Jain, D. Sahasrambudhe and Girish University Press, I Edition, 2009.
- 4. Engineering Physics D K Pandey, S. Chaturvedi, Cengage Learning, I Edition, 2012
- 5. Engineering Physics Hitendra K Mallik and AK Singh, McGraw Hill Education Pvt. Ltd, New Delhi , I Edition, 2010
- 6. Engineering Physics M. Arumugam, Anuradha Publications II Edition, 1997.
- 7. Engineering physics M.N. Avadhanulu and P.G. KshirSagar, Chand and Co, Revised Edition, 2013.
- 8. Solid State Physics A.J. Dekkar, McMillan Publishers, Latest edition, 2012.
- 9. Engineering Physics Gaur and Gupta Dhanapati, Rai Publishers, 7th Edition, 1992.
- 9. Text book of Nanoscience and Nanotechnology: B S Murthy, P.Shankar, Baldev Raj B B Rath, James Murday, University Press, I Edition, 2012.
- 10. Carbon Nanotubes and Graphene Device Physics H.S. Philip Wong, Deji Akinwande, Cambridge University Press, 2011.

B.Tech. I Year

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Common to All Branches

(13A51101) ENGINEERING CHEMISTRY

Preamble:

Knowledge in chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering is depend on the outcome of basic sciences. Many advances in engineering either produce a new chemical demand as in the case of polymers or wait upon chemical developments for their applications as in the case of implants and alloys. Currently the electronics and computer engineers are looking forward for suitable biopolymers and nano materials for use in miniature super computers, the electrical materials engineers are in search of proper conducting polymers, the mechanical engineers are on lookout for micro fluids and the civil engineers are looking for materials that are environmental friendly, economical but long lasting.

Course Objective:

- The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.
- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering.
- The lucid explanation of the topics will help students understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application.
- The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells is one such example.
- After the completion of the course, the student would understand about the concepts of chemistry in respect of Electrochemical cells, fuel cells, mechanism of corrosion and factors to influence, polymers with their applications, analytical methods, engineering materials and water chemistry.

Learning Outcome:

The student is expected to:

- Understand the electrochemical sources of energy
- Understand industrially based polymers, various engineering materials.
- Differentiate between hard and soft water. Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.

UNIT 1

ELECTROCHEMISTRY:

Review of electrochemical cells, Numerical calculations, Batteries: Rechargeable batteries (Lead acid, Ni-Cd, Lithium Ion Batteries). Fuels cells: (Hydrogen-Oxygen and Methanol-Oxygen).

Electrochemical sensors: Potentiometric Sensors and voltammetric sensors. Examples: analysis of Glucose and urea.

Corrosion: Electrochemical Theory of corrosion, Factors affecting the corrosion. Prevention: Anodic and cathodic protection and electro and electroless plating.

UNIT II POLYMERS:

Introduction to polymers, Polymerisation process, mechanism: cationic, anionic, free radical and coordination covalent, Elastomers (rubbers), Natural Rubber, Compounding of Rubber, Synthetic

Rubber: Preparation, properties and engineering applications of Buna-S, buna-N, Polyurethene, Polysulfide (Thiokol) rubbers. Plastomers: Thermosetting and Thermoplatics, Preparation, properties and Engineering applications, PVC, Bakelite, nylons.

Conducting polymers: Mechanism, synthesis and applications of polyacetyline, polyaniline. Liquid Crystals: Introduction, classification and applications.

Inorganic Polymers: Basic Introduction, Silicones, Polyphospazins (-(R)2-P=N-) applications.

UNIT III

FUEL TECHNOLOGY:

Classifications of Fuels – Characteristics of Fuels- Calorific Value – Units, Numerical Problems, Solid Fuels–Coal, Coke : Manufacture of Metallurgical Coke by Otto Hoffmann's by product oven processes.

Liquid Fuels: Petroleum: Refining of Petroleum, Gasoline: Octane Number, Synthetic Petrol: Bergius Processes, Fischer Troph's synthesis.

Power Alcohol: Manufacture, Advantages and Disadvantages of Power Alcohol

Gaseous Fuels: Origin, Production and uses of Natural gas, Producer gas, Water gas, Coal gas and Biogas. Flue Gas analysis by Orsat's apparatus, Solving of problems on Combustion.

UNIT IV

CHEMISTRY OF ENGINEERING MATERIALS:

Semiconducting and Super Conducting materials-Principles and some examples, Magnetic materials – Principles and some examples, Cement: Composition, Setting and Hardening (Hydration and Hydrolysis), Refractories: Classification, properties and applications, Lubricants: Theory of lubrication, properties of lubricants and applications, Rocket Propellants: Classification, Characteristics of good propellant

UNIT V

WATER TREATMENT:

Impurities in water, Hardness of water and its Units, Disadvantages of hard water, Estimation of hardness by EDTA method, Numerical problems on hardness, Estimation of dissolved oxygen, Alkalinity, acidity and chlorides in water, Water treatment for domestic purpose (Chlorination, Bleaching powder, ozonisation)

Industrial Use of water: For steam generation, troubles of Boilers: Scale & Sludge, Priming and Foaming, Caustic Embrittlement and Boiler Corrosion.

Treatment of Boiler Feed water: Internal Treatment: Colloidal, Phosphate, Carbonate, Calgon and sodium aluminate treatment.External Treatment: Ion-Exchange and Permutit processes.

Demineralisation of brackish water: Reverse Osmosis and Electrodialysis

Text Books:

- 1. Engineering Chemistry by KNJayaveera, GVSubba Reddy and C. Ramachandraiah, McGraw Hill Higher Education, New Delhi, Fourth Edition, 2012.
- 2. A Text book of Engineering Chemistry by S.S Dhara, S.S.Umare, S. Chand Publications, New Delhi, 12th Edition, 2010.

- 1. A Text Book of Enigneering Chemistry, Jain and Jain, Dhanapath Rai Publishing Company, New Delhi, 15th Edition, 2010.
- 2. Engineering Chemistry by K.B.Chandra Sekhar, UN.Das and Sujatha Mishra, SCITECH, Publications India Pvt Limited, Chennai, 2nd Edition, 2012.
- 3. Concepts of Engineering Chemistry- Ashima Srivastava and N.N. Janhavi, Acme Learning Pvt Ltd, First Edition, 2013.
- 4. Text Book of Engineering Chemistry C. Parameswara Murthy, C.V.Agarwal and Andra Naidu, BS Publications, Hyderabad, 3rd Edition, 2008.
- 5. Text Book of Engineering Chemistry, Shashichawla, Dhanapath Rai Publications, New Delhi, 4th Edition, 2011.
- 6. Engineering Chemistry, K. Sesha Maheswaramma and Mrudula Chugh, Pearson Education, First Edition, 2013.

B.Tech. I Year

Th	Tu	С
3	1	5

Common to All Branches (13A54101) MATHEMATICS – I

Course Objective:

- To train the students thoroughly in Mathematical concepts of ordinary differential equations and their applications in electrical circuits, deflection of beams, whirling of shafts.
- To prepare students for lifelong learning and successful careers using mathematical concepts of differential, Integral and vector calculus, ordinary differential equations and Laplace transforms.
- To develop the skill pertinent to the practice of the mathematical concepts including the student abilities to formulate the problems, to think creatively and to synthesize information.

Learning Outcome:

- The students become familiar with the application of differential, integral and vector calculus, ordinary differential equations and Laplace transforms to engineering problems.
- The students attain the abilities to use mathematical knowledge to analyze and solve problems in engineering applications.

UNIT I

Exact, linear and Bernoulli equations, Applications to Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , Sin ax, cos ax, polynomials in x, $e^{ax} V(x)$, xV(x), method of variation of parameters. Applications to oscillatory electrical circuits, Deflection of Beams, whirling of shafts.

UNIT II

Taylor's and Maclaurin's Series - Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrange's method of undetermined Multipliers with three variables only. Radius of curvature, center of curvature, Involutes evolutes, envelopes.

UNIT III

Curve tracing – Cartesian, polar and parametric curves. Length of curves.

Multiple integral – Double and triple integrals – Change of Variables – Change of order of integration. Applications to areas and volumes, surface area of solid of revolution in Cartesian and polar coordinates using double integral.

UNIT IV

Laplace transform of standard functions – Inverse transform – First shifting Theorem, Transforms of derivatives and integrals – Unit step function – Second shifting theorem – Dirac's delta function – Convolution theorem – Laplace transform of Periodic function.

Differentiation and integration of transform – Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT V

Vector Calculus: Gradient – Divergence – Curl and their properties; Vector integration – Line integral - Potential function – Area – Surface and volume integrals. Vector integral theorems: Green's theorem – Stoke's and Gauss's Divergence Theorem (Without proof). Application of Green's – Stoke's and Gauss's Theorems.

Text Books:

- 1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers-42 Edition(2012)
- 2. Engineering Mathematics, Volume I, E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher 1st Edition (2010)

- 1. Engineering Mathematics Volume-I, by T.K.V. Iyengar, S.Chand publication-12th Edition(2013)
- 2. Engineering Mathematics, Volume I, by G.S.S.Raju, CENGAGE publisher.(2013)
- 3. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India-10thEdition(2012)
- 4. Higher Engineering Mathematics, by B.V.Ramana, Mc Graw Hill publishers(2008)
- 5. Advanced Engineering Mathematics, by Alan Jeffrey, Elsevier-1st Edition(2001)

B.Tech. I Year	Th	Tu	С
	3	1	5

(13A05101) PROBLEM SOLVING AND COMPUTER PROGRAMMING

Course Objective:

- To understand the core aspects of computer problem solving techniques
- To understand the programming language constructs
- To understand the programming paradigms
- To understand the compound data types
- To understand dynamic memory allocation concepts

Learning Outcome:

- Able to design the flowchart and algorithm for real world problems
- Able to learn and understand new programming languages
- Able to construct modular and readable programs
- Able to write C programs for real world problems using simple and compound data types
- Adapt programming experience and language knowledge to other programming language contexts
- Employee good programming style, standards and practices during program development

UNIT I

Introduction to Computers: Computer Systems, Computing Environment, Computer Languages, Creating and Running Programs, System Developments.

Introduction to the C Language: Introduction, C programs, Identifiers, Types, Variables, Constants, Input and Output, Programming Examples.

Introduction to Computer Problem Solving: Introduction, The Problem-Solving Aspect, Topdown Design, Bottom-up Approach, Flowcharts, Implementation of Algorithms, Program Verification, The Efficiency of Algorithms, The Analysis of Algorithms.

UNIT II

Structure of C program: Expressions, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Sample Programs.

Selections and Making Decisions: Logical Data and Operators, Two-way Selection, Multiway Selection.

Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updation, Event and Counter Controller Loop, Loops in C, Looping Applications.

Fundamental Algorithms: Exchanging the values between two variables, Counting, Summation of a set numbers, Factorial Computation, Sine Function Computation, Generation of the Fibonacci Sequence, Reversing the digits of a integer, Basic conversions, Character to Number Conversion

UNIT III

Factoring Methods: Finding Square root of a Number, The Smallest Deviser of an Integer, The GCD of two Integers, Generating Prime Numbers, Computing Prime Factor of an Integer, Computing the prime factors of an Integer, Generation of Pseudo Random Number, Raising the number to Large Power, Computing the nth Fibonacci.

Functions: Introduction, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Programming Examples.

Array Techniques: Array Order Reversal, Array Counting, Finding the Maximum Number Set, Removal Duplicates from an Ordered Array, Partitioning an Array, Finding kth smallest Element, Longest Monotone Subsequence.

Arrays: Introduction, Two Dimensional Arrays, Multi Dimensional Arrays, Inter Function Communication, Array Applications, Exchange Sort, Binary Search, Linear Search.

UNIT IV

Strings: String Concepts, C Strings, Sting Input/Output Functions, Arrays of Strings, String Manipulation Functions, String/Data Conversion.

Enumerated, Structure, and Union Types: The Type Definition, Enumerated Types, Structure, Unions, Programming Applications.

Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators, Mask.

UNIT V

Pointers: Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, Lvalue and Rvalue.

Pointer Applications: Array and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications.

Binary Input/output: Text Versus Binary Streams, Standard Library Functions for Files, Converting File Type.

Linked List: Single Linked List, Insertion and Deletion

Text Books :

- 1. How to Solve it by Computer by R.G. Dromey, Pearson
- 2. Computer Science, A Structured Programming Approach Using C by Behrouz A. Forouzan & Richard F. Gilberg, Third Edition, Cengage Learning

- 1. Programming in C: A Practical Approach, Ajay Mittal, Pearson.
- 2. The C programming Language, B. W. Kernighan and Dennis M. Ritchi, Pearson Education.
- 3. Problem Solving and Programming Designs in C, J. R. Hanly and E.B. Koffman.,
- 4. Programming with C Rema Theraja, Oxford
- 5. Problem Solving with C, M.T.Somashekara, PHI
- 6. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
- 7. Programming with C, R.S.Bickar, Universities Press.

B.Tech. I Year	Th	Tu
	3	1

(13A54102) MATHEMATICS – II

Course Objective:

- This course aims at providing the student with the concepts of Matrices, Fourier series, Fourier and Z-transforms and partial differential equations which find the applications in engineering.
- Our emphasis will be more on logical and problem solving development in Numerical methods and their applications.

Learning Outcome:

- The student becomes familiar with the application of Mathematical techniques like Fourier series, Fourier and z-transforms.
- The student gains the knowledge to tackle the engineering problems using the concepts of *Partial differential equations and Numerical methods.*

UNIT I

Rank – Echelon form, normal form – Consistency of System of Linear equations. Linear transformations

Hermitian, Skew-Hermitian and Unitary matrices and their properties. Eigen Values, Eigen vectors for both real and complex matrices. Cayley – Hamilton Theorem and its applications – Diagonolization of matrix. Calculation of powers of matrix. Quadratic forms – Reduction of quadratic form to canonical form and their nature.

UNIT II

Solution of Algebraic and Transcendental Equations: The Bisection Method – The Method of False Position– Newton-Raphson Method.

Interpolation: Newton's forward and backward interpolation formulae – Lagrange's Interpolation formula.

Curve fitting: Fitting of a straight line – Second degree curve – Exponentional curve-Power curve by method of least squares. Numerical Differentiation and Integration – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

UNIT III

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods – Predictor-Corrector Method – Milne's Method. Numerical solution of Laplace equation using finite difference approximation. Fourier Series: Determination of Fourier coefficients – Fourier series – Even and odd functions – Fourier series in an arbitrary interval – Even and odd periodic continuation – Half-range Fourier sine

UNIT IV

and cosine expansions.

Fourier integral theorem (only statement) – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – Properties – Inverse transforms – Finite Fourier transforms. z-transform – Inverse z-transform – Properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equations by z-transforms.

UNIT V

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace's equation under initial and boundary conditions.

C 5

Text Books:

- 1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers- 42 Edition(2012)
- 2. Introductory Methods of Numerical Analysis, S.S. Sastry, PHI publisher 5th Edition (2012)

- 1. Engineering Mathematics, Volume II, E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher-1st Edition (2010)
- 2. Engineering Mathematics, Volume II, by G.S.S.Raju, CENGAGE publisher 1st Edition(2013)
- 3. Mathematical Methods by T.K.V. Iyengar, S. Chand publication-8th Edition(2013)
- 4. Higher Engineering Mathematics, by B.V.Ramana, Mc Graw Hill publishers (2008)
- 5. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India 10th Edition (2013)

B.Tech. I Year

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3

(13A99101) BASIC ELECTRICAL & ELECTRONICS ENGINEERING

PART-A

Course Objective:

• This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes Circuit concepts, Machines etc

UNIT I

Introduction To Electrical Engineering: Ohm's Law, Basic Circuit Components, Kirchhoff's Laws, Types of Sources, Resistive Networks, Inductive Networks, Capacitive Networks, Series Parallel Circuits, Star Delta and Delta Star Transformation. Principle of AC Voltages, Root Mean Square and Average Values of Alternating Currents and Voltage, Form Factor and Peak Factor, Phasor Representation of Alternating Quantities, The J Operator and Phasor Algebra, Analysis of Ac Circuits With Single Basic Network Element, Single Phase Series and Parallel Circuits

UNIT II

Network Theorems: Thevenin's, Norton's, Maximum Power Transfer and Millman's Theorems for D.C and Sinusoidal Excitations. Tellegen's, Superposition, Reciprocity and Compensation Theorems for D.C And Sinusoidal Excitations.

Two Port Networks: Two Port Network Parameters – Impedance, Admittance, Transmission and Hybrid Parameters and Their Relations. Concept of Transformed Network - Two Port Network Parameters Using Transformed Variables

UNIT III

Rotating Machines

D.C. Generators: Principles of Operation –Constructional Details-Expression for Generated EMF-Applications of D.C.Generators.

D.C. Motors: Principles of Operation –Constructional Details-Back EMF- Armature Torque of a D.C. Motor - Characteristics of D.C. Motors -Applications of D.C.Motors

Induction Motors: Introduction to 3-Phase Induction Motor- Principle of Operation- Constructional Details – Slip- Expression for Torque -Torque-Slip Characteristics- Applications of 3 Phase Induction Motors.

PART-B

Course Objective:

• The objective of this Course is to provide the students with an introductory and broad treatment of the field of Electronics Engineering.

UNIT IV

Semiconductor Devices: Intrinsic semiconductors-Electron-Hole Pair Generation, Conduction in Intrinsic Semiconductors, Extrinsic Semiconductors-N-Type and P-Type Semiconductors, Comparison of N-Type and P-Type Semiconductors. The p-n Junction - Drift and Diffusion Currents, The p-n Junction Diode-Forward Bias, Reverse Bias, Volt-Ampere Characteristics- Diode Specifications, Applications of Diode, Diode as a Switch. Diode as a Rectifier-Half-wave Rectifier, Full-Wave Rectifier, Full-Wave Bridge Rectifier, Rectifiers with Filters, Zener Diode- Volt-Ampere Characteristics, Zener Diode as Voltage Regulator.

UNIT V

BJT and FETs: Bipolar Junction Transistor (BJT) – Types of Transistors, Operation of NPN and PNP Transistors, Input-Output Characteristics of BJT-CB, CE and CC Configurations, Relation between I_{C, I_B} and I_E . Transistor Biasing- Fixed Bias, Voltage Divider Bias, Transistor Applications- Transistor as an Amplifier,

Transistor as a Switch, Junction Field Effect Transistor (JFET)- Theory and Operation of JFET, Output Characteristics, Transfer Characteristics, Configurations of JFET-CD, CS and CG Configurations, JFET Applications- JFET as an Amplifier, JFET as a Switch, Comparison of BJT and JFET, MOSFET-The Enhancement and Depletion MOSFET, Static Characteristics of MOSFET, Applications of MOSFET

UNIT VI

Oscillators and Op-Amps: Sinusoidal Oscillators, Barkhausen Criteria for Oscillator Operation, Components of an Oscillator-Transistor Amplifier Circuits, Feedback Circuits and Oscillator Circuits, Classification of Oscillators, LC Tuned, RC Phase Shift Oscillator circuits.

Operational Amplifiers(Op-Amps)-Symbol of an Op-Amp, single Input and Dual Input Op-Amps(Differential Amplifier), Characteristics of an Ideal Op-Amp, Basic Forms of Op-Amps-Inverting & Non-Inverting Amplifiers, Applications of Op-Amps, summing, Differential, Integrator, differentiator Amplifier.

Text Books:

- 1. Basic Electrical Engineering by D P KOTHARI & I J NAGRATH, Tata McGraw Hill, Second Edition, 2007.
- 2. Electrical Circuit Theory and Technology by JOHN BIRD, Routledge publisher, 4Th Edition, 2011.
- 3. Basic Electrical and Electronics Engineering, M.S.Sukhija, T.K.Nagsarkar, Oxford University Press, 1st Edition, 2012.
- 4. Basic Electrical and Electronics Engineering, S.K Bhattacharya, Pearson Education, 2012.

- 1. Electrical & Electronic Technology by Edward Hughes, 10th Edition, Pearson, 2008
- 2. "Basic Electrical Engineering", Uma Rao, Sanguine-Pearson.

B.Tech. I Year

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(13A05102) COMPUTER PROGRAMMING LAB

- Week-1 1) Write an algorithm and draw a flowchart to make the following exchange between the variables a-> b -> c->d -> a
 - 2) Write an algorithm and draw a flowchart to generate the first n terms of the sequence. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
- Week-2 1) Write an algorithm and draw a flowchart to carry out the arithmetic operations addition, subtraction, multiplication, and division between two variables
 - 2) Write an algorithm and draw a flowchart for printing prime numbers between 1 and n.
- Week-3 1) The packing department of a television set manufacturer has to prepare a requisition note listing the number of different boxes required for the different TV models that it has received from the production department. The list prepared has to be forwarded to the stores department so that the required boxes are issued to the packing department. The category and the number of boxes required for each type of TV model is given as follows:

Model type	Box type	Numbers
TV-LCD 17	1	98
TV-LCD 22	2	79
TV-LCD 26	3	65
TV-LCD 32	4	43
TV-LCD 37	5	17

2) Write a program that reads 10 integers and prints the first and last on one line, the second and the ninth on the next line, the third and the seventh on the next line, and so forth. Sample input and the results are shown below.

Please enter 10 numbers : 10 31 2 73 24 65 6 87 18 9 Your numbers are : 10 9 31 18 2 87 73 6 24 65 1) Write a program that prompts

Week-4

1) Write a program that prompts the user to enter an integer and then prints the integer first as a character and then as a decimal and finally as a float. Use separate print statements.

Expected output	
The number as a character	: K
The number as a decimal	: 75
The number as a float	: 0.000000

- 2) Write a program to read two floating point numbers add these two numbers and assign the result to an integer. Finally display the value of all the three variables.
- 3) Write a program to demonstrate the results obtained by using the increment and decrement operators(++, --) along-with logical operators(&&, ||) on operands

Week-5	 Write a program to demonstrate the results obtained by using the arithmetic operators for addition, subtraction, multiplication and division on integer data. Write a program to evaluate the following expression
	$Y = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \frac{n(n-3)x^2}{3!} + \sqrt{\cos(x^2)}$
Week-6	 Write a C program to construct a multiplication table for a given number. Write a program to reverse the digit of a given integer. Write a C program to calculate the factorial of a given number
Week-7	 rite a program to calculate tax, given the following conditions: a) If income is less than 1,50,000 then no tax. b) If taxable income is in the range 1,50,001 - 300,000 then charge 10% tax c) If taxable income is in the range 3,00,001 - 500,000 then charge 20% tax d) If taxable income is above 5,00,001 then charge 30% tax
Week-8	1) Write a program to print the calendar for a month given the first Week- day of the month.
	Input the first day of the month (Sun=0,Mon=1,Tue=2,Wed=3,) :: 3 Total number of days in the month : 31
	Expected output
	Sun Mon Tue Wed Thu Fri Sat
	1 2 3 4
	5 6 7 8 9 10 11
	12 13 14 15 16 17 18
	19 20 21 22 23 24 25
	25 26 27 28 29 30 31
Week-9	Write a program to print the Pascal triangle for a given number
	Write a program to calculate the following expression for given x value
	$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{n} + b_n \sin \frac{n\pi x}{n} \right)$
	$\int (x)^{-u_0} + \sum_{n=1}^{u_n} (u_n \cos \frac{u_n}{L} + b_n \sin \frac{u_n}{L})$
Week-10	Write C code to define a function median that takes 3 numbers as its inputs and returns the
	median.
	Write a function to find the sum of the digit of a given number
	Write a program to perform simple calculator operations(use functions: addition, subtraction, multiplication and division)
Week-11	Write C code to define a function cash dispense, which takes an amount as its input, and
	returns the number of 1000, 500, 100, 50, 20, 10, 5, 2, 1 rupee denomination that make up the
	given amount.
	Write C code to reverse the contents of the array. For example, [1,2,3,4,5] should become
	[3,4,3,2,1] Write a program that will search and find out the position where the given key element exist in
	a user chosen array and print it as output.

- Week-12 1) Write a program that uses the binary search algorithm to find out the position where the given key element exist in a user chosen array and print it as output
 - 2) Write a program perform matrix multiplication between two matrices.
- Week-13 1) Write C code to compute the frequency table of survey responses given by 20 users. The survey responses range from 1 to 5 and are stored in an array. For example, 10 responses are stored in the array [1,1,5,2,3,3,5,5,2,2]. The frequency table will be as shown below:
 - a. 1 = 2
 - b. 2 = 3
 - c. 3 = 2
 - d. 4 = 0
 - e. 5 = 3
 - 2) Write a program to define a function to sort an array of integers in ascending order by using exchange sort.
- Week-14 1) Write a c program to define a function to find the largest and smallest numbers in list of integers.
 - 2) Write a C program that uses a recursive function for generating the Fibonacci numbers.
- Week-15 1) Write a C program to check whether a given string is a palindrome or not, without using any built-in functions
 - 2) Write a function that accepts a string and delete the first character.
 - 3) Write a function that accepts a string and delete all the leading spaces.
- **Week-16** Write a program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given string.
- Week-17 Write a C program that uses functions to perform the following operations:
 - a) Reading a complex number
 - b) Writing a complex number
 - c) Addition of two complex numbers
 - d) Multiplication of two complex numbers

(Note: represent complex numbers using structures)

- Week-18 1) Write a C program to define a union and structure both having exactly the same numbers using the size of operators print the size of structure variables as well as union variable
 - 2) Declare a structure *time* that has three fields *hr*, *min*, *secs*. Create two variables, *start_time* and *end_time*. Input there values from the user. Then while *start_time* is not equal to *end_time* display GOOD DAY on screen.
- Week-19 1) Write a function that flips the bits in an 16-bit unsigned integer.
 - 2) Write a function that changes the first(leftmost) hexadecimal digit in a 32-bit unsigned integer. The function is to have two parameters. The first is the integer to be manipulated, the second the replacement digit.
- Week-20 1) Write a program to read in an array of names and to sort them in alphabetical order. Use sort function that receives pointers to the functions strcmp, and swap, sort in turn should call these functions via the pointers.
 - 2) Write a program to read and display values of an integer array. Allocate space dynamically for the array using the *malloc()*.

- Week-21 Write a program to calculate area of a triangle using function that has the input parameters as pointers as sides of the triangle.
- Week-22 1) Two text files are given with the names text1 and text2. These files have several lines of text. Write a program to merge (first line of text1 followed by first line of text2 and so on until both the files reach the end of the file) the lines of text1 and text2 and write the merged text to a new file text3.
 - 2) Write a program to split a given text file into n parts. Name each part as the name of the original file followed by .part<**n>** where n is the sequence number of the part file.
- Week-23 Write a program in C using structures which stores the code, name and price of an item stored in a file and perform the following operations:
 - a) Append item
 - b) Modify an item
 - c) Display all items
 - d) Delete n item

Week-24 1) Write a program that uses the functions to perform the following operations on a single linked list

- a. Creation
- b.Insertion
- c. Deletion
- d.Traversal

- 1. Computer Science, A Structured Programming Approach Using C by Behrouz A. Forouzan & Richard F. Gilberg, Third Edition, Cengage Learning
- 2. C Programming A Problem-Solving Approach, Behrouz A. Forouzan & E.V. Prasad, F. Gilberg, Third Edition, Cengage Learning
- 3. Programming with C Rema Theraja, Oxford
- 4. "C Test Your Skills", Kamthane, Pearson Education
- 5. Programming in C: A Practical Approach, Ajay Mittal, Pearson
- 6. Problem solving with C, M.T.Somasekhara, PHI
- 7. *C* Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
- 8. Programming with C, Byron S Gottfried, Jitender Kumar Chhabra, TMH, 2011

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Common to All Branches

(13A99102) ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

ENGINEERING PHYSICS LAB

LIST OF EXPERIMENTS

Any 10 of the following experiments has to be performed:

- 1. Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method
- 2. Determination of dispersive power of the prism
- 3. Determination of thickness of thin object by wedge method
- 4. Determination of radius of curvature of lens by Newton's Rings
- 5. Laser : Diffraction due to single slit
- 6. Laser : Diffraction due to double slit
- 7. Laser: Determination of wavelength using diffraction grating
- 8. Determination of Numerical aperture of an optical fiber
- 9. Meldes experiment: Determination of the frequency of tuning fork
- 10. Sonometer: Verification of the three laws of stretched strings
- 11. Energy gap of a material using p-n junction diode
- 12. Electrical conductivity by four probe method
- 13. Determination of thermistor coefficients (α , β)
- 14. Hall effect : Determination of mobility of charge carriers in semiconductor
- 15. B-H curve
- 16. Magnetic field along the axis of a current carrying coil Stewart and Gee's method.
- 17. Determination of lattice constant using X-ray spectrum.

ENGINEERING CHEMISTRY LAB

Preamble:

The experiments are designed in a manner that the students can validate their own theory understanding in chemistry by self involvement and practical execution. Thus the execution of these experiments by the student will reinforce his/her understanding of the subject and also provide opportunity to refine their understanding of conceptual aspects. As a result, the student gets an opportunity to have feel good factor at the laboratory bench about the chemical principles that he/she learned in the classroom.

Course Objective:

- Will learn practical understanding of the redox reaction
- Will able to understand the function of fuel cells, batteries and extend the knowledge to the processes of corrosion and its prevention
- Will learn the preparation and properties of synthetic polymers and other material that would provide sufficient impetus to engineer these to suit diverse applications
- Will also learn the hygiene aspects of water would be in a position to design methods to produce potable water using modern technology

Learning Outcome:

- Would be confident in handling energy storage systems and would be able combat chemical corrosion
- Would have acquired the practical skill to handle the analytical methods with confidence.

- Would feel comfortable to think of design materials with the requisite properties
- Would be in a position to technically address the water related problems.

LIST OF EXPERIMENTS

Any 10 of the following experiments has to be performed:

- 1. Determination of total hardness of water by EDTA method.
- 2. Determination of Copper by EDTA method.
- 3. Estimation of Dissolved Oxygen by Winkler's method
- 4. Determination of Copper by Iodometry
- 5. Estimation of iron (II) using diphenylamine indicator (Dichrometry Internal indicator method).
- 6. Determination of Alkalinity of Water
- 7. Determination of acidity of Water
- 8. Preparation of Phenol-Formaldehyde (Bakelite)
- 9. Determination of Viscosity of oils using Redwood Viscometer I
- 10. Determination of Viscosity of oils using Redwood Viscometer II
- 11. Conductometric titration of strong acid Vs strong base (Neutralization titration).
- 12. Conductometric titration of Barium Chloride vs Sodium Sulphate (Precipitation Titration)
- 13. Determination of Corrosion rate and inhibition efficiency of an inhibitor for mild steel in hydrochloric acid medium.
- 14. Estimation of Chloride ion using potassium Chromite indicator (Mohrs method)

References:

- 1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et al, Pearson Education, Sixth Edition, 2012.
- Chemistry Practical Lab Manual by K.B.Chandra Sekhar, G.V. Subba Reddy and K.N.Jayaveera, SM Publications, Hyderabad, 3rd Edition, 2012.

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Common to All Branches

(13A99103) ENGINEERING & I.T. WORKSHOP

ENGINEERING WORKSHOP

Course Objective:

The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students

1. TRADES FOR EXERCISES:

- a. Carpentry shop- Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock
- b. Fitting shop- Two joints (exercises) from: square joint, V joint, half round joint or dove tail 100 x 50 x 5 mm M.S. stock joint out of
- c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guage G.I. sheet
- d. House-wiring- Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
- e. Foundry– Preparation of two moulds (exercises): for a single pattern and a double pattern.
- Welding Preparation of two welds (exercises): single V butt joint, lap joint, double V butt f. joint or T fillet joint.

2. TRADES FOR DEMONSTRATION:

- a. Plumbing
- b. Machine Shop
- c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

References:

- 1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009
- 2. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
- 3. Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, 4/e Vikas
- 4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

I.T. WORKSHOP

Course Objective:

- To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
- To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system
- To learn about Networking of computers and use Internet facility for Browsing and Searching.

Learning Outcome:

- Disassemble and Assemble a Personal Computer and prepare the computer ready to use.
- Prepare the Documents using Word processors
- Prepare Slide presentations using the presentation tool
- Interconnect two or more computers for information sharing
- Access the Internet and Browse it to obtain the required information
- Install single or dual operating systems on computer

Preparing your Computer (5 weeks)

Task 1: Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2: Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3: Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

Task 4: **Operating system features**: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Networking and Internet (4 weeks)

Task 5: Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 6: Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, skype etc.

If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, and search process using different natural languages, and creating e-mail account.

Task 7: Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Productivity tools (6 weeks)

Task 8: Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines,

Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 9: Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

Task 10: Presentations : creating, opening, saving and running the presentations, Selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

Optional Tasks:

Task 11: Laboratory Equipment: Students may submit a report on specifications of various equipment that may be used by them for the laboratories in their curriculum starting from I B.Tech to IV. B.Tech. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop computer
- Server computer
- Switch (computer science related)
- Microprocessor kit
- Micro controller kit
- Lathe machine
- Generators
- Construction material
- Air conditioner
- UPS and Inverter
- RO system
- Electrical Rectifier
- CRO
- Function Generator
- Microwave benches

Task 12: Software: Students may submit a report on specifications of various software that may be used by them for the laboratories in their curriculum starting from I B.Tech to IV. B.Tech. The software may be proprietary software or Free and Open source software. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop operating system
- Server operating system
- Antivirus software
- MATLAB
- CAD/CAM software
- AUTOCAD

References:

- 1. Introduction to Computers, Peter Norton, Mc Graw Hill
- 2. MOS study guide for word, Excel, Powerpoint & Outlook Exams", Joan Lambert, Joyce Cox, PHI.
- 3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
- 4. Networking your computers and devices, Rusen, PHI
- 5. Trouble shooting, Maintaining & Repairing PCs", Bigelows, TMH

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	Common to All Branches		

(13A52102) ENGLISH LANGUAGE COMMUNICATION SKILLS (ELCS) LAB

The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Objective:

B.Tech.

- To train students to use language effectively in everyday conversations.
- To expose the students to a varied blend of self-instructional learner-friendly modes of language learning through computer-aided multi-media instruction.
- To enable them to learn better pronunciation through stress on word accent, intonation, and *rhythm*.
- To help the second language learners to acquire fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Learning Outcome:

- Becoming active participants in the learning process and acquiring proficiency in spoken English of the students
- Speaking with clarity and confidence thereby enhancing employability skills of the students

PHONETICS

Importance of speaking phonetically correct English Speech mechanism-Organs of speech Uttering letters-Production of vowels sounds Uttering letters -Production of consonant sounds Uttering words-Stress on words and stress rules Uttering sentences-Intonation-tone group

LISTENING

Listening as a skill Listening activities PRESENTATIONAL SKILLS Preparation Prepared speech Impromptu speech topic originative techniques JAM (Just A Minute) Describing people/object/place Presentation-Stage dynamics Body language SPEAKING SKILLS Telephone skills Role plays **Public Speaking GROUP ACTIVITIES** Debates Situational dialogues

MINIMUM REQUIREMENT FOR ELCS LAB:

The English Language Lab shall have two parts:

Computer Assisted Language Learning (CALL) Lab:

- The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system, Projector, a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component):

- Computer network with LAN with minimum 60 multimedia systems with the following specifications:
 - \circ P IV Processor
 - \circ Speed 2.8 GHZ
 - \circ RAM 512 MB Minimum
 - Hard Disk 80 GB
 - Headphones of High quality

SUGGESTED SOFTWARE:

- Clarity Pronunciation Power Part I (Sky Pronunciation)
- Clarity Pronunciation Power part II
- K-Van Advanced Communication Skills
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- English Pronunciation in Use (Elementary, Intermediate, Advanced) CUP
- Cambridge Advanced Learners' English Dictionary with CD.
- Oxford Advanced Learner's Compass, 8th Edition
- Communication Skills, Sanjay Kumar & Pushp Lata. 2011. OUP

References:

- 1. Strengthen Your Steps, Maruthi Publicaions, 2012.
- 2. A Course in Phonetics and Spoken English, <u>Dhamija Sethi</u>, Prentice-Hall of India Pvt.Ltd.
- 3. A Textbook of English Phonetics for Indian Students 2nd Ed T. Balasubramanian. (Macmillian),2012.
- 4. Speaking English Effectively, 2nd Edition Krishna Mohan & NP Singh, 2011. (Mcmillan).
- 5. Listening in the Language Classroom, John Field (Cambridge Language Teaching Library),2011
- 6. A Hand Book for English Laboratories, E.Suresh Kumar, P.Sreehari, Foundation Books,2011
- 7. English Pronunciation in Use. Intermediate & Advanced, Hancock, M. 2009. CUP.
- 8. Basics of Communication in English, Soundararaj, Francis. 2012.. New Delhi: Macmillan
- 9. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
- 10. English Pronouncing Dictionary, Daniel Jones, Current Edition with CD.Cambridge, 17th edition, 2011.