TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
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B.TECH – COMPUTER SCIENCE & ENGINEERING
Course Structure R-20

SEMESTER I

S.No.	Class	Course Code	Name of the Subject	L	T	P	C
1	BS	CBSM2	Linear Algebra & Graph Theory	3	0	0	3
2	HS	CHSE1	English	2	0	0	2
3	BS	CBSC7	Chemistry	3	1	0	4
4	ES	CESEG1	Engineering Graphics	1	0	4	3
5	ES	CESCP1	C Programming for Problem Solving	2	1	0	3
6	HS	CHSE2	English Language & Communication Skills Lab	0	0	2	1
7	BS	CBSC8	Chemistry Lab	0	0	3	1.5
8	ES	CESCP2	C Programming for Problem Solving Lab	0	0	3	1.5
9	MC	MC001	Sports	0	0	0	Satisfactory
Total Credits							19

Mandatory Course: SPORTS
The Students need to participate in any physical activity such as sports, marathon, conducted by any college or any organization, students should produce participation certificate for clearing this course.

SEMESTER II

S.No.	Class	Course Code	Name of the Subject	L	T	P	C
1	BS	CBSM1	Ordinary Differential Equations & Vector Calculus	3	0	0	3
2	BS	CBSP1	Applied Physics	3	1	0	4
3	ES	CESSD1	Semi-Conductor Devices & Circuits	3	0	0	3
4	ES	CESBE2	Basic Electrical Engineering	3	0	0	3
5	BS	CBSP2	Applied Physics Lab	0	0	3	1.5
6	ES	CESSD2	Semi-Conductor Devices & Circuits Lab	0	0	3	1.5
7	ES	CESBE4	Basic Electrical & Simulation Lab	0	0	3	1.5
8	ES	CESIT1	IT Workshop	0	0	3	1.5
9	MC	MC002	Yoga	0	0	0	Satisfactory
Total Credits							19

Mandatory Course: YOGA
The student should undergo yoga meditation course offered by any organization or conducted by any college. Student should produce the completion certificate for clearing this course.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
3/0/0 3

LINEAR ALGEBRA & GRAPH THEORY (CBSM2)

Course Objectives:
To learn:

1. Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
2. Concept of Eigen values and Eigen vectors and to reduce the quadratic form to canonical form.
3. Concept of matrix differentiation and integration.
4. Introduce basic concepts like representation of graphs, isomorphism of graphs.
5. Understand the concepts of graph theory in analysis of various computer science applications.

Course Outcomes:
After learning the contents of this paper the student must be able to:

1. Discuss the matrix representation of a set of linear equations and to analyse the solution of the system of equations. L4
2. Apply the concept of matrices to reduce the quadratic form to canonical form using orthogonal Transformation. L3
3. Solve ordinary differential equatins by matrix method and can solve Eigen values and Eigen vectors of complex matrices. L3
4. To represent a graph using an adjacency list and an adjacency matrix and apply graph theory to application problems such as computer networks. L3
5. Perform tree traversals and apply it to solve problems, use binary search trees to solve problems. L3

UNIT I

Matrices & System of Equations:

Types of matrices - rank of a matrix by Echelon form and normal form- inverse of nonsingular matrices by Gauss-Jordan method - system of linear equations- solving system of homogeneous and non homogeneous equations- Gauss elimination method.

UNIT II

Eigen Values and Eigen Vectors:

Eigen values and Eigen vectors and their properties - Cayley-Hamilton theorem(without proof) finding inverse and powers of a matrix by Cayley-Hamilton theorem- diagonalization of a matrix - linear transformation and orthogonal transformation - quadratic forms and nature of the quadratic forms- reduction of quadratic form to Canonical forms by orthogonal transformation.

UNIT III

Differentiation and Integration of Matrices & Complex Matrices:

Differentiation and integration of matrices- complex matrices-Hermitian, skew Hermitian matrices- periodic, Idempotent, unitary matrices and properties.

UNIT IV

Graphs:

Basic concepts-isomorphism and sub graphs- planar graphs Euler's formula- multi graphs and Euler

circuits, Hamiltonian graphs-chromatic numbers, the four color problem.

UNIT V

Trees:

Trees- spanning trees, DFS and BFS algorithms-minimal spanning trees, Kruskal's and Prim's algorithms- binary trees, applications of binary trees.

Text Books:

1. B.S.Grewal- Higher Engineering Mathematics- Khanna Publishers- 36th Edition-2010.
2. Advanced Engineering Mathematics by H.K.Dass - S.chand and company LTD-2013.
3. Discrete Mathematics for Computer scientists & Mathematicians, J. L. Mott, A.Kandel,T.P.Baker.

Reference Books:

1. N.P. Bali and Manish Goyal- A text book of engineering Mathematics- Laxmi Publications Reprint-2008.
2. Advanced Engineering Mathematics by S.R.K. Iyengar R.K. Jain – NarosaPublications.
3. Graph Theory with applications to Engineering and Computer science by Narsingh Deo Prentice-Hall of India Publications.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
2/0/0 2

ENGLISH (CHSE1)

Course Objectives:

1. Improve the language proficiency of students in English with an emphasis on Vocabulary (Identify Different types of words), Grammar (the structure and form of the language), Reading and Writing skills.
2. Equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.
3. Develop study skills and communication skills in formal and informal situations.

Course Outcomes:

1. Choose appropriate forms of reading and change his/her mode of reading. L5
2. Analyze the grammatical accuracy of his/her speech and writing. L4
3. Compare verities of English and the tone and style writing of different authors. L5
4. Interpret a text witL4h knowledge gained while acquiring the LSRW skills. L4
5. Take part in interviews, group discussions JAM sessions etc… by improving the listening And speaking skills. L4

UNIT I

"The Raman Effect" from the prescribed textbook „English for Engineers" published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes and root words.

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

Reading: Reading and Its Importance- Techniques for Effective Reading.

Basic Writing Skills: Sentence Structures - Use of Phrases and Clauses in Sentences-Importance of Proper Punctuation- Techniques for writing precisely – **Paragraph writing** – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

UNIT II

Letter/Report writing

Vocabulary: Synonyms, Antonyms.

Grammar: Identify Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject- verb agreement. Tenses, Active and Passive Voice, Direct and Indirect Speech

Reading: Improving Comprehension Skills – Techniques for Good Comprehension **Writing:** Format of a Formal Letter-**Writing Formal Letters** E.g.., Letter of Complaint, Letter of Requisition, Job Application with Resume.

UNIT III

"Blue Jeans" from the prescribed textbook „English for Engineers" published by **Cambridge University Press.**

Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.

Grammar: Degrees of Comparison, Simple, Compound and Complex sentences.

Reading: Sub-skills of Reading- Skimming and Scanning

Writing: Nature and Style of Sensible Writing- **Defining- Describing** Objects, Places process/experiment and Events.

UNIT IV

"What Should You Be Eating" from the prescribed textbook "English for Engineers" published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English, Idioms and phrases, one word substitutes. Grammar: Redundancies and Clichés in Oral and Written Communication. Reading: Comprehension- Intensive Reading and Extensive Reading

Writing: Writing Practices--Writing Introduction and Conclusion -Précis Writing.

UNIT V

"How a Chinese Billionaire Built Her Fortune" from the prescribed textbook "English for Engineers" published by Cambridge University Press.

Vocabulary: Technical Vocabulary and their usage Grammar:

Common Errors in English,

Reading: Reading Comprehension-Exercises for Practice

Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Prescribed Textbook:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

References:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007).Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge University Press.
6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press.

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B.Tech I Semester **L/T/P C**
3/1/0 4

CHEMISTRY (CBSC7)

Course Objectives:

1. To make the students understand the basic concepts and skills in chemistry and thereby induce the concepts in engineering.
2. To orient the students in understanding the latest advancements in chemistry and to encouraging to develop new software and molecular modeling.
3. To inculcate the essence of atomic structure and water treatment methods in understanding the chemical bonding, material properties and importance of water purity for industrial and households.
4. To impart the basic knowledge electrochemistry, reaction mechanism which are essential in calculation of internal energy molecules, to predict the fusibility of reactions and to designing biologically and industrially important molecules.
5. To acquire the characterization of different materials and the application of spectroscopy.

Course Outcomes:

1. Construct the molecular orbital energy level diagrams to determine bond orders, Molecular electron configurations and magnetic properties. L3
2. Apply the concepts to identify the hardness, boiler troubles of water, water Purification and its significance in industry and Dailylife Explain the working principle, Electro chemistry and applicationsof fuel cells. L5
3. Apply the fundamentals of reaction mechanisms for the synthesis of organic compounds. L3
4. Identify the molecular/atomic changes using UV-Visible, IR and NMR Spectroscopic Techniques. L3
5. Improve and expand their skills in performing and analyzing the properties of Polymers. L4

Unit I

Molecular Structure and Theories of Bonding:

Chemical bonding: Introduction to atomic and molecular orbitals. Linear combination of atomic orbital's (LCAO). Energy level diagram of homo-nucleus (N_2, O_2 and F_2) and hetro-nucleus (CO and HF). π-molecular orbital's of butadiene and benzene.

Crystal field theory (CFT): Salient features of CFT, crystal field splitting of transition metal ion d-orbital's in tetrahedral, octahedral and square planar geometries, calculation of crystal field splitting energy.

Bonding solids: Band structure of solids. The effect of doping on band structure in solids and electronic properties of materials.

Unit II

Water and its Treatment:

Introduction: hardness of water; causes of hardness; types of hardness-temporary and permanent; units of hardness; estimation of hardness of water by complexometric method(EDTA).

Municipal water treatment: specifications of potable/municipal water; steps involved in treatment of municipal/potable water-disinfection of water by chlorination, ozonolysis and UV-treatment.

Boiler feed water treatment: Boiler troubles-scales, sledges and boiler corrosion; internal treatments of water for boiler feeding-calgon conditioning, phosphate conditioning and colloidal conditioning. External treatment of water-ion exchange process, desalination of water and reverse osmosis.

Unit III

Electrochemistry:

Introduction: Electrolytic and electro chemical cells; electrode potential(E), standard electrode potential (E^o) and free energy(G & G^o); relation between free energy and electrode potential Nernst's equation to estimate the cell potential, Numerical problems.

Types of electrodes: Calomel, quinhydrone and glass electrode-determination of pH of a solution by using quinhydrone and glass electrode.

Electrochemical series and it's applications.

Batteries: primary (Lithium cell) and secondary batteries (Lead-acid storage battery and Lithium ion battery).

Fuel cells: H_2-O_2 and methanol-H_2 fuel cell and its applications.

Unit IV

Stereochemistry, Reaction Mechanism and Synthesis of Drug Molecules:

Stereochemistry: Isomerism-structural and stereoisomers-configurational isomerism-symmetry and chirality; enantiomers, diastereomers, optical activity R-S and d-l configurations; conformational isomerism-analysis for n-butane.

Reaction Mechanism: Addition reactios-necleophilic, electrophilic and free radical addition reactions; substitution reactions-electrophilic substitution reactions in benzene; Nucleophilic substitution reactions- SN_1, SN_2 reactions and mechanism;

Elimination reactions: E_1 and E_2 reactions-Dehydro halogenations of alkyl halides.

Oxidation reactions: Oxidation of alcohols using $KMnO_4$ and chromic acid.

Reduction reactions: reduction of carbonyl compounds using $LiAlH_4$, $NaBH_4$ and hydroboration of olefins. Synthesis and applications of paracetamol and Aspirin.

Unit V

Spectroscopic Techniques and Applications:

Introduction of spectroscopy: parameters for light-wavelength, wavenumber, frequency, energy, spectrum.

UV-visible (electronic) spectroscopy: selection rule; types of transitions; auxochrome and chromophore; hypso-, batho-, hyper- and hypo-cromic shifts; and applications of electronic spectroscopy-Beer-Lambert's law.

Infra red (vibrational) spectroscopy: selection rules; types of moleculer vibrations; calculation of frequency of bond vibration and applications of IR spectroscopy.

Micro-wave(rotational) spectroscopy: Selection rule; rotational spectra of diatomic molecules; and applications micro-wave spectroscopy.

Nuclear magnetic resonance spectroscopy (NMR): Basic concepts (NMR), instrumentation, chemical shift- factors effecting chemical shift; magnetic resonance imaging (MRI-imaging) using NMR.

Text Books:

1. Engineering Chemistry by P.C.Jain & M.Jain; Dhanpat Rai Publishing Company (P) Ltd., New Delhi.
2. Engineering Chemistry by P. Rath, B. Ramadevi, Ch. V. R. Reddy & S. Chakroborty; Cengage publications.
3. Engineering Chemistry by M. Tirumal Chary, V. Laxminarayana & A. Shashikala; Pearson publications.

Reference Books:

1. Physical Chemistry, by P.W. Atkins.
2. Fundamentals of Molecular Spectroscopy, by C.N. Banwell.
3. Organic Chemistry: Structure and Function by K.P.C. Volhardt and N.E.Schore, 5^{th} Edition.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
1/0/4 3

ENGINEERING GRAPHICS (CESEG1)

Course Objectives:

This subject aims to

1. The student will be able to understand importance of dimensioning in large scale drawings used as design initiation in manufacturing and will be able to understand the significance of different kinds of pencils used for drawing different types of lines.
2. The subject will ensure the student to learn basics of drawing like conics, scales etc.
3. The student will be able to understand in detail about the coordinate system the topics to be able to locate the points in all the 4 quadrants.
4. The student will be introduced to topics like lines, planes and solids and their position w.r.t. HP and VP in simple position, inclined to one and both reference planes.
5. The student will also be introduced to topics like development of surfaces, perspective views, Isometric projections, orthographic projections.

Course Outcomes:

Upon completion of the course the graduate will be able to:

1. Understand the BIS standards and conventions employed in engineering graphics. L3
2. Demonstrate the ability to sketch diverse engineering curves such as ellipses, parabolas, cycloids, and involutes. Additionally, create various reduced scales, including plain, diagonal, and Vernier scales. L3
3. Evaluate and compare the underlying principles of first-angle and third-angle methods of projection, while critically discerning the nuances between parallel and perspective projection techniques. L4
4. Synthesize visual representations of various views, such as elevation and plan, corresponding to a specified line, plane figures, or solid objects. L3
5. Utilize advanced drafting techniques and proficiently employ 2D software, such as AutoCAD, to create intricate sketches of 2D plane figures. L3

UNIT I

Introduction to Engineering Drawing:

Principles of Engineering Graphics and their Significance, Usage of Instruments, Conic Sections- (Ellipse, Parabola, Hyperbola and Rectangular Hyperbola) General method only. Cycloid, picycloid and Hypocycloid Involutes.

UNIT II

Orthographic Projections:

Principles of Orthographic Projections – Conventions – Projections of Points and Lines inclined to both principal planes.

Projections of Planes: Projections of Plane regular geometric figures inclined One and to both principal planes, Regular planes such as square, rectangle, Rhombus, triangle, pentagon, Hexagon, Circle, Semi circle.

Unit III

Projections of Regular Solids:

Projections of Regular Solids axis parallel, perpendicular and inclined to reference Planes. The regular solids are prisms, pyramids, Cone and cylinder.

UNIT IV

Section of Solids:

Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views **Development of Surfaces:** Development of Surfaces of Right Regular Solids – Prisms, Pyramid, Cylinder and Cone.

UNIT V

Isometric Projections:

Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Plane Figures, Simple & Compound solids- Conversion of Isometric Views to Orthographic Views and Vice-versa.

Text Books:

1. Engineering Drawing / Basant Agrawal and Mc Agrawal/ Mc Graw Hill.
2. Engineering Drawing: Gopala Krishna, Subhas Stores.

Reference Books:

1. Engineering Drawing / N.S. Parthasarathy and Vela Murali/ Oxford.
2. Engineering Drawing N.D. Bhatt / Charotar.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
2/1/0 3

C PROGRAMMING FOR PROBLEM SOLVING (CESCP1)

Course Objective:
Learn the fundamentals of computers and C Programming concepts.

Course Outcomes:
After learning the contents of this course, the student must be able to:

1. Apply number system concepts and implement basic algorithms for solving computational problems. L3
2. Make use of arrays and functions to write C programming. L3
3. Make use of pointers and strings in writing C programs. L3
4. Demonstrate Enumerated data types and data structures to develop C programs. L3
5. Develop C programs for various applications using files and I/O functions. L3

UNIT I
Introduction to Computers Data Representation:
Number Systems, Computer Languages, Algorithms. Introduction to C Language: Data types, Operators, Expressions, Statements-Selection Statements – if and Switch Statements, Repetition (Loop) statements.

UNIT II
Arrays:
One and two dimensional arrays, multidimensional arrays, inter function communication Arrays applications- linear search, binary search, bubble sort, Implementation of stacks and queues.
Functions: Scope and Extent, storage classes, recursive functions.

UNIT III
Pointers:
Introduction, Pointers for inter function communication, arrays of pointers, pointer arithmetic and arrays, passing an array to a function, memory allocation functions, pointers to functions, pointers to pointers.
Strings: Concepts, String Input/ Output functions, arrays of strings, string manipulation functions.

UNIT IV
User Defined Data types Structure and Unions:
Initialization, accessing structures, operations on structures. Complex structures-Nested structures, structures containing arrays, structures containing pointers, arrays of structures, structures and functions, Passing structures through pointers, self-referential structures, unions, bit fields, C programming examples, command–line arguments, pre-processor commands.

UNIT V
Input and Output:
Concept of a file, streams, text files and binary files, file input/output functions (standard library input/output functions for files), error handling, positioning functions (fseek, rewind and ftell).

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B. A. Forouzan and R. F. Gilberg,Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh, Second Edition, Oxford University Press.

Reference Books:

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearson education.
2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw Hill Education (India)Pvt Ltd.
3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRC Press.
4. Basic computation and Programming with C, Subrata Saha and S. Mukherjee, Cambridge University Press.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
0/0/2 1

ENGLISH LANGUAGE & COMMUNICATION SKILLS LAB (CHSE2)

Course Objectives:

1. To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.
2. To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm.
3. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing and opportunity for practice in speaking.
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence.
5. To train students to use language appropriately for public speaking and interviews.

Course Outcomes:

1. Analyse the skills required to listen for content and eliminate the barriers to listening. L4
2. Take part in JAM sessions effectively by participating in role-play and understanding Situationaldialogues. L4
3. Measure their improvement in pronunciation by working on neutralization of accent. L5
4. Distinguish between British and American pronunciation and common variants in pronunciation. L4
5. Choosingappropriate accent for intelligibility. L6

Exercise – I

CALL Lab:

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening.
Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants.

ICS Lab:

Understand: Communication at Work Place- Spoken vs. Written language.
Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II

CALL Lab:

Understand: Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context.
Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

ICS Lab:

Understand: Features of Good Conversation – Non-verbal Communication.
Practice: Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise - III

CALL Lab:

Understand: Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI). Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.

ICS Lab:

Understand: How to make Formal Presentations, Describing picture

Practice: Formal Presentations-individual and team.

Exercise – IV

CALL Lab:

Understand: Listening for General Details. Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Public Speaking – Exposure to Structured Talks.

Practice: Making a Short Speech – Extempore.

Exercise – V

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Introduction to Interview Skills. Practice: Mock Interviews-Role Play.

Text Books:

1. A book entitled "**ELCS Lab Manual – A Workbook for CALL and ICS Lab Activities"** by Board of Editors: Hyderabad: Orient BlackSwan Pvt. Ltd. 2016. Print.

Reference Book:

1. Hart, Steve; Nair, Aravind R.; Bhambhani, Veena. **"EMBARK- English for undergraduates"** Delhi: Cambridge University Press. 2016. Print.

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COMPUTER SCIENCE & ENGINEERING

B.Tech I Semester **L/T/P C**
0/0/3 1.5

CHEMISTRY LAB (CBSC8)

Course Objectives:

1. To make the students understand the basic concepts and skills in chemistry and thereby induce the concepts in engineering.
2. To orient the students in understanding the latest advancements in chemistry and to encouraging to develop new software and molecular modeling.
3. To inculcate the essence of atomic structure and water treatment methods in understanding the chemical bonding, material properties and importance of water purity for industrial and households.
4. To impart the basic knowledge electrochemistry, reaction mechanism which are essential in calculation of internal energy molecules, to predict the fusibility of reactions and to designing biologically and industrially important molecules.
5. To acquire the characterization of different materials and the application of spectroscopy.

Course Outcomes:

1. The course helps students to develop the knowledge in chemical bonds and reaction mechanisms and it is also useful to construct molecular models for biological and chemical applications. L3
2. Students in the course will be able to utilize and analyze characterization techniques ascertain material quality and damage mechanisms in engineering applications. L3
3. The course assists to examine the chemical reactions in different environmental conditions on engineering works. L4
4. Students can able to estimate the viscosity of lubricants in various conditions. L5
5. The course supports in understanding and examining the hardness and significance of water quality for daily living and engineering. L4

List of Experiments:

1. Bond length and bond angle calculation for benzene using Chem3D Pro. Software.
2. Drawing the structure benzene and graphene using ChemDraw Pro. Software.
3. Estimation of strength of HCl by conductometric titrations.
4. Determination of surface tension of a give liquid using stalagmometer.
5. Estimation of strength of HCl by Potentiometric titrations.
6. Verification of Lambert's and Beer's law using $KMnO_4$.
7. Determination of rate constant of acid catalysed hydrolysis of methyl acetate.
8. Synthesis of Aspirin and Paracetamol.
9. Thin layer chromatography calculation of Rf values.
10. Determination of acid value of coconut oil.
11. Verification of Freundlich adsorption isotherm-adsorption of acetic acid on activated charcoal.
12. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.
13. Estimation of strength of acetic acid by conductometric titrations.
14. Estimation of Fe^{2+} amount present in unknown sample by $KMnO_4$ using potentiometric titration.
15. Determination of ion-exchange resin capacity using EDTA Method.

16. Determination of single electrode potential.

Text Books:

1. Senior practical physical chemistry, B.D. Khosla, A. Gulati and V. Garg (R. Chand & Co.,Delhi)
2. An introduction to practical chemistry, K.K. Sharma and D. S. Sharma (Vikas publishing, N.Delhi)

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0/0/3 1.5

C PROGRAMMING FOR PROBLEM SOLVING LAB (CESCP2)

Course Objective:
Write programs in C using structured programming approach to solve the problems.

Course Outcomes:
After learning the contents of this course, the student will be able to:
1. Develop and test programs to solve mathematical and scientific problems. L3
2. Develop structured programs using control structures and functions. L3

Experiments:
1. a) Write a C program to find the factorial of a positive integer.
   b) Write a C program to find the roots of a quadratic equation.
2. a) Write a C program to determine if the given number is a prime number or not.
b) 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. Write a C program to generate the first n terms of the sequence.
3. a) Write a C program to construct a pyramid of numbers.
b) Write a C program to calculate the following Sum: Sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!
4. a) The Least Common Multiple (LCM) of two positive integers a & b is the smallest integer that is evenly divisible by both a and b. Write a C program that reads two integers and calls GCD (a, b) function that takes two integer arguments and returns their LCM. The lcm (a, b) function should calculate the least common multiple by calling the GCD (a,b) function and using the following relation: LCM (a,b) = ab / GCD (a,b)
b) Write a C program that reads two integers n and r to compute the ncr value using the following relation: ncr (n,r) = n! / r! (n-r)! . Use a function for computing the factorial value of an integer.
5. a) Write C program that reads two integers x and n and calls a recursive function to compute xn.
b) Write a C program that uses a recursive function to solve the Towers of Hanoi problem.
c) Write a C program that reads two integers and calls a recursive function to compute ncr value.
6. a) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user using Sieve of Eratosthenes algorithm.
b) Write a C program that uses non recursive function to search for a Key value in a given list of integers. Use linear search method.
7. a) Write a menu-driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.
b) Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers. Use binary search method.
8. a) Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.
b) Write a C program that reads two matrices and uses functions to perform the following:
i) Addition of two matrices
ii) Multiplication of two matrices
9. a) Write a C program that uses functions to perform the following operations:
i) to insert a sub-string into a given main string from a given position.
ii) to delete n characters from a given position in a given string

b) Write a C program that uses a non-recursive function to determine if the given string is a palindrome or not.

10. a) Write a C program to replace a substring with another in a given line of text.
b) Write a C program that reads 15 names each of up to 30 characters, stores them in an array, and uses an array of pointers to display them in ascending (ie. alphabetical) order.
11. a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.
b) Write a C program to convert a positive integer to a roman numeral. Ex. 11 is converted to XI.
12. a) Write a C program to display the contents of a file to standard output device.
b) Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.
13. a) Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command-line arguments.
b) Write a C program to compare two files, printing the first line where they differ.
14. a) Write a C program to change the nth character (byte) in a text file. Use fseek function.
b) Write a C program to reverse the first n characters in a file. The file name and n are specified on the command line. Use f seek function.
15. a) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).
b) Define a macro that finds the maximum of two numbers. Write a C program that uses the macro and prints the maximum of two numbers.
16. a) Write a C Program to calculate the sum of n numbers entered by the user using malloc( ) and free() functions.
b) Write a C Program to calculate the sum of n numbers entered by the user using calloc( ) and free() functions.

Text Books:

1. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publishers.
2. Computer Programming using C in C, V. Rajaraman, PHI.
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. C++: The complete reference, H. Schildt, TMH Publishers.

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COMPUTER SCIENCE & ENGINEERING

B.Tech II Semester **L/T/P C**
3/0/0 3

ORDINARY DIFFERENTIAL EQUATIONS & VECTOR CALCULUS (CBSM1)

Course Objectives:
To learn:

1. Methods of solving the differential equations of first and higher order.
2. Find general solution to linear, homogeneous and non homogeneous ODEs with constant Coefficients
3. Methods of solving linear DE with variable coefficients
4. The physical quantities involved in engineering field related to vector valued functions
5. The basic properties of vector valued functions and their applications to line- surface and volume integrals.

Course Outcomes:
After learning the contents of this paper the student must be able to:

1. Identify whether the given differential equation of first order is exact or not and Utilizes the knowledge of ODE to solve problems on application of ODE. L3
2. Solve higher order differential equation and apply the concept of differential Equation to real world problems. L3
3. Solve non homogeneous linear ODEs with variable coefficient and Analyse and Simultaneous linear differential equations. L3
4. Explain and compute derivatives of vector valued functions, gradient functions. L5
5. Evaluate the line-surface and volume integrals and converting them from one to Another. L5

UNIT I
Ordinary Differential Equations of First Order and Applications
Exact- linear and Bernoulli's equations- orthogonal trajectories – applications - Newton's law of Cooling- law of natural growth and decay.

UNIT II
Second Order Ordinary Differential Equations
Second order linear differential equations with constant coefficients- Non-Homogeneous terms of the type e^{ax} - sin ax - cos ax- polynomials in x- $e^{ax}V(x)$and $xV(x)$ - method of variation of parameters.

UNIT III
Ordinary Differential Equations with Variable Coefficients
Equations reducible to linear ODE with constant coefficients - Legendre's equation- Cauchy-Euler equation. Simultaneous differential equations (first order).

UNIT IV
Vector Differentiation
Vector point functions and scalar point functions- gradient- divergence and curl- directional derivatives- tangent plane and normal line-vector Identities-scalar potential functions. Solenoidal and Irrotational vectors.

UNIT V

Vector Integration

Line- surface and volume Integrals- theorems of Green, Gauss and Stokes (without proofs) and their applications.

Text Books:

1. B.S. Grewal- Higher Engineering Mathematics- Khanna Publishers- 36th Edition- 2010.
2. Erwin Kreyszig- Advanced Engineering Mathematics- 9th Edition- John Wiley & Sons-2006.

Reference Books:

1. Paras Ram- Engineering Mathematics- second Edition- CBS Publishes.
2. S. L. Ross- Differential Equations- third Edition.- Wiley India- 1984.
3. R K Jain & S R K Iyengar - Advanced Engineering Mathematics -fifth Edition
4. Narosa Publications.
5. N.P. Bali and Manish Goyal- A text book of engineering Mathematics- LaxmiPublications- Reprint-2008.

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APPLIED PHYSICS (CBSP1)

Course Objectives:
The objectives of this course,
1. To impart the knowledge of Quantum mechanics for understanding the conduction mechanism in solids
2. To understand the physics of semiconductors and their working mechanism for their utility.

Course Outcomes:
On completion of the course student will able to:
1. Illustrate the V-I characteristics of Laser diode. L3
2. Evaluate the numerical and bending loss of given optical fiber. L3
3. Analyse the V-I characteristics of LED and photodiode devices. L4
4. Illustrate the type of semiconductor by using Hall Effect experiment. L3
5. Calculate the Planck's constant using Photocell. L3

Unit I
Electron Theory of Solids
Free electron theory-Classical &Quantum theory, Density of states, Fermi level, Occupation probability, Bloch theorem, Kronig-Penny model, E-k diagram and Effective mass. Types of materials: metals, semiconductors, and insulators.

Unit II
Introduction to Semiconductors
Dependence of Fermi level on carrier-concentration and temperature, Intrinsic and extrinsic semiconductors, Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction, Hall effect and its applications.

Unit III
Light-Semiconductor Interaction
Types of Semiconductor materials of interest for optoelectronic devices, band gap modification, Hetero structures; Optical transitions in bulk semiconductors: absorption, spontaneous emission, and stimulated emission; Joint density of states, Density of states for photons, Transition rates- Fermi's golden rule, Optical loss and gain; Photovoltaic effect.

Unit IV
Semiconductor Light Emitting Diodes (LEDs)
Direct and indirect band gap semiconductors, Injection Electro luminescence, LED: Device structure, materials, characteristics, Laser diode, Quantum-well, wire, and dot based lasers.

Unit V
Photodetectors & Low dimensional Optoelectronic Devices
General properties of Photo detectors, Photo conductors, Types of semiconductor photo detectors, P-N junction, PIN and Avalanche Photodiodes; structure, materials, working principle, and characteristics, Noise limits on performance; Solar cells.

Text Books:

1. S.O. Pillai, Solid state physics, New age publications.
2. B. E. A. Saleh and M. C. Teich, Fundamentals of Photonics, John Wiley & Sons,

Reference Books:

1. Ch. Srinivas, Ch. Seshubabu, Engineering Physics, Cengage learning publications.
2. P. Bhattacharya, Semiconductor Optoelectronic Devices, Prentice Hall of India (1997).
3. Online course: “Semiconductor Optoelectronics” by M R Shenoy on NPTEL
4. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Gupta on NPTEL

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SEMI-CONDUCTOR DEVICES & CIRCUITS (CESSD1)

Pre-requisite: Fundamentals of Semiconductors.

Course Objectives:

1. To introduce the concepts of various semiconductor devices like Diodes, Transistors, FET's and MOSFET'S.
2. To impart the knowledge of various configurations, characteristics and applications of electronic circuits.

Course Outcomes:

After this course, the student will be able to:

1. Apply the knowledge of semiconductor physics to solve the problems related to PN junction diode. L3
2. Demonstrate the special purpose devices for various applications. L3
3. Analyze the working principles of rectifier circuits and filters. L4
4. Analyze and design the different biasing techniques of BJT. L5
5. Demonstrate the FET and MOSFET characteristics. L3

UNIT I

Introduction to Semiconductor Physics

Formation of p-type and n-type semiconductors, principle and operation of Diode, Current components in a p-n Diode, Diode equation, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Load line analysis, Diffusion and Transition Capacitances.

UNIT II

Special Purpose Devices

Breakdown Mechanisms in Semi-Conductor Diodes, Zener diode characteristics, Use of Zener diode as simple regulator, Principle of operation and Characteristics of Tunnel Diode (With help of Energy band diagram) and Varactor Diode, Principle of Operation of SCR.

UNIT III

Rectifiers and Filters

P-N junction diode as a Rectifier - Half Wave Rectifier, Ripple Factor, Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L-section Filters and π- section Filters.

UNIT IV

Bipolar Junction Transistor (BJT)

Construction, Principle of Operation, Transistor current components, Transistor as an Amplifier, Common Emitter, Common Base and Common Collector configurations and their Characteristics.

Transistor Biasing and Stabilization - Operating point, DC & AC load lines, Biasing - Fixed Bias, Emitter Feedback Bias, Collector to Emitter feedback bias, Voltage divider bias, Bias stability, Stabilization against variations in V_{BE} and β, Bias Compensation using Diodes and Transistors, h-parameter analysis, small signal equivalent circuit of a transistor, Analysis of CE, CB, CC amplifiers.

UNIT V

Field Effect Transistor (FET)

Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET biasing.

Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Different types of MOSFET's, Working operation and V-I Characteristics of different types of MOSFET's.

Text Books:

1. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias, Satyabratajit, TMH, 2/e, 1998.

Reference Books:

1.Electronic Devices and Circuits –S.Salivahanan, NSuresh Kumar & A.Vallavaraj.
2.Electronic Devices and Circuits – Sanjeev Gupta & Santosh Gupta, Dhanpat Rai Publications.

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B.Tech II Semester **L/T/P C**
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BASIC ELECTRICAL ENGINEERING (CESBE2)

Prerequisites: Linear Algebra and Calculus

Course Objectives:
Objectives of this course are
1. To introduce the concept of DC and AC electrical circuits and its applications.
2. To determine the performance of single phase transformer.
3. To study the concepts of different types of Electrical Machines.
4. To acquire knowledge about various configurations for electrical installations and its applications.

Course Outcomes:
After this course, the student will be able to:
1. Examine a variety of theorems including as Thevenin's, Norton's, Superposition, Reciprocity, Maximum Transfer, Tellgen's, and Millman's. L4
2. Understand various fundamentals and analyse single-phase AC circuits with combinations of R, L, C, RL, RC, and RLC. L4
3. Understand the working principle and analyse the performance Transformers. L4
4. Understand the working principle and analyse the performance of different C &DC machines. L4
5. Understand the basic concepts of wiring systems and Elementary calculations for energy consumption, power factor improvement and battery backup. L2

UNIT I
DC Circuits
Electrical circuit elements (R, L and C), Dependent and Independent of voltage and current sources, Kirchhoff current and voltage laws, Analysis of Resistive circuits-Mesh, Nodal Analysis and Star-Delta Transformations, Superposition, Reciprocity, Thevenin, Norton, Maximum Power Transfer Theorems, Numerical problems.

UNIT II
AC Circuits
AC Fundamentals: Sinusoidal voltage and currents, mathematical and graphical representation, concept of cycle period, frequency, instantaneous, peak, average, RMS values, peak factor, form factor, phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasors. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC and RLC combinations (series and parallel). Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT III
Transformers
Magnetic circuits, Construction and working principle of Ideal and Practical Transformer, Equivalent Circuit, Losses in Transformers, Regulation and Efficiency, OC &SC test on 1-phase Transformer. Auto- Transformer. Three-phase transformer connections.

UNIT IV

Electrical Machines

Construction of DC machines, Armature windings – DC Generator – Principle of operation - EMF Equation – DC Motor – Principle of operation – Back EMF - Torque Equation, Generation of rotating magnetic fields, Construction and working principle of a three-phase and Single-phase induction motor, torque- speed characteristics, Construction and working principle of synchronous generators.

UNIT V

Electrical Installations

Basic concept of wiring systems, Service Mains, Meter board and Distribution board, Concept of Earthing. Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

Text Books:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. S.K.Bhattacharya, "Electrical installations and House Wiring", Pearson Publications.

Reference Books:

1. S.K.Bhattacharya, "Basic Electrical & Electronics Engineering", Pearson Publications.
2. V. N. Mittal and Arvind Mittal;, " Basic Electrical Engineering" McGraw Hill.
3. Edward Hughes, " Electrical Technology,", Pearson Education.
4. Edminister.J., "Electrical Circuits" Schaum's Outline Series, Tata McGrawHill.
5. Sudhakar and Shyam Mohan, "Circuits and Networks Analysis and Synthesis, Tata McGrawHill.

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COMPUTER SCIENCE & ENGINEERING

B.Tech II Semester **L/T/P C**
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APPLIED PHYSICS LAB (CBSP2)

Course Objectives:

The objectives of this course,

1. To apply the theoretical knowledge of Physics through hands on experimental instruments
2. To understand the basic need of experiments.
3. To know how to measure the different physical quantities.
4. To gain the knowledge about different electrical components and basic electrical circuits.

Course Outcomes:

On completion of the course student will able to:

1. Illustrate the V-I characteristics of Laser diode. L3
2. Evaluate the numerical and bending loss of given optical fiber. L3
3. Analyse the V-I characteristics of LED and photo diode devices. L4
4. Illustrate the type of semiconductor by using Hall Effect experiment. L3
5. Calculate the Planck's constant using Photocell. L3

List of Experiments:

Any eight experiments are compulsory

1. P-N junction diode- Determination of Energy band gap of a semiconductor.
2. Hall effect – Determination of Hall coefficient of a semiconductor.
3. Stewart and Gees experiment-Determination of magnetic field on the axis of a current carrying coil .
4. Photo electric effect-Study the spectral response of photo cell-Planck's constant.
5. Light Emitting Diode- Study of V-I characteristics and to determine knee voltage.
6. Laser Diode- Study of V-I characteristics, threshold current and slope efficiency.
7. Solar cell- Study the characteristics of a Solar cell and to find Fill factor and efficiency.
8. Photodiode-Determination of V-I characteristics of a photo diode .
9. BJT Characteristics-Study of common base and common emitter configuration of a NPN/PNP transistor.
10. Diffraction grating- To determine the wavelength of laser diode.

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SEMI-CONDUCTOR DEVICES & CIRCUITS LAB (CESSD2)

Course Objectives:

1. To impart the knowledge of various configurations, characteristics and applications of various electronic devices.
2. Acquires the knowledge of various biasing circuits of Transistor.

Course Outcomes:
After the completion of the lab student can be able to:

1. Apply the knowledge of semiconductor physics to analyze the characteristics of diodes, transistors and SCR in different operating conditions. L4
2. Design and implement rectifier circuits along with filters using semiconductor devices. L5
3. Design and analyze the transistor biasing circuits. L5
4. Evaluate and analyze the performance of transistor based amplifiers. L4

List of Experiments:
PART A:
Electronic Workshop Practice (in 3 lab sessions):

1. Familiarization of R,L,C, Components
2. Familiarization of Devices, Diodes, BJT's, and Low power JFET's MOSFET's, LED's, LCD's, SCR.
3. Study and operation of

- Multimeters (Analog and Digital)
- Function Generator
- Regulated Power Supplies
- CRO

PART B:
Note: Minimum of 12 Experiments are to be done.

1. Forward & Reverse Bias Characteristics of PN Jn. Diode.
2. Zener Diode V-I Characteristics and as a voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. I/P & O/P Characteristics of Transistor in CB Configuration.
6. I/P & O/P Characteristics of Transistor in CE Configuration.
7. Calculation of h-parameters from CE and CB configured transistor circuits.
8. FET Characteristics in CS Configuration.
9. Design of Fixed Bias Circuit.
10. Design of Collector to Base bias Circuit
11. Design of Self Bias Circuit.
12. SCR Characteristics.
13. CE Amplifier.
14. CC Amplifier.

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COMPUTER SCIENCE & ENGINEERING

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BASIC ELECTRICAL & SIMULATION LAB (CESBE4)

Prerequisites: Basic Electrical Engineering

Course Objectives:

1. Students will gain the basic knowledge of electrical circuits using various laws.
2. Identify and apply different theorems for electrical circuits.
3. Assess the performance of different types of Electrical machines and single phase transformer.
4. Apply basic electrical engineering knowledge for house wiring practice.

Course Outcomes:

After the completion of this laboratory course, the student will be able to:

1. Mesh and Nodal analysis using hardware and digital simulation. L4
2. Examine a variety of theorems including as The venin's, Norton's, Superposition, Reciprocity by using hardware and digital simulation. L4
3. Evaluate the transformer's performance using both open and short circuit tests. L5
4. Evaluate electrical installations using various wiring connections, stair case wiring, and go down wiring. L5

List of Experiments: (Any 10 Experiments)

1. Verification of Ohm's, Kirchhoff's current law and Voltage law using hardware and digital simulation.
2. Mesh analysis using hardware and digital simulation.
3. Nodal analysis using hardware and digital simulation
4. Verification of Thevenin and Norton theorems using hardware and digital simulation.
5. Verification of Superposition and Reciprocity theorems hardware and digital simulation.
6. Magnetization characteristics of DC shunt generator.
7. Conduct brake test on dc shunt motor.
8. To perform open circuit and short circuit test on single phase transformer.
9. Make circuit for series and parallel connection of lamps.
10. Make a circuit for stair case wiring.
11. Make a circuit for Godown wiring.
12. Make a electrical bell connection practice board.

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COMPUTER SCIENCE & ENGINEERING

B.Tech II Semester **L/T/P C**
0/0/3 1.5

IT WORKSHOP (CESIT1)

Course Objectives:
Training on PC Hardware, assembling, software installation, Internet, World Wide Web, and usage of productivity tools for documentation, Spreadsheet computations and Presentations.

Course Outcomes:
After learning the contents of this course, the student will be able to:

1. Apply knowledge for computer assembling and software installation. L3
2. Solve the trouble shooting problems. L3
3. Apply the tools for preparation of PPT, Documentation and budget sheet etc. L3
4. Create standard documents and research documents using Latex. L6
5. Create project plans. L6

PC Hardware
The students should work on working PC to disassemble and assemble to working condition and install operating system like Linux or any other on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Problem 1
Every student should 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. Every student should disassemble and assemble the PC back to working condition.

Problem 2
Every student should individually install operating system like Linux or MS windows on the personal computer. The system should be configured as dual boot with both windows and Linux.

Problem 3
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.
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.

Internet & World Wide Web
Problem 5
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. Finally students should demonstrate how to access the websites and email.

Problem 6
Web Browsers, 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.

Problem 7

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. Usage of search engines like Google, Yahoo, ask.com and others should be demonstrated by student.

Problem 8

Cyber Hygiene: Students should learn about viruses on the internet and install antivirus software. Student should learn to customize the browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Problem 9

Develop home page: Student should learn to develop his/her home page using HTML consisting of his/her photo, name, address and education details as a table and his/her skill set as a list.

Productivity Tools LaTeX and Word Word Orientation

An overview of LaTeX and Microsoft (MS) office / equivalent (FOSS) tool word should be learned: Importance of LaTeX and MS office / equivalent (FOSS) tool Word as word
Processors, Details of the three tasks and features that should be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Problem 10

Using LaTeX and Word

To create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colours, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Problem 11

Creating project abstract Features to be covered

Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Problem 12

Creating a Newsletter Features to be covered

Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs in word.

Spreadsheet Orientation

Accessing, overview of toolbars, saving spreadsheet files, Using help and resources.

Creating a Scheduler

Gridlines, Format Cells, Summation, auto fill, Formatting Text.

Problem 14

Calculating GPA Features to be covered

Cell Referencing, Formulae in spreadsheet – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, Sorting, Conditional formatting.

Problem 15

Creating Power Point

Student should work on basic power point utilities and tools in Latex and Ms Office/equivalent (FOSS) which help them create basic power point presentation. PPT Orientation, Slide Layouts, Inserting Text, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting Images, Tables and Charts.

Text Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
4. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
5. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft).

SCI LAB

1. a) Introduction to Sci lab and its benefits
   b) Sci Lab migration, Toolboxes and Forums
2. a) Installing
   b) Getting Started
3. a) Vector Operation
   b) Matrix Operation
4. a) Conditional branching
   b) Iteration
5. Scripts and Functions
6. Plotting 2D graphs
7. File Handling
8. User Defined Input and Output
9. Integration
10. Solving Non linear Equations
11. a) Linear equations Gaussian Methods
    b) Linear equations Iterative Methods
12. Interpolation
13. a) ODE Euler methods
    b) ODE Applications
    c) Optimization Using Karmakar Function
14. Digital Signal Processing
15. a) Control systems
    b) Discrete systems
16. a) Xcos Introduction
    b) Calling User Defined Functions in XCOS
    c) Simulating a PID controller using XCOS