SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Bachelor of Technology

Department of Computer Science & Information Technology

I B. Tech. – I Semester (CSIT)

S.No.	Course Code	Subject	L	T	P/Drg	C
1.	16HS601	Functional English	3	-	-	3
2.	16HS602	Engineering Mathematics- I	3	1	-	3
3.	16HS604	Engineering Chemistry	3	1	-	3
4.	16CS501	Computer Programming	3	1	-	3
5.	16ME302	Engineering Graphics	-	-	6	3
6.	16HS607	English Language and Communication Skills Lab	-	-	4	2
7.	16HS609	Engineering Chemistry Lab	-	-	4	2
8.	16CS502	Computer Programming Lab	-	-	4	2
Contact Periods / Week			12	03	18	21
			Total/Week 33			

I B. Tech. – II Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS610	Professional English	3	-	-	3
2.	16HS611	Engineering Mathematics-II	3	1	-	3
3.	16HS603	Engineering Physics	3	1	-	3
4.	16HS606	Human Values & Professional Ethics	3	-	-	3
5.	16CS503	Data Structures through C	3	1	-	3
6.	16HS608	Engineering Physics Lab	-	-	4	2
7.	16CS504	Data Structures through C Lab	-	-	4	2
8.	16ME301	Engineering & IT Workshop Lab	-	-	4	2
Contact Periods / Week			15	03	12	21
			Total/Week 30			

II B. Tech. – I Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS612	Engineering Mathematics-III	3	1	-	3
2.	16HS605	Environmental Studies	3	-	-	3
3.	16CS505	Advanced Data Structures through C++	3	1	-	3
4.	16CS506	Digital Logic Design	3	1	-	3
5.	16CS507	Mathematical Foundations of Computer Science	3	1	-	3
6.	16EE207	Basic Electrical and Electronics Engineering	3	1	-	3
7.	16CS508	Advanced Data Structures through C++ Lab	-	-	4	2
8.	16EE208	Basic Electrical and Electronics Engineering Lab	-	-	4	2
Credit Course						
9.	COE-I	Comprehensive Online Examination-I	-	-	-	1
Audit Course						
10.	16CS538	Ethical Hacking	3	-	-	-
Contact Periods / Week			21	05	08	**23**
			Total/Week **34**			

II B. Tech. – II Semester (CSIT)

S. No.	Course Code	Subject	L	T	P	C
1.	16HS615	Probability & Statistics	3	1	-	3
2.	16CS509	Object Oriented Programming	3	1	-	3
3.	16CS510	Computer Organization	3	1	-	3
4.	16CS511	Database Management Systems	3	1	-	3
5.	17IT601	Operating Systems	3	1	-	3
6.	16CS513	Object Oriented Programming Lab	-	-	4	2
7.	16CS514	Database Management Systems Lab	-	-	4	2
8.	17IT602	Operating Systems Lab	-	-	4	2
Credit Course						
9.	COE-II	Comprehensive Online Examination-II	-	-	-	1
Audit Course						
10.	16HS614	Comprehensive Soft Skills-I	3	-	-	-
Contact Periods / Week			18	5	12	**22**
			Total/Week **35**			

*L-Lecture hours, T-Tutorial, P-Practical, Drg: Drawing, C-Credit

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I B. Tech. – I Sem. (CSIT)	**L**	**T**	**C**
	3	**0**	**3**

(16HS601) FUNCTIONAL ENGLISH
(Common to All Branches)

Course Objectives:
- To develop communication skills among the students.
- To construct proficiency in academic and social purpose to improve their grammatical accuracy.

- To understand LSRW skills and inculcate the habit of reading for pleasure.
- To obtain study skills and communication skills in formal and informal situations.
- To use appropriate vocabulary

Course Outcomes:
 Students will be able to
- Use LSRW skills through the prescribed text and develop their ability to communicate effectively.
- Articulate well among themselves and with Faculty.
- Construct compound sentences using common conjunctions.
- Manage to organize and deliver oral presentations.
- Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively.

UNIT I
 MINDSCAPES (Environmental Consciousness: Pollution - How To Regain Green Cover):
1. Learning English Language through Literature (Secret of work- Swami Vivekananda)
2. Present, Past and Future aspects
3. Introducing oneself
> Grammar: Parts of speech-Kinds of sentences-Tenses
> Vocabulary: Synonyms & Antonyms-Affixes – Phrasal verbs
> Listening & Reading Activities
> Writing: Paragraph writing-Note taking & Note making
> Phonetics- Syllabification

UNIT II
MINDSCAPES (Emerging Technologies: Solar Thermal Power- Nano Technology):
1. Learning English Language through Literature (Stopping by Woods on a Snowy Evening-Robert Frost)
2. Set in the Past
3. Inter-personal skills Grammar – Articles – Past Events – Voice & Impersonal passive voice – Gerund & -ing forms

        to-infinitives
        Vocabulary: Phrases – Idioms – word roots
        Listening & Reading Activities
        Writing: Letter writing-Informal-Formal
        Phonetics – Accent

UNIT III
MINDSCAPES (Global Issues: Child Labor- E- Waste):
1. Learning English Language through Literature (What is my Name?-P.Satyavathi)
2. Describing a person, place and object
3. Possibilities

        Grammar: Modals – Conditionals – Framing Questions – Compound nouns
        Verbs
        Vocabulary: One word substitute– Fixed expressions– Clauses
        Listening & Reading Activities
        Writing: Information transfer
        Intonation: Falling & Rising

UNIT IV
MINDSCAPES (Space Trek: Hubble Telescope- Genesis of ISRO):
1. Learning English Language through Literature (Man in Black-Oliver Goldsmith)
2. Analytical thinking
3. Co-operative learning

      Grammar: Concord–Reported speech-compare & contrast
      Vocabulary: Numerical expressions-definitions-collocations
      Listening & Reading
      Writing: Summary-Essay writing-Making instructions
      JAM

UNIT V
MINDSCAPES (Media Matters: History Of Media- Power of Media- Interviews):
1. Learning English Language through Literature (The Power of Prayer-Abdul Kalam)

2. Exploring creative ideas
3. Synthesis of sentences

    Grammar: Simple, compound and complex-Spotting errors
    Vocabulary: Discourse markers-Homonyms-Homophones-Homographs
    Listening & Reading Activities
    Writing: Writing recommendations-scrambled sentences
    Convincing others

TEXT BOOKS:

1. *Mindscapes:* English for Technologists and Engineers- Orient Black Swan, 2014.
2. *Paths to Progress in English: Orient Black Swan*

REFERENCES:

1. *Raymond Murphy's Intermediate English Grammar with CD*, Raymond Murphy, Cambridge University Press, 2012.
2. *Communication Skills*, Sanjay Kumar & Pushpalatha, Oxford University Press, 2012.
3. *Writing Tutor*. Advanced English Learners' Dictionary, 9th Edition, Oxford University Press, 2015.
4. *Powerful Vocabulary Builder*, Anjana Agarwal, New Age International Publishers, 2011.
5. *Keep Talking*, F. Klippel, Cambridge University Press, 2013.
6. *Listening Extra*, Miles Craven, Cambridge University Press, 2008.
7. *Reading Extra*, Liz Driscoll, Cambridge University Press, 2004.
8. *Writing Extra*, Graham Palmer, Cambridge University Press, 2004.
9. *Speak Well*, Jayashree Mohanraj et al, Orient Blackswan, 2013.

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	3	**1**	**3**

(16HS602) ENGINEERING MATHEMATICS-I
(Common to all Branches)

Course Objectives:
- To train the students thoroughly in Mathematical concepts of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- To prepare students for lifelong learning and successful careers using mathematical concepts of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- To develop the skill pertinent to the practice of the mathematical concepts including the student abilities to formulate and modeling the problems, to think creatively and to synthesize information

Course Outcomes:
- The students become familiar with the application of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- The students attain the abilities to use mathematical knowledge to analyze, formulate and solve problems with engineering applications

UNIT I
DIFFERENTIAL EQUATIONS: Exact and Non-exact (Integrating factors), Linear and Bernoulli differential equations, Applications to first order equations: Orthogonal Trajectories, Newton's Law of Cooling, Natural Law of Growth and Decay. Linear Differential Equations of second and higher order with constant coefficients. Method of variation of parameters. Applications of linear differential equations- Simple electric circuits.

UNIT II
Taylor's and Maclaurin's Series, Functions of several variables, Jacobian, Maxima and Minima of functions of two variables, Lagrange's method of undetermined Multipliers with three variables only. Radius of curvature.

UNIT III
MULTIPLE INTEGRALS: Evaluation of Double and Triple integrals, Change of order of integration, Change of variables. Simple applications to areas.

UNIT IV
Laplace transform I: Laplace transforms of standard functions, First shifting Theorem, Transforms of derivatives and integrals, Unit step function, Second shifting theorem, Laplace transforms of Periodic functions.

UNIT V
LAPLACE TRANSFORM II: Inverse Laplace Transforms,Convolution theorem, Application of Laplace transforms to ordinary differential equations of first and second order.

TEXT BOOKS:
1. *Higher Engineering Mathematics*, B.S.Grewal, Khanna publishers-42nd Edition (2012).
2. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India-10th Edition (2012).
3. *Engineering Mathematics* Volume-I, by T.K.V. Iyengar, S.Chand publication-12thEdition.

REFERENCES:
1. *Engineering Mathematics*, Volume - I, E. Rukmangadachari & E.Keshava Reddy, Pearson Publisher 1st Edition (2010)
2. *Engineering Mathematics*, Volume - I, by G.S.S.Raju, CENGAGE publisher (2013).
3. *Higher Engineering Mathematic*s, by B.V.Ramana, Mc Graw Hill publishers (2008).
4. *Advanced Engineering Mathematics*, by Alan Jeffrey, Elsevier-1st Edition (2001).
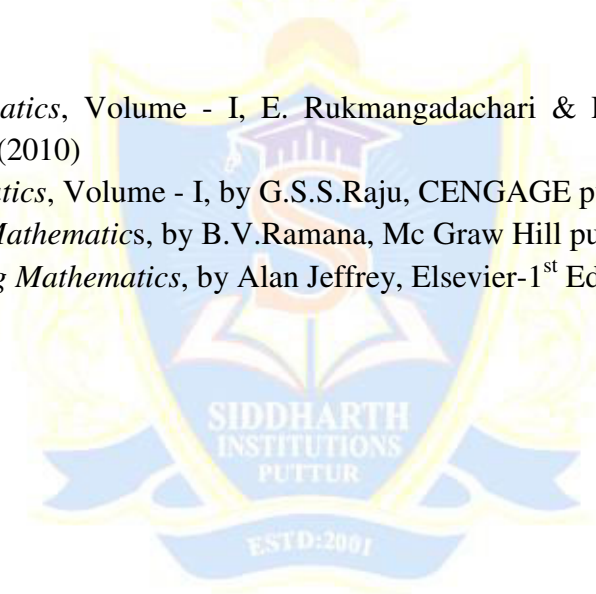
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	3	1	3

(16HS604) ENGINEERING CHEMISTRY
(Common to ECE, CSE & CSIT)

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

Course Outcomes:
The student is expected to:
• Differentiate between hard and soft water. Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.
• Understand the electrochemical sources of energy
• Understand industrially based polymers, various engineering materials.
• Understand characteristics and applications of fuels and Lubricants.

UNIT I
ELECTROCHEMISTRY, CELL & CORROSION: Electrolytes- Strong and Weak electrolytes- Definition- examples. Electrolysis- Industrial applications of electrolysis. Cell- Galvanic cell, Batteries- Rechargeable batteries (Lead acid, Ni-Cd, Lithium Ion Batteries), Fuels cells - (Hydrogen-Oxygen and Methanol-Oxygen). Corrosion- Introduction, type of corrosion (Concentration cell corrosion, Galvanic corrosion), Chemical (Dry) and Electrochemical (Wet) Theory of corrosion, Galvanic series, factors affecting the corrosion (Metal and environment) Prevention- Cathodic protection (Sacrificial anode and impressed current), electroplating (Copper, nickel and chromium) and electroless plating (Copper and nickel).

UNIT II
WATER AND ITS TREATMENT: Hardness of water and its Units, Estimation of hardness by EDTA method.

Troubles of Boilers: Scale & Sludge, Priming and Foaming, and Boiler Corrosion.

Treatment of Boiler Feed water:

Internal Treatment: Colloidal, Phosphate, Carbonate, Calgon and sodium aluminate treatment.

External Treatment: Ion-Exchange and Permutit processes.

UNIT III
FUEL TECHNOLOGY AND LUBRICANTS: Fuel Technology- Introduction, classification, characteristics of a good fuel, calorific value, liquid fuels, petroleum, refining of petroleum, knocking, octane number, cetane number, power alcohol, synthetic petrol, gaseous fuels, important gaseous fuels.

Lubricants- Definition, functions of lubricants, mechanism of lubrication, properties of lubricants – viscosity, flash and fire points, cloud and pour points, aniline points, neutralization number and mechanical strength.

UNIT IV
POLYMERS: Introduction- Basic concepts of polymerization, types of polymerization (Chain Growth –Addition, step growth (Condensation), Mechanism: Cationic , anionic, free radical and coordination covalent.

Plastomers- Thermosetting and thermoplastics, preparation, properties and engineering applications of PVC, Teflon, Bakelite and nylons.

Elastomers-Natural rubber, processing of natural rubbers, compounding of rubber.

Synthetic rubber- Preparation, properties and engineering applications of Buna-S, Buna-N, polyurethane, polysulfide (Thiokol) rubbers.

Conducting polymers- mechanism, synthesis and applications of polyacetyline, polyaniline.
Inorganic polymers: Basic introduction, silicones, polyphospazines applications.

UNIT V
ENGINEERING MATERIALS : Cement- composition of Portland cement, preparation (dry and wet process) setting and hardening of cement.

Refractories- introduction, classification, properties and applications.

Nanomaterials- Introduction-Carbon Nano Tubes, Fullerenes. Semi conductors, superconductors and quantum dots.

TEXT BOOKS:

1. *Engineering Chemistry*, First Edition, Jayaveera KN, Subba Reddy GV and Ramachandraiah C, McGraw Hill Higher Education, New Delhi, 2013.
2. *A Text Book of Enigneering Chemistry*, 15th Edition, Jain and Jain, Dhanapathi Rai Publications, New Delhi, 2013.

REFERENCES:

1. *A Text book of Engineering Chemistry*, 12th Edition, SS Dhara, Uma, S. Chand Publications, New Delhi, 2010.
2. *Engineering Chemistry*, First edition, Chandra Sekhar K B, Das U N and Sujatha Mishra, SCITECH Publications India Pvt. Limited, 2010.
3. *Engineering Chemistry*, First edition, Seshamaheswaramma K and Mridula Chugh, Pearson Education, 2013.
4. *Concise Inorganic Chemistry,* 7th Edn, Lee J.D., Blackwel Science Publications Oxford, London, 2004.
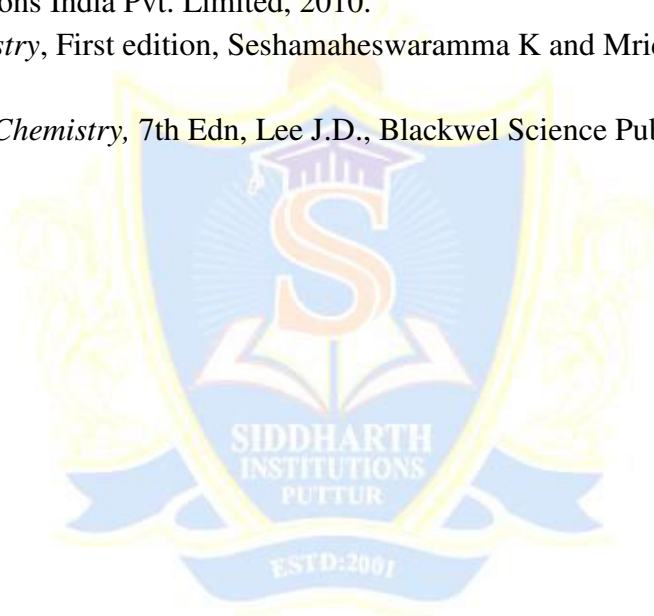
SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
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I B. Tech. – I Sem. (CSIT)	L	T	C
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(16CS501) COMPUTER PROGRAMMING
(Common to all Branches)

Course Objectives:
- To understand the core aspects of computer problem solving techniques
- To understand the programming language constructs
- To understand the programming paradigms

Course Outcomes:
- Able to design the flowchart and algorithm for real world problems
- Able to learn and understand new programming languages
- Able to construct modular and readable programs
- Able to write C programs for real world problems using simple and compound data types

UNIT I
OVERVIEW OF COMPUTERS AND PROGRAMMING: Electronic Computers Then and Now – Computer Hardware - Computer Software - Algorithms - Flowcharts - Software Development Method - Applying the Software Development Method. C Language Elements-Variable Declarations & Data Types Executable Statements – General form of a C Program-Expressions - Precedence and Associativity- Operators and Expression – Type Conversions

UNIT II
DECISION STATEMENTS: If Statement, If-else Statement, Nested- If-else Statement, Else if Ladder, Switch case – break – continue – go to Statements – Example Programs Loop Control Statements – for loop – while loop - do while – Example Programs

UNIT III
ARRAYS: Declaring and referencing Arrays – Array Subscripts, Using for loops for sequential access – Using Array elements as Function arguments – Array arguments – Multidimensional Arrays – Example Programs
STRINGS: Introduction – Declaring and Initializing String variables – Reading Strings from Terminals – Writing Strings to Screen – Arithmetic Operations on Characters – Putting Strings

together – Comparison of two Strings – String Handling Functions – Table of Strings- Other Features of Strings.

UNIT IV

FUNCTIONS: Definition – Function without Arguments – Functions with input arguments – Functions with simple output parameters – Communication among Functions – Scope – Storage clauses – Type Qualifiers – Recursion

Pointers: Introduction – Understanding Pointers – Accessing the address of a variable – Declaring Pointers variables- Initialization of Pointer variables – Accessing a variable through its Pointer – Chain of Pointers – Pointer Expressions – Pointer Increment & Scale Factors – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments .- Function returning Pointers – Pointers to Function.

UNIT V

STRUCTURES: Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Copying and Comparing Structure variables – Operations on Individual members – Arrays of Structures – Arrays with in Structures – Structures with in Structures – Structures and Functions – Unions –Bit fields – TYPEDEF – ENUM

File Management in C: Introduction – Types of Files – Defining and Opening a File – Closing a File – Input / Output Operations on Files – Error handling during IO Operations – Random access to files – Command line arguments. Preprocessor - #define and #include.

TEXT BOOKS:

1. Programming in C and Data Structures – Jeri R. Hanly, Elliot B Koffman, Ashok Kamthane, A Anand Rao – Pearson.(UNITS I, II and III)
2. The C Programming Language – Brain W. Kernighan and Dennis M. Ritchie, PHI Publishers.
3. Programming in C and Data Structures – E Balagurusamy – McGrawHill

REFERENCES:

1. Computer Fundamentals and C Programming - Dr. P. Chenna Reddy, ISBN: 9789351045885, Publisher: Pothi.com
2. The art of Computer Programming - Donald E. Knuth
3. Programming in C, Second Edition – Pradip Dey, Manas Ghosh, Oxford University Press.
4. "C from Theory to Practice"- George S. Tselikis- Nikolaos D. Tselikas- CRC Press.
5. "Programming with C"- R S Bichkar- University Press.
6. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, Pearson Education. (UNIT-I)

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I B. Tech. – I Sem. (CSIT)

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(16ME302) ENGINEERING GRAPHICS
(Common for CSE, ECE & CSIT)

Course Objectives:
- To familiarize the students in basic concept of conic sections, projections and developments of Objects.
- To develop the imagination and drafting skills of students.

Course Outcomes:
Students undergoing this course are able to
- Frame ideas based on the conceptual modeling and design
- Provide good understanding of the methods involved in preparing various views in engineering drawings
- Can prepare 2D and 3D diagrams of various objects

INTRODUCTION (**Not to be included for examination**)
Drawing instruments and their use – Lettering - Dimensioning – Simple Geometrical constructions.

UNIT I
CONIC SECTIONS: Construction of Ellipse, Parabola, Hyperbola (General and special methods).
Special Curves: Cycloids, Involutes.

UNIT II
POINTS: Projections of points
LINES: Projections of straight lines - Determination of true lengths and true inclinations – line inclined to both reference planes., traces.

UNIT III
PLANES: Projections of planes – Surface inclined to both reference planes
SOLIDS: Projections of simple solids (Prisms, pyramids, cylinder and cone) - Axis inclined to both the planes.

UNIT IV

SECTIONS: Sections of solids (prisms, pyramids, cylinder and cone) in simple vertical position by using cutting plane inclined to one reference plane and perpendicular to the other – true shape of the section.

DEVELOPMENTS: Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinder and cone.

UNIT V

ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS: Principles of Isometric projection-Isometric Scale- Isometric Views- Conversion of Isometric to orthographic views– Isometric projection of simple solids (Cube, Cylinder and Cone)

INTERPENETRATION/INTERSECTIONS OF SOLIDS: Simple solids.

COMPUTER AIDED DRAFTING: Introduction to drafting packages - orthographic views and projections and Isometric projections (demonstration only)

TEXT BOOKS:
1. *Engineering Drawing*, N.D.Bhatt, Charotar Publishers
2. *A text Book of Engineering Drawing*, K.L.Narayana, Kannaiah, Scitech Publishers,   2010
3. *Engineering Graphics with using AutoCAD,2007*. Jeyapoovan.T., Vikas Publishing House

REFERENCES:
1. *Fundamentals of Engineering Drawing*, Warren J. Luzadder and Jon. M.Duff Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.
2. *Engineering Graphics,* Bhattacharyya, S.C.Bera, I.K .International Pvt Ltd. 2009.
3. *A text Book of Engineering Drawing and Graphic,* K.Venugopal New Age Publishing New Delhi, 2008,

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I B. Tech. – I Sem. (CSIT)   **P   C**
                                                                 4   2

(16HS607) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common to ECE, CSE & CSIT)

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

Course objectives:
- To enable students to learn better pronunciation through stress on word accent,   Intonation and rhythm.
- To help the second language learners to acquire fluency in spoken English and   neutralize mother tongue influence.
- To train students to use language appropriately in both formal and informal situations.
- To enhance written communication among the students.

Course outcomes:
- To become active participants in the learning process and acquire proficiency in spoken English.
- To speak with clarity and confidence thereby enhances employability skills.
- To prepare effective job application

UNIT I
1. Phonetics -Importance
2. Introduction to Sounds of Speech
3. Vowels and Consonant sounds
4. Phonetic Transcription

UNIT II
5. Word Stress
6. Syllabification
7. Rules of Word Stress
8. Intonation

UNIT - III
9. Situational Dialogues/ Role Play
10. Telephonic Communication
11. JAM

UNIT IV
12. Describing Persons/ places/ things
13. Oral Presentations
14. Debate
UNIT V
15. Group Discussion
16. Job application
17. Interview skills

Minimum Requirements for ELCS Lab:

The English Language Lab shall have two parts:

1. Computer Assisted Language Learning (CALL) Lab: The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

2. The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system, Projector, a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

    i) P – IV Processor
      a) Speed – 2.8 GHZ
      b) RAM – 512 MB Minimum
      c) Hard Disk – 80 GB
    ii) Headphones of High quality

Suggested Software:
  1. Clarity Pronunciation Power – Part I (Sky Pronunciation)
  2. Clarity Pronunciation Power – part II
  3. K-Van Advanced Communication Skills
  4. Walden InfoTech Software.

REFERENCES:
  1. A Textbook of English Phonetics for Indian Students 2nd Ed T. Balasubramanian. Macmillian),2012.
  2. A Course in Phonetics and Spoken English, Dhamija Sethi, Prentice-Hall of India Pvt.Ltd
  3. Speaking English Effectively, 2nd Edition Krishna Mohan & NP Singh, 2011. (McMillan).
  4. A Hand book for English Laboratories, E.Suresh Kumar, P.Sreehari, Foundation Books, 2011.
  5. Spring Board Success, Sharada Kouhik, Bindu Bajwa, Orient Blackswan, Hyderabad, 2010.

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(16HS609) ENGNEERING CHEMISTRY LAB
(Common to ECE, CSE & CSIT)

Course Objectives:

- To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

Course Outcomes:

On completion of this course, students will have the knowledge in.

- Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
- Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.

Any 10 of the following experiments has to be performed during the I year I Sem.

List of Experiments:

1. Determination of total hardness of water by EDTA method.
2. Determination of Copper by EDTA method.
3. Estimation of Dissolved Oxygen by Winkler's method.
4. Estimation of iron (II) using diphenylamine indicator (Dichrometry –Internal indicator method).
5. Determination of Alkalinity of Water.
6. Determination of acidity of Water.
7. Preparation of Phenol-Formaldehyde (Bakelite).
8. Determination of Viscosity of oils using Redwood Viscometer I.
9. Determination of Viscosity of oils using Redwood Viscometer II.
10. Determination of calorific value of gaseous fuels by Junker''s Calorimeter.
11. Conductometric estimation of strong acid using standard sodium hydroxide solution.
12. Determination of Corrosion rate and inhibition efficiency of an inhibitor for mild steel in hydrochloric acid medium.
13. Potentio metric determination of iron using standard potassium dichromate.

14. Colorometric estimation of manganese.
15. pH meter calibration and measurement of pH of water and various other samples.

REFERENCES:

1. *Vogel's Text book of Quantitative Chemical Analysis*, Sixth Edition – Mendham J et al, Pearson Education, 2012.
2. *Chemistry Practical– Lab Manual,* First edition, Chandra Sekhar KB, Subba Reddy GV and Jayaveera KN, SM Enterprises, Hyderabad, 2014.

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I B. Tech. – I Sem. (CSIT)   **P   C**

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(16CS502) COMPUTER PROGRAMMING LAB
(Common to all Branches)

Course Objectives:
- To make the student learn C Programming language.
- To make the student solve problems, implement those using C & C++ programming languages.
- To strengthen the ability to identify and apply the suitable data structure for the given real world problem.

Course Outcomes:

At the end of the course, students will be able to
- Apply problem solving techniques of C to find solution.
- Use C language features effectively to implement solutions.
- Use C++ language features effectively to solve problems.
- Identify and develop apt searching and sorting technique for a given problem.
- Identity, design and develop the appropriate data structure for a given problem or application.

LIST OF EXPERIMENTS/TASKS:
1. Practice DOS and LINUX Commands necessary for design of C Programs.
2. Practice programs: Finding the sum of three numbers, exchange of two numbers, maximum of two numbers, to read and print variable values of all data types of C language, to find the size of all data types, to understand the priority and associativity of operators using expressions, to use different library functions of C language.
3. Write a program to find the roots of a Quadratic equation.
4. Write a program to compute the factorial of a given number.
5. Write a program to check whether the number is prime or not.
6. Write a program to find the series of prime numbers in the given range.
7. Write a program to generate Fibonacci numbers in the given range.
8. Write a program to find the maximum and minimum of a set of numbers.
9. Write a program to reverse the digits of a number.
10. Write a program to find the sum of the digits of a number.
11. Write a program to find the sum of positive and negative numbers in a given set of numbers.
12. Write a program to check for number palindrome.
13. Write a program to evaluate the sum of the following series up to n terms
    $$e^x = 1+x+x2/2!+x3/3!+x4/4!+--------$$
14. Write a program to generate Pascal Triangle.

15. Write a program to read two matrices and print their sum and product in the matrix form.
16. Write a program to read matrix and perform the following operations.
    i.   Find the sum of Diagonal Elements of a matrix.
    ii. Print Transpose of a matrix.
    iii. Print sum of even and odd numbers in a given matrix.
17. Write a program to accept a line of characters and print the number of Vowels, Consonants, blank spaces, digits and special characters.
18. Write a program to insert a substring in to a given string and delete few characters from the string. Don't use library functions related to strings.
19. Write a program to split a „file" in to two files, say file1 and file2. Read lines into the file from standard input. File1 should consist of odd numbered lines and file2 should consist of even numbered lines.
20. Write a program to merge two files.
21. Write a program to read a set of strings and sort them in alphabetical order.
22. Write a program to read two strings and perform the following operations without using Built in string Library functions and by using your own implementations of functions.
    i.   String length determination   ii .Compare Two Strings
    ii. Concatenate them, if they are not equal   iv. String reversing
23. Write programs using recursion for finding Factorial of a number, GCD, LCM, and solving Towers of Hanoi problem.
24. Write a program to exchange two numbers using pointers.
25. Write a program to read student records into a file. Record consists of roll no, name and Marks of a student in six subjects and class. Class field is empty initially. Compute the class of a student. The calculation of the class is as per JNTUA rules. Write the first class, second class, third class and failed students lists separately to another file.
26. A file consists of information about employee salary with fields employee id, name, Basic, HRA, DA, IT, other-deductions, Gross and Net salary. Initially only employee id, name, and basic have valid values. HRA is taken as 10% of the basic, DA is taken as 80% of basic, IT is 20% of the basic, other deductions are user specified. Compute the Gross and Net salary of the employee and update the file.
27. Write a program to perform Base (decimal, octal, hexadecimal,…) conversions.
28. Write a program to find the square root of a number without using built-in library function.
29. Write C program to convert a string to number.
30. Write C program to generate multiplication tables from 11 to 20.

REFERENCES:

1. How to Solve it by Computer, R.G. Dromey, Pearson.
2. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Pearson.
3. Let us C Yeswant Kanetkar, BPB publications
4. Pointers in C, Yeswant Kanetkar, BPB publications.
5. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, Pearson Education.

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I B. Tech. – II Sem. (CSIT)   **L   T   C**
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(16HS610) PROFESSIONAL ENGLISH
(Common to All Branches)

Course Description: The course content focuses on LSRW skills and vocabulary building to enrich their command over language. Relevant task based activities are also carried out to enhance their communication skills.

Course Objectives:
• To develop communication skills among the students
• To construct proficiency in academic and social purpose.
• To improve their grammatical accuracy.
• To understand LSRW skills and inculcate the habit of reading for pleasure.

Course Outcomes:
Students will be able to
• Use LSRW skills through the prescribed text and develop their ability to communicate effectively.
• Articulate well among themselves and with Faculty.
• Construct compound sentences using common conjunctions.
• Manage to organize and deliver oral presentations.
• Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively

UNIT I
MINDSCAPES (Lessons from the past: Importance of the Past)
1. Learning English Language through Literature (*Playing the English Gentleman*
   M.K.Gandhi)
2. Oral presentation
3. Effective writing
      Grammar: Relative clauses-Adjectives
      Vocabulary: Sequencing words
      Listening & Reading Activities
      Writing: Analytical paragraph writing-Minutes of meeting

UNIT II

MINDSCAPES (Energy: Renewable and Non-renewable Sources - Alternative Sources)

1. Learning English Language through Literature. (*The Portrait of a Lady* -Kushwant Singh)

2. Preparing and presenting slides, Telephone etiquette

3. Making drafts

    Grammar: Adverbs - prepositions -cause and effect expressions

    Vocabulary: phrasal verbs - Technical vocabulary-Extended definitions

    Listening & Reading Activities

    Writing: Report writing

UNIT III

MINDSCAPES (Engineering Ethics: Biotechnology - Protection from Natural Calamities)

1. Learning English Language through Literature (*La Belle Dame Sans Mercy*-John Keats)

2. Poster presentation, Debate

3. Technical drafting

    Grammar: Using connectives-Gap filling exercise using appropriate tense form

    Vocabulary: Acronyms & Abbreviations

    Listening & Reading Activities

    Writing: Writing projects

UNIT IV

MINDSCAPES (Travel and Tourism: Atithi Devo Bhava- Tourism in India)

1. Learning English Language through Literature (*A Marriage Proposal*-Anton Chekov)

 2. Group Discussion

3. Reading comprehension

    Grammar: Structure indicating purpose-Subject-verb agreement

    Vocabulary: emoticons-cloze test

    Listening & Reading

    Writing: Intensive and extensive

UNIT V

MINDSCAPES (Getting Job Ready: SWOT Analysis- Preparing for Interviews)

1. Learning from Literature (*Bird Sanctuary* -Sarojini Naidu)

2. Interview etiquette

3. Job application

    Grammar: Spotting errors, Gap filling exercises using ''gerunds'' & present participle
           forms

    Vocabulary: verbal ability

    Listening & Reading Activities

    Writing: Covering letter, Resume, Curriculum vitae

    Convincing others

TEXT BOOKS:
1. *Mindscapes*: *English for Technologists and Engineers*, Orient Blackswan, 2014
2. *Paths to Progress in English:* Orient Black Swan

REFERENCES:

1. *Effective Tech Communication*, Rizvi,Tata McGraw-Hill Education, 2007.
2. *Technical Communication,* Meenakshi Raman, Oxford University Press.
3. *English Conversations Practice,* Grant Taylor, Tata Mc GrawHill publications,2013.
4. *Practical English Grammar,* Thomson and Martinet, OUP, 2010.

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I B. Tech. – II Sem. (CSIT)	**L**	**T**	**C**
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(16HS611) ENGINEERING MATHEMATICS-II
(Common to all Branches)

Course Objectives:
- To train the students thoroughly in Mathematical concepts of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- To prepare students for lifelong learning and successful careers using mathematical concepts of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- To develop the skill pertinent to the practice of the mathematical concepts including the Student abilities to formulate and modeling the problems, to think creatively and to Synthesize information

Course Outcomes:
- The students become familiar with the application of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- The students attain the abilities to use mathematical knowledge to analyze, formulate and solve problems with engineering applications

UNIT I
MATRICES: Rank of a matrix, Echelon form, Normal form, Consistency of system of linear equations (Homogenous and Non-homogeneous), Eigen values, Eigen vectors, Cayley Hamilton theorem (Only statement) and its applications. Quadratic forms, Diagonolization.

UNIT II
VECTOR CALCULUS: Gradient, Divergence, Curl of a vector and related properties, Line, Surface and Volume integrals, Green's, Stoke's and Gauss divergence theorems (Only statement) and its applications.

UNIT III
FOURIER SERIES: Determination of Fourier coefficients- Fourier series- Even and odd functions, Fourier Series in an arbitrary interval, Periodic function, Half range sine and cosine series, Harmonic Analysis.

UNIT IV

Fourier integral theorem (only statement), Fourier sine and cosine integrals. Fourier transform, Fourier sine and cosine transforms, properties, Inverse transforms, Finite fourier transforms.

UNIT V

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, Method of separation of variables, Solution of one dimensional wave equation, Heat equation and two dimensional Laplace equation under initial and boundary conditions.

TEXT BOOKS:

1. *Higher Engineering Mathematics,* B.S.Grewal, Khanna publishers
2. *Engineering Mathematics Volume-I,* by T.K.V. Iyengar, S.Chand publication
3. *Mathematical Methods* by T.K.V. Iyengar, S.Chand publication

REFERENCES:

1. *Engineering Mathematics*, Volume - I, E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher 1st Edition (2010)
2. *Fourier Series and Integral Transforms*, by S.Sreenadh & S. Ranganatham, S.Chand Publication (2014)
3. *Engineering Mathematics*, Volume - I, by G.S.S.Raju, CENGAGE publisher.(2013)
4. *Advanced Engineering Mathematics*, by Erwin Kreyszig, Wiley India-10th Edition (2012)
5. *Advanced Engineering Mathematics*, by Erwin Kreyszig, Wiley India-10th Edition (2012)
6. *Higher Engineering Mathematics*, by B.V.Ramana, Mc Graw Hill publishers (2008)
7. *Advanced Engineering Mathematics*, by Alan Jeffrey, Elsevier-1st Edition (2001)
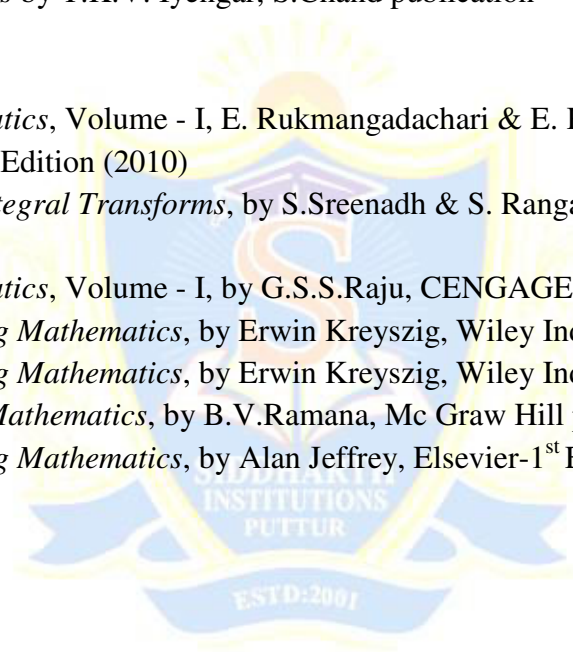
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I B. Tech. – II Sem. (CSIT)	L	T	C
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(16HS603) ENGINEERING PHYSICS
(Common to ECE, CSE & CSIT)

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

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

- The properties and device applications of semiconducting & magnetic materials are illustrated.
- The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

UNIT I
PHYSICAL OPTICS, LASERS AND FIBRE OPTICS: Physical Optics: Interference **-** Introduction - Interference in thin films by reflection – Newton's Rings. Diffraction - Introduction-Fraunhofer diffraction due to single slit and diffraction grating.
LASERS: Introduction - Characteristics of laser – Spontaneous and stimulated emission of radiation –-Einstein's relation, Population inversion – Excitation mechanism & optical resonator – ND: YAG laser - He-Ne laser, semiconductor diode laser -Applications of lasers.
FIBRE OPTICS: Introduction– Construction and working principle of optical fiber –Numerical aperture and acceptance angle – Types of optical fibers – Attenuation and losses in fibers -Optical fiber communication system – Applications of optical fibers in communications, sensors and medicine.

UNIT II
CRYSTALLOGRAPHY, ACOUSTICS AND ULTROSONICS: Crystallography**:** Introduction – Space lattice –Unit cell – Lattice parameters –Bravias lattice –Crystal systems – Packing fractions of SC, BCC and FCC-Directions and planes in crystals – Miller indices – Inter planar spacing in cubic crystals – X-ray diffraction - Bragg's law.
Acoustics Intensity – Absorption coefficient and its determination –Reverberation – Reverberation time (qualitative treatment) – Factors affecting acoustics of buildings and their remedies.
Ultrasonics Introduction – Production of ultrasonics by piezoelectric method – Properties and detection – Applications in non-destructive testing.

UNIT III
QUANTUM MECHANICS AND FREE ELECTRON THEORY: Quantum Mechanics**:** Introduction to matter waves – de'Broglie hypothesis - Heisenberg's uncertainty principle and its applications - Schrödinger's time independent and time dependent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well .
Free Electron theory: Classical free electron theory - Equation for electrical conductivity - Quantum free electron theory - Origin of bands in solids – Classification of solids into conductors, semiconductors and insulators.

UNIT IV
SEMICONDUCTORS AND MAGNETIC MATERIALS: Semiconductor Physics: Introduction – Intrinsic and extrinsic semiconductors (qualitative treatment), Drift & diffusion currents - Einstein's relation– Hall effect Direct & indirect band gap semiconductors. Magnetic materials: Introduction and basic definitions – Origin of magnetic moments – Bohr magneton – Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials – Hysteresis - Soft and hard magnetic materials and applications.

UNIT V

SUPERCONDUCTIVITY AND PHYSICS OF NANOMATERIALS: Superconductivity: Introduction – Meissner effect - Properties of superconductors- Type I and Type II superconductors-ac and dc Josephson effects BCS theory (qualitative) –Applications of superconductors. Physics of Nanomaterials: Introduction - Significance of nanoscale - Surface area and quantum confinement – Synthesis of nanomaterials: ball mill, chemical vapour deposition, sol-gel, plasma arcing – applications of nano materials

TEXT BOOKS:

1. *Engineering Physics* – K.Thyagarajan, 5th Edition, McGraw Hill Publishers, NewDelhi, 2014.
2. *Engineering Physics* - Gaur R.K. and Gupta S.L. Dhanpat Rai Publishers, 2009

REFERENCES:

1. *Engineering Physics* - Mani Naidu S.,Pearson Publications, 2011.
2. *Engineering Physics* - Arumugam K.-PHI Learning Pvt., India, 2009.
3. *Engineering Physics* -Palanisamy P.K, SCITECH Publications, 2011.
4. *Engineering Physics* -Rajagopal K. PHI, New Delhi, 2011.
5. *Engineering Physics* – Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, 10th Edition,S.Chand and Company, New Delhi, 2014
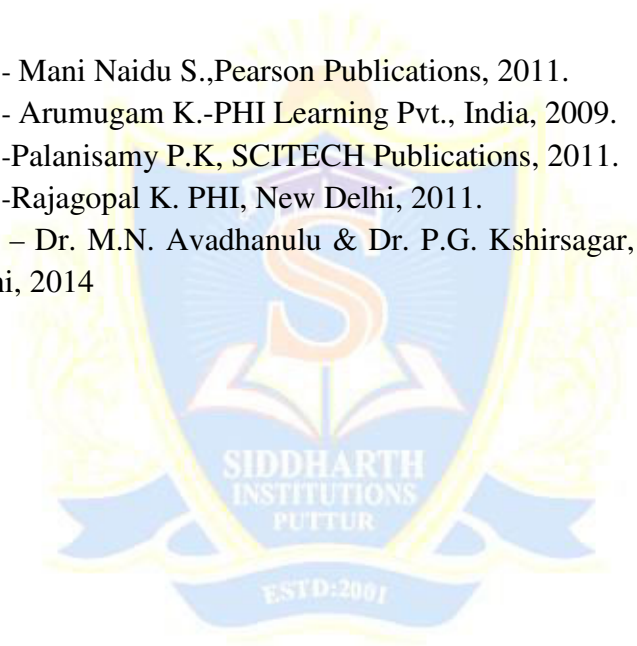
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I B. Tech. – II Sem. (CSIT)	L	T	C
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(16HS606) HUMAN VALUES AND PROFESSIONAL ETHICS
(Common to ECE, CSE & CSIT)

Course Objectives:
- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

Course Outcomes:
Students undergoing this course are able to
- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society

.UNIT I
Human Values - Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II
Engineering Ethics - Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories

UNIT III
Engineering As Social Experimentation - Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV
Safety, Responsibilities And Rights- Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk
Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

UNIT V
Global Issues-Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility

TEXTBOOKS:
1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:
1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001

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(16CS503) DATA STRUCTURES THROUGH C
(Common to CSE & CSIT)

Course Objective:
- Understand different data structures
- Understand searching and sorting techniques

Course Outcome:
- At the end of the course, students will be able to:
- Understand and program stacks and list data structures.
- Write programs to implement different types of queues.
- Understand and make use of hash tables in applications like dictionary, spell checker etc.,
- Understand why height balanced trees are advantageous over other data structures.
- Design algorithms to implement various data structures.

UNIT-I
Introduction and overview: One Dimensional array- Multi Dimensional array- pointer arrays.
Linked lists: Definition- Single linked list- Circular linked list- Double linked list- Circular Double linked list- Application of linked lists.

UNIT-II
Stacks: Introduction-Definition-Representation of Stack-Operations on Stacks- Applications of Stacks. **Queues**: Introduction, Definition- Representations of Queues- Various Queue Structures- Applications of Queues.

UNIT-III
Trees: Basic Terminologies- Definition and Concepts- Representations of Binary Tree- Operation on a Binary Tree- Types of Binary Trees-Binary Search Tree, Heap Trees
Graphs: Introduction- Graph terminologies- Representation of graphs- Operations on Graphs- Application of Graph Structures: Shortest path problem- topological sorting.

UNIT-IV

Sorting : Sorting Techniques- Sorting by Insertion: Straight Insertion sort- List insertion sort- Binary insertion sort- Sorting by selection: Straight selection sort- Heap Sort- Sorting by Exchange- Bubble Sort- Shell Sort- Quick Sort-Sorting by Mergin: Simple Merging-Binary Merge-Merge Sort.

UNIT-V
Searching: Linear Search Techniques: Linear Search with Array- Linear Search with Linked List- Linear Search with ordered list- Binary Search- Fibonacci Search.
**Tables**: Hash Tables: Hashing Techniques- Collision Resolution Techniques- Closed Hashing- Open Hashing.

TEXT BOOKS:
1. "Classic Data Structures", Second Edition by Debasis Samanta, PHI.
2. "Data Structures A Pseudo code Approach with C", Second Edition by Richard F. Gilberg, Behrouz A. Forouzan, Cengage Learning.

REFERENCES:
1. Fundamentals of Data Structures in C – Horowitz, Sahni, Anderson-Freed, Universities Press, Second Edition.
1. Schaum' Outlines – Data Structures – Seymour Lipschutz – McGrawHill- Revised First Edition.
2. Data structures and Algorithms using C++, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.
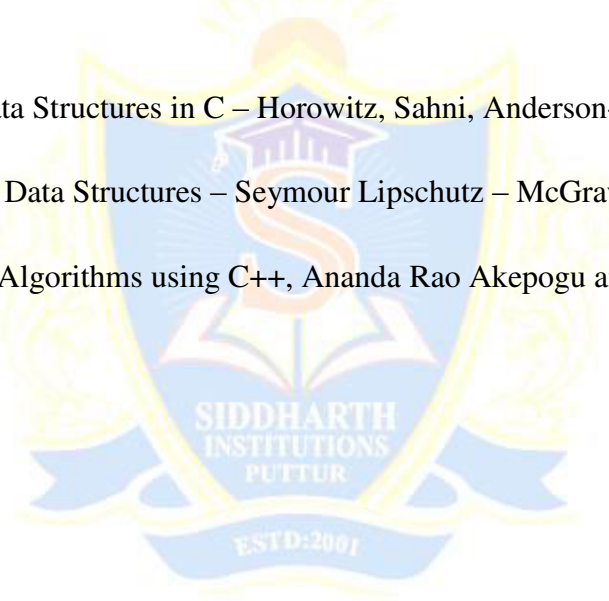
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I B. Tech. – II Sem. (CSIT) **P   C**
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(16HS608) ENGINEERING PHYSICS LABORATORY
(Common to ECE, CSE & CSIT)

Course Objectives:
- Will recognize the important of optical phenomenon like interference and diffraction.
- Will understand the role of optical fibre parameters and signal losses in communication.
- Will recognize the importance of energy gap in the study of conductivity and Hall- Effect in a semiconductor.
- Will understand the application of B-H curve.
- Will acquire a practical knowledge of studying the crystal structure in terms lattice constant.
- Will recognize the application of laser in finding the particle size and its role in diffraction studies.
- Will learn to synthesis of the nanomaterials and recognize its importance by knowing its nano particle size and its impact on its properties.

Course Outcomes:
- Would recognize the importance of optical phenomenon like interference and diffraction.
- Would have acquired the practical application knowledge of optical fibre, semiconductor, dielectric and magnetic materials, crystal structure and lasers by the study of their relative parameters.
- Would recognize the significant importance of nanomaterials in various engineering fields.

Any 10 of the following experiments has to be performed during the I year II Sem.
1. Determination of radius of curvature of a Plano-convex lens by forming Newton's rings.
2. Determination of wavelength of given source using diffraction grating in normal incidence method.
3. Determination of Numerical aperture, acceptance angle of an optical fiber.
4. Determination of the Energy gap of a Semiconductor diode.
5. Hall-Effect – Determination of mobility of charge carriers.
6. B-H curve – Determination of hysteresis loss for a given magnetic material.
7. Determination of Crystallite size using X-ray pattern (Powder) using Debye- Scheerer method.

8. Determination of particle size by using laser source.

9. Determination of dispersive power of a prism.

10. Determination of thickness of the thin wire using wedge Method.

11. Laser: Diffraction due to single slit.

12. Laser: Diffraction due to double slit.

13. Laser: Determination of wavelength using diffraction grating.

14. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.

15. Synthesis of nano material by any suitable method.

REFERENCES:

1. *Engineering Physics Practicals* – NU Age Publishing House, Hyderabad.

2. *Engineering Practical Physics* – Cengage Learning, Delhi.

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(16CS504) DATA STRUCTURES THROUGH C LAB
(Common to CSE & CSIT)

Course Objectives:
- To develop skills to analyze and program linear and nonlinear data structures.
- Develop different data structures with effective usage of arrays and linked lists.
- Develop recursive algorithms as they apply to trees and graphs

Course Outcomes:

At the end of the course the student will be able to:
- Implement data structures like array, list, stack, queue, various trees, and graphs.
- Design an appropriate data structure to solve a real world problem.
- Develop various types of Programs in sorting.
- Implement the binary search tree operations.

Apply searching and tree traversal techniques.

List of Experiments/Tasks
 1. Write a program to sort the elements of an array using sorting by exchange.
 2. Write a program to sort the elements of an array using Selection Sort.
 3. Write a program to implement heap sort.
 4. Write a program to perform Linear Search on the elements of a given array.
 5. Write a program to perform Binary Search on the elements of a given array.
 6. Write a program to convert infix expression to postfix expression and evaluate postfix expression.
 7. Write a program to implement stack, queue, circular queue using arrays and linked lists.
 8. Write a program to perform the operations creation, insertion, deletion, and traversing a Singly linked list.
 9. Write a program to perform the operations creation, insertion, deletion, and traversing a Doubly linked list.
    10. Write a program to remove duplicates from ordered and unordered arrays.
11. Write a program to sort numbers using insertion sort.
12. Write a program to implement quick sort using non-recursive
13. Write a program to search a word in a given file and display all its positions.
14. Write a program to perform Hash Based Searching.

15. Write a program to perform Warshall's Algorithm for Shortest Path.
16. Write a program to implement depth first search and breadth first search on graphs.
17. Write a program to perform different operations on Binary Search Trees.
18. Write a program to implement Binary Tree.

REFERENCES:

1. "Classic Data Structures", Second Edition by Debasis Samanta, PHI.
2. "Data Structures A Pseudo code Approach with C", Second Edition by Richard F. Gilberg, Behrouz A. Forouzan, Cengage Learning

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(16ME301) ENGINEERING & IT WORK SHOP LAB
(Common to all Branches)

Course Educational Objectives:

ENGINEERING WORKSHOP
- The course provides hands-on training in the trades of Carpentry, Fitting, House-wiring, Tin Smithy, Foundry. Overview of metal cutting processes, plumbing and welding is provided through live demonstrations.

IT WORKSHOP
- This course deals with practice sessions on PC hardware, Internet, World Wide Web, MS-Word, Excel, Power Point and Publisher. Demonstrations on installations of system software such as MS-Windows, Linux and device drivers, hardware and software troubleshooting, and protecting the personal computer from viruses and other cyber-attacks are include.

Course Outcomes:
ENGINEERING WORKSHOP
After completion of this course, a successful student will be able to :
- Utilize workshop tools for engineering practice.
- Employ skills for the production a component for real time applications.
- Appreciate the hard work and intuitive knowledge of the manual workers.

IT WORKSHOP
After completion of this course, a successful student will be able to:
- Can install the softwares in the computers
- Utilize skills for the development of application softwares
- Can protect personal computer from virus and other cyber attacks

<u>**LIST OF EXPERIMENTS**</u>

1. TRADES FOR EXERCISES

a. **Carpentry shop**: Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, Cross lap joint, Mortise and tenon T joint, Bridle T joint from soft wood stock.

b. **Fitting shop**: Two joints (exercises) from: Square joint, V joint, Half round joint or Dove tail joint out of 100 x 50 x 5 mm M.S. stock.

c. **Sheet metal shop**: Two jobs (exercises) from: Tray, Cylinder, Hopper or Funnel from out of 22 or 20 gauge G.I. sheet.

d. **House-wiring**: Two jobs (exercises) from: Wiring for ceiling rose and two lamps (bulbs) with independent switch, two way switch, controls with or without looping, wiring for stair case lamp, wiring for water pump with single phase starter.

e. **Foundry**: Preparation of two moulds (exercises): for a single pattern and a double pattern.

f. **Welding**: Preparation of two welds (exercises): Single V butt joint, Lap joint, Double V butt joint or T fillet joint.

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

REFERENCES:
1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009
2. Work shop Manual, P.Kannaiah & K.L.Narayana, SciTech Publishers.
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

IT WORKSHOP
LIST OF EXPERIMENTS

1. Preparing your Computer Knowledge (5 weeks)

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

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

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

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

6 Networking and Internet (4 weeks)

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

6.2 Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, skype etc.
If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, and search process using different natural languages, and creating e-mail account.

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

8. Productivity tools (6 weeks)

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

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

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

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

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II B.Tech. - I Sem. (CSIT)

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(16HS612) ENGINEERING MATHEMATICS-III
(Common to all branches)

Course Objectives:
- To train the students thoroughly in Mathematical concepts of Complex Analysis, Interpolation, Curve fitting, Numerical Differentiation and Integration and their applications
- To prepare students for lifelong learning and successful careers using mathematical concepts of Complex Analysis, Interpolation, Curve fitting, Numerical Differentiation and Integration and their applications
- To develop the skill pertinent to the practice of the mathematical concepts including the students abilities to formulate and modeling the problems, to think creatively and to synthesize information
.

Course Outcomes:
At the end of the course, students would be expected to:
- Have acquired ability to participate effectively in group discussions
- Have developed ability in writing in various contexts
- Have acquired a proper level of competence for employability
- Have acquired computational skills to solve real world problems in engineering

UNIT I
COMPLEX ANALYSIS-I: Analytic functions, Cauchy– Riemann equations, complex integration, Cauchy's theorem, Integral formula, Evaluation of Integrals.

UNIT II
COMPLEX ANALYSIS-II: Singularities, poles, Residues, Residues theorem, Evaluation of real integrals of the types $\int_{0}^{2\pi} f(\cos\theta, \sin\theta)d\theta$, $\int_{-\infty}^{\infty} e^{imx} f(x)dx$ - conformal mapping – Bilinear transformations- Transformation of e^z, Z^2, Sin z, and Cos z.

UNIT III
SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: The Bisection Method, The Method of False Position, Newton-Raphson Method.

INTERPOLATION: Newton's forward and backward interpolation formula, Lagrange's interpolation formula.

UNIT IV
CURVE FITTING: Fitting of a straight line, Second degree curve, Exponentional curve, Power curve by method of least squares.

NUMERICAL DIFFERENTIATION AND INTEGRATION: Trapezoidal rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule.

UNIT V
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Solution by Taylor's series, Picard's Method of successive Approximations, Euler's Method, Runge-Kutta second and fourth order methods.

TEXT BOOKS:
1. *Higher Engineering Mathematics,* B.S.Grewal, Khanna publishers.
2. *Advanced Engineering Mathematics,* Peter V.O'Neil, CENGAGE publisher.

REFERENCES:
1. Engineering *Mathematics III* by T.K.V. Iyengar, S.Chand publications.
2. *Mathematical Methods* by T.K.V. Iyengar, S.Chand publications.
3. *Engineering Mathematics, Volume - III*, E. Rukmangadachari & E. Keshava Reddy Pearson Publisher.
4. *Advanced Engineering Mathematics* by M.C. Potter, J.L. Goldberg, Edward F.Aboufadel, and Oxford.
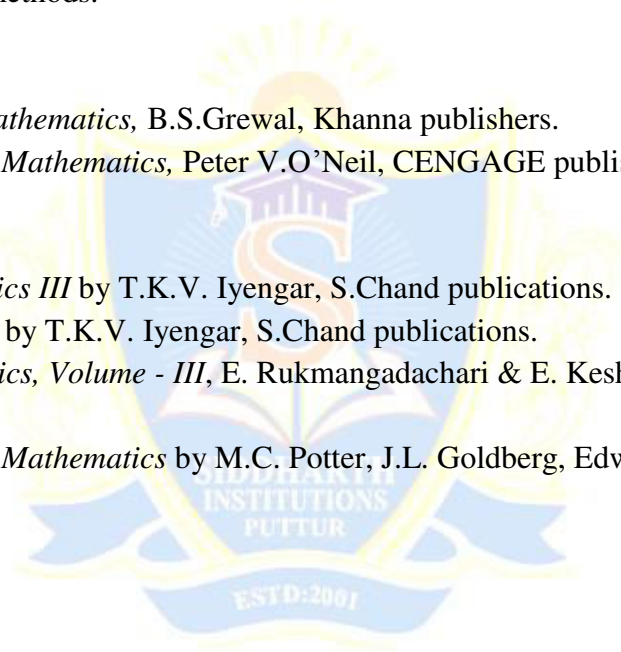
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II B. Tech -I Sem. (CSIT)   **L   T   C**
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(16HS605) ENVIRONMENTAL STUDIES
(Common to EEE, ECE & CSE)

Course Objectives:
- Students have got an idea about the importance of pollution free air, water, soil and food.
- They know about global environmental problems like Acid Rains, Global Warming, Green House Effects, Ozone layer depletion.
- To understand the impacts of developmental activities and mitigation measures along with the environmental policies and regulations.
- To recognize major concepts in environmental studies and demonstrate in-depth understanding the environment.

Course Outcomes:
- Based on this course, the Engineering Student will be able to understand/evaluate/develop technologies on the basis of Ecological principles and environmental regulations along with Legislation, Laws and Policies which in turn help in sustainable development.
- Take preventive measures to reduce air, water, soil pollutions and contaminants in food.
- Effectively carry out waste disposal at individual level.
- Involve in preservation of natural resources.

UNIT- I
INTRODUCTION:
Definition, Scope and Importance-Need for Public Awareness
NATURAL RESOURCES:
Classification of resources-Forest resources: Use and over-exploitation, deforestation- Mining, dams and their effects on forests and tribal people – Water resources - Use and over utilization of surface and ground water- Floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources –Energy resources: Renewable and Non- Renewable sources of energy- Solar energy, Hydro electrical energy, Wind energy, Nuclear energy, etc.

UNIT-II
ECOSYSTEMS:
Concept of an ecosystem– structural features of ecosystem- Producers, Consumers and Decomposers–-Biogeochemical cycles- Ecological succession-Food chains, food webs and ecological pyramids – Energy flow in the ecosystem-Types of ecosystems (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems.

UNIT-III
BIODIVERSITY AND ITS CONSERVATION:
Introduction, Definition, genetic, species and ecosystem diversity, Bio-geographical classification of India, India as a Mega-diversity Nation, Hot spots of biodiversity, Value of biodiversity, threats to biodiversity, endemic, endangered and extinct species of India, In-Situ and Ex-situ conservation of biodiversity.

UNIT-IV
ENVIRONMENTAL POLLUTION AND GLOBAL ENVIRONMENTAL ISSUES:
Natural Disasters: Droughts, Floods, Cyclone, Landslides, Earthquake,
Pollution episodes: Air pollution, Water pollution, Land pollution, Noise pollution, Automobile pollution and Nuclear pollution –Effects-Global warming, Acid Rain and Ozone layer depletion and controlling measures.
Global Environmental Issues: Population Growth, Urbanizations, Land Management, Water and Waste Water Management. Climate change and impacts on human environment
Solid Waste Management: causes, effects and control measures of Municipal solid wastes – E-waste and management, Role of an individual in prevention of pollution – pollution case studies.

UNIT-V
ENVIRONMENTAL LEGISLATION, LAWS, POLICIES FOR SUSTAINABLE DEVELOPMENT:
Environmental Legislation, Environmental Protection act – Air Prevention and Control of Pollution act–Water Prevention and control of Pollution act– Wildlife protection act – Forest conservation act – Municipal Solid Waste management, International conventions/Protocols : Earth summit, Kyoto protocol and Montreal Protocol. From Unsustainable to sustainable development, Role of NGO's for Sustainable development, Concepts of Green belt development, Role of IT in Environment-Remote Sensing and GIS methods for Sustainable development.

Field work- visit to a local area to document environmental assets-river forest grassland/hill, mountain and polluted sites (urban/rural/industrial/Agriculture) - study simple ecosystems (pond/river/hill slopes)

TEXT BOOKS:

1. *A Text book on Environmental Sciences* by Kaushik A and Kaushik C P 5th edition, New age international publishers, 2015.
2. *Text Book of Environmental Science and Technology* by Anji Reddy M, BS Publications, 2007.

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II B. Tech. – I Sem. (CSIT)

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(16CS505) ADVANCED DATA STRUCTURES THROUGH C++
(Common to CSE & CSIT)

Course Objectives:
- This course is aimed to provide basic understanding of different data structures and algorithms.
- This Course covers C++, C++ features, various types of trees, graphs and their implementation and hashing.

Course Outcomes:
- To develop skills to design and analyze linear and nonlinear data structures.
- Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
- Develop recursive algorithms as they apply to trees and graphs.

UNIT- I
C++ Class Overview: Class definition, Objects, class members, Access control, Class scope, Constructors and Destructors, Parameter passing methods, Inline functions, Static class members, This pointer, Friend functions, Dynamic memory allocation and De-allocation (new and delete), Exception handling.

UNIT- II
Function Over Loading, Operator Overloading, Generic Programming-Function and class templates, Inheritance basics, Base and derived classes, Inheritance types, Base class access control, Runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT- III
Trees: Introduction, Representation of Trees, Binary Trees, Binary Tree Traversal, Threaded Binary Trees, Binary Search Trees, Selection Trees. **Graphs**: Introduction- Graph terminologies-Representation of graphs, Operations on Graphs, graph traversals, Applications of graph.

UNIT- IV
Dictionaries: Definition, Hash Table Representation, Static and Dynamic Hashing, Skip List Representation.

Priority Queues: Definition and Applications, Leftist Trees, Binomial Heaps, Fibonacci Heaps, Pairing Heaps.

UNIT- V
Efficient Binary Search Trees: Optimal Binary Search Trees, AVL Trees, Red – Black Trees, Splay Trees.
Multiway Search Trees: M – way Search Trees, B – Trees, B+ Trees

Text Books:
1. Fundamentals of Data Structures in C++ by Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Universities Press, Second Edition.
2. Data structures and Algorithms using C++, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.

Reference Books:
1. Data structures and Algorithms in C++, Michael T.Goodrich,R.Tamassia and .Mount, Wiley student edition, John Wileyand Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education.Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
4. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
    Data Structures using C++, D.S. Malik, Cengage Learning, India Edition

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II B. Tech. – I Sem. (CSIT)	L	T	C
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(16CS506) DIGITAL LOGIC DESIGN
(Common to CSE & CSIT)

Course Objectives:
- To study the basic philosophy underlying the various number systems, negative number representation, binary arithmetic, binary codes and error detecting and correcting binary codes.
- To study the theory of Boolean algebra and to study representation of switching functions using Boolean expressions and their minimization techniques.
- To study the combinational logic design of various logic and switching devices and their realization. To study the sequential logic circuits design both in synchronous and Asynchronous modes for various complex logic and switching devices, their minimization techniques and their realizations.
- To study some of the programmable logic devices and their use in realization of switching functions

Course Outcomes

- Students will be aware of theory of Boolean Algebra & the underlying features of various number systems.
- Students will be able to use the concepts of Boolean Algebra for the analysis & design of various combinational & sequential logic circuits.
- Students will be able to design various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays.

UNIT- I
Binary systems and Boolean algebra:
Digital Systems, Binary Numbers, Number Base Conversions, Octa land Hexa decimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Axiomatic Definition of Boolean Algebra, Basic Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates.

UNIT- II
Gate–Level Minimization: The Map Method, Four Variable Map, Five-Variable Map, Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Other Two Level Implementations, EX-OR Function, Tabular Minimization method.

UNIT- III
Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, De-Multiplexers.

UNIT- IV
Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Registers, Shift Registers, Ripple counters, Synchronous counters, Ring Counter and Johnson Counter.

UNIT- V
Memory And Programmable Logic: Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices, Integrated circuits.

TEXT BOOKS:

1. Digital Design, M.Morris Mano, Micheal D.Ciletti, 5th Edition, 2013, Pearson.

REFERENCES:

1. Digital Logic & State Machine Design, David J. Comer, Oxford University Press, 3rd Reprinted Indian Edition, 2012.
2. Digital Logic Design, R.D.Sudhakar Samuel, Elsevier Fundamentals of Logic Design, 5/e, Roth, Cengage

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II B. Tech –I Sem. (CSIT)	**L**	**T**	**C**
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(16CS507) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to CSE & CSIT)

Course Objectives:
- To train the students thoroughly in Mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.
- To prepare students for lifelong learning and successful careers using mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.
- To develop the skill pertinent to the practice of the mathematical concepts including the students abilities to formulate and modeling the problems, to think creatively and to synthesize information.

Course Outcomes:
At the end of the course, students would be expected to:
- Have acquired ability to participate effectively in group discussions.
- Have developed ability in writing in various contexts.
- Have acquired a proper level of competence for employability.

UNIT-I
Mathematical Logic:
Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers
Predicates:
Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of Contradiction, Automatic Theorem Proving.

UNIT-II
Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram.
Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties.
Algebraic structures: Algebraic systems examples and general properties, Semi groups and monads, groups, sub groups homomorphism, Isomorphism.

UNIT-III
Elementary Combinatorics:
Basis of counting, Enumerating Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application

UNIT-IV
Recurrence Relation:
Generating Functions & Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving Recurrence relation by substitution and Generating functions. Characteristic roots, solution of Inhomogeneous Recurrence Relation.

UNIT-V
Graph Theory:
Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs
Graph Theory Applications: Basic Concepts Isomorphism and Sub graphs, Multi graphs and
Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Books:
1. Elements of Discrete Mathematics- A Computer Oriented Approach, C.L.Liu, D.P. Mohapatra, 3/e, TMH.
2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI

REFERENCES:
1. Discrete Mathematical Structures with Application to Computer Science, Tremblay, Manohar McGraw Hill Publication
2. Discrete and Combinatorial Mathematics- An Applied Introduction, Ralph.P. Grimaldi, 5/e, Pearson Education.
3. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.

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II B. Tech –I Sem. (CSIT)   **L   T   C**
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(16EE207) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & CSIT)

Course Objectives:

Basic Electrical Engineering contains basic Electrical Laws, Network theorems, AC & DC generators and motors which are widely used in industry are covered and their performance aspects will be studied.

UNIT – I INTRODUCTION TO ELECTRICAL ENGINEERING

Ohm's Law, Basic Circuit Components, Kirchhoff's Laws, Types of Sources, Resistive Networks, Inductive Networks, Capacitive Networks, Series Parallel Circuits, Star Delta and Delta Star Transformation. Principle of AC Voltages, Root Mean Square and Average Values of Alternating Currents and Voltage, Form Factor and Peak Factor, Phasor Representation of Alternating Quantities.

UNIT- II NETWORK THEOREMS & TWO PORT NETWORKS

Network Theorems: Thevenin's, Norton's, Maximum Power Transfer, Reciprocity and Superposition Theorems for DC Excitations.

Two Port Networks: Two Port Network Parameters – Impedance, Admittance, Transmission and Hybrid Parameters and Their Relations.

UNIT-III DC MOTORS and TRANSFORMERS

DC Motors: Principle of Operation of DC Motors, Types of DC Motors, Torque Equation, Losses and Efficiency Calculation in DC Motor- Swinburne's Test and Applications.

Transformers: Principles of Operation, EMF equation, Losses and Efficiency, Regulation of Transformer, Testing: OC & SC Tests.

Outcomes:

After going through this course the student gets a thorough knowledge on basics of Network theorems, Two port networks, DC Motors and Transformers with which he/she can able to apply the above conceptual things to real-world problems and applications.

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.

2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University
   Press.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Fundamentals of Electrical Electronics Engineering by T.Thyagarajan, SCITECH
   Publications 5th Edition-2007
4. Electrical and Electronic Technology-By Hughes – Pearson Education.

PART-B

UNIT I

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

UNIT II

BJT and FETs: Bipolar Junction Transistor (BJT) – Types of Transistors, Operation of NPN and PNP Transistors, Input-Output Characteristics of BJT-CB, CE and CC Configurations, Relation between I_C, I_B and I_E. Transistor Biasing- Fixed Bias, Voltage Divider Bias, Transistor Applications- Transistor as an Amplifier, Transistor as a Switch,. Junction Field Effect Transistor (JFET)- Theory and Operation of JFET, Output Characteristics, Transfer Characteristics, Configurations of JFET-CD, CS and CG Configurations, JFET Applications- JFET as an Amplifier, JFET as a Switch, Comparison of BJT and JFET,MOSFET-The Enhancement and Depletion MOSFET, Static Characteristics of MOSFET, Applications of MOSFET.

UNIT III

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

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

TEXT BOOKS:

1. Basic Electrical and Electronics Engineering, M.S.Sukhija, T.K.Nagsarkar, Oxford University Press, 1st Edition, 2012.
2. Basic Electrical and Electronics Engineering, S.K Bhattacharya, Pearson Education, 2012

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II B. Tech -I Sem. (CSIT)   **P   C**
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(16CS508) ADVANCED DATA STRUCTURES THROUGH C++ LAB
(Common to CSE & CSIT)

Course Objectives:
- This course is aimed to provide basic understanding of different data structures and algorithms.
- This Course covers C++, C++ features, various types of trees, graphs and their implementation and hashing.

Course Outcomes:
- To develop skills to design and analyze linear and nonlinear data structures.
- Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
- Develop recursive algorithms as they apply to trees and graphs.

Week 1 :
   a) Write a C++ program implement area of circle using constructor.
   b) Write a C++ program to implement inline functions.

Week 2:
   a) Write a C++ program to implement friend function and this pointer.
   b) Write a C++ program to perform student marks record using dynamic memory allocation (new and delete).

Week 3:
   a) Write a C++ program to implement user-defined Exceptions.
   b) Write a C++ program to implement Operator Overloading.

Week 4 :
   a) Write a C++ program to implement the Inheritance using class templates.
   b) Write a C++ program to implement static and abstract classes.

Week 5:

    Write a C++ program to perform the following operations:

    a) Insert an element into a binary search tree.

    b) Delete an element from a binary search tree.

    c) Search for a key element in a binary search tree.

Week 6:

    Write C++ programs that use recursive functions to traverse the given binary tree in

    a) Preorder   b) inorderand c) postorder.

Week7 :

    Write a C++ program to implement complete binary tree using arrays.

Week8 :

    Write C++ programs for the implementation of BFS and DFS for a given graph.

Week9 :

    Write a C++ program to implement hash based search.

Week10 :

    Write a C++ program to perform the following operations

    a) Insertion into a B-tree b) Deletion from a B-tree

Week11 :

    Write a C++ program to perform the following operation

    a) Insertion into an AVL-tree

Week12 :

    Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

(Note: Use Class Templates in the above Programs)

Reference Books:

1. Data structures and Algorithms using C++, Ananda Rao Akepogu and RadhikaRajuPalagiri, Pearson Education.
2. Data Structures A Pseudocode Approach with C++, India Edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
3. Programming Principles and Practice using C++, B.Stroustrup,Addison-Wesley(Pearson education).
4. Data Structures and STL, W.J.Collins, McGrawHill,International edition.
5. Data structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley& sons.

       The Art,Philosophy, and Science of OOP with C++,Rick Miller,SPD

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(16EE208) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB
(Common to CSE & CSIT)

PART – A
BASIC ELECTRICAL ENGINEERING LAB
PART- A : ELECTRICAL LAB

1. Verification of Superposition Theorem.
2. Verification of Thevenin's Theorem.
3. Determination of Open circuit and Short circuit parameters
4. Swinburne's Test on DC Shunt Machine (Predetermination of Efficiency of a Given DC Shunt Machine Working as Motor and Generator).
5. Brake Test on DC Shunt Motor. Determination of Performance Characteristics.
6. OC & SC Tests on Single-Phase Transformer (Predetermination of Efficiency and Regulation at Given Power Factors).

PART – B
ELECTRONICS LABORATORY
(Any Six Experiments)

1. P-N Junction Diode and Zener Diode Volt-Ampere Characteristics.
2. Bipolar Junction Transistor in CB Configuration-Input and Output Characteristics, Computation of α.
3. Half-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
4. Full-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
5. Bipolar Junction Transistor in CE Configuration-Input and Output Characteristics, Computation of β.
6. Junction field effect Transistor in Common Source Configuration Output and Transfer Characteristics.
7. Verification of Logic Gates- AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.

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(COE-1) COMPREHENSIVE ONLINE EXAMINATION -I

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(16CS538) ETHICAL HACKING
(Common to CSE & CSIT)

Course Objectives:
- This course will function as an introduction to ethical hacking mechanisms.
- Students will understand about social engineering and types of attacks.
- Students will begin by understanding how perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed.
- Students then learn how intruders escalate privileges and what steps can be taken to secure a system.

Course Outcomes:
1. To understand how intruders escalate privileges.
2. To understand Intrusion Detection, Policy Creation, Social Engineering, Buffer Overflows and different types of Attacks and their protection mechanisms.
3. To learn about ethical laws and tests.

UNIT- I
ETHICAL HACKING: Types of Data Stolen From the Organizations, Elements of Information Security, Authenticity and Non-Repudiation, Security Challenges, Effects of Hacking, Hacker – Types of Hacker, Ethical Hacker, Hacktivism - Role of Security and Penetration Tester, Penetration Testing Methodology, Networking & Computer Attacks – Malicious Software (Malware), Protection Against Malware, Intruder Attacks on Networks and Computers, Addressing Physical Security – Key Loggers and Back Doors.

UNIT- II
FOOT PRINTING AND SOCIAL ENGINEERING: Web Tools for Foot Printing, Conducting Competitive Intelligence, Google Hacking, Scanning, Enumeration, Trojans & Backdoors, Virus & Worms, Proxy & Packet Filtering, Denial of Service, Sniffer, Social Engineering – shoulder surfing, Dumpster Diving, Piggybacking.

UNIT-III
DATA SECURITY: Physical Security – Attacks and Protection, Steganography – Methods, Attacks and Measures, Cryptography – Methods and Types of Attacks, Wireless Hacking, Windows Hacking, Linux Hacking.

UNIT- IV

NETWORK PROTECTION SYSTEM & HACKING WEB SERVERS: Routers, Firewall & Honeypots, IDS & IPS, Web Filtering, Vulnerability, Penetration Testing, Session Hijacking, Web Server, SQL Injection, Cross Site Scripting, Exploit Writing, Buffer Overflow, Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobiles Phone Hacking.

UNIT- V

ETHICAL HACKING LAWS AND TESTS : An introduction to the particular legal, professional and ethical issues likely to face the domain of ethical hacking, ethical responsibilities, professional integrity and making appropriate use of the tools and techniques associated with ethical hacking – Social Engineering, Host Reconnaissance, Session Hijacking, Hacking - Web Server, Database, Password Cracking, Network and Wireless, Trojan, Backdoor, UNIX, LINUX, Microsoft, NOVEL Server, Buffer Overflow, Denial of Service Attack, Methodical Penetration Testing.

TEXT BOOK:

1. Michael T. Simpson, Kent Backman, James E. "Corley, Hands-On Ethical Hacking and Network Defense", Second Edition, CENGAGE Learning, 2010.

REFERENCES:

1. Steven DeFino, Barry Kaufman, Nick Valenteen, "Official Certified Ethical Hacker Review Guide", CENGAGE Learning, 2009-11-01
2. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy", Syngress Basics Series – Elsevier, August 4, 2011.
3. Whitaker & Newman, "Penetration Testing and Network Defense", Cisco Press, Indianapolis, IN, 2006.

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(16HS615) PROBABILITY & STATISTICS
(Common to CSE & CSIT)

Course Objectives:
- To train the students thoroughly in Mathematical concepts fundamentals of probability, test of hypothesis, Test of significance and ANOVA
- To prepare students for lifelong learning and successful careers using mathematical concepts of probability, test of hypothesis, Test of significance and ANOVA
- To develop the skill pertinent to the practice of the mathematical concepts including the Student abilities to formulate and modeling the problems, to think creatively and to Synthesize information

Course Outcomes:
   At the end of the course, students would be expected to:
- Have acquired ability to participate effectively in group discussions
- Have developed ability in writing in various contexts

Have acquired a proper level of competence for employability

UNIT- I
Probability: Introduction, Conditional probability – Baye's theorem, Random variables – Discrete and continuous Distributions, Expectation, Varience, Moments, Moment generating functions

UNIT- II
Distributions-Binomial, Poisson, Normal, Uniform, Exponential and Gamma distributions – Related properties and applications

UNIT- III
Test of Hypothesis: Population and Sample, Confidence interval of mean from Normal distribution, Null and Alternative hypothesis, Level of significance
Test of significance: Test based on normal distribution, Z test for means and proportions, Small samples t- test for one sample and two sample problem and paired t-test, F-test and Chi-square test (testing of goodness of fit and independence).

UNIT- IV

Analysis of variance one way classification and two way classification (Latin square Design and RBD)

UNIT- V

Statistical Quality Control: Concept of quality of a manufactured product -Defects and Defectives - Causes of variations - Random and assignable - The principle of Shewhart Control Chart-Charts for attribute and variable quality characteristics- Constructions and operation of X- bar Chart, R-Chart, P-Chart and C-Chart.

TEXT BOOKS:

1. *Statistical methods* by S.P. Gupta, S.Chand publications.
2. *Probability & Statistics* by T.K.V. Iyengar, S.Chand publications.
3. Probability and statistics by Murray R Spiegel, John J Schiller, R Alu Srinivasan Schaum's Outlines.

REFERENCES:

1. *Probability & Statistics* by E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher.
2. *Probability & Statistics for engineers* by Dr. J. Ravichandran WILEY-INDIA publishers.
3. *Probability & Statistics for Science and Engineering* by G.ShankerRao, Universities Press.
4. *Probability and Statistics for Engineering and Sciences* by Jay L.Devore, CENGAGE.
5. *Probability and Statistics* by R.A. Jhonson and Gupta C.B.
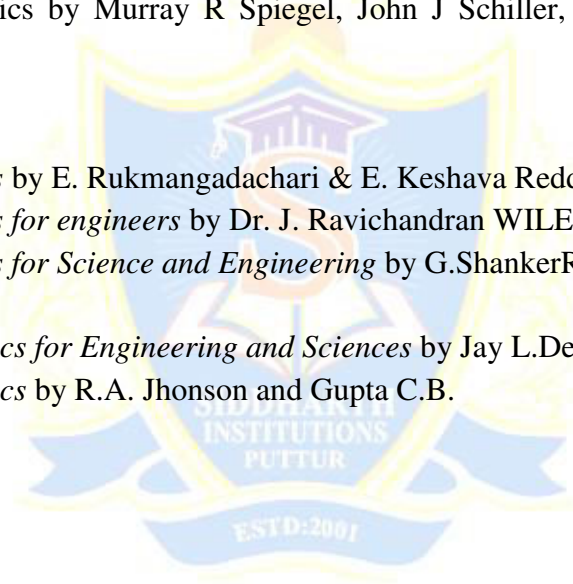
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(16CS509) OBJECT ORIENTED PROGRAMMING
(Common to CSE & CSIT)

Course Objectives:
- Study the syntax, semantics and features of Java Programming Language
- Learn the method of creating Multi-threaded programs and handle exceptions
- Learn Java features to create GUI applications & perform event handling
- Learn basics of Java Data Base Connectivity

Course Outcomes:
- Solve problems using object oriented approach and implement them using Java
- Write efficient programs with multitasking.
- Create own Exceptions and handle Exceptions.
- Develop GUI Components.
- Develop application projects and design Java Application to connect Database

UNIT- I
The Java Language - The History and Evolution of Java – Security – Portability –Byte Code- The Java Buzzwords - An Overview of Java -Data Types Variables, and Arrays -Operators -Control Statements – Java's Selection Statements – Iteration Statements – Jump Statements

UNIT- II
Introducing Classes – Class Fundamentals – Declaring Objects – Introducing Methods – Constructors – Garbage Collection – Understanding static – Introducing final - Command line arguments –Varargs - Inheritance – Using Super – Method Overriding – Dynamic Method Dispatch- abstract classes – Packages and Interfaces

UNIT- III
Exception Handling – Exception Fundamentals - Exception Types -Uncaught Exceptions -Using try and catch - Nested try Statements -throw -throws –finally - Java's Built-in Exceptions -Creating Your Own Exception Subclasses - Chained Exceptions -Multithreaded Programming - The Java Thread Model -Thread Priorities - The Thread Class and the Runnable Interface - Creating Multiple Threads -Using isAlive( ) and join( ) - Thread Priorities – Synchronization. String Handling.

UNIT-IV

The Applet Class – Event Handling – Two Event Handling Mechanism – The Delegation Event Model – Event Classes –Source of Events –Event Listener Interfaces - Event– Introducing the AWT - Using AWT Controls, Layout Managers, and Menus – Introducing Swing – Exploring Swing.

UNIT- V

Java.net package, basics of network programming, address ports, sockets, simple client-server program. Introduction to JDBC, java.sql package, JDBC architecture, Drivers, Connections, Statement, Prepared Statement, Example Programs.

TEXT BOOKS:
1. The Complete Reference Java Eight Edition – Herbert Schildt – McGrawHill.
2. Introduction to Java programming – Y Daniel Liang – Que E & T.

REFERENCES:
1. Java for Programmers, P.J. Deitel and H.M. Deitel, Pearson education (OR) Java: How to Program P.J. Deitel and H.M. Deitel, PHI.
2. Thinking in Java, Bruce Eckel, Pearson Education
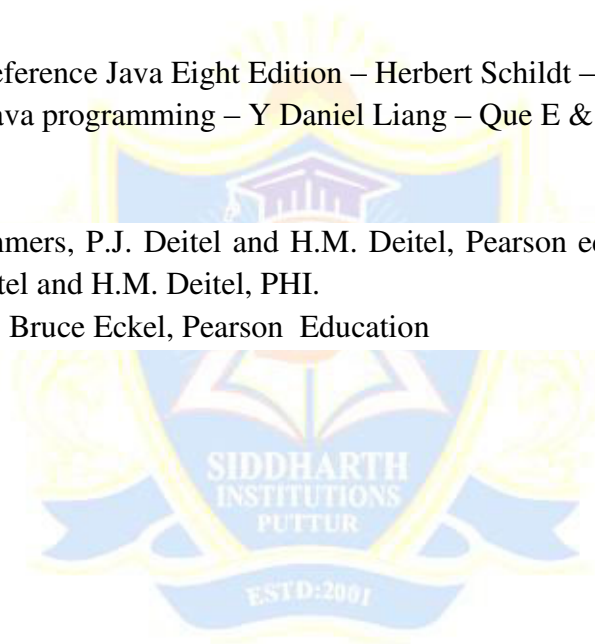
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(16CS510) COMPUTER ORGANIZATION
(Common to CSE & CSIT)

Course Objectives:
- To learn the fundamentals of computer organization and its relevance to classical and Modern problems of computer design
- To make the students understand the structure and behavior of various functional modules of a computer.
- To understand the techniques that computers use to communicate with I/O devices.
- To study the concepts of pipelining and the way it can speed up processing.
- To understand the basic characteristics of multiprocessors

Course Outcomes:
- Use memory and I/O devices effectively
- Understand the CPU design and computer arithmetic
- Understand the design of control unit
- Explain hardware requirements for cache memory and virtual memory
- Design algorithms to exploit pipelining and multiprocessors

UNIT-I
Basic Structure of Computers : Functional Units -Basic Operational Concepts - Assembly Language - Basic I/O Operations -Bus Structures - Instruction Cycle - Memory Reference Instructions - Data Transfer, Data Manipulation and Program Control- Addressing Modes.

UNIT-II
Arithmetic Unit: Addition and Subtraction ofSigned Numbers - Multiplication Algorithms-Signed Operand Multiplication and Fast Multiplication -Integer Division-Floating Point Numbers and Operations-Decimal Arithmetic unit.

UNIT-III
Basic Processing Unit: Register Transfer Language - Register Transfer - Bus and Memory Transfers -Arithmetic Micro operations-Logic Micro operations - Shift Micro operations-Hardwired Control - Micro Programmed Control - Address Sequencing.

UNIT-IV

Memory System: Basic Concepts **-**Memory Hierarchy **-** Main Memory **-** Auxiliary Memory **-**Cache Memories**-**Virtual Memory**-** Memory Management Requirements **-** Secondary Storage.

UNIT-V

I/O Organization: Parallel Processing **-** Pipelining **-** Multiprocessor **-** Interconnection Structures – Inter Processor Arbitration – Inter Processor Communication and Synchronization **-**Direct Memory Access (DMA)**-**Standard I/O Interfaces (PCI, SCSI and USB).

TEXT BOOKS

1. "Computer Organization", Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Mcgraw-Hill, Fifth Edition, Reprint 2012.
2. William Stallings, "Computer Organization and Architecture", Pearson Education, 7/e, 2006.
3. "Computer Systems Organization and Architecture", John D. Carpinelli, PEA, 2009.
4. "Computer Systems Architecture", 3/e, M. Moris Mano, PEA, 2007.

REFERENCES

1. David A. Patterson and John L. Hennessy, "Computer Architecture-A Quantitative Approach", Elsevier, A Division of Reed India Private Limited, Fifth Edition, 2012.
2. John P. Hayes, "Computer Architecture and Organization", Tata Mcgraw Hill, 3/e, 1998.
3. "Computer Systems Architecture a Networking Approach", 2/e, Rob Williams.
4. "Computer Organization and Architecture" Ghoshal, Pearson Education, 2011.

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(16CS511) DATABASE MANAGEMENT SYSTEMS
(Common to CSE & CSIT)

Course Objective:
- To provide the student with clear conceptual understandings related to databases. After this course, the student should gain knowledge in the relational model, SQL, database design storage & indexing, failure recovery and concurrency control.

Course Outcome:
- Students can design the simple database, and can use the SQL instructions in developing the database applications.
- Can apply the ER concepts to design the databases.
- Advanced concepts like triggers, assertions and constraints can be applied effectively in designing the business applications

UNIT-I
Introduction-Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Instances and Schemas, Data Models, Database Languages - DDL, DML, Database Architecture, Database Users and Administrators, History of Data base Systems.
Introduction to Data base design , ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises.
Relational Model: Introduction to the Relational Model - Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT-II
Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus - Tuple relational Calculus - Domain relational calculus - Expressive Power of Algebra and calculus.
Form of Basic SQL Query - Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values - Logical connectives - AND, OR and NOT - Impact on SQL

Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Introduction to Schema Refinement - Problems Caused by redundancy, Decompositions - Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions - Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design - Multi valued Dependencies - FOURTH Normal Form, Join Dependencies, FIFTH Normal form, Inclusion Dependencies.

UNIT-IV

Transaction Management - Transaction Concept - Transaction State - Implementation of Atomicity and Durability - Concurrent - Executions - Serializability - Recoverability - Implementation of Isolation - Testing for serializability.
Concurrency Control - Lock - Based Protocols - Timestamp Based Protocols - Validation - Based Protocols - Multiple Granularity.
Recovery System-Failure Classification-Storage Structure-Recovery and Atomicity - Log - Based Recovery - Recovery with Concurrent Transactions - Buffer Management - Failure with loss of nonvolatile storage - Advance Recovery systems - Remote Backup systems.

UNIT-V

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing - Clustered Indexes, Primary and Secondary Indexes, Index data Structures - Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.
Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods(ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.
Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, McGrawHill Education, 3rd Edition, 2003.
2. Data base System Concepts, A. Silberschatz, H.F. Korth, S. Sudarshan, McGraw Hill, VI edition, 2006.
3. Database Systems : The Complete book , Hector Garcia – Molina, Jeffrey Ullman, and Jennifer Widom.

REFERENCES:

1. Database Systems, 6th edition, Ramez Elmasri, Shamkat B. Navathe, Pearson Education, 2013.
2. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
3. Introduction to Database Systems, C.J. Date, Pearson Education.
4. Database Management Systems, G.K. Gupta, McGrawHill Education.

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(17IT601) OPERATING SYSTEMS

Course Objective:

- To make the students understand the basic operating system concepts such as processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection.

Course Outcome:
- Student Able to use operating systems effectively.
- Able to write system and application programs to exploit operating system functionality.
- Add functionality to the exiting operating systems
- Design new operating systems

UNIT I
Operating Systems Overview: Operating system structure, operating systems Operations, protection and security, Computing Environments, Open- Source Operating Systems
System Structures: Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.
Processes: Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

UNIT II
Threads: overview, Multicore Programming, Multithreading Models, Thread Libraries, Implicit Threading, Threading Issues.
Process Synchronization: The critical-section problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic problems of synchronization, Monitors, Synchronization examples, Alternative approaches.
CPU Scheduling: Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

UNIT III
Memory Management: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.
Virtual memory: demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory

Deadlocks: System Model, deadlock characterization, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

UNIT IV

Mass-storage structure: Overview of Mass-storage structure, Disk structure, Disk attachment, Disk scheduling, Swap-space management, RAID structure, Stable-storage implementation.

File system Interface: The concept of a file, Access Methods, Directory and Disk structure, File system mounting, File sharing, Protection.

File system Implementation: File-system structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space management.

UNIT V

I/O systems: I/O Hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O requests to Hardware operations.

Protection: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection

Security: The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Ninth Edition, 2012, Wiley.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition, 2009, Pearson Education.

Reference Books:
1. Operating systems by A K Sharma, Universities Press,
2. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, A.S.Godbole, Second Edition, TMH.
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
7. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
8. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
9. Operating System Desgin, Douglas Comer, CRC Press, 2nd Edition.

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(16CS513) OBJECT ORIENTED PROGRAMMING LAB
(Common to CSE & CSIT)

Course Objective:

- Study the syntax, semantics and features of Java Programming Language
- Learn the method of creating Multi-threaded programs and handle exceptions
- Learn Java features to create GUI applications & perform event handling
- Learn basics of Java Data Base Connectivity

Course Outcome:

- Solve problems using object oriented concepts.
- Write efficient programs for string handling and file handling.
- Write efficient programs to perform multitasking and exception handling.
- Develop GUI Components.
- Develop Java applications to connect database.

Week-1:

1. Use Eclipse or Netbean platform and acquaint with the various menus. Create a test project, add a test Class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with java program to find prime numbers between 1 to n.

Week-2:

1. Write a Java program that prints all real and imaginary solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula.

2. Write a Java program for sorting a given list of names in ascending order

3. Write a java program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given text.

Week -3:

1. Write a java program to make rolling a pair of dice 10,000 times and counts the number of times doubles of are rolled for each different pair of doubles. *Hint: Math.random()*

2. Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it's not a duplicate of any number already read display the complete set of unique values input after the user enters each new value.

3. Write a java program to read the time intervals (HH:MM) and to compare system time if the system time between your time intervals print correct time and exit else try again to repute the same thing. By using String Tokenizer class.

Week-4:

1. Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part<n> where n is the sequence number of the part file.

2. Write java program to create a super class called Figure that receives the dimensions of two dimensional objects. It also defines a method called area that computes the area of an object. The program derives two subclasses from Figure. The first is Rectangle and second is Triangle. Each of the sub class overridden area() so that it returns the area of a rectangle and a triangle respectively.

3. Write a Java program that creates three threads. First thread displays ―Good Morning‖ every one second, the second thread displays ―Hello‖ every two seconds and the third thread displays ―Welcome‖ every three seconds

Week-5:

1. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication

2. Write a java program to find and replace pattern in given file,

3. Use inheritance to create an exception super class called Exception A and exception sub class Exception B and Exception C, where Exception B inherits from Exception A and Exception C inherits from Exception B. Write a java program to demonstrate that the catch block for type Exception A catches exception of type Exception B and Exception C

Week-6:

1. Write a java program to convert an ArrayList to an Array.

2. Write a Java Program for waving a Flag using Applets and Threads

3. Write a Java Program for Bouncing Ball (The ball while moving down has to increase the size and decrease the size while moving up)

Week-7:

1. Write a Java Program for stack operation using Buttons and JOption Pane input and Message dialog box.

2. Write a Java Program to Addition, Division, Multiplication and subtraction using JOption Pane dialog Box and Text fields

Week-8:

1. Write a Java Program for the blinking eyes and mouth should open while blinking.

2. Implement a Java Program to add a new ball each time the user clicks the mouse. Provided a maximum of 20 balls randomly choose a color for each ball.

Week-9:

1. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component

2. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Week-10:

1. Write a Java Program to implement the opening of a door while opening man should present before hut and closing man should disappear.

2. Write a Java code by using JtextField to read decimal value and converting a decimal number into binary number then print the binary value in another JtextField

Week-11:

1. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

2. Write a Java program for handling mouse events.

Week-12:

1. Write a java program establish a JDBC connection, create a table student with properties name, register number, mark1,mark2, mark3. Insert the values into the table by using the java and display the information of the students at front end.

TEXT BOOKS:
1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Java The Complete Reference" by Herbert Schildt, TMH, 8th Edition

REFERENCES:
1. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education
2. Programming in Java, Sachine
3. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.
4. Introduction to Programming with Java, J.Dean&R.Dean, McGraw Hill education.

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(16CS514) DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE & CSIT)

Course Objective:
- To know the components of DBMS.
- To understand design of ER Diagrams and represent using Relational model.
- To understand the concept of normal forms in the design of databases.
- To Understand representation of retrieval of data using relational algebra and calculus.

Course Outcome:
Apply ER concepts to design databases.
- Design simple database using a tool and implement it using SQL.
- Access normalization relations of relational model using normal forms
- Apply all constrains to develop a business application using cursors, triggers and stored

LIST OF EXPERIMENTS:
1. Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries, use SQLPLUS features, use PL/SQL features like cursors on sample database. Students should be permitted to practice appropriate User interface creation tool and Report generation tool.
2. A college consists of number of employees working in different departments. In this context, create two tables **employee** and **department**. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra, da are as per the rules of the college. Initially only empno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primarykey in department table and referential integrity constraint exists between employee and department tables. Perform the following operations on the database:
- Create tables department and employee with required constraints.
- Initially only the few columns(essential) are to be added. Add the remaining columns separately by using appropriate SQL command
- Basic column should not be null
- Add constraint that basic should not be less than 5000.
- Calculate hra, da, gross and net by using PL/SQL program.

- Whenever salary is updated and its value becomes less than5000 a trigger has to be raised preventing the operation.
- The assertions are: hra should not be less than 10% of basic and da should not be less than 50% of basic.
- The percentage of hra and da are to be stored separately.
- When the da becomes more than 100%, a message has to be generated and with user permission da has to be merged with basic.
- Empno should be unique and has to be generated automatically.
- If the employee is going to retire in a particular month, automatically a message has to be generated.
- The default value for date-of-birth is1jan, 1970.
- When the employees called daily-wagers are to be added the constraint that salary should be greater than or equal to5000 should be dropped.
- Display the information of the employees and departments with description of the fields.
- Display the average salary of all the departments.
- Display the average salary department wise.
- Display the maximum salary of each department and also all departments put together.
- Commit the changes whenever required and rollback if necessary.
- Use substitution variables to insert values repeatedly.
- Assume some of the employees have given wrong information about date-of- birth. Update the corresponding tables to change the value.
- Find the employees whose salary is between 5000 and 10000 but not exactly 7500.
- Find the employees whose name contains 'en'.
- Try to delete a particular deptno. What happens if there are employees in it and if there are no employees.
- Create alias for columns and use them in queries.
- List the employees according to ascending order of salary.
- List the employees according to ascending order of salary in each department.
- Use'&&'wherever necessary
- Amount 6000 has to be deducted as CM relief fund in a particular month which has to be accepted as input from the user. Whenever the salary becomes negative it has to be maintained as1000 and the deduction amount for those employees is reduced appropriately.
- The retirement age is 60 years. Display the retirement day of all the employees.
- If salary of all the employees is increased by 10% every year, what is the salary of all the employees at retirement time.
- Find the employees who are born in leap year.
- Find the employees who are born on feb 29.
- Find the departments where the salary of at least one employee is more than 20000.
- Find the departments where the salary of all the employees is less than 20000.

- On first January of every year a bonus of 10% has to be given to all the employees. The amount has to be deducted equally in the next 5 months. Write procedures for it.
- As a designer identify the views that may have to be supported and create views.
- As a designer identify the PL/SQL procedures necessary and create the musing cursors.
- Use appropriate Visual programming tools like oracle forms and reports, visual basic etc. to create user interface screens and generate reports.

Note: As a designer identify other operations that may be required and add to the above list. The above operations are not in order. Order them appropriately. Use SQL or PL/SQL depending on the requirement.

3. Students may be divided in to batches and the following experiments may be given to them to better understand the DBMS concepts. Students should gather the required information, draw ER diagrams, map them to tables, normalize, create tables, triggers, procedures, execute queries, create user interfaces, and generate reports.

- Student information system
- APSRTC reservation system
- Hostel management
- Library management
- Indian Railways reservation
- Supermarket management
- Postal system
- Banking system
- Courier system
- Publishing house system

REFERENCES:

1. "Learning Oracle SQL and PL/SQL", Rajeeb C. Chatterjee,PHI.
2. "Oracle Database11g PL/SQL Programming",M.McLaughlin,TMH.
3. "Introduction to SQL",RickF.VanderLans, Pearson education.

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II B. Tech -II Sem. (CSIT)   **P**   **C**

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(17IT602) OPERATING SYSTEMS LAB

Course Objectives:

- To understand the design aspects of operating system
- To solve various synchronization problems

Course out comes:
- Ensure the development of applied skills in operating systems related areas.
- Able to write software routines modules or implementing various concepts of operating system.

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc. …
8. Simulate Paging Technique of memory management
9. Control the number of ports opened by the operating system with
   a) Semaphore b) monitors
10. Simulate how parent and child processes use shared memory and address space
11. Simulate sleeping barber problem
12. Simulate dining philosopher's problem
13. Simulate producer and consumer problem using threads (use java)
14. Simulate little's formula to predict next burst time of a process for SJF scheduling algorithm.
15. Develop a code to detect a cycle in wait-for graph

Reference Books :

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition‑2009, Pearson Education
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
5. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
6. Operating Systems, A.S.Godbole, Second Edition, TMH.
7. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.

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II B. Tech -II Sem. (CSIT)

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(COE-II) COMPREHENSIVE ONLINE EXAMINATION -II

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

II B. Tech -II Sem. (CSIT)

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(16HS614) COMPREHENSIVE SOFT-SKILLS
(Common to All Branches)

Course Description:

Soft Skills is an intangible idea in which the qualities like attitude, ability, integrity, reliability, positivity, flexibility, dependability, punctuality, management, cooperation, habits and practices are combined proficiently to capitalize on a person's work efficacy. Soft Skills do the work of combining all these components in accurate share into skills and shaping them into competencies. Companies opt for, maintain and prop up persons, who are trustworthy, ingenious, principled and good communicators and who are prepared to work under stress. These lessons are developed with a view to create awareness of the importance of the soft skills and assist the learners to improve them.

Course Objectives:

The main objectives of this course are:
- To help the students understand interpersonal skills.
- To support them in building interpersonal skills.
- To enhance the ability to work with others.

Course Outcomes:
- To know the importance of Soft Skills.
- To apply Soft Skills in the different environment.
- To enrich the different levels of Soft Skills to develop their personality.

UNIT I:

Non verbal Communication – Body Cues – Smiling, Posture, Gesture, Eye-contact – Stage appearance –Interpersonal and Intrapersonal skill Telephonic Etiquette – Dos andDon'ts of Telephonic Conversation

UNIT II:

Self exploration – Self Discovery – Self acceptance – Self esteem – Self confidence – Personal grooming – Attitudes – Confidence building. Interpersonal relationship in the present context – Kinds of   relationships – Team building – Formation of team

UNIT III:

Vision and Goal setting – Personal goal – Career goal – Types of Organization – Deep dive of company profiles – Win-win situation – Proactive skills – Entrepreneurial skills and model start-ups- Developing Mind skills – quizzes – General knowledge – Puzzles – Reading Comprehension - Spell Bee - Seminar – Who is who? – Biographies

UNIT IV:

Flight Leadership: Assessing Leadership qualities – Experiential learning of leadership skills exercise in team work Time and Stress Management: Importance of Time Management – The art of prioritizing and scheduling – Stress and Source of Stress Types of Stress – Managing stress

UNIT V:

Change: Coping skills – Critical and Adaptive Mindsets – Changes in Career/ Life/ people – Just A Minute – Mock GDs and Mock Interviews

References:
1. *Business Communication*, Aruna Koneru
2. *Effective Tech Communication*, Rizvi, Tata McGraw – Hill Education, 2007.
3. *Reading Extra*, Liz Driscoll, Cambridge University Press, 2004.
4. *Speak Well*, Jayashree Mohanraj et al, Orient Blackswan, 2013.