

J.B INSTITUTE OF ENGINEERING AND TECHNOLOGY
UGC AUTONOMOUS
 Bhaskar Nagar, Moinabad(M), RR Dist , Telangana-500075

COURSE STRUCTURE – R14

COURSE STRUCTURE AND SYLLABUS



J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY

UGC AUTONOMOUS
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(Common to EEE, ECE, ECM, CSE, IT Branches)

I YEAR I –SEMESTER

Code	Subject	L	T/P/D	C
1405101	English	3	-	3
1405102	Mathematics—I	4	-	4
1405103	Engineering Physics	3	-	3
1405104	Computer Programming	3	-	3
1405105	Engineering Drawing - I	3	-	3
1405106	Computer Programming Lab.	-	3	2
1405107	Engineering Physics Lab.	-	3	2
1405108	Engineering Workshop Lab	-	3	2
1405109	English Lab	-	3	2
	Total			24

I YEAR II -SEMESTER

Code	Subject	L	T/P/D	C
1405201	Technical English	3	-	3
1405202	Mathematics—II	4	-	4
1405203	Mathematical Methods	4	-	4
1405204	Engineering Chemistry	3	-	3
1405205	Data Structure	3	-	3
1405205	Human Values & Professional Ethics	3	-	3
1405207	Data Structure Lab.	-	3	2
1405208	Engineering Chemistry Lab.	-	3	2
1405209	IT Workshop Lab	-	3	2
	Total			26

SYLLABUS

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I Year B.Tech. Sem

L	T/P/D	C
	3	1/- 3

ENGLISH

Unit-I Academic Vocabulary

- Word Formation-Word Disintegration-Root/Base Word- Word Origin
- Affixation-Prefix & Suffix-Synonym/Antonym-Homophone/Homonym/Homograph
- Use of Dictionary & Thesaurus
- Phrasal Verbs, Idioms- One Word Substitutes
- Collocations- Technical Vocabulary

Unit-II- Grammar

- Parts of Speech- Introduction to English Grammar
- All about- Noun, Pronoun, Verb, Adverb
- Adjective, Preposition, Conjunction, Interjection
- Articles- Use of Articles A, An and The.
- Punctuations

Tenses

- Tenses in English
- Use of appropriate Tenses in different contexts
- Use of Tenses in Narration

Unit-III-- Improving Reading Skills

- Reading for Specific Purposes -Reading for General Information
- Reading for facts -Reading between/beyond the lines
- Reading for Skimming & Scanning -Dialogue Reading
- Comprehension

Unit-IV- Basics of Writing

- Syntax & Sentence Structure
- Construction of Proper Sentences in English
- Sentences Types- Purposes
- Email Etiquette -Note Making and Note Taking

Unit-V Common Errors in English

- Subject-Verb Agreement

Text Books:

English Vocabulary in Use, 1.Intermediate - Macarthy- CUP, 2011

Reference Books:

Language in Use-Cambridge University,Pre-Intermediate - Self-Study Workbook

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ENGINEERING MATHEMATICS – I

UNIT-I : Sequences - Series

Basic definitions of Sequences and Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence.

Function of Single Variable

Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized mean value theorem (all theorems without proof) .

UNIT-II : Function of Several Variables

Functional dependence – Jacobian – Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT-III : **Curve Tracing** : Cartesian, polar and parametric curves.

Geometrical applications of Differential Calculus: Radius of Curvature, Centre and Circle of Curvature-Evolutes and Envelopes.

UNIT-IV : **Multiple Integrals** :Double and triple integrals – change of order of integration – change of variable.

UNIT-V : Vector Calculus

Vector Calculus: Gradient-Divergence-Curl and their related properties, Potential function – Laplacian and second order operators. Line integral – work done – surface integrals-Flux of a vector valued functions.

Vector integrals theorem: Green's –Stoke's and Gauss's Divergence Theorems (Statement & their verification).

TEXT BOOKS:

1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition 2012
2. Advanced Engineering Mathematics by Jain and S.R.K. Iyengar, Narosa Publications.
3. Engineering Mathematics by B.V.Ramana, Tata McGrawhill Publishing company Ltd .New Delhi, 5th edition, 2011.

REFERENCES:

1. Engineering Mathematics-I by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand
2. Engineering Mathematics-I by G.Shankar Rao, I.K.International Publications.
3. KREYSZIG. E, "Advanced Engineering Mathematics" JohnWiley & Sons Singapore, 10th edition, 2012.
4. Veerarajan.T " Engineering Mathematics-I", Tata McGrawhill Publishing Co.New Delhi, 5th edition, 2006

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ENGINEERING PHYSICS

UNIT-I: Crystallography-Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Packing Factor of SC, BCC, FCC, Diamond structure, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal System.

XRD and its Applications: Basic Principles of XRD, Bragg's Law, X-Ray diffraction methods: Laue Method, Powder Method, and Applications of XRD.

UNIT-II: Defects in solids: Vacancies, Substitution, Interstitial, concentration of Frenkel and Schottky Defects (Qualitative), line defects & Burger's Vector.

Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, Physical Significance of the Wave Function, Schrödinger's Time Independent Wave Equation —Particle in a One-Dimensional potential well(Zero point energy).

UNIT-III: Acoustics of Building: Basic Requirement of Acoustically Good Hall, Reverberation and Time of Reverberation, Sabine's Formula for reverberation Time (Quantative treatment), Measurement of Absorption Coefficient of a Material, Factors Affecting The Architectural Acoustics and their Remedies.

Ultrasonic's: Concept of ultrasonic wave generation, Properties of Ultrasonic's, Different methods of generation of Ultrasonic's (Piezoestriction and Magnetostriction), Applications of ultrasonic's.

UNIT-IV :Physical Optics: Interference: Types of Interferences, Interference in thin films (reflected light) - Newton's rings.

Diffraction: Types of diffraction, Frounhoffer's Diffraction due to single slit Polarization: Introduction to polarization, Double refraction, Nicol's prism.

UNIT-V :Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and Relation between them, Population Inversion, Lasing Action, Ruby Laser, Helium-Neon Laser, Applications of Lasers

Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Top-down Fabrication: Chemical Vapour Deposition, Characterization by TEM.

TEXT BOOKS:

1. Applied physics – p.k.mettal (i.k.international hosese pvt ltd (new edition)
2. Enginnering physics-p.k palaniswamy -(scitech publications india) pvt ltd, fifth print 2010.)
3. Engineering physics-senthilkumar (vrp publishers limited,) new edition

References

1. Applied physics for engineers – a.j. dekker (macmillan).

2. Introduction to solid state physics – c. Kittel (wiley eastern).
3. Solid state physics –s.o.pillai
4. Solid state physics – m. Armugam (anuradha publications).
5. Modern physics – r. Murugesan & k. Siva prassh – s. Chand & co.
6. A text book of engg physics – m. N. Avadhanulu & p. G. Khsirsagar– s. Chand & co.

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COMPUTER PROGRAMMING

UNIT- I

Computer fundamentals-Hardware, software, computer language, translators, Compiler, Interpreter, Loader, and linker, Program Development steps-Algorithms, Pseudo code, flow charts, Specification for Converting Algorithms into Programs basic,

Introduction to C Language – History, Simple C Program, Structure of a C Program, Identifiers, Basic data types, user defined data types, Variables, Constants, type qualifiers, Managing Input / Output, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

UNIT - II

Selection Statements – if and switch statements, Repetitive statements – while, for, do-while statements, C Programming examples, other statements related to looping – break, continue, go to, C Programming examples. Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples.

UNIT - III

Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication, Standard functions, Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs. Command line arguments in C.

Strings – Basic concepts, String Input / Output functions, arrays of strings, string handling functions, strings to functions, C programming examples.

UNIT - IV

Derived types – Structures – Basic concepts, nested structures, arrays of structures, structures and functions, unions, bit fields, C programming examples.

Pointers – Basic concepts, pointers and functions, pointers and strings, pointers and arrays, pointers and structures, self-referential structures, example C programs.

UNIT – V

Introduction Using Files in C, Declaration of File Pointer, Opening a File, Closing and Flushing Files, Working with Text Files, Character Input and Output, End of File (EOF). Creating header file and using in the C Program.Working with Binary Files, Direct File Input and Output, Sequential Versus Random File Access, Files of Records, working with Files of Records, Random Access to Files of Records, Other

File Management Functions, Deleting a File Renaming a File. Low-Level I/O. Working with C graphics functions.

TEXT BOOKS:

1. Programming in C. P. Dey and M Ghosh , Oxford University Press.
2. The C Programming Language, by Brian W. Kernighan , Dennis M. Ritchie

REFERENCE BOOKS:

1. C programming A Problem-Solving Approach by Behrouz A.Forouzan
2. Programming with C, B.Gottfried, 3rd edition, Schaum's outlines, TMH.
3. Graphics Under C by Yashavant Kanetkar , BPB Publications , 2003
4. Programming in C – Stephen G. Kochan, III Edition, Pearson Education
5. C Programming with problem solving, J.A. Jones & K. Harrow,Dreamtech Press.

TEXT BOOK:

1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing and Graphics, Venugopal / New age.
3. Engineering Drawing – Basant Agrawal, TMH

REFERENCES :

1. Engineering drawing – P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. International.
5. Engineering Drawing – Grower.
6. Engineering Graphics for Degree – K.C. John

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ENGINEERING DRAWING-I

UNIT – I

INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions.

SCALES: Different types of Scales, Plain scales comparative scales, scales of chords.

UNIT - II

CONSTRUCTION OF CURVES USED IN ENGINEERING PRACTICE:

- a) Conic Sections including the Rectangular Hyperbola – General method only.
- b) Cycloid, Epicycloid and Hypocycloid
- c) Involute.
- d) Scales: Different types of Scales, Plain scales comparative scales, scales of chords.

UNIT – III

PROJECTIONS OF POINTS AND LINES: Principles of Orthographic Projections – Conventions – First and Third Angle, Projections of Points and Lines inclined to planes, True lengths, traces.

UNIT – IV

PROJECTIONS OF PLANES: Projections of regular Planes, auxiliary planes and Auxiliary projection inclined to both planes.

UNIT – V

PROJECTIONS OF SOLIDS : Projections of Regular Solids inclined to both planes – Auxiliary Views. SECTIONS AND SECTIONAL VIEWS:Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

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ENGINEERING PHYSICS LAB

List of Experiments:

1. Dispersive power of the material of a prism – Spectrometer
2. Newton's Rings - Radius of curvature of plano convex lens.
3. Frequency of AC Supply by Using Sonometer.
4. Time constant of an R-C circuit..
5. Time constant of an LCR circuit..
6. Diffraction Grating using LASER
7. Torsional pendulum.
8. Study the characteristics of LASER source
9. Analysis of XRD Spectra.
10. Energy gap of Semiconductor.

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COMPUTER PROGRAMMING LABORATORY

WEEK 1 : Simple C programs -to implement basic arithmetic operations – sum, average, product, smallest, largest of the numbers, difference, quotient and remainder of given numbers etc.

WEEK 2 : Programs on if, else-if, nested if, else if ladder - largest and smallest of given numbers, to find the grade of a student based on marks, roots of a quadratic equation etc.

WEEK 3: a. Programs on switch-case – to check the type of a given character, to find the grade of a student etc.

b. Programs on while and do-while- to find factorial, Fibonacci series, GCD, Sin(x), Cos(x) series , to check whether a given number is an Armstrong, Palindrome, Perfect, number conversion, and Prime number etc.

WEEK 4 : Programs on for loop- sum of n natural numbers, factorial, sin(x), to generate Pascal's triangle etc.

WEEK 5 : a. Programs on nested loops – check for Fibonacci prime, Pyramids of numbers, generation of prime numbers in the given range, multiplication table etc.

b. programs using break, go to, continue.

WEEK 6 :a. Programs on 1-D array-finding Minimum and maximum element ,Sorting and Searching etc.

b. Programs on 2-D array – Sum, product and Multiplication of two Matrices etc.

WEEK 7: a. Programs on Functions-Implementation of user defined functions categories, passing of arrays to functions etc.

b. Programs on recursion - factorial of a given integer, GCD of two given integers etc.

WEEK 8 :a. Programs on String handling functions-Copying, reverse, substring, concatenation.

b. Programs on structure and unions.

WEEK 10 :Programs using pointers- pointer basic operations, pointers and functions etc

WEEK 11: Programs on pointers and structures, Pointers and arrays, pointers and strings.

WEEK 12 :Programs on files-Implementation of file handling functions. Programs on files error handling. Programs on Dynamic memory allocation

WEEK 13 :Programs on command line arguments. Programs on preprocessor directives

WEEK 14 : Program draws basic shapes such as circle, line, rectangle, ellipse and display text on screen using c graphics. Smiling face Animation using c graphics displaying face at random position on screen

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ENGINEERING WORKSHOP-I

TRADES FOR EXERCISES

Three exercises from each trade

- (i) Carpentry
- (ii) Fitting
- (iii) Black Smithy
- (iv) Welding
- (v) Power Tools in Construction, Wood working, Electrical Engineering and Mechanical Engineering

TRADES FOR DEMONSTRATION & EXPOSURE

- (vi) Plumbing

TEXT BOOKS:

1. Work shop manual-P.Kannaiah, K.Narayana, Scitech Publishers
2. Workshop Manual-Venkat Reddy

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ENGLISH LAB

MULTI-MEDIA LANGUAGE LAB

- Unit 1 Introduction to Phonetics
- Unit 2 Sounds of English- Vowels, Diphthongs
- Unit 3 Consonants
- Unit 4 Introduction to Stress, Rhythm and Intonation
- Unit 5 Improving Listening Skills

ENGLISH COMMUNICATION SKILLS LAB

- Unit 1 Self Introduction, Introducing others Agreeing/Disagreeing and Asking questions
- Unit 2 'Just A Minute' Sessions (JAM) & Situational Dialogues
- Unit 3 Describing Objects / Situations / People.
- Unit 4 Oral Presentations- Prepared and Extempore.

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TECHNICAL ENGLISH

Unit-I Formal & Informal Writing

-Formal & Informal Writing, Cover Letter

Unit-II- Writing Techniques

-Developing Paragraphs- Cohesion, Developing passage by arranging paragraphs

Unit-III- Official Correspondence

- Types of Business Correspondence

-Technical Vocabulary, Report writing, Applications, Complaints & Requisitions

Unit-IV- e-Writing

-e-Mail Etiquette

Unit-V- Presentation Skills

- Paper, Seminars, Conferences, Symposia, Workshop presentation

-Power Point Presentation(Microsoft Office Suit), -Project Proposal Presentation

TEXT BOOKS:

Strengthen Your Steps-Maruthi Publications, Hyderabad

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ENGINEERING MATHEMATICS – II

UNIT-I : Differential equations of first order and their applications

Overview of differential equations – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories

Higher Order Linear differential equations and their applications

Linear differential equations of second and higher order with constant coefficients, RHS term of the $f(x)=e^{ax}$, $\cos ax$, $\sin ax$, x^n , $e^{ax} V(x)$, $x^n V(x)$ and method of variation of parameters. Applications on bending of beams, Electrical circuits, simple harmonic motion.

UNIT-II : Laplace transform and its application to Ordinary differential equations

Laplace transform of standard functions – Inverse transform – first shifting theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem –Convolution theorem-Periodic function – differentiation and integration of transforms-Application of Laplace transforms to ordinary differential equations.

UNIT-III :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 and cosine expansions.

UNIT-IV : Transforms: Fourier Transform: Fourier integral theorem – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms, Parseval's formula.

Z-Transform : Z-Transform-Properties-Damping rule-shifting rule-Initial & Final value theorems-convolution theorem –solution of difference equations by Z-transform.

UNIT-V : Partial differential equations: Introduction and Formation of partial equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations-Classification of PDE-Finite difference methods for: Elliptic, Hyperbolic & Parabolic equations-solution of Heat equation(one dimensional)

TEXT BOOKS:

1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition 2012
2. Advanced Engineering Mathematics by Jain and S.R.K. Iyengar, Narosa Publications.
3. Engineering Mathematics by B.V.Ramana, Tata McGrawhill Publishing company Ltd .New Delhi, 5th edition, 2011.

REFERENCES:

4. Engineering Mathematics-I, Mathematical Methods by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand
5. Engineering Mathematics-I, Mathematical methods by G.Shankar Rao, I.K.International Publications.
6. KREYSZIG. E, "Advanced Engineering Mathematics" JohnWiley & Sons Singapore, 10th edition, 2012.
7. Veeraranjan.T " Engineering Mathematics-I", Tata McGrawhill Publishing Co.New Delhi, 5th edition, 2006

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MATHEMATICAL METHODS

UNIT-I : Solution of Algebraic and Transcendental Equations

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

Interpolation:

Introduction – Errors in Polynomial Interpolation – Finite differences – Forward Difference – Backward difference – Central difference – Symbolic relations and separation of symbols – Difference Equations – Differences of polynomial – Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points.

UNIT-II: Solution for linear systems

Matrices and Linear systems of equations: Elementary row transformations- Rank-Echelon form, Normal forms–Existence of solution-Gauss elimination with pivoting-Gauss Jordan Method-III conditioned systems-Jacobi iterative method-Gauss seidal method-convergence of iterative methods

UNIT-III: Vector Spaces & Linear Transformatins

Vector Spaces : Vector Spaces- Linear independence- Basis & Dimensions- Linear transformation-Matrix linear transformation- permutations-inner product- orthogonal and –Orthonormal sets – Gram-Schmidt process.

Linear Transformations: Properties of Real & Complex Matrices, orthogonal matrices, Linear Transformation – Orthogonal Transformation. Eigen values and Eigen vectors of Real & complex matrices and their properties.

UNIT- IV: Eigen Values & Eigen Vectors

Quadratic forms- Reduction of quadratic form to canonical form – Rank – Positive, Negative definite – semi definite – index – signature- Sylvester law, Singular value decomposition.

Eigen values, Eigen vectors – properties, Cayley-Hamilton – Theorem (with Proof) – Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonization of matrix. Calculation of powers of matrix – Model and spectral matrices.

UNIT-V : Numerical Differentiation & Numerical solution of IVP's in ODE

Numerical Differentiation: Derivatives using Forward, Backward & central difference formulae.

Numerical solution of IVP's in ODE: 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 Methods.

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1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition 2012
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ENGINEERING CHEMISTRY

UNIT I:

Electrochemistry and Batteries: Concept of Electrochemistry, Conductance-Electrolyte in solution, Conductance-Specific, Equivalent and molar conductance, Kolrausch's Law, application of conductance. EMF: Galvanic Cells, Reference Electrode, Nernst equation, galvanic series, Application of EMF measurements.

Batteries: Primary and secondary cells, (lead-Acid cell, Ni-Cd cell, Lithium cells). Application's of batteries. Fuel cells – Hydrogen – Oxygen fuel cells, advantages of fuel cells.

UNIT II:

Polymers: Introduction-classification-natural and synthetic polymers; Types of Polymerization (Chain growth & Step growth).Plastics: Thermoplastic & Thermoset resins. Engineering applications of: Teflon, Bakelite, Nylon. Conducting polymers- Poly acetylene, polyaniline- conduction, doping, and its application. Fibers – polyester, fiber reinforced plastics (FRP), applications.

UNIT III:

Energy sources: Introduction- fuels, classification – conventional fuels (solid, liquid, gaseous). Calorific value-HCV and LCV. Solid fuels – coal –processing of coal. Liquid fuels – primary – petroleum – refining of petroleum-cracking knocking synthetic petrol – Bergius and Fischer-tropsech's process

UNIT IV:

Water Technology: Introduction, Hardness: Causes, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water. Boiler troubles – Scale & sludge formation, caustic embrittlement, corrosion, priming & foaming Softening of water (Internal & external treatment- Lime soda, Zeolites, Ion exchange process) Reverse osmosis, electro dialysis.

UNIT V:

Phase rule: Introduction- Phase rule equation –terms involved. One Component system-water system. Two component system- Pd-Ag System and Fe-carbon system. Hardening and annealing. Nanochemistry: Introduction. Synthesis: Top down and bottom up processes, Properties and Applications and future prospects.

TEXT BOOKS:

1. Text Book of Engineering Chemistry – Shasi Chawla, Dhanpat Rai publishing Company, New Delhi (2008).
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).
3. Text of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co, New Delhi (2006)

REFERENCE BOOKS:

1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited , New Delhi (2006)
2. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills co., New Delhi (2004).
3. Chemistry of Engineering Materials by R.P Mani and K.N.Mishra, CENGAGE learning.
4. Applied Chemistry – A text for Engineering & Technology – Springer (2005).
5. Text Books of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).
6. Engineering Chemistry – R. Gopalan, D. Venkatappayya, D.V. Sulochana Nagarajan – Vikas Publishers (2008).
7. P. Kannan and A. Ravikrishnan, “Engineering Chemistry”, Sri Krishna Hi-tech Publishing Company Pvt. Ltd. Chennai, 2009.
9. S. Vairam, P. Kalyani and Suba Ramesh, “Engineering Chemistry”, Wiley India, 2011
10. G.A. Ozin and A.C. Arsenault, “Nanochemistry: A Chemical Approach to Nanomaterials”, RSC Publishing, 2005

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DATA STRUCTURES

UNIT-I

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT –II

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation. Queues-operations, array and linked representations. Circular Queue operations, Dequeue, applications of queue

UNIT-III

Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals.

UNIT-IV

Graphs: Terminology, sequential and linked representation, graph traversals : Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

UNIT-V

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

TEXT BOOKS:

1. Data Structures Using C Reema Thareja, Oxford University Press, 2011 Learning.
2. Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCE BOOKS:

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage
2. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
3. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education
4. C Programming & Data Structures, E. Balagurusamy, TMH.
5. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
6. C& Data structures – E V Prasad and N B Venkateswarlu, S. Chand&Co.

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PROFESSIONAL ETHICS

Unit-I BASIC CONCEPTS : 1.1 Introduction 1.2 Terminology 1.3 Stake holders 1.4 Governing Edicts 1.5 Contextual aspects 1.6 Ethical Dilemmas 1.7 Life Skills 1.8 Emotional Intelligence 1.9 Indian and Western thoughts on ethics 1.10 Value Education 1.11 Dimensions of Ethics 1.12 Setting goals in life 1.13 Importance of Morality and Ethics 1.14 Basic Ethical Principles 1.15 Moral Development Theories 1.16 Classification of Ethical theories 1.17 Some Basic Theories 1.18 Moral Issues 1.19 Moral Dilemmas & Autonomy

UNIT-II PROFESSION AND PROFESSIONALISM : 2.1 Introduction 2.2 Meaning of Profession 2.3 Professionals 2.4 Professionalism 2.5 Professional Associations 2.6 Professional's Roles & Professional Risks 2.7 Professional Accountability 2.8 Successful Professional 2.9 Ethics and Profession 2.10 Engineering Profession 2.11 Engineering as Social Experimentation 2.12 Engineering professionals 2.13 Engineering Ethics 2.14 Roles of Engineers 2.15 Balanced outlook on Law 2.16 Rights and responsibilities as citizens 2.17 Professional Responsibilities 2.18 Professional Rights

UNIT -III GLOBAL ISSUES & SAFETY : 3.1 Introduction 3.2 Current Scenario 3.3 Business Ethics 3.4 Environmental Ethics 3.5 Computer Ethics 3.6 Media Ethics 3.7 War Ethics 3.8 Bioethics 3.9 Research Ethics 3.10 Intellectual Property Right 3.11 Safety and Risk 3.12 Assessment of Risk 3.13 Risk and cost 3.14 Engineer's responsibility for safety 3.15 Risk benefit Analysis 3.16 Risk costs and Management 3.17 Case studies 3.18 Providing for Safe Exit 3.19 Ethical issues of safety

UNIT -IV ETHICAL CODES & AUDITS : 4.1 Introduction 4.2 Need for ethical codes 4.3 Sample codes 4.4 Corporate codes 4.5 Limitations of the Codes 4.6 Need for ethical Audit 4.7 Ethical Profile of Organizations 4.8 Ethical Standards and Benchmarking 4.9 Audit Brief 4.10 Ethical Auditors 4.11 Procedure for Ethical Audit 4.12 Ethical Audit Report 4.13 Examples

UNIT X HUMAN VALUES AND ETHICAL LIVING: 5.1 Introduction 5.2 Terminology 5.3 Domains of Learning 5.4 Human Values 5.5 Attitudes 5.6 Values, Attitudes and Professionals 5.7 Needs of Life 5.8 Harmony in Life 5.9 What is Ethical Living 5.10 Case Studies

Text book

T1. Professional Ethics by R. Subramanian, Oxford Press.

T2. Textbook on Professional Ethics and Human Values by R.S. Naagarazan New Age International.

Reference Books

R1. Professional Ethics & Human Values by Prof D.R. Kiran, Tata McGraw Hill Education.

R2. Ethics in Engineering by Mike W. Martin and Roland Schinzinger, McGraw Hill.

R3. Fundamental of Ethics by Edmund G Seebauer & Robert L. Barry, Oxford University Press.

**J.B INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC-AUTONOMOUS)**

I Year B.Tech. II Sem

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DATA STRUCTURES LAB

WEEK 1: Write a C program that uses functions to perform the following operations on singly linked list:
i) Creation ii) Insertion iii) Deletion iv) Traversal v) merge two single linked lists

WEEK 2: Write a C program that uses functions to perform the following operations on doubly linked list:
i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways

WEEK 3: Write a C program that uses functions to perform the following operations on circular linked list:
i) Creation ii) Insertion iii) Deletion iv) Traversal

WEEK 4: Write C programs that implement stack operations using
i) Arrays ii) Linked Lists

WEEK 5: 1. Write a program to convert infix expression to postfix expression using stack
2. Write a program to evaluate postfix expression

WEEK 6: 1. Programs using recursion
2. Write a program to convert infix expression to prefix expression using stack

WEEK 7: Write a program to implement Linear queue using
i) Arrays ii) Linked Lists

WEEK 8: Write a program to perform following operations on a circular Queue
I) insertions II) deletions III) search and count

WEEK 9: Write a program to perform following operations on a circular DeQueue
I) insertions II) deletions III) search and count

WEEK 10: 1. Write a program to implement Linear search
2. Write a program to implement Binary Search

WEEK 11: Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

I) Bubble sort ii) Selection sort II) Insertion Sort

WEEK 12: Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

I) Merge sort II) Quick sort

WEEK 13: Implementation of a binary tree representation using
i) Arrays ii) Linked Lists

WEEK 14: 1. Implementation of a Graph representation using Adjacency Matrix
2. Write a program to implement graph traversals.

TEXT BOOKS:

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

- Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCE BOOKS:

- C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
- Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
- C Programming & Data Structures, E. Balagurusamy, TMH

- Estimation of λ_{\max} for Fe and Cu solutions using colorimeter.

TEXT BOOKS:

- Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
- Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:

- Text Book of engineering chemistry by R. N. Goyal and Harmendra Goel.
- A text book on experiments and calculation Engg. S.S. Dara.
- Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications

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I Year B.Tech. II Sem L T/P/D C
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ENGINEERING CHEMISTRY LAB

List of Experiments (Any 10 of the following)

Introduction:

- Laboratory safety and precautions.
- Preparation of solution.
- Determination of unknown concentration of given solutions and calculations.

Titrimetry:

- Estimation of hardness of water by EDTA method.

Mineral Analysis:

- Determination of percentage purity of pyrolusite.

Instrumental Methods:

- Conductometric titration of strong acid Vs strong base.
- Effect of dilution on conductance for i) Strong acids, ii) weak acids and iii) Ionic salts.
- Construction of Daniel cell and determination of EMF of cell.
- Determination of ferrous iron in cement by colorimetric method
- Estimation of Copper by Colorimetric method.

Physical Properties:

- Determination of viscosity of sample oil by Oswald's viscometer
- Determination Surface Tension of given unknown liquid using stalganometer.

Preparations:

- Preparation of organic compound Aspirin.
- Preparation of Nanoparticles.

Demonstration Experiments: (Any two)

- Preparation of Thiokol rubber.
- Determination of viscosity of sample oil by Redwood Viscometer.
- Corrosion of Zn and Cu metals.

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IT WORKSHOP

Week 1: Familiarizing with Computer Hardware

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Week 2: PC Assembly

Every student should disassemble and assemble the PC back to working condition. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 3: Installation of Windows and Linux

Every student should individually install MS windows on the personal computer. Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux.

Week 4: Hardware Troubleshooting:

Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

Week 5: Software Troubleshooting:

Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

Week 6: Networking Concepts

Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured. Setting up wireless router.

Week 7: Internet and Search Engines

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google / yahoo / Bing. Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and / or worms

Week 8: Word Processor

The mentor needs to give an overview of Microsoft (MS) office / Libre Office tool - Overview of toolbars, saving files, Using help and resources, rulers, format painter. Overview of formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option, Inserting Table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes. Overview of Creating a Table of Content, Newspaper columns, Images from files and clipart. Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Week 9: Spread Sheet

The mentor needs to tell the importance of MS Excel / Libre office Calc tool - teach toolbars, saving excel files, Using help and resources. Create employee payroll using functions. Other features to be covered are Cell Referencing, Charts, Renaming and Inserting worksheets, Hyper linking, LOOKUP/VLOOKUP, Sorting, Conditional formatting.

Week 10: Presentation

The mentor needs to give overview of MS Power Point / Libre office Impress tool – to create basic power point presentation. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows. Students need to create a PPT and present it.

Week 10: Virtual Box Installation

Installing multiple operating systems on your PC using (virtual box) / hyper-v / VM Ware