GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING (Autonomous)
(Approved by AICTE, Affiliated to JNTU – Kakinada)
Re-accredited by NAAC with 'A' Grade with a CGPA of 3.47/4.00
Madhurawada, Visakhapatnam - 530048

LIST OF EXPERIMENTS

DEPARTMENT OF CHEMICAL ENGINEERING

MECHANICAL OPERATIONS LAB

1. To determine the time of grinding in a ball mill for producing a product with 80 % passing a given screen.

    Major equipment - Ball mill, Sieve shaker, Different sizes of sieves, weighing balance.

2. To verify the laws of crushing using any size reduction equipment like crushing rolls or vibrating mills and to find out the working index of the material.

    Major equipment – Jaw Crusher, Sieve shaker, Different sizes of sieves, Weighing balance, Energy meter.

3. To find the effectiveness of hand screening of a given sample by a given screen.

    Major equipment - Vibrating Sieve shaker, Different sizes of sieves, Weighing balance.

4. To separate a mixture of oil into two fractions using froth flotation technique.

    Major equipment - Froth flotation cell.

5. To obtain batch sedimentation data and to calculate the minimum thickener area under given conditions.

    Major equipment- Sedimentation apparatus.

6. To determine the specific cake resistance and filter medium resistance of a slurry in plate and frame filter press. Major equipment - Plate and Frame filter press.

7. To separate a mixture of particles by Jigging. Major equipment - Jigging apparatus

8. Studies on cyclone separator.

    Major equipment - Cyclone separator

9. Studies on pulverizer.

    Major equipment – Pulverizer.

10. Verification of Stoke's law.

    Major equipment – Stoke's law apparatus.

11. Grinding studies on hard/ soft materials. Major equipment – Grinder.

MOMENTUM TRANSFER LAB
(Chemical Engineering)

1. Identification of laminar and turbulent flows. Major equipment - Reynolds apparatus.

2. Verification of Bernoulli's equation. Major equipment – Bernoulli's Apparatus.

3. Variation of Orifice coefficient with Reynolds Number. Major equipment - Orifice meter Assembly.

4. Determination of Venturi coefficient. Major equipment – Venturi meter Assembly.

5. Friction losses in Fluid flow in pipes.

    Major equipment - Pipe Assembly with provision for Pressure measurement.

6. Determination of minor losses for various pipe fittings.
    Major equipment- A pipe system with sudden contraction, sudden enlargement, bend and elbow.

7. Pressure drop and void fraction in a fluidized bed.

    Major equipment-Fluidized bed with pressure drop measurement.

8. Studying the coefficient of contraction for a given open orifice. Major equipment - Open Orifice Assembly.

9. Studying the coefficient of contraction for a given Mouth Piece.

    Major equipment - Mouth Piece Assembly.

10. Studying the coefficient of discharge in a V-notch. Major equipment - V-notch Assembly.

11. Studying the Characteristics of a centrifugal pump Major equipment - Centrifugal Pump.

12. Viscosity determination using Stoke's law.

    Major equipment – Terminal Velocity determination column.

13. Determination of coefficient of impact on vanes.

    Major equipment- A Jet impinges on a flat plate, inclined plate and hemispherical dome.

PROCESS HEAT TRANSFER LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1. Determination of total thermal resistance and thermal conductivity of composite wall.

    Major equipment - Composite wall Assembly

2. Determination of thermal conductivity of a metal rod. Major equipment - Thermal Conductivity apparatus

3. Determination of natural convective heat transfer coefficient for a vertical tube.

    Major equipment - Natural convection heat transfer apparatus

4. Determination of critical heat flux point for pool boiling of water.

    Major equipment- Pool boiling apparatus

5. Determination of forced convective heat transfer coefficient for air flowing through a pipe

    Major equipment – Forced convection heat transfer apparatus

6. Determination of overall heat transfer coefficient in double pipe heat exchanger.

    Major equipment - Double pipe heat exchanger apparatus

7. Study of the temperature distribution along the length of a pin-fin under natural and forced convection conditions Major equipment - Pin fin apparatus

8. Estimation of un-steady state film heat transfer coefficient between the medium in which the body is cooled.

    Major equipment - Heat transfer coefficient determination apparatus

9. Determination of Stefan – Boltzmann constant. Major equipment - Stefan Boltzmann apparatus

10. Determination of emissivity of a given plate at various temperatures.

    Major equipment - Emissivity determination apparatus

11. Determination of radiation constant of a given surface. Major equipment - Emissivity determination apparatus.

BASIC COMPUTATIONS LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1.   Basic MATLAB commands like representing arrays, matrices, reading elements of a matrix, row and columns of matrices, random numbers.

2.   Floor, ceil, and fix commands.

3.   Eigen values and Eigen vectors of a matrix.

4.   Plotting tools for 2 dimensional and 3 dimensional plots, putting legends, texts, using subplot tool for multiple plots.

5.   Linear Regression, interpolation and polynomial regression.

6.   Non linear regression.

7.   Solving non linear algebraic equations.

8.   ODE IVP problems using Runge - Kutta method.

9.   ODE BVP problems using shooting method.

10.   Using quadrature to evaluate integrals (1, 2 and 3 dimensional cases).

11.   Symbolic manipulation to evaluate Laplace and Fourier transforms.

12.   Finding the minimum of an unconstrained function.

MASS TRANSFER OPERATIONS LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1.   Estimation of Vapor Diffusion Coefficient.

2.   Estimation of Liquid Diffusion Coefficient.

3.   Evaluation of Mass transfer coefficients by Surface Evaporation Unit.

4.   Obtain the Rate of Drying using Tray Dryer.

5.   Verify the law of Steam Distillation.

6.   Verify Rayleigh's equation using Differential Distillation.

 7.   Determine the Vapor Liquid Equilibrium for the given system.

8.   Determine the equilibrium distribution data for the given system using LLE.

9.   Determine the saturation isotherm for the given system using TLE.

10.   Determine Height Equivalent to Theoretical Plate.

PROCESS DYNAMICS AND CONTROL LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1.   Study of On-Off controller.

2.   Determination of time constant and Response of a thermometer without thermal well.

3.   Determination of time constant and Response of a thermometer with thermal well.

4.   Study of two tank interacting Step response

5.   Study of two tank interacting impulse response

6.   Study of response of Single capacity system.

7.   Study of Temperature control dynamics.

8.   Estimation of Control valve flow coefficient

9.   Estimation of Control valve flow characteristics.

10.   Estimation of damping coefficient for U-tube manometer

11.   Hysteresis of a control valve.

CHEMICAL REACTION ENGINEERING LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1. Determination of specific reaction rate constant and order of a reaction using a batch reactor and analyzing the data by

    (i) Differential method (ii) Integral method.

2. Determination of the activation energy of a reaction using a batch reactor.

3. To determine the order of the reaction and the rate constant using a tubular reactor.

4. To determine the order of the reaction and the rate constant using a CSTR.

5. To compare experimental and theoretical values of conversion in CSTR in series.

6. To compare experimental and theoretical values of conversion in combination of reactors.

7. Mass transfer with chemical reaction (solid-liquid system) – determination of mass transfer coefficient.

8. Determination of RTD and dispersion number for a packed-bed using a tracer.

9. Determination of RTD and dispersion number in a reactor using a tracer. Major equipment - PFR set up.

10. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment – CSTR in series.

11. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment - CSTR setup.

12. Determination of RTD and dispersion number in a reactor using a tracer.

    Major equipment – Combination of reactors.

COMPUTER AIDED DESIGN OF CHEMICAL EQUIPMENT-LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1. Introduction of different basic symbols and drawing flow sheet symbols.

2. Design of a Double Pipe Heat Exchanger

3. Design of a 1-2 shell & tube Heat Exchanger-Rating

4. Design of a 1-2 shell & tube Heat Exchanger-Sizing

5. Design of a Evaporator

6. Design of a Tray Distillation Column

7. Design of a Packed Distillation Column

8. Design of a Batch Reactor

9. Process simulation of Absorber using PRO-II

10. Process simulation of Distillation Column using PRO-II

11. Process simulation of LLE columns using PRO-II

CONTROL SYSTEM DESIGN, SIMULATION AND OPTIMIZATION LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1. Constructing Transfer functions.

2. Poles and zeros of a Transfer functions.

3. Bode plots and their analysis.

4. Inverse response.

5. Control system design using PI and PID controllers.

6. Control system simulation using SIMULINK for P, PI and PID Controllers in the closed loop response of first order and second order systems with time delay.

7. Control system simulation using SIMULINK for P, PI and PID Controllers in the closed loop response of first order and second order systems without time delay.

8. Unconstrained Optimization using MATLAB Optimization Toolbox.

9. Linear Optimization using MATLAB Optimization Toolbox.

10. Constrained Optimization using MATLAB Optimization Toolbox. Design of a PI controller using Optimization technique.

SBLE 1: COMPUTATIONAL HEAT AND FLUID FLOW LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1) Flow past a flat plate, calculation of the drag coefficient.

2) Flow past a sphere, calculation of the Nusselt number.

3) Flow past a cylinder, calculation of the Nusselt number.

4) Flow in a tube, calculation of the Nusselt number.

5) Lid driven cavity, calculation of the nusselt number.

SBLE 2: HEAT EXCHANGER NETWORK DESIGN LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1) Calculation of minimum hot and cold utilities and pinch temperatures for a two hot and cold streams analytically.

2) Calculation of the minimum hot and cold utilities and pinch temperature for 2 hot and 2 cold streams.

3) Handling multiple hot and cold streams, interpret the composite and grand composite curves.

4) HEN design for stream splitting and the necessity for stream splitting.

5) HEN design for a process flow sheet by retrieval of process data of each stream.

SBLE 3: DCS BASED SIMULATOR LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1)   Run the binary distillation column for a binary system

2)   Run the heat exchanger equipment

3)   Run the Absorber column

4)   Run the stirred tank reactor

5)   Run the filtration and dryer equipment.

SBLE 4: SIMULATION OF SEPARATION PROCESSES LAB
(Chemical Engineering)

LIST OF EXPERIMENTS:

1)   Simulation of an absorber

2)   Simulation of absorber with multiplefeeds and their importance

3)   Simulation of distillation columns

4)   Simulation of multiple feed and product distillation column

5)   Simulation of azeotropic and extractive distillation column

DEPARTMENT OF CIVIL ENGINEERING

S.No.	List of Experiments
Name of the Laboratory: **SURVEYING LAB**	
1	Measuring of an area by Chain Surveying and Plotting.
2	An exercise on Chaining and Ranging across obstacles.
3	Determination of distance between two in accessible points using compass.
4	Closed Traversing by compass & graphical adjustment.
5	Open traversing by compass and plotting.
6	Measurement of elevation difference between two points using dumpy level by Height of Instrument & Rise and fall methods (by taking atleast two change points)
7	Profile levelling – an exercise of Longitudinal Section and Cross Section and plot the profile.
8	Contouring of a small area by method of blocks / grids.
9	Measurement of horizontal angles by method of repetition by Theodolite.
10	Measurement of horizontal angles by method of reiteration by Theodolite.
11	Trignometric levelling – determination of a given Tower / Building height with base is accessible and is in-accessible.
12	Demonstration of Total Station

S.No.	List of Experiments
Name of the Laboratory: **STRENGTH OF MATERIALS LAB**	
1	Tension test on mild steel and HYSD bars.
2	Bending test on (Steel / Wood) Cantilever beam.
3	Bending test on simply supported beam.
4	Torsion test.
5	Hardness test.
6	Helical Spring test.
7	Compression test on wood.
8	Impact test.
9	Shear test.
10	Verification of Maxwell's Reciprocal theorem on beams.
11	Use of Electrical Resistance Strain gauges.
12	Compression test on Bricks.

Name of the Laboratory: **ENGINEERING GEOLOGY LAB**	
S.No.	**List of Experiments**
1	Study of physical properties and identification of Rock forming minerals.
2	Study of physical properties and identification of Economic minerals.
3	Megascopic description and identification of Igneous rocks.
4	Megascopic description and identification of Sedimentary rocks.
5	Megascopic description and identification of Metamorphic rocks.
6	Structural geology problems- Calculation of Thickness of Beds
7	Structural Geology problems – Simple Strike & Dip problems (Calculation of direction and amount of True Dip).
8	Structural Geology problems – Faults
9	Structural geology problems - Borehole on three point Problems.
10	Interpretation and drawing of sections for geological maps showing Normal beds.
11	Interpretation and drawing of sections for geological maps showing Tilted beds.
12	Interpretation and drawing of sections for geological maps showing Fault beds.
13	Interpretation and drawing of sections for geological maps showing Folded beds.

Name of the Laboratory: **TRANSPORTATION ENGINEERING LAB**	
S.No.	**List of Experiments**
	ROAD AGGREGATES:
1	CBR Test
2	Aggregate Crushing value
3	Aggregate Impact Test.
4	Specific Gravity and Water Absorption.
5	Abrasion Test.
6	Shape tests
	BITUMINOUS MATERIALS:
7	Viscosity Test & Flash and fire point tests.
8	Ductility Test.
9	Softening Point Test.
10	Marshall mix design
11	Benkelman beam
	TRAFFIC ENGINEERING :
12	Traffic volume studies
13	Spot speed studies
14	Parking study

Name of the Laboratory: **CONCRETE TECHNOLOGY LAB**	
S.No.	**List of Experiments**
	TESTS ON CEMENT
1	Determination of Fineness of Cement.
2	Determination of Specific Gravity of Cement.
3	Determination of Normal Consistency of Cement.
4	Determination of Initial and Final Setting time of Cement.
5	Determination of Soundness of Cement.
6	Determination of Compressive Strength of Cement.
	TESTS ON AGGREGATE
7	Determination of Fineness Modulus and Zoning of Sand.
8	Determination of Fineness Modulus of Coarse Aggregate.
9	Determination of Bulk Density of Fine Aggregate.
10	Determination of Bulk density of Coarse Aggregate.
	TESTS ON CONCRETE
11	Test on Green concrete
12	Test on Hardened concrete

Name of the Laboratory: **FLUID MECHANICS AND HYDRAULIC MACHINES LAB**	
S.No.	**List of Experiments**
1	Calibration of Venturimeter / Orifice meter.
2	Determination of coefficient of discharge for a small orifice / external mouthpiece by constant head method / variable head method.
3	Calibration of contracted Rectangular Notch / Triangular Notch / Broad crested weir.
4	Determination of friction factor / coefficient of loss of head due to pipe fittings in a given pipeline.
5	Verification of Bernoulli's theorem.
6	Reynolds's Experiment- Demonstration of types of flows.
7	Impact of jet on vanes.
8	Performance test on Pelton Wheel / Francis Turbine / Kaplan Turbine.
9	Performance test on Single Stage / Multi Stage Centrifugal Pump / Jet Pump.
10	Performance Test on Reciprocating Pump.
11	Study of hydraulic jump.
12	Determination of coefficient of discharge for a Spillway / Hump / Venture flume.

Name of the Laboratory: **STRUCTURAL ENGG. DETAILING LAB**	
S.No.	**List of Experiments**
1	Detailing of R.C Cantilever beam and slab
2	Detailing of two span simply supported R.C continuous beam
3	Detailing of two span fixed R.C continuous beam
4	Detailing of three span continuous slab.
5	Detailing of Sunken slab cross section .
6	Detailing of Isolated footing
7	Detailing of Combined Footing
8	Detailing of Raft foundation
9	Detailing of R.C Continuous column
10	Detailing of Cantilever retaining wall
11	Prepare Bar Bending schedule and estimate reinforcement
12	Detailing of Flat slab

Name of the Laboratory: **GEOTECHNICAL ENGINEERING LAB**	
S.No.	**List of Experiments**
1	Sieve Analysis
2	Sedimentation Analysis
3	Specific Gravity Test
4	Field density- Core cutter and Sand Replacement Methods
5	Atterberg's Limits.
6	Permeability of soil using Constant Head test and Variable Head test
7	Compaction Test
8	CBR Test
9	Consolidation Test
10	Unconfined Compression Test
11	Direct Shear Test.
12	Vane Shear Test
13	Triaxial Shear Test

Name of the Laboratory: **COMPUTER LAB**	
S.No.	**List of Experiments**
1	Analysis of Continuous beams.
2	Analysis of 2D frames for combined gravity and lateral loads.
3	Analysis of 3D frames for combined gravity and lateral loads.
4	Analysis of trusses.
5	Determine the fundamental frequency and mode shapes for agiven structure.
6	Calculation of area and volume for a given block level surveydata and to plot the contours.
7	To design the pipe network for a sewer line.
8	Stability analysis of gravity dams.
9	Calculation of earth pressures on retaining wall and assessment of slope stability of a fniteslope.
10	Determination of safe bearing capacity of soil using "C"Programming.
11	Design of Flexible pavement.
12	Design of rigid pavement.

Name of the Laboratory: **ENVIRONMENTAL ENGINEERING LAB**	
S.No.	**List of Experiments**
1	Determination of pH and Turbidity .
2	Determination and Estimation of total solids, organic solids, dissolved solids, inorganic solids, determination of electrical conductivity.
3	Determination of Alkalinity/Acidity.
4	Determination of Optimum coagulant dose
5	Determination of Chlorides.
6	Determination of Chlorine demand.
7	Determination of Dissolved Oxygen.
8	Determination of B.O.D
9	Determination of C.O.D
10	Determination of total Hardness.
11	Determination of Nitrogen.
12	Determination of Total Phosphates.

Name of the Laboratory: **Advanced Structural Engineering Lab (M.Tech.)**	
S.No.	**List of Experiments**
1	Elastic properties of concrete and steel.
2	Shear capacity of R.C. beam.
3	Flexural on R.C. under reinforced Beam.
4	Flexural on R.C. balanced reinforced Beam.
5	Flexural on R.C. over reinforced Beam.
6	Flexural capacity of R.C. slabs(one way slab simply supported on two sides).
7	Flexural capacity of corrugated metal decks and slabs.
8	Non-Destructive testing of concrete.
9	Double shear test on steel rod specimen.
10	Prestressing of beam (pre-tensioning).
11	Natural frequency of cantilever beam (with and without damage).
12	Natural frequency of simply supported beam (with and without damage).

List of Laboratory Experiments

Department of Computer Science & Engineering

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COLLEGE OF ENGINEERING
(AUTONOMOUS)

Department of Computer Science & Engineering

Room No: **B4 - 203**	
Course Code: **19CS1101**	Name of the Course: **IT ESSENTIALS LAB, B Tech, I Sem**

List of software used: MS Office, Miktex Editor, G-Suite

List of Experiments:

1. Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

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

3. Every student should individually install open source software like WEKA, Python, GitHub, Orange, etc on the personal computer.

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

5. Practice the following LINUX Commands

Help commands: whatis, man, info.Filesystem: ls, mkdir, cd, chmod, rm, mv, bc, who, whoami, ps, du, df,cal, date. Filters and Text processing: echo, cat, rev, head, tail, nl, cut, cp, paste, wc, cmp, diff, tr, ln.

6. Practice the following LINUX Commands

File compression: tar, compress, uncompress, Miscellaneous: apt-get, vi editor. Networking Commands :ping, ssh, ifconfig, netstat, traceroute. Execute simple C program using the vi editor.

7. Create a simple document using LaTeX that consists of document structure, typesetting, tables.

8. Create a simple document using LaTeX that consists of figures, equations and references.

9. Using MS word perform the following:

Formatting Fonts in word, Drop Cap in word, Columns, Tables, Borders and Colors, Inserting Header and Footer, Newspaper columns, clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs, Hyper linking.

10. Using MS Excel perform the following:

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

11. Using MS Power Point perform the following:

PPT Orientation, Slide Layouts, Auto Shapes, Lines and Arrows, Inserting Images, Tables and Charts.

12. Students should get connected to the Local Area Network to access the Internet and customize their web browsers with the LAN proxy settings, bookmarks, pop up blockers and plug-ins like Macromedia Flash.

13. Using collaboration tools of G-suite Domain perform the following Store, sync, and share files with ease in the cloud using Google Drive.

Document creation and editing text documents in your web browser using Google Docs.

Handle task lists, create project plans, analyze data with charts and filters using

Google Sheets.

Manage event registrations, create quizzes, and analyze responses using Google Forms.

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COLLEGE OF ENGINEERING
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Department of Computer Science & Engineering

Room No: **B6-302**

Course Code: **19CT1102**	Name of the Course**: Problem Solving Lab Using C, B Tech - II Sem**

List of software used: TurboC,Visual studio, Dev C++

List of Experiments:

Week 1 (Basic Programs)

1.   C program to display hello world message.

2.   C program to scan all data type variables as input and print it as output.

3.   C program to perform arithmetic operations like +,-,*,/,% on two input variables.

4.   C program to perform temperature conversions from Centigrade to Fahrenheit and vice versa.

Week 2 (Programs on Operators)

1.   C program to scan an input and perform pre and post increment operation on it and display the result.

2.   C program to perform all bit wise operations.

3.   C program to extract the last two digits of a given integer n, where the number of digits should be greater than 2.

4.   C program to display the greatest of three numbers using conditional operator.

5.   C program to swap two numbers without using third variable.

Week 3 (Programs on Conditional Statements)

1.   C program to check whether a given input integer is in between two values x and y.

2.   C program to check whether a given character is a vowel or a consonant or a digit or a special symbol.

3.   C program to display the nature and roots of a quadratic equation.

4.   C program to perform arithmetic operations using switch statement.

5.   C program to convert upper case character to lower case and vice versa.

Week 4 (Programs on Loop Statements)

1.   C program to print odd numbers between specified ranges.

2.   C program to display the factors of a given number and check whether it is a prime or not.

3.   C program to display the sum of individual digits of a given integer raised to the power of n. Also check whether the given integer is Armstrong or not.

4.   C Program to demonstrate the usage of unconditional control statements.

5.   C program to display the following pattern.

Week 5 (Programs on Functions)

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

 1.   C program to demonstrate the various categories of functions with respect to return type and number of arguments.

2.   C program to find the LCM of two numbers using functions.

3.   Create a header file which contains the following prototype:

i.   int factorial (int) ;   // non-recursive function

ii.   int factorial_rec(int); //Recursive function

iii.   int prime (int) ;

Use the above functions in a C program by including the above header file.

4.   C program to display Pascal's triangle using functions.

Week 6 (Programs on Arrays)

1. C program to read n integer values into an array and display them

2. C program to count and display the number of positive, negative, even and odd numbers in a given array of integers and also display their sum.

3. C program to find the smallest and largest numbers in an array of integers.

4. C program to perform addition, multiplication, transpose of given matrices using functions.

5. C program to check whether a given integer exists in a list of numbers and print its

index value if it is present, otherwise print "No".

Week 7 (Programs on Strings)

1. C program to convert upper case character to lower case and vice versa in a given string.

2. C program to delete all vowels in a given string and display the remaining string.

3. C program to check whether a given string is palindrome or not.

4. C program that reads two integers as strings and display their sum.

Week 8 (Programs on Strings)

1. C program to demonstrate the usage of at least 10 predefined string handling functions.

2. C program that implements the following user defined string handling functions

i. To find the length of the given string

ii. To copy the contents of one string to another

iii. To reverse the contents of a string

iv. To compare two strings

v. To concatenate two strings

Week 9 (Programs on Pointers and Dynamic Memory Allocation)

1. C program to demonstrate the usage of pointers.

2. C program that uses dynamic memory allocation functions to add n elements and display their average.

3. C program that performs pointer arithmetic.

4. C program that implements call by reference.

Week 10 (Programs on Pointers)

1.   C program to demonstrate the following

i.   Pointers to Pointers

ii.   Array of Pointers

iii.   Pointer to Array

iv.   Pointers to Functions

Week 11 (Programs on Structures)

1.   C program to access and display the members of the structure.

2.   C program that demonstrates different ways to access the structure elements using pointers.

Week 12 (Programs on Files)

1.   C program to read the contents of a file and display on to output screen.

2.   C program to copy the contents of one file to another.

3.   C program to count and display the number of characters, words and lines in a file.

4.   C program to print last n characters of a file by reading file name and n value from command line.

Programs beyond the syllabus

1. Write a general-purpose function to convert any given year into its roman equivalent.

Eg: Example:

Roman equivalent of 1988 is MDCCCCLXXXVIII Roman equivalent of 1525 is MDXXV

2. C program to replace all the vowels in a given string with a given character

3. C program to display upper and lower triangles of a given matrix.

4. C program to find the LCM of array of integers

5. C program to display the first n terms of the Fibonacci sequence. Example: If n= 5 it has to print
        0   1   1   2   3

6. C program to check whether the matrix is symmetric or not.

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Department of Computer Science & Engineering

Room No: **B3-201**	
Course Code**: 15CT1106**	Name of the Course: **Data Structures Lab, B Tech - III Sem**

List of software used: Codeblocks/ Dev-C++/TurboC++/ Visual Studio Code with MinGW compiler

List of Experiments:

1. Write C programs that uses recursive function to:

i) Compute factorial of a given number

ii) Solve the towers of Hanoi problem.

2. Write C programs that implement the following data structures using arrays:

i) Stack   ii) Queue.

3. Write C programs to implement the following Stack applications

i) Factorial   ii) Evaluations of postfix expression.

4. Write C program to implement the following types of queues

i) Priority Queue ii) Circular Queue.

5. Write C programs to implement the following types of Lists

i) Singly linked list   ii) Circular Linked list   iii) Doubly linked list.

6. Write C programs to implement the following data structures using Lists

i) Stack   ii) Queue.

7. Write C programs to implement the following search algorithms:

i) Linear Search ii) Binary Search   iii) Fibonacci Search.

8. Write C programs to implement the following sorting algorithms

i) Bubble Sort   ii) Insertion Sort   iii) Selection Sort.

9. Write C programs to implement the following sorting

algorithms i) Merge Sort ii) Quick Sort.

10. Write a C program to implement binary tree using arrays and to perform binary tree traversals

i) inorder ii) postorder iii) preorder.

11. Write a C program to perform the following operations using linked lists:

i)insert an element into a binary search tree.

ii)Delete an element from a binary search tree.

iii) Search for akey element in a binary search tree.

12. Write a C program to perform the following operations using linked lists :

i) Insert an element into an AVL tree.

ii) Delete an element from an AVL tree.

13. Write C programs for the implementation of bfs and dfs for a given graph.

14. Write a C program for the implementation of Prim's algorithm to obtain the minimum cost spanning tree from a connected undirected graph.

15. Write a C program to implement Dijkstra's algorithm for the single source shortest path problem.

Experiments beyond Syllabus:

1. Converting an infix expression to a postfix expression using stack.

2. Addition of polynomial expression using Multiply linked list.

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Department of Computer Science & Engineering

Room No:**B3-202**	
Course Code:**15CT1112**	Name of the Course: **Database Management Systems Lab, B.Tech - IV Sem**

List of software used: Oracle 10g

List of Experiments:

1. Introduction to Oracle, Creation of table, data types, Displaying table definition using DESCRIBE, inserting rows into table and SELECT command.

2. Projection, ORDER BY clause, Altering and dropping of tables (use constraints while creating tables) examples using SELECT command.

3. Queries using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.

4. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

5. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date).

6. SUBQUERIES(Multiple Subqueries, Nested subqueries)

7. Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found).

    a. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in

    PL/SQL block.

8. CONTROL STRUCTURES (IF statement, Loop…End Loop, Exit command, While Loop, For loop, Goto statement).

9. Nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.

10. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

11. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

12. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

13. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

14. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

Programs Beyond Syllabus

A) Write a program to check whether the given number is Armstrong or not

B) Write a program to generate all prime numbers below 100.

C) Write a program to final largest number from the given three numbers.

D) Create a procedure which updates the salaries of an employee.

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Department of Computer Science & Engineering

Room No: **B3-201**	
Course Code**: 15CT1113**	Name of the Course**: OBJECT ORIENTED PROGRAMMING LAB, B Tech, IV Sem**

List of software used: JDK1.7.0 or Above versions, Eclipse

List of Experiments:

1. a) Write a program that displays welcome dear user followed by user name. Accept username from the user.

 b) Write a program to print the multiplication table (till 20) of a given number.

 c) Write a program that prompts the user for an integer and then prints out all the prime numbers up to that Integer

2. a) Write a program to create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.

 b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence

3. a) Write a program to check the compatibility for multiplication, if compatible multiply two matrices and find its transpose.

 b) Write a program that checks whether a given string is a palindrome or not. Ex: MALAYALAM is a palindrome. Accept the string as command line argument.

c) Write a program for sorting a given list of names in ascending order.

4. a) Create an inheritance hierarchy of Rodent, Mouse, Gerbil, Hamster etc. In the base class provide methods that are common to all Rodents and override these in the derived classes to perform different behaviors, depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents and call your base class methods.

b) Write a program to create an abstract class named Shape that contains an empty method named numberOfSides( ). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides ( ) that shows the number of sides in the given geometrical figures. (Use Runtimepolymorphism).

5. Design a package to contain the class Student that contains data members such as name, roll number and another package contains the interface Sports which contains some sports information. Import these two packages in a package called Report which process both Student and Sport and give the report.

6. a) Write a program to demonstrate wrapper classes, and to fix the precision.

   b) Write a program that calculates roots of a quadratic equation.

   c) Write a program that illustrates Vector class.

7. a) Write a program that reads on file name from the user then displays information about whether the file exists, whether the file is readable/writable, the type of file and the length of the file in bytes and display the content of the using File Input Stream class.

   b) Write a program that copies contents from one file to another file.(Using character streams).

8. a) Write a program to generate a set of random numbers between two numbers x1 and x2, and x1>0.

b) Write a program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util) c) Using the Java API write a program to obtain the following output: Today's date is <> The month is <> The year is <> <> days have passed in this year so far.

9. a) Write a program that reads two numbers from the user to perform integer division into Num1 and Num2 variables.The division of Num1 and Num2 is displayed if they are integers. 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.

b) Create a user defined exception.

10. a) Write a program that creates 3 threads by extending Thread class. First thread displays "Good Morning" every 1 sec, the second thread displays "Hello" every 2 seconds and the third displays Welcome" every 3 seconds. (Repeat the same by implementing Runnable).

b) Write a program that correctly implements ProducerConsumer problem using the concept of Inter Thread Communication.

11. a) Develop an applet that displays a simple message.

b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.

12. a) Write a program that allows user to draw lines, rectangles and ovals.

b) Write a program that illustrates different AWT controls.

13. a) Write a program for handling mouse events with adapter classes.

b) Write a 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.

c) Write a program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.

14. Write a program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

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Department of Computer Science & Engineering

Room No:**B3-202**	
Course Code:**15CT 1122**	Name of the Course: **Embedded Systems Lab - I, B.Tech - V Semester**

List of software used: KEIL OR AVR STUDIO 4

List of Experiments:

Using both 8051 and AVR 8535 Controllers:

1. ELEMENTARY OPERATIONS USING DIRECT AND INDIRECT ADDRESS MODES:

  i. Multi precision Addition, subtraction, Multiplication and division

  ii. Handling Fractional numbers

  iii. BCD- binary Conversion examples

  iv. ASCII to BCD conversion

  v. Binary to ASCII conversion

2. INPUT,OUTPUT CONTROL PROGRAMMING

  i. Controlling the external logical switching, for DC motors, Steppers

  ii. Timers and counters with and without Interrupts

  iii. Pulse width modulation for speed control.

  iv. Capture control of external events.

3. PROGRAMMING USING BUILT IN TIMERS

  i. As Event Timers

  ii. As Fast Counters

  iii. Frequency generation

4. CAPTURE CONTROL AND ITS APPLICATION EXAMPLES

I. Measurement of pulse width

ii.Measurement of Duty cycle

iii.Measurement of velocity and acceleration.

5.SERIAL COMMUNICATION METHODS.

I. usart AND ITS PROGRAMMING

II.SPI bus and its programming

6.SINE WAVE GENERATION

BEYOND THE SYLLABUS:

1. Distance Measurement using ultrasonic sensors

2. Angular speed calculation using LDR/IR

3.Fire alarm using temperature sensor

Department of Computer Science and Engineering

Room No: **B3-203**	
Course Code: **15CT1123**	Name of the Course: **Web Programming Lab, B Tech - V Sem**

List of Software used: XAMPP Stack Package

List of Experiments:

S.No	Cycle	Name of the Experiment
1	Week 1	Develop Static WebPages (Using only HTML) for an Online Book Store Website a) HOME PAGE b) LOGIN PAGE c) CATALOGUE PAGE
2	Week 2	Develop Static WebPages (Using only HTML) for an Online Book Store Website a) CART PAGE b) REGISTRATION PAGE
3	Week 3	Write a JavaScript to validate the field like Name, Password, E-mail id, Phone number.
4	Week 4	Design a Webpage using CSS (Cascading Style Sheets) which include font styles, background image, link styles, layers and customized cursors
5	Week 5	Write an XML file which displays the Book information. Display the XML file contents in table using XSL and also write a Document Type Definition (DTD) to validate the above XML file.
6	Week 6	1) Install TOMCAT web server. While installation assign port number 8080. Make sure that this port are available i.e., no other process is using this port. 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1and week-2 in the document root. Access the pages by using the url : http://localhost:4040/rama/books.html
7	Week 7	Install a database (Mysql or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration

		form). Practice 'JDBC' connectivity. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week1). Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them.
8	Week 8	Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the database. If he is a valid user (i.e., user - name and password match) you should welcome him by name (user-name) else you should display "You are not an authenticated user". COOKIES: Practice a cookie programs to add and read cookies.
9	Week 9	Write a JSP code Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database& also using cookies.
10	Week 10	1. Create a simple XML Http Request and retrieve data from a TXT file using AJAX 2. Create an XMLHttpRequest to retrieve data from an XML file using AJAX
11	Week 11	Design the web pages required for an online book store web site using PHP, AJAX, and HTML5.

Experiments beyond Curriculum

S.No	Name of the Experiment
1	Write a HTML code to display Class Time Table
2	Write a JavaScript to code demonstrate Simple Calculator
3	Write a JDBC code to retrieve data from database

Department of Computer Science & Engineering

Room No: **B3-204**

Course Code: **15CT1131**	Name of the Course: **Computer Networks Lab, B.Tech, VI Sem**

List of software used: C,C++ , Java , NS2 and Cisco -Packet Tracer

List of Experiments:

1.Connect the computers in Local area Networks

2.Implement CRC and Hamming Code for Error handling

3. Implement sliding window protocols.

4.Configure a network using Distance Vector Routing algorithm

5.Implement Address Resolution Protocol(ARP) and Reverse Address Resolution Protocol (RARP)

6.Using RSA algorithm Encrypt the data while sending it and decrypt it while receiving

7.NS2 installation Procedure

8.Design a sample topology using NS2

9.Implement Transmission control protocol (TCP) and User Datagram Protocol (UDP) using different pairs of system using NS2

10. Design network using loop constraint

11.Design network using Packet Tracer

12. Implement the multicast Routing technique using NS2

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Department of Computer Science & Engineering

Room No:**B2-201**	
Course Code:**15CT1140**	Name of the Course: **Data Warehousing and Data Mining Lab, B tech - VII Sem**

List of software used: WEKA and JDK

List of Experiments:

1. Basics of weka tool a) Investigate the application interfaces   b) Explore the default databases

2. Preprocess a given dataset based on the following

   a) Attribute selection   b) Handelling missing values c) Discretization   d) Eleminating Outliers

3. Preprocess a given data set based on the following

   a) Discretization b) Eleminating Outliers

4. Create a dataset in ARFF for any given dataset and perform Market basket analysis

5. Generate the association rules using the apriori algorithm

6. Generate the association rules using the FP - Growth algorithm

7. Build a decision tree by using ID3 algorithm

8. Demonstrate a classification rule process on a given dataset by using Naive baseyian classifier

9. Demonstrate a classification rule process on a given dataset by using Back propagation classifier

10. Build various regression models

11. Cluster the given dataset by using k-means clustering algorithm and visualize the cluster mean values and standard deviation of dataset attributes.

12. Cluster the given dataset by using the DBSCAN clustering algorithm

13. Cluster the given data set by using the Expectation and Maximization clustering algorithm

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Room No: **B2-201**	
Course Code: **15CS1108**	Name of the Course: **Network Security and Cryptography Lab, B.Tech - VII Semester**

List of software used: C or Python

List of Experiments:

1. Implement Caesar cipher encryption and decryption.

2. Implement Hill cipher encryption.

3. Implement play fair cipher encryption.

4. Implement fast modular exponentiation algorithm.

5. Implement Rabin-Miller Primality Testing Algorithm.

6. Implement the Euclid Algorithm to generate the GCD of an array of 10 integers.

7. Implement Extended Euclid Algorithm to find multiplicative inverse of a number.

8. Implement the encryption and decryption of 8-bit data using Simplified DES Algorithm (created by Prof. Edward Schaefer).

9. Implement RSA algorithm for encryption and decryption.

10. Implement Diffie-Hellman Key Exchange Algorithm.

11. Implement CRT (Chinese Remainder Theorem).

12. Configure a mail agent to support Digital certificates,send a mail and verify the correctness of this system using the configured parameters.

Department of Computer Science & Engineering

Room No:**B3-202**	
Course Code:**15CS11S1**	Name of the Course: **R - Programming lab, B.Tech-VII Sem**

List of software used: RStudio

List of Experiments:

1. Download and install R-Programming environment and install basic packages using install.packages() command in R.

2. Learn all the basics of R-Programming (Data types, Variables, Operators etc.,)

3. Write a program to find list of even numbers from 1 to n using R-Loops.

4. Create a function to print squares of numbers in sequence.

5. Write a program to join columns and rows in a data frame using cbind() and rbind() in R.

6. Implement different String Manipulation functions in R.

7. Implement different data structures in R (Vectors, Lists, Data Frames)

8. Write a program to read csv file and analyze the data in the file in R.

9. Create pie chart and bar chart using R.

10. Create a data set and do statistical analysis on the data using R.

Department of Computer Science & Engineering

Room No: **B3-204**	
Course Code: **15CS11S2**	Name of the Course: **HADOOP LAB, B Tech - VII Sem**

List of software used: Ubuntu 18.04 or Ubuntu 20.04,Apache Hadoop 3.x

List of Experiments:

1) Create SSH connection on system installed with Ubuntu 14.04 LTS.

2) Download and Install Hadoop stable version on the above system.

3) Write necessary HDFS commands to place the data from Local file system to HDFS.

4) Develop a Mapper class for the word count on text document.

5) Develop a Reducer class for the word count on text document.

6) Develop an application to find the word count on text document.

7) Develop a Mapper class for the Maximum temperature calculation in the weather dataset.

8) Develop a Reducer class for the Maximum temperature calculation in the weather dataset.

9) Develop an application to find the Maximum temperature in the weather dataset.

10) Develop an application to find the Maximum temperature, using combiner function.

11) Download and Install Hive on Hadoop system.

12) Write a Hive query to find maximum temperature using MAX() function.

Department of Computer Science & Engineering

Room No: **B3-202**	
Course Code: **15CT11S1**	Name of the Course: **APP Development Lab, B.Tech - VII Sem**

List of software used: Android Studio, Java

List of Experiments:

1.Develop an application that uses Layout Managers and event listeners.

2.Develop an application that uses GUI components, Font and Colors

3. Develop a native calculator application.

4. Develop an application that makes Music player

5. Implement an application that implements Multi threading

6. Develop an application that makes use of database.

7. Implement an application that writes data to the SD card.

8. Implement an application that creates an alert upon receiving a message.

9. Write a mobile application that creates alarm clock

10. Write a mobile application that use fragmentation

11. Develop a native application that uses GPS location information.

12. Develop a native application that uses Google map services.

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Room No: **B3-202**	
Course Code**: 15CT11S2**	Name of the Course: **Python Lab, B. Tech - VII Sem**

List of software used: Python

List of Experiments:

1. a. Write a program to get the list of even numbers upto a given number. b. Write a program to get the ascii distance between two characters. c. Write a program to get the binary form of a given number. d. Write a program to convert base36 to octal.

2.a. Write a program to get the number of vowels in the input string (No control flow allowed) b. Write a program to check whether a given number has even number of 1's in its binary representation (No control flow, the number can be in any base) c. Write a program to sort given list of strings in the order of their vowel counts.

3. a. Write a program to return the top 'n' most frequently occurring chars and their respective counts. E.g. aaaaaabbbbcccc, 2 should return [(a 5) (b 4)] b. Write a program to convert a given number into a given base. Note: Convert the given number into a string in the given base. Valid base is 2 <= base <= 36 Raise exceptions similar to how int ("XX", YY) does (play in the console to find what errors it raises). Handle negative numbers just like bin and oct do.

4.a. Write a program to convert a given iterable into a list. (Using iterator) b. Write a program to implement user defined map() function. Note: This function implements a map. It goes through the iterable and applies func on each of the elements and returns a list of results. Don't use a for loop or the builtin map function. Use exceptions, while loop and iter. c. Write a progra m to generate an infinite number of even numbers (Use generator) d. Write a program to get a list of even numbers from a given list of numbers.(use only comprehensions)

5. Write a program to implement round robin. Note: This routine to take a variable number of sequences and return elements from them in round robin till each sequence is exhausted. If one of the input sequences is infinite, this is also infinite. e.g if input is [1,2,3], (4,5) -> yield 1,4,2,5,3 one after the other. Use exception control and comprehensions to write elegant code. Hint: This requires you to use understand variable arguments, lists, list copy, comprehensions, iterators, generators, exception handling, control flow etc.

6. a. Write a program to sort words in a file and put them in another file.The output file should have only lower case words, so any upper case words from source must be lowered.(Handle exceptions) b. Write a program return a list in which the duplicates are removed and the items are sorted from a given input list of strings.

7. a. Write a program to test whether given strings are anagrams are not. b. Write a program to implement left binary search. Note: Left binary search returns the left most element when a search key repeats. For e.g if input is [1,2,3,3,4,4,5] and I search 3, it should return 2 as index 2 is the left most occurrence of 3.

8.a. write a class Person with attributes name, age, weight (kgs), height (ft) and takes them through the constructor and exposes a method get_bmi_result() which returns one of "underweight", "healthy", "obese" b. Write a program to convert the passed in positive integer number into its prime factorization form. Note: If number = a1 ^ p1 * a2 ^ p2 ... where a1, a2 are primes and p1, p2 are powers >=1 then we represent that using lists and tuples in python as [(a1,p1), (a2,p2), ...] e.g.[(2,1), (5,1)] is the correct prime factorization of 10

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Department of Computer Science & Engineering

Room No:**B3-303**	
Course Code:**19CS2104**	Name of the Course: **Advanced Data Structures Lab, M Tech - I Sem**

List of software used: Visual Studio 2019 (version 1.51)

List of Experiments:

1. Write a program to implement stack operations using linked list.

2. Write a program to implement circular queue operations using arrays.

3. Write a program to implement the following operations on singly linked list

   a) Creation of a linked list b) Insert a node into linked list c) Delete a node from linked list

4. Write a program to implement the following the operations on doubly linked list

   a) Creation of a linked list b) Insert a node into linked list c) Delete a node from linked list

5. Write a program to implement the following. a)Linear probing b)Quadratic probing c)Double hashing

6. Write a program to implement the following in binary search tree a) Creation b) Insertion c) Deletion

7. Write a program to implement AVL tree a) Creation b) Insertion c) Deletion

8. Write a program to create a Red-black tree for the given elements.

9. Write a program to create a splay tree for the given elements.

10. Write a program to implement Boyer-Moore pattern matching algorithm.

11. Write a program to implement KMP pattern matching algorithm.

12. Write a program to create a Kd tree for the given element.

13. Write a program to construct a binomial heap for the given elements.

14. Write a program to construct a leftist tree for the given elements.

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Department of Computer Science & Engineering

Room No: **B3-203**	
Course Code: **19CS2157**	Name of the Course**: Databases Lab, M Tech, I Sem**

List of software used: MongoDB

List of Experiments:

1. Installation of MongoDB on Windows & Linux.

 2. Implementation of mongo Shell, Create database and display the database.

3. Execute the Commands of MongoDB and operations in MongoDB : Insert, Query, Update, Delete and Projection.

4. Implementation of Where Clause, AND,OR operations in MongoDB.

5. Implementation of MongoDB count() cursor method.

6. Execute Aggregation Pipeline and its operations.

7. Execute Limit Records and Sort Records operation in MongoDB.

8. Implementation of Aggregation and Map Reduce functions in MongoDB.

9. Implementations of Indexing, Advanced Indexing using MongoDB.

10. Implementations of Hashing using MongoDB.

11. Practice with ' McDonalds ' collection data for document oriented database.Import restaurants collection and apply some queries to get specified output.

12. Create a backup for an entire server to back up a Database with Mongo dump.

13. Establish a connection with a database or access any tabular data source using Java Driver, Python Driver, PHP Driver to do the following operations. a) Send various MongoDB statements. b) Retrieve and process the results received from the database.

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Room No: **B3 203**	
Course Code: **15CS2117**	Name of the Course: **Network Security and Data Mining Lab, M Tech, II Sem**

List of software used: C Language, UNIX Operating System, Weka Tool

List of Experiments:

Part A: Network Security

1. Implement the encryption and decryption of 8-bit data using Simplified DES Algorithm (created by Prof. Edward Schaefer) in C

2. Write a program to break the above DES coding

3. Implement Linear Congruential Algorithm to generate 5 pseudorandom numbers in C

4. Implement Rabin-Miller Primarily Testing Algorithm in C

5. Implement the Euclid Algorithm to generate the GCD of an array of 10 integers in C

6. a)Implement RSA algorithm for encryption and decryption in C

b) In an RSA System, the public key of a given user is e=31, n=3599. Write a program to find private key of the User.

Part B: Data Mining

1. Implementation of multi-dimensional data model using oracle warehouse builder/SQL Server.

2. Introduction to Weka: All the features of Weka software will be explored in this assignment.

3. Implementation of the following programs in C/C++:

4. Implementation of Apriori algorithm

5. Implementation of FP tree algorithm

6. Implementation of Naïve Bayesian classification algorithm

7. Introduction to ROSETTA: All the features of Rosetta software.

8. Generate lower and upper boundary values for a database using Rosetta.

9. Classify a database using Rosetta for an input excel database file.

10. Generate the decision rules and partition an input database using Rosetta.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ELECTRONIC DEVICES AND CIRCUITS LAB

1. PN Junction Diode Characteristics

2. Zener Diode Characteristics & Voltage Regulator using Zener Diode

3. Rectifiers without Filters (Full wave & Half wave

4. Rectifiers with Filters (Full wave & Half wave) - ripple factor, % regulation, load regulation calculation.

5. Bipolar Junction Transistor- CB Characteristics

6. Bipolar Junction Transistor - CE Characteristics

7. Transistor as a switch

8. JFET Characteristics

9. MOSFET Characteristics

10. SCR Characteristics

11. CE Amplifier

12. CC Amplifier

13. FET amplifier

14. UJT characteristics

ELECTRONIC CIRCUIT ANALYSIS LAB

1. Common Emitter amplifier

2. Two stage R-C coupled Amplifier

3. Linear wave shaping- Low pass RC circuit

4. Linear wave shaping-High pass RC circuit

5. Non Linear wave shaping – Clippers

6. Non Linear wave shaping - Clampers

7. Astable multivibrator

8. Monostable multivibrator

9. Class A Power Amplifier

10. Class B Complementary Symmetry Amplifier

11. Schmitt trigger

12. Single tuned amplifier.

LINEAR AND DIGITAL IC APPLICATIONS LAB

1. Integrator, differentiator using IC 741

2. Function Generator using IC 741

3. Astable and Monostable multivibrator using 555 Timer

4. 4-bit D/A converter

5. 4-bit A/D converter

6. Comparators using Op-Amp

7. Study of Logic Gates using Discrete

8. Study of Combinational Circuits

9. Study of Flip-Flops

10. 4 Bit Asynchronous Counter

11. Serial In Parallel Out Shift Register

12. Schmitt Trigger using Op-Amp

13. Band Pass and Band stop filters using IC 741

ANALOG COMMUNICATIONS LAB

1. Generation and Detection of Amplitude modulated signal.

2. Generation and Detection of Suppressed Carrier Amplitude modulated signal (DSB-SC)

3. Generation and Detection of Single Sideband Suppressed Carrier (SSB-SC) signal.

4. Generation and Detection of Frequency modulated signal.

5. Generation of Intermediate frequency (IF) signal using mixer circuit.

6. Design of Pre-emphasis and De-emphasis circuits.

7. Phase Locked Loop operation and verification of capture range and lock range.

8. Determination of Squelch level in FM detection.

9. Frequency Synthesizer – Multiplication and Division.

10. Characteristics of Automatic Gain Controller.

11. Spectral analysis of AM, DSB-SC, SSB-SC using spectrum analyzer.

12. Spectral analysis of FM using spectrum analyzer. 13. Simulation of Amplitude Modulation. 14. Simulation of Frequency Modulation.

VLSI DESIGN LAB

To Design and implement

1. 4 to 16 Decoder

2. 8 to 3 Encoder

3. 8:1 Multiplexer and 1:8 De-multiplexer

4. 8-bit Comparator

5. SR, D , JK and T Flip-Flops

6. 4-bit Serial in Parallel out and Parallel in Serial Out Shift registers

7. Decade Counter

8. 4-bit Parity generator

9. 4-bit Ripple Carry Adder

10. 4-bit Array Multiplier Semester - V 155 G V P College of Engineering (Autonomous) 2016 ECE

11. 4-bit ALU.

12. Mealy/Moore FSM Design.

NETWORKING TOOLS

USING NETLOGO SOFTWARE

1. Develop Sliders, Switches, Buttons in the Interface using Control Statements.

2. Arithmetic and Logical Operations.

3. Create a Static and Dynamic Network with 'N' Nodes.

4. Find the Best Neighbor Node of a given Network Node with respect to Specified Criteria.

5. Perform Basic Matrix Operations and Accessing Values from the Matrices.

6. Plot The Graph of Network Efficiency with respect to Time by sending Data from one Node to the
   other Node in a given Network.

LABVIEW TOOLS

1. Find the largest number in a given array using Binary Search.

2. Generate and detect AM signals using LABVIEW.

3. Generate and detect FM signals using LABVIEW.

4. Generate and detect DSB-SC signals using LABVIEW.

5. Generate and detect SSB signals using LABVIEW.

6. Generate and detect ASK, BPSK signals and analyze their spectrum.

7. Generate and detect QAM signals using LABVIEW.

8. Design an FIR filter using Windowing techniques.

9. Design an n-point DFT. Also perform the IDFT on the result.

10. Design a 4-point FFT.

11. Design a matched filter.

12. Design and implement various filters.

ARM BASED/AURDINO PROGRAMMING

1. Measure Analog signal from Temperature Sensor

2. Generate PWM output

3. Drive single character generation on Hyper Terminal

4. Drive a given string on Hyper Terminal

 5. Full duplex Link establishment using Hyperterminal

6. Drive a given value on a 8 bit DAC consisting of SPI

7. Drive Stepper motor using Analog GPIOs

8. Drive Accelerometer and Display the readings on Hyper terminal

APP DEVELOPMENT LAB (Skill Based Lab Elective)

1. Develop an application that uses Layout Managers and event listeners.

2. Develop an application that uses GUI components, Font and Colors

3. Develop a native calculator application.

4. Develop an application that makes Music player

5. Implement an application that implements Multi threading

6. Develop an application that makes use of database.

7. Implement an application that writes data to the SD card.

8. Implement an application that creates an alert upon receiving a message.

9. Write a mobile application that creates alarm clock

10. Write a mobile application that use fragmentation.

VLSI DESIGN TOOLS (Skill Based Lab Elective)

1. 4 to 16 Decoder

2. 8:1 Multiplexer and 1:8 De-multiplexer

3. 8-bit Comparator

4. 4-bit Serial in Parallel out and Parallel in Serial Out Shift registers

5. Decade Counter

6. 4-bit Parity generator

7. Ripple Carry Adder and Carry select Adder

8. 4-bit Array Multiplier

9. 4-bit ALU.

10. Sequence detector

EDA TOOLS (Skill Based Lab Elective)

To Design and implement

1. Schematic, Symbol and layout of a CMOS Buffer

2. Schematic, Symbol and layout of NAND Gate and NOR Gate

3. Schematic, Symbol of XOR Gate using instance of NAND Gates

4. Schematic and Symbol of Half Adder using instance of XOR gate & NAND Gate.

5. Schematic and Symbol of Full Adder using instance of Half Adder

6. Schematic and Symbol of D-Latch & D-Flip flop

7. Schematic of 2:1 Multiplexer using Pass Transistor Logic and Transmission Gate

8. Schematic, Symbol of CMOS Inverter and Calculation of Noise Margin, Propagation Delay and Power

   Dissipation

9. Schematic and Symbol of ALU.

10. Schematic and Symbol of 4-bit Shift Register

PCB DESIGNING (Skill Based Lab Elective)

LIST OF EXPERIMENTS:
1. Placement of DIP ICs, Transistor, Resistor, Ground using Schematic entry

2. Generation of Voltage Regulator using Schematic entry

3. Generation of Crystal Oscillator using Schematic entry

4. Generation of Common Anode Seven Segment Display using Schematic entry

5. Transfer of a given schematic design in to PCB using Place and Route and Populate the PCB

MINI PROJECT:
Implementation of 89c51 on a PCB. Items/ Components required
1. Keil Software

2. Eagle Software

3. Universal Programmer

4. Glass Paper

5. Drilling Machine (Handheld/ Power)

6. Drill bits of 0.25 mm, 0.3 mm, 3 mm diameter

FPGA VALIDATION LAB (Skill Based Elective)

1. Development of core clock generator module, Data Generate block RAM, Data Reader block ROM

2. Development of Data Generate block FIFO, RS232 Serializer block, Comparison block

3. Implementation of RAM using IP Coregen

4. Implementation of Dual port RAM using IP Coregen

5. Implementation of FIFO

6. Validation of RS232 Link

7. Implementation of ROM using IP Coregen and signal probing using Chipscope

MICROWAVE AND ANTENNA DESIGN (Skill Based Lab Elective)

1. Calculation of transmission line parameters (R, L, G and C) for two wire line, coaxial line and strip line.

2. Study on the standing wave pattern along a transmission line when the line is open-circuited, short

   circuited and terminated by a resistive load at the load end.

3. Investigate the effect of length of transmission line on the input impedance at the sending end.

4. Familiarization of Smith chart on MATLAB platform.

5. Radiation resistance of electric and magnetic dipoles as a function of electrical size.

6. Feed (input terminal) impedance of an electric dipole as a function of antenna length.

7. 3D radiation pattern of a half-wavelength dipole antenna in both horizontal and vertical orientations. 8.

   Radiation patterns for electric dipoles of various electrical lengths.

9. Characteristics and radiation patterns of Linear array, Planar and Circular arrays.

10. Variation of normalized input impedance with Feeding position in Inset-Fed Microstrip patch

   antenna.

11. Design of Rectangular Microstrip Patch antenna.

DIGITAL COMMUNICATIONS LAB

1. Pulse Amplitude modulation & Demodulaiton

2. Pulse Width modulation & Demodulaiton

3. Pulse Position modulation & Demodulaiton

4. Time Division multiplexing

5. Pulse Code modulation

6. Delta modulation

7. Amplitude Shift keying

8. Frequency Shift keying

9. Phase Shift keying

10. Differential phase Shift keying

11. Simulation of pulse modulation

12. Simulation of pass band modulation techniques

13. Simulation of multiplexing techniques

14. Simulation of channel coding schemes

MICROWAVE ENGINEERING LAB

1. To verify Reflex Klystron Characteristics and to determine the frequency and tuning range of reflex klystron.

2. To verify Gunn Diode Characteristics.

3. To analyze the fixed and variable attenuator and plot the micrometer reading Vs attenuation.

4. To determine the coupling factors and directivity of directional coupler.

5. To measure the power distribution of various wave guide Tee junctions

6. VSWR Measurement and load impedance calculations using smith chart.

7. Scattering parameters of Circulator.

8. Characterization of Laser Diode.

9. Intensity modulation of Laser output through an optical fiber.

10. Measurement of Data rate for Digital Optical link.

11. Measurement of Numerical Aperture of fiber cable.

MICROCONTROLLER AND INTERFACING LAB

CYCLE 1:

1. Perform addition/subtraction of 8/16 bit numbers.
2. Find smallest and largest number from series of numbers.
3. Sort the numbers from a given array.
4. Searching the numbers from a given array.
5. Convert Hex to BCD and BCD to Hex.
6. Convert ASCII to BCD and BCD to ASCII.
7. Find checksum of a given string.

CYCLE 2:

1. LED/Seven segment display interfacing with 8051 microcontroller.
 2. LCD interfacing with 8051 microcontroller.
3. Generate a PWM wave form continuously using timers.
4. Generate a triangular/saw tooth/sine wave using DAC.
5. To convert analog signal into digital using ADC.
6. Stepper motor interfacing with 8051 microcontroller.
7. Serial communication using 8051 microcontroller

ELECTRONICS WORKSHOP

1. Study of datasheets for various electronic components.

2. Study of resistor colour codes, identification of active and passive electronic components.

3. Study of multimeter, CRO and DSO.

4. Testing of Electronic Components.

5. Assembling and Testing of simple electronic circuits on breadboards.

6. Study of Function Generator and Regulated power supply.

7. Soldering of Electronic components on PCBs.

8. Study of Different types of batteries.

9. Study of Battery Charging circuit.

10.Installation of open source Operating System.

11.Installation and demonstration of Linux based Office Tools.

12.Demonstration of EDA Tools.

13.Study of Sensors & Actuators.

14.Mini Hobby project.

DIGITAL SIGNAL PROCESSING LAB

1. Implement and verify linear and circular convolution between two given sequences.
2. Implement and verify autocorrelation for the given sequence and cross correlation between two given sequences.
3. Compute and implement the 8-point DFT of a given sequence and compute power density spectrum of the sequence.
4. Implement and verify 4-point and 8-point DIT-FFT of a given sequence and find the frequency response (magnitude and phase).
5. Implement and verify 4-point and 8-point IFFT of a given sequence.
6. Generate the following standard discrete time signals.
   i) Unit Impulse
   ii) Unit step
   iii) Ramp
   iv) Exponential
   v) Sawtooth
7. Generate sum of two sinusoidal signals and to find the frequency response (magnitude and phase).
8. Design IIR Butterworth and Chebyshev filters (LP/HP).
9. Design FIR filter (LP/HP) using windowing technique.
   i. Using rectangular window
   ii. Using hamming window
   iii. Using Kaiser window

10. Design and verify Filter (IIR and FIR) response by using Filter Design and Analysis Tool.
11. Find the 8-point FFT of given 2-D signal and plot the frequency response (magnitude and phase).
12. Compute the Discrete Cosine Transform of a given 1D/2D sequence.
13. Compute the Decimation and Interpolation for the given sequence.
14. Real time implementation of an audio signal usingTMS320C6713 DSK.
15. Removal of DC Components from the given audio signal usingTMS320C6713 DSK.
16. Compute the correlation coefficient for the two given audio signals of same length using TMS320C6713 DSK.
17. FIR Filter implementation of an audio signal usingTMS320C6713 DSK.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP

Course Code: 19EE1101

The following experiments are required to be conducted as **compulsory experiments**.

1. Demonstration and identification of various electrical components and tools in a laboratory environment.

2. Study of various electrical types of cables and wires with their specifications.

3. Wiring of lighting circuit using two-way switches. (stair case wiring/Godown Wiring)

4. Measurement of voltage, current, resistance in DC circuit.

5. Study of resistor color codes and Verification of Ohms Law

6. Understand the usage of Digital Storage Oscilloscope / Cathode Ray Oscilloscope, Function Generator & Regulated power supply and obtain various waveforms on Oscilloscope.

7. Component testing of elements (R, L, C, Diodes, Transistors, MOSFETs) by using Multimeter.

8. Study of different types of Cells/Batteries (Primary Cell & Secondary Cell)

9. Measurement of earth resistance by fall of potential method.

10. Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and energy meter for calculating Power and Power Factor.

11. Trouble shooting of electrical equipment's (fan, iron box, mixer-grinder, etc.)

12. Determination of Insulation Resistance and Continuity test of wiring installation using Megger.

❖ **Additional Experiments**

13. Study of CFL and LED. / Obtain V-I characteristics of Compact Fluorescent light & Light Emitting Diode.

14. Study of PV Cell

15. Study of Induction motor and Transformer

16. Assembly of choke or small transformer

17. Measurement of Energy (using Single phase and Three phase Energy meter)

18. Wiring of backup power supply for domestic Installations including inverter, battery and load.

PRINCIPLES OF ELECTRICAL ENGINEERING LAB
(Electrical & Electronics Engineering)

Course Code: 19EE11D3

List of Experiments:

1. Study and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Verification of Thevenin's and Norton Theorems.
3. Time Response of series RL and RC Circuits
4. Transient response of   Series RLC Circuit
5. Form Factor calculation of Nonsinusoidal input
6. Series Resonance
7. Load test on single phase Transformer
8. Determine the performance characteristics of a Shunt Motor.
9. Speed control of DC Shunt Motor.
10. Determine the load characteristics of a Shunt Generator.
11. Determine the load characteristics of a Single Phase Induction Motor.
12. Study and use of the LT switchgear.

In addition to the above experiments, at least any one or two of the experiments from the following list are required to be conducted

13. OCC Characteristics of Synchronous Generator
14. Determine the performance characteristics of a Series Motor.
15. Measurement of voltage, current and phase using three phase transformer connections.
16. Determine the performance characteristics of a Compound Motor.

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB
(Electrical & Electronics Engineering)

Course Code: 19EE11D4

List of Experiments:

1. Verification of Kirchhoff's Laws.
2. Verification of Superposition Theorem.
3. Verification of Thevenin's Theorem.
4. Speed Control of DC shunt motor.
5. OC and SC Tests on a single phase transformer.
6. Brake Test on DC shunt motor.
7. Current Voltage Characteristics of a p-n Junction Diode/LED.
8. Diode Rectifier Circuit- Half wave rectifier
9. Diode Rectifier circuit- Full wave bridge rectifier
10. Voltage Regulation with Zener Diodes.
11. Observe output waveform of Inverting amplifier with Op-Amps
12. Observe output waveform of Non-inverting Amplifier with Op-amps.

In addition to the above experiments, at least any one or two of the experiments from the following list are required to be performed

13. Open Circuit characteristics of separately excited DC generator.
14. Design of a MOSFET amplifier.
15. Operate MOSFET as inverter/NOR gate.
16. Simulation experiments using PSPICE

    (a) Diode and Transistor Circuit Analysis.

    (b) MOSFET Amplifier design.

17. Inverting and Noninverting Amplifier Design with Op-amps.
18. Swinburn's test on DC Shunt Machine.

NETWORKS & SIMULATION LAB
(Electrical & Electronics Engineering)

Course Code: 15EE1106

The following experiments are required to be conducted as compulsory experiments:.

1. Verification and Simulation of KIRCHHOFFS laws.

2. Volt-Ampere Characteristics of a Filament Lamp.

3. Verification and Simulation of THEVENIN's& NORTON's Theorems.

4. Verification and Simulation of Superposition & Reciprocity Theorems.

5. Verification and Simulation of Maximum Power Transfer Theorems.

6. Locus Diagrams of RL and RC Series Circuits.

7. Series Resonance

8. Determination of Self, Mutual Inductances and Coefficient of Coupling.

* In addition to the above eight experiments, at least any two experiments from the following list are required to be conducted.

9. Harmonic Analysis of Non-Sinusoidal Waveform Signal.

10. Transient Analysis of RLC circuit.

11. Time Response of RL & RC Networks

12. Determination of a Form factor of Non-Sinusoidal Input.

BASIC COMPUTATIONS LAB
(Engineering Science Elective Lab)

Course Code: 15CH1117

1. Basic MATLAB commands like representing arrays, matrices, reading elements of a matrix, row and columns of matrices, random numbers.

2. Floor, ceil, and fix commands.

3. Eigen values and Eigen vectors of a matrix.

4. Plotting tools for 2 dimensional and 3 dimensional plots, putting legends, texts, using subplot tool for multiple plots.

5. Linear Regression, interpolation and polynomial regression.

6. Non linear regression.

7. Solving non linear algebraic equations.

8. ODE IVP problems using Runge - Kutta method.

9. ODE BVP problems using shooting method.

10. Using quadrature to evaluate integrals (1, 2 and 3 dimensional cases).

11. Symbolic manipulation to evaluate Laplace and Fourier transforms.

12. Finding the minimum of an unconstrained function.

CONTROL SYSTEMS & SIMULATION LAB
(Electrical & Electronics Engineering)

Course Code: 15EE1109

The following are the experiments required to be conducted as compulsory experiments:

1. Characteristics of Synchros.

2. Characteristics of magnetic amplifiers

3. Effect of feedback on DC servo motor.

4. Lag and lead compensation – Magnitude and phase plot

5. Effect of P, PD, PI, PID Controller on a second order systems.

6. Root locus and Bode Plot from MATLAB.

7. State space model for classical transfer function verification using MATLAB.

8. PSPICE-simulation of Op-Amp based integrator and differentiator circuits.

In addition to the above eight experiments, at least any two of the Experiments from the list are required to be conducted:
1. Transfer function of DC generator

2. Temperature controller using P,PI controllers.

3. Transfer function of DC motor.

4. Characteristics of AC servo motor.

5. Time response of second order system (Linear System Simulator)

ELECTRICAL MACHINES LAB-I
(Electrical & Electronics Engineering)

Course Code: 15EE1110

COMPULSARY EXPERIMENTS
1. O.C. & S.C. tests on a single-phase transformer
2. Sumpner's test on a pair of single-phase transformers for efficiency determination.
3. Derive two-phase from a three-phase supply using (Scott) connection of 2 transformers.
4. Separation of core losses in a single-phase transformer
5. Open Circuit Characteristics of DC shunt generator and determination of critical field resistance and critical speed.
6. Load test on DC shunt generator and compound generators and determination of their performance characteristics.
7. Speed control of separately excited DC motor.
8. Predetermination of efficiency at various loads (1/4,1/2,3/4 and full load). (using Swinburne's test).

AT LEAST TWO OF THE EXPERIMENTS FROM THE FOLLOWING ARE TO BE CONDUCTED:
9. Hopkinson's test on two identical DC shunt machines and determination of the efficiency.
10. Load test on a DC shunt motor and determination of performance characteristics.
11. Load test on DC compound motor. Determination of performance curves.
12. Retardation test on DC shunt motor (for determination of moment of inertia of machines).
13. Separation of losses in a separately excited DC motor.

Note: It is suggested that about 5 experiments should be done using LABVIEW/ Multisim Software either for data acquisition or for understanding through simulation

ELECTRICAL MACHINES LAB-II
(Electrical & Electronics Engineering)

Course Code: 15EE1115

LIST OF EXPERIMENTS/PROGRAMMES:
1. Determination of Xd and X q of a salient pole synchronous generator with Data acquisition in LabVIEW.
2. Load test on a three- phase Synchronous motor (Electrical loading) with Data acquisition in LabVIEW
3. Load test on a three-phase induction motor with Data acquisition in LabVIEW
4. No-load & blocked rotor tests on a three- phase induction motor
5. Regulation of a three-phase alternator by synchronous impedance method with Data acquisition in LabVIEW.
6. V and inverted-V curves of a three-phase synchronous motor at finite load with Data acquisition in LabVIEW.
7. Determination of equivalent circuit parameters of a singlephase induction motor.
8. Open loop v/f control for an inverter fed induction motor with Data acquisition in LabVIEW.
9. Efficiency determination of three- phase Alternator with Data acquisition in LabVIEW
10. Induction machine as Motor and Generator with Data acquisition in LabVIEW

In Addition to the above ten experiments at least any two of the experiments from the following list are required to be conducted
1. Parallel operation of single phase transformers.
2. Phantom loading on a bank of 3 Nos. of single-phase delta connected transformers.
3. Study the winding of a 3 phase induction machine.
4. Polarity test, poly phase connection of transformers using 3 single-phase transformers.

ELECTRICAL MEASUREMENTS LAB
(Electrical & Electronics Engineering)

Course Code: 15EE1117

LIST OF EXPERIMENTS:
1. Calibration of single phase wattmeter by Phantom loading
2. Calibration of dynamometer type power factor meter.
3. Measurement of parameters of a choke coil using three ammeter and three voltmeter methods.
4. Perform an experiment to find very low resistance, medium resistance and very high
   resistance using suitable test.
5. Measurement of 3-phase active and reactive power in balanced & unbalanced loads.
6. Calibration and testing of single phase energy meter.
7. Measurement of Inductance using Anderson Bridge.
8. Measurement of capacitance using Schering Bridge
9. Measurement of Dielectric strength of oil using H.T testing kit.
10. Measurement of 3 phase power with single watt meter and 2 No's of C.T.

In Addition to the above ten experiments at least any two of the experiments from the following list are required to be conducted
11. Polar curve using Lux meter, Measurement of intensity of illumination of fluorescent lamp.
12. Crompton D.C Potentiometer – Calibration of PMMC ammeter and PMMC Voltmeter.
13. Resistance Strain Gauge-Strain Measurements and Calibration and assessing the measurement with Strain Gauge simulator.
14. LVDT and capacitance pickup – characteristics and Calibration and assessing the performance with a simulator.
15. Measurement of temperature coefficients for different conditions using RTD simulator.

POWER ELECTRONICS AND SIMULATION LAB
(Electrical & Electronics Engineering)

COURSE CODE: 15EE1120

The following experiments are required to be conducted as compulsory experiments:
1. Study of static characteristics of SCR, MOSFET & IGBT and firing circuits for SCR and driver circuit for MOSFET/IGBT.
2. Single Phase AC Voltage Controller with R and RL Loads.
3. Single Phase fully controlled AC/DC converter with R and RL loads.
4. Single phase parallel inverter with R & RL loads.
5. Simulation of single-phase full converter using RL load.
6. Simulation of three phase AC voltage controller using RL & RLE load.
7. Simulation of buck/boost converters.
8. Simulation of single phase Inverter with PWM control.
9. Simulation of a DC-DC chopper fed DC drive.
10. Single Phase Half controlled AC-DC converter with R and RL load.

In addition to the above ten experiments at least any two of the experiments from the following list are required to be conducted:
1. DC-AC Inverter fed Induction motor drive.
2. Three Phase fully controlled AC-DC bridge converter with RL load.
3. Single Phase PWM inverter (Uni-polar /Bi-polar) with R and RL loads.
4. Speed Control of D.C. motor using AC/DC converter.

EMBEDDED PROCESSORS LAB
(Electrical & Electronics Engineering)

Course Code: 15EE1121

The Following Ten Experiments are Required to be Conducted as Compulsory Experiments:
1. Evaluation of Arithmetic Expression Using 8051 Trainer Kit.
2. Binary, BCD, ASCII Conversions using Keil IDE.
3. Multi-precision Addition, Subtraction, Multiplication and Division Using AVR Studio (Ver 5)
4. Program to generate square wave using 8051 microcontroller.
5. Stepper motor Control using 8051/AVR microcontroller.
6. Keyboard & LCD interfacing using 8051/ AVR processor.
7. Generation of a square wave of given duty cycle using AVR Processor.
8. Measurement of voltage using ADC channels using AVR microcontroller
9. Servo motor – Position Control using Fast PWM in AVR Microcontroller
10. Generation of PWM Waveform of given Frequency and duty cycle using ARM Processor.

In addition to the above TEN experiments, at least any two of the Experiments from the following list are required to be conducted :
11. Generation of FSK using AVR microcontroller.
12. Generation of switching signals for IGBTs using ARM processor for given dead time.
13. Measurement of Power factor using AVR microcontroller.
14. Measurement of speed using optical sensors using Atmel STK500.
15. Real Time Clock Interface to display date and time on LCD Display using AVR /ARM Processor.
16. Measurement of frequency using counters using AVR microcontroller,
17. Measurement of Power using dual ADC channels of AVR microcontroller.
18. Measurement of Energy using dual ADC channels of AVR microcontroller
19. Measurement of Torque using AVR microcontroller.
20. DC Motor – Speed and Direction Control using AVR microcontroller
21. Interfacing GLCD to ARM Processor.
22. BLDC Motor – Speed control using PWM using AVR microcontroller.
23. Touch Screen Interfacing with ARM Processor.
24. USART and its programming to communicate with GSM Modem using AVR /ARM Processor.
25. Output Voltage Control of chopper using ARM Processor.
26. Sinusoidal Pulse Width Modulation using ARM Processor.

POWER SYSTEM & SIMULATION LAB-I
(Electrical & Electronics Engineering)

Course Code: 15EE2106

LIST OF EXPERIMENTS

1. Develop a program to solve Swing Equation.

2. Measurement of earth resistance

3. Study and testing of over current and over voltage relay in Generator protection system.

4. Develop a Simulink model for a single area load frequency problem and simulate the same.

5. Write a program to find Y-bus & Z-bus

6. Observation and analysis of transient response in a synchronous machine during an L-G fault by using a digital storage oscilloscope.

7. Simulate a transmission line and find

  i. Ferranti effect,

  ii. Efficiency

8. Economic load dispatch without and with transmission loss using MiPower.

9. Design a PID controller.

10. Fault Analysis of 3 phase alternator

  i) LG Fault
  ii) LL Fault
  iii) LLG Fault
  iv) LLLG Fault

POWER SYSTEM & SIMULATION LAB-II
(Electrical & Electronics Engineering)

Course Code: 15EE2112

LIST OF EXPERIMENTS

1. IDMT (Inverse Definite Minimum Time) Relay Characteristics

2. Study and testing of over current and over voltage relays in transformer protection module.

3. Conduct a power flow study on a given power system.

4. Conduct a power flow study on a given power system network using Gauss-Seidel iterative method.

5. Determination of breakdown strength of oil by variable distance electrodes.

6. Develop a Simulink model for a two-area load frequency problem and simulate the same.

7. Observation and analysis of Power Quality parameters at a given power input terminal.

8. Design a PID controller for two-area power system and simulate the same.

9. Simulate Transmission line and find :

  a. Transmission line parameter

  b. Surge Impedance loadings

10. Transient Stability analysis of a typical power system by using MiPower.

POWER ELECTRONICSCONVERTERS AND DRIVES LABORATORY-I
(Electrical & Electronics Engineering)

Course Code: 15EE2209

LIST OF EXPERIMENTS (ANY TEN EXPERIMENTS TO BE PERFORMED)

1. Simulation of Three phase full converter using R-L-E Load.

2. Simulation of Three phase semi converter using R-L-E Load.

3. Simulation of three phase AC Voltage controller using R-L load.

4. Simulation of single phase cyclo converter using R-L load.

5. Simulation of three phase inverter with Sinusoidal PWM control.

6. Simulation of DC-DC converter in CCM and DCM.

7. Simulation of the Space Vector pulse width Modulation scheme for a 3-phase VSI.

8. Performance and operation of 3- phase full-Converter with R-L-E load.

9. Performance and operation of 3- phase semi-Converter with R-L-E load.

10.Performance & Operation of a four quadrant Chopper fed DC drive.

11.Performance and Operation of a three phase PWM inverter with R load.

12.Speed Control of DC Shunt Motor using SCR Dual converter.

POWER ELECTRONICS CONVERTERS AND DRIVES LABORATORY-II
(Electrical & Electronics Engineering)

Course Code: 15EE2218

LIST OF EXPERIMENTS
1. Simulation of Chopper fed DC motor drive using MATLAB/SIMULINK

2. Simulation for the study of four quadrant operation of DC drives using dual converter.

3. Simulation of 3-phase PWM Inverter with sinusoidal pulse-width modulation using MATLAB/SIMULINK.

4. Characteristics of induction machines under balanced and symmetrical conditions for the following using

   MATLAB/SIMULINK

        a. dq model in synchronous reference frame.

        b.dq model in stator reference frame

        c. dq model in rotor reference frame.

5. Simulation of v/f control of an induction motor drive using MATLAB/SIMULINK.

6. Simulation of Open-loop v/f control of a synchronous motor drive using MATLAB/SIMULINK.

7. Simulation of ZVS/ZCS resonant converter.

8. Performance &speed control of 1-phase Induction motors with A.C. voltage controllers.

9. Performance & Speed control of three phase Induction Motor with v/f control.

10. Performance & Operation of a three phase Induction motor fed from3-phase A.C. Voltage controller.

B.Tech. Programme in
INFORMATION TECHNOLOGY

List of Experiments

COLLEGE OF ENGINEERING
(AUTONOMOUS)

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING

(AUTONOMOUS)

MADHURAWADA, VISAKHAPATNAM

AFFILIATED TO JNTU- KAKINADA

IT WORKSHOP

LIST OF EXPERIMENTS

1. Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

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

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

4. Using MS word perform the following

   Formatting Fonts in word, Drop Cap in word, Columns, Tables, Borders and Colors, Inserting Header and Footer, Newspaper columns, clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs, Hyper linking.

5. Using MS Excel perform the following

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

6. Using MS Powerpoint perform the following

   PPT Orientation, Slide Layouts, Auto Shapes, Lines and Arrows, Inserting Images, Tables and Charts.

7. Practice the following LINUX Commands

   Help commands: whatis, man, info.Filesystem: ls, mkdir, cd, chmod, rm, mv, bc, who, whoami, ps, du, df, cal, date. Filters and Text processing: echo, cat, rev, head, tail, nl, cut, cp, paste, wc, cmp, diff, tr, ln

8. Practice the following LINUX Commands

   File compression: tar, compress, uncompress., Miscellaneous: apt-get, vi editor. Networking Commands :ping, ssh, ifconfig, netstat, traceroute.

9. Create a simple document using LaTeX that consists of Document structure, typesetting, tables.

10. Create a simple document using LaTeX that consists of figures, equations and References

11. Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP settings, customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug- ins like Macromedia Flash

12. Using Cloud based collaboration tools perform the following

- Store, sync and share files with ease in the cloud using **Google Drive**

- Document creation and editing text documents in your web browser using **Google docs**

- Handle task lists, create project plans, analyze data with charts and filters using **Google Sheets**

- Manage event registrations, create quizzes, and analyze responses using **Google Forms.**

Additional Experiments:

1. Setup and configure new virtual machine.

2. Compile and run simple C programs in Linux environment using the vi editor.

3. Edit photos/images in various formats using photo editing tools.

4. Keep track of important events, sharing one's schedule using Google Calendar.

PROBLEM SOLVING LAB USING C

List of Programs:

Week 1 (Basic Programs)
1. C program to display hello world message.
2. C program to scan all data type variables as input and print it as output.
3. C program to perform arithmetic operations like +,-,*,/,% on two input variables.
4. C program to perform temperature conversions from Centigrade to Fahrenheit and vice versa.

Week 2 (Programs on Operators)
1. C program to scan an input and perform pre and post increment operation on it and display the result.
2. C program to perform all bit wise operations.
3. C program to extract the last two digits of a given integer n, where the number of digits should be greater than 2.
4. C program to display the greatest of three numbers using conditional operator.
5. C program to swap two numbers without using third variable.

Week 3 (Programs on Conditional Statements)
1. C program to check whether a given input integer is in between two values x and y.
2. C program to check whether a given character is a vowel or a consonant or a digit or a special symbol.
3. C program to display the nature and roots of a quadratic equation.
4. C program to perform arithmetic operations using switch statement.
5. C program to convert upper case character to lower case and vice versa.

Week 4 (Programs on Loop Statements)
1. C program to print odd numbers between specified ranges.
2. C program to display the factors of a given number and check whether it is a prime or not.
3. C program to display the sum of individual digits of a given integer raised to the power of n. Also check whether the given integer is Armstrong or not.
4. C Program to demonstrate the usage of unconditional control statements.
5. C program to display the following pattern.

```
5 4 3 2 1
 4 3 2 1
  3 2 1
   2 1
    1
```

Week 5 (Programs on Functions)

1. C program to demonstrate the various categories of functions with respect to return type and number of arguments.
2. C program to find the LCM of two numbers using functions.
3. Create a header file which contains the following prototype:
   i. int factorial (int) ;   // non-recursive function
   ii. intfactorial_rec(int); //Recursive function
   iii. int prime (int) ;
   Use the above functions in a C program by including the above header file.
4. C program to display Pascal's triangle using functions.

Week 6 (Programs on Arrays)
1. C program to read n integer values into an array and display them
2. C program to count and display the number of positive, negative, even and odd numbers in a given array of integers and also display their sum.
3. C program to find the smallest and largest numbers in an array of integers.
4. C program to perform addition, multiplication, transpose of given matrices using functions.
5. C program to check whether a given integer exists in a list of numbers and print its index value if it is present, otherwise print "No".

Week 7 (Programs on Strings)
1. C program to convert upper case character to lower case and vice versa in a given string.
2. C program to delete all vowels in a given string and display the remaining string.
3. C program to check whether a given string is palindrome or not.
4. C program that reads two integers as strings and display their sum.

Week 8 (Programs on Strings)
1. C program to demonstrate the usage of at least 10 predefined string handling functions.
2. C program that implements the following user defined string handling functions
   i.   To find the length of the given string
   ii.   To copy the contents of one string to another
   iii.   To reverse the contents of a string
   iv.   To compare two strings
   v.   To concatenate two strings

Week 9 (Programs on Pointers and Dynamic Memory Allocation)
1. C program to demonstrate the usage of pointers.
2. C program that uses dynamic memory allocation functions to add n

elements and display their average.
3. C program that performs pointer arithmetic.
4. C program that implements call by reference.

Week 10 (Programs on Pointers)
   1. C program to demonstrate the following
      i. Pointers to Pointers
      ii. Array of Pointers
      iii. Pointer to Array
      iv. Pointers to Functions

Week 11 (Programs on Structures)
   1. C program to access and display the members of the structure.
   2. C program that demonstrates different ways to access the structure elements using pointers.

Week 12 (Programs on Files)
   1. C program to read the contents of a file and display on to output screen.
   2. C program to copy the contents of one file to another.
   3. C program to count and display the number of characters, words and lines in a file.
   4. C program to print last n characters of a file by reading file name and n value from command line.

   Programs to be covered beyond syllabus:
1. C program to find the factorial of a given number using recursive and non recursive functions.
2. C program to display the first n terms of the Fibonacci sequence.
        Example: If n= 5 it has to print   0 1 1   2 3

3. Write a general-purpose function to convert any given year into its roman equivalent. The following table shows the roman equivalents of decimal numbers:

Decimal	Roman
1	I
5	V
10	X
50	L

100	C
500	D
1000	M

Example:
Roman equivalent of 1988 is
MDCCCCLXXXVIII Roman equivalent of 1525
is MDXXV

4. C program to display upper and lower triangles of a given matrix.

5. C program to add the sum of row wise elements, column wise elements and diagonal elements of a given square matrix and display the result.

6. C program to check whether the matrix is symmetric or not.

7. Given a positive integer (<= 1000000), find the minimum number of bits required to represent it as a binary number.

8. C program to perform left rotation of the array.

9. C program to implement binary search

10. C program to sort a given list of values using bubble sort.

11. C program to find the LCM of array of integers

12. C program to find the two's complement of a given binary input.

13. C program to replace all the vowels in a given string with a given character

14. C program to perform arithmetic operations using command line arguments

15. C program that writes the contents to a file and reads the contents from a file using structures.

PROGRAMMING USING C++

1. Write a program illustrating function overloading feature.

2. Write programs illustrating the overloading of various operators

   Ex: Binary operators, Unary operators, New and delete operators etc.

3. Write Programs illustrating the use of the following functions:

   a) Friend functions.   b) Inline functions

   c) Static Member functions   d) Functions with default arguments.

4. Write a program to perform Operations-using self-referential classes, new and delete operators.

5. Write programs to create singly and doubly linked lists and perform insertion and deletion.

6. Programs illustrating the use of destructor and the various types of constructors (constructors without arguments, constructor with arguments, copy constructor etc).

7. Programs illustrating the various forms of inheritance:

   Ex. Single, Multiple, multilevel, hierarchical inheritance etc.

8. Write a program having student as on abstract class and create many derived classes such as Engineering, Science, Medical, etc. from student class. Create their objects and process them.

9. Write a program illustrating the use of virtual functions.

10. Write a program which illustrates the use of virtual base class.

11. Write a program to sort elements in ascending order.

12. Write programs illustrating file handling operations:

Ex. a) Copying a text files b) Displaying the contents of the file etc.

13. Write programs illustrating the console I/O operations.

DATABASE MANAGEMENT SYSTEMS LAB

List of Experiments:

1. Data Definition Commands, Data Manipulation Commands for inserting and deleting of data from Tables.

2. Data Manipulation Commands for updating and retrieving of data from Tables and Transaction Control statements

3. Basic functions like Numeric, String, Date and conversion functions.

4. Database Querying – Simple queries.

5. Queries using aggregate functions, GROUP BY and HAVING clauses.

6. Database Querying – Nested queries, Sub-queries.

7. Queries using Joins

8. Queries using Views

Programs using PL/SQL:
9. Procedures and Functions.

10. Implicit and Explicit Cursors

11. Triggers

12. Exception Handling

Case studies: *Students shall form in groups at the beginning of the semester and perform the following steps by the end of the semester and submit a project.*

13. Design a Database for any real-life application using ER model and normalize it.

14. Connect the Database through any programming language

15. Build real life database applications.

DATA STRUCTURES AND ALGORITHMS LAB

List of Experiments:

1. Write a program that uses recursive function to:

    i) Compute factorial of a given number ii) Solve the towers of Hanoi problem.

2. Write a program to implement the following search algorithms:

    i)   Linear Search ii) Binary Search iii) Fibonacci Search.

3. Write a program to implement the following sorting algorithms

    i) Bubble Sort ii) Insertion Sort iii) Selection Sort.

4. Write a program to implement different types of hash functions.

5. Write a program that implements the following data structures using arrays:

    i) Stack ii) Queue.

6. Write a program to implement the following Stack applications

    i) Factorial ii) Evaluations of postfix expression.

7. Write a program to implement the following types of queues

    i) Priority Queue ii) Circular Queue.

8. Write a program to implement the following types of Lists

    i) Singly linked list ii) Doubly linked list.

9. Write a program to implement binary tree using arrays and to perform binary tree traversals

    i) inorder ii) postorder iii) preorder.

10. Write a program to perform the following operations using linked lists:

    i)   Insert an element into a binary search tree.

    ii) Delete an element from a binary search tree.

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

11. Write a program to perform the following operations using linked lists:

    i) Insert an element into an AVL tree. ii) Delete an element from an

AVL tree.

12. Write a program for the implementation of BFS and DFS for a given graph.

Additional Programs/Beyond Syllabi:

13. Write a program to implement queue using stack.

14. Write a program to implement double stack.

15. Write a program to implement Dijkstra's algorithm for the single

source shortest path problem.

16. Write a program to reverse a linked list.

PROGRAMMING WITH PYTHON

List of Experiments:

1. **Input and output**
   (a) Print the "Python" for 1, print "Day - 1" for 2. By changing the variable "look" for each statement.
   (b) Create a variable "number" and assign an Integer to the number. Check the assigned Integer is "Positive" or "Negative".
   (c) Python program to find the largest element among three Numbers.
   (d) Write a program to print the sum of all the even numbers in the range 1 - 50 and print the even sum.
   (e) Python Program to display all prime numbers within an interval of 20 and 50.

2. **Variables and Functions**
   a. Write a program to swap two numbers without using a temporary variable.
   b. Write a program to define a function with multiple return values.
   c. Write a program which creates an adder given a value (Use only lambda).
   d. Write a program to define a function using default arguments.

3. **Loops and conditionals**
   a. Write a program to print the following patterns using loop:
   ```
   *
   **
   ***
   ****
   ```
   b. Write a program to print multiplication tables of 8, 15, 69.

4. **Strings**
   a. Write a program to find the length of the string without using any library functions.
   b. Write a program to check if two strings are anagrams or not.
   c. Write a program to check if the substring is present in a given string or not.

5. **Lists**

a. Write a program to perform the given operations on a list:

    i. add   ii. insert   iii. slicing

b. Write a program to perform any 5 built-in functions by taking any list.

c. Write a program to get a list of the even numbers from a given list of numbers. (use only comprehensions)

d. Write a program to implement round robin.

   Note: This routine to take a variable number of sequences and return elements from them in round robin till each sequence is exhausted. If one of the input sequences is infinite, this is also infinite. e.g if input is [1,2,3], (4,5) -> yield 1,4,2,5,3 one after the other. Use exception control and comprehensions to write elegant code. Hint: This requires you to use understand variable arguments, lists, list copy, comprehensions, iterators, generators, exception handling, control flow etc.

6. **Tuples**

a. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.

b. Write a program to return the top 'n' most frequently occurring chars and their respective counts.

  e.g. aaaaaabbbbcccc, 2 should return [(a 5) (b 4)]

7. **Sets**

a. Write a program to count the number of vowels in a string (No control flow allowed).

b. Write a program that displays which letters are present in both strings.

c. Write a program to sort given list of strings in the order of their vowel counts.

8. **Dictionaries**

a. Write a program to generate a dictionary that contains numbers (between 1 and n) in the form of (x, x*x).

b. Write a program to check if a given key exists in a dictionary or not.

c. Write a program to add a new key-value pair to an existing dictionary.

d. Write a program to sum all the items in a given dictionary.

9. **Files**

a. Write a program to sort words in a file and put them in another file.

The output file should have only lower-case words, so any upper-case words from source must be lowered. (Handle exceptions)

b. Write a program to find the most frequent words in a text read from a file.

10. Classes

a. Write a class Person with attributes name, age, weight (kgs), height (ft) and takes them through the constructor and exposes a method get_bmi_result() which returns one of "underweight", "healthy", "obese".

b. Write a Python class named Circle constructed by a radius and two methods which will compute the area and the perimeter of a circle.

11. Arrays

a. Write a program to create, display, append, insert and reverse the order of the items in the array.

b. Write a program to add, transpose and multiply two matrices.

12. GUI

Write a program to create a basic calculator using tkinter.

Additional Programs:

1. Write a program to check whether a given number has an even number of 1's in its binary representation (No control flow allowed).
2. Write a program to implement user defined map() function.
3. Write a program to return a list in which duplicates are removed and the items are sorted from a given input list of strings.
4. Write a program to implement left binary search.
5. Write a program to change days to hours, hours to minutes, and minutes to seconds using currying of composition of functions.
6. Write a program to generate an infinite number of even numbers (Use generator)
7. Write a program to convert a given iterable into a list. (Using iterator)
1. Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting

them alphanumerically.

2. Given a string and a number k, find the kth non-repeating character in the string. Consider a large input string with lakhs of characters and a small character set. How to find the character by only doing only one traversal of input string?

   e.g. input : str = hellopython k=3; output = y

3. To add 'ing' at the end of a given string (length should be at least 3). If the given string already ends with 'ing' then add 'ly' instead. If the string length of the given string is less than 3, leave it unchanged.

   E.g. input : 'abc' output : 'abcing' ; input : 'string' output : 'stringly'

OPERATING SYSTEMS LAB

List of Programs:

1. Simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.

   a) FCFS   b) SJF   c) Round Robin (pre-emptive)   d) Priority

2. Implement multi-level queue scheduling algorithm

3. Develop a program to simulate producer-consumer problem using semaphores.

4. Develop a program to simulate the concept of Dining-Philosophers problem.

5. Implement Bankers algorithm for the purpose of deadlock avoidance.

6. Simulate the following contiguous memory allocation techniques

   a) Worst-fit b) Best-fit   c) First-fit

7. Implement MVT and MFT memory management techniques

8. Develop a program to simulate paging technique of memory management.

9. Simulate the following page replacement algorithms:
   a) FIFO   b) LRU   c) Optimal   d) LFU

10. Simulate the following file allocation strategies:

    a) Sequential   b) Indexed   c) Linked

11. Develop a program to simulate the following file organization techniques

    a) Single level directory b) Two level directory c) Hierarchical

12. Develop a program to simulate the following disk scheduling algorithms:
    a) FCFS   b) SCAN   c) C-SCAN

OBJECT ORIENTED PROGRAMMING LAB

List of Programs:

1)   A) Implement the following programs using command line arguments

i)   Accept two strings from the user and print it on console with concatenation of "and" in middle of the strings

ii)   Accept 12-hour time zone and convert into it's corresponding 24-hour time zone.

Note: Accept hours, minutes and seconds separately from the user (e.g. 07 05 45 PM should be displayed as 19:05:45)

iii)   Accept a number 'n' and print the list of 'n' Fibonacci terms recursively

B) Perform the above programs using Scanner class.

2)   A) Write a program that accepts set of inputs from the user of various integer data types and determines the primitive data type that is capable of properly storing that input.

B) Write a program that accepts an array of integers and print those which are both odd and prime. If no such element in that array print "Not Found".

C) Write a program to accept contents into an Integer Array and print the frequency of each number in the order of their number of occurrences.

3)   A) Write a program that accepts an 'n' ordered square matrix elements into a single dimension array and print the elements of leading diagonal (top left to bottom right)

B) Write a program that accepts an 'm x n' double dimension array, where 'm' represents financial years and 'n' represents Ids of the items sold. Each element in the array represents number of items sold in a particular year. Identify the year and id of the item which has more demand

C) Write a program that accepts an 'n' ordered square matrix and calculate absolute difference between the sum of elements in their diagonals

4)   A) Create a class Box that uses a parameterized constructor to initialize the dimensions of a box. The dimensions of the Box are width, height, depth. The class should have a method that can return the volume of the box. Create an object of the Box class and test the functionalities.

B) Create a new class called Calculator with the following methods:

- A static method called powerInt(int num1,int num2)

This method should return num1 to the power num2.

- A static method called powerDouble(double num1,double num2).

This method should return num1 to the power num2.

- Invoke both the methods and test the functionalities. Also count number of objects created.

5)   A) Accept a String and a number 'n' from user. Divide the given string into substrings each of size 'n' and sort them lexicographically.
B) Accept Array of strings and display the number of vowels and consonants occurred in each string.

C) Accept two strings from the user and determine if the strings are anagrams or not.

6)   A) Create a multilevel inheritance for classes vehicle, brand and cost. The vehicle class determines the type of vehicle which is inherited by the class brand which determines the brand of the vehicle. Brand class is inherited by cost class, which tells about the cost of the vehicle. Create another class which calls the constructor of cost class and method that Displays the total vehicle information from the attributes available in the super classes.

B) Create an inheritance hierarchy of Figure_3D, Cylynder, Cone, Sphere etc. In the base class provide methods that are common to all Figure_3Ds and override these in the derived classes to perform different behaviors, depending on the specific type of Figure_3D. Create an array of Figure_3D, fill it with different specific types of Figure_3Ds and call your base class methods.

7)   Design a package to contain the class Student that contains data members such as name, roll number and another package contains the interface Sports which contains some sports information. Import these two packages in a package called Report which process both Student and Sport and give the report.

8)   A) Write a program that reads two numbers from the user to perform integer division into Num1 and Num2 variables. The division of Num1 and Num2 is

displayed if they are integers. 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.

B) Create a user defined exception.

9) A) Write a program that creates 3 threads by extending Thread class. First thread displays "Good Morning" every 1 sec, the second thread displays "Hello" every 2 seconds and the third displays Welcome" every 3 seconds. (Repeat the same by implementing Runnable).

B) Write a program to perform Thread synchronization.

10) A) Write a program that displays a sample registration page using Swing controls use appropriate layout managers.

B) Write a program for handling mouse events with adapter classes.

11) A) Write a program to create 3 radio buttons named line, rectangle and oval. Based on the radio button selected, allows user to draw lines, rectangles or ovals as per the locations selected by the user on the applet with mouse.

B) Write a program to create a Table inside a JFrame.

12) A) For program 10) A) check all the fields filled or not, display success dialogue if all fields are filled with the help of Action Listener. Display error dialogue if at least one field is empty.

B) Write a program to create three JSliders where each represents colors RED, GREEN and BLUE. Each slider has a value from 0 to 255. The background color of the applet is set based on the values retrieved from each slider to form a color using the color class constructor. On sliding any slider, the background color of applet changes.

13) A) Write a program to implement a new ArrayList class. It should contain add(), get(), remove(), size() methods. Use dynamic array logic.

B) Create an employee class containing at least 3 details along with Id, setters and getters. Insert the employee objects dynamically key as employee id and value as it's corresponding object into a HashMap. Perform Id based search operation on the HashMap.

14) A) Write a program that reads on file name from the user then displays information about whether the file exists, whether the file is readable/writable, the type of file and the length of the file in bytes and display the content of the using File Input Stream class.

B) Write a program that copies contents from one file to another file.(Using character streams).

C) Write a program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

15) A) Write a program that illustrates Vector class and wrapper classes

B) Write a program to generate a set of random numbers between two numbers x1 and x2, and x1>0.

C) Write a program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

Case Studies:

- Grading a Multiple-choice Test for students
- Create a Person class containing basic details like Name, Gender, Mobile and Email Based on that create and manage the objects that are related to student and employee   Classes
- Create a package called Banking containing classes and interfaces related to various banking operations such as withdrawal, deposits, loans and insurance etc. Create two classes related to any two specific banks that uses this package.
- Write a 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.
- Write a program that implements simple chat application using GUI

WEB PROGRAMMING LAB

LIST OF PROGRAMS:

WEEK-1 & 2

1) HOME PAGE:

The static home page must contain three frames.

Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link "IT" the catalogue for IT Books should be displayed in the Right frame.

Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
IT				
CSE				
ECE				
EEE				

2) Login Page:

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
IT CSE ECE EEE	User Name [____] password [____] Reset Submit			

3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in

a table.The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Note: Week 2 contains the remaining pages and their description.

4) CART PAGE:

      The cart page contains the details about the books which are added to the cart.

      The cart page should look like this:

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
IT CSE ECE EEE	Book Name Price Quantity Amount Java 2 Rs.300 1 Rs.300 XML Rs.170 2 Rs.340			
	Total Amount- Rs.640			

5) REGISTRATION PAGE:

Create a "registration form "with the following fields:

1)   Name (Text field)
2)   Password (password field)
3)   E-mail id (text field)
4)   Phone number (text field)
5)   Sex (radio button)
6)   Date of birth (3 select boxes)
7)   Languages known (check boxes – English, Telugu, Hindi, Tamil)
8)   Address (text area)

WEEK 3:

VALIDATION:

Write JavaScript to validate the following fields of the above registration page.

1.   Name (Name should contains alphabets and the length should not be less than 6 characters).

2. Password (Password should not be less than 6 characters length).

3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)

4. Phone number (Phone number should contain 10 digits only). Note: You

can also validate the login page with these parameters.

WEEK 4:

Design a web page using CSS (Cascading Style Sheets) which includes the following:

1) Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.

2) Add customized cursors: CROSS LINK, HELP LINK

3) Set a background image for both the page and single elements on the page. You can define the background image for the page like this: BODY {background-image:url(myimage.gif);}

4) Control the repetition of the image with the background-repeat property. As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

5) Define styles for links i.e., link, visited, active, hover

6) Work with Layers For example:

LAYER 1 ON TOP:
<div style="position:relative;font-size:50px;z- index:2;">LAYER 1</div>

<div style="position:relative; top:-50; left:5; color:red; font- size:80px; zindex:1">LAYER 2</div>

LAYER 2 ON TOP:

<div style="position:relative;font-size:50px; z-index:3;">LAYER1</div>

s<div style="position:relative; top:-50; left:5; color:red; fontsize:80px; zindex:4">LAYER   2</div>

WEEK 5:

Write an XML file which will display the Book information which includes the following:

i)   Title of the book

ii) Author Name

iii) ISBN number

iv) Edition

v) Price

Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows. The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically. Hint: You can use some xml editors like XML-spy

WEEK 6:

1) Install TOMCAT web server. While installation assign port number 8080. Make sure that this port are available i.e., no other process is using this port.

2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1and week-2 in the document root. Access the pages by using theurl : http://localhost:4040/rama/books.html

WEEK 7:

Install a database(Mysql or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form).

Practice 'JDBC' connectivity. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week1).

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them.

WEEK 8:

USER AUTHENICATION:

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a *servlet* for doing the following.

Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the database. If he is a valid user (i.e., user - name and password match) you should welcome him by name(user-name) else you should display "You are not an authenticated user".

COOKIES: Practice a cookie programs to add and read cookies.

WEEK 9:

WRITE A JSP WHICH DOES THE FOLLOWING JOB:

Insert the details of the 3 or 4 users who   register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database& also using cookies.

WEEK 10:

1. Create a simple XML Http Request and retrieve data from a TXT file using AJAX
2. Create an XMLHttpRequest to retrieve data from an XML file using AJAX

WEEK 11:

Design the web pages required for an online book store web site using PHP, AJAX, and HTML5.

EMBEDDED SYSTEMS LAB

LIST OF PROGRAMS:

1. ELEMENTARY OPERATIONS USING DIRECT AND INDIRECT ADDRESS MODES:

   i. Multi precision Addition, Subtraction, Multiplication and division

   ii. Handling Fractional numbers

   iii. BCD-Binary Conversion examples

   iv. ASCII to BCD conversion

   v. Binary to ASCII conversion

2. INPUT OUTPUT CONTROL PROGRAMMING.

   i. Controlling the external logical switching, for DC motors, Steppers

   ii. Timers and Counters with and without Interrupts modulation for speed control.

   iii. Capture control of external events

3. PROGRAMMING USING BUILT IN TIMERS.

   i. As Event Timers

   ii. As fast Counters

   iii. Frequency Generation

4. CAPTURE CONTROL AND ITS APPLICATION EXAMPLES

   i. Measurement of pulse width

   ii. Measurement of Duty cycle,

   iii. Measurement of velocity and acceleration.

5. SERIAL COMMUNICATION METHODS.

   i. USART and its programming

   ii. SPI bus and its programming

6. SINE WAVE GENERATION.

COMPUTER NETWORKS LAB

LIST OF PROGRAMS:

1. Connect the computers in Local Area Network

2. Implement CRC and Hamming code for error handling.

3. Implement Sliding window protocol.

4. Configure a network using Distance Vector Routing Algorithm.

5. Implement Address Resolution Protocol (ARP) and Reverse Address Resolution Protocol (RARP)

6. Using RSA algorithm Encrypt the data while sending it and Decrypt while receiving.

7. NS-2 Installation Procedure.

8. Design a sample topology using NS-2

9. Implement Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) between different pairs of systems using NS-2

10. Design Network using loop constraint.

11. Design a Network using Packet Tracer.

    (The way the network has to be designed is given by the faculty

UML LAB

LIST OF PROGRAMS:

1.   Draw a model for Airport management system in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2.   Draw a model for E-commerce sites in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

3.   Draw a model for online ticket reservation system in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project

SOFTWARE TESTING LAB

LIST OF PROGRAMS:

1. Write the function with memory leak.

2. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.

3. Write the test cases for any known application (e.g. Banking application)

4. Write the test suit for any known application (e.g. Banking application)

5. Study of any testing tool (e.g. Win runner)

6. Study of any web testing tool (e.g. Selenium)

7. Study of any bug tracking tool (e.g. Bugzilla, bugbit)

8. Study of any test management tool (e.g. Test Director)

9. Study of any open source-testing tool (e.g. Test Link)

10. Study of Regression testing tool (QTP).

DATA WAREHOUSING AND DATA MINING LAB

LIST OF EXPERIMENTS:

1. Basics of WEKA tool

a. Investigate the Application interfaces.

b. Explore the default datasets.

2. Pre-process a given dataset based on the following:

a. Attribute Selection b.Handling Missing Values

c. Discretization   d. Eliminating Outliers

3. Pre-process a given dataset based on the following:

a. Discretization   b. Eliminating Outliers

4. Create a dataset in ARFF (Attribute-Relation File Format) for any given dataset and perform Market-Basket Analysis.

5. Generate Association Rules using the Apriori algorithm.

6. Generate Association Rules using the FP-Growth algorithm.

7. Build a Decision Tree by using ID3 algorithm.

8. Demonstration of classification rule process on a given dataset using Naïve Bayesian Classifier.

9. Demonstration of classification rule process on a given dataset using Back propagation (Multi-layer perceptron) Classifier.

10. Build various Regression models.

11. Cluster the given dataset by using the k-Means Clustering algorithm and visualize the cluster mean values and standard deviation of dataset attributes.

12. Cluster the given dataset by using the DBSCAN Clustering algorithm.

13. Cluster the given dataset by using the Expectation Maximization Clustering algorithm.

NETWORK PROGRAMMING LAB

LIST OF PROGRAMS:

1.   Design TCP iterative Client and Echo server application to given input sentence.

2.   Design TCP iterative Client and server application to reverse the given input sentence

3.   Design TCP client and server application to transfer file.

4.   Design a TCP concurrent server to convert a given text into upper case using multiplexing system call "select".

5.   Design a TCP concurrent Server to echo given set of sentences using poll functions

6.   Design UDP Client and Server application to reverse the given input sentence

7.   Design UDP Client Server to transfer a file

8.   Design UDP Client Server application to count the total number of special characters in given input string.

9.   Design UDP Client Server application to calculate the sum of two integers.

10. Implement the following forms of IPC.

a.   Pipes

b.   FIFO

11. Implement file transfer using Message Queue form of IPC

12. Write a program to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use semaphores to avoid race conditions.

APP DEVELOPMENT LAB

LIST OF PROGRAMS:

1. Develop an application that uses Layout Managers and event listeners.
2. Develop an application that uses GUI components, Font and Colors
3. Develop a native calculator application.
4. Develop an application that makes Music player
5. Implement an application that implements Multi threading
6. Develop an application that makes use of database.
7. Implement an application that writes data to the SD card.
8. Implement an application that creates an alert upon receiving a message.
9. Write a mobile application that creates alarm clock
10. Write a mobile application that use fragmentation.
11. Develop a native application that uses GPS location information.
12. Develop a native application that uses Google map services.

PYTHON LAB

LIST OF PROGRAMS:

1. a. Write a program to get the list of even numbers upto a given number.

    b. Write a program to get the ascii distance between two characters.

    c. Write a program to get the binary form of a given number.

    d. Write a program to convert base36 to octal.

2. a. Write a program to get the number of vowels in the input string (No control flow allowed)

    b. Write a program to check whether a given number has even number of 1's in its binary representation (No control flow, the number can be in any base)

    c. Write a program to sort given list of strings in the order of their vowel counts.

3. a. Write a program to return the top 'n' most frequently occurring chars and their respective counts. E.g. aaaaaabbbbcccc, 2 should return [(a 5) (b 4)]

b. Write a program to convert a given number into a given base.

Note: Convert the given number into a string in the given base. Valid base is 2 <= base <= 36

Raise exceptions similar to how int ("XX", YY) does (play in the console to find what errors it raises). Handle negative numbers just like bin and oct do.

4. a. Write a program to convert a given iterable into a list. (Using iterator)

    b. Write a program to implement user defined map() function.

    Note: This function implements a map. It goes through the iterable and applies func on each of the elements and returns a list of results.

Don't use a for loop or the builtin map function. Use exceptions, while loop and iter.

    c. Write a progra m to generate an infinite number of even numbers (Use generator)

    d. Write a program to get a list of even numbers from a given list of numbers. (use only comprehensions)

5. Write a program to implement round robin.

Note: This routine to take a variable number of sequences and return elements from them in round robin till each sequence is exhausted. If one of the input sequences is infinite, this is also infinite.

e.g if input is [1,2,3], (4,5) -> yield 1,4,2,5,3 one after the other. Use exception control and comprehensions to write elegant code.

Hint: This requires you to use understand variable arguments, lists, list copy, comprehensions, iterators, generators, exception handling, control flow etc.

6. a. Write a program to sort words in a file and put them in another file. The output file should have only lower-case words, so any upper-case words from source must be lowered. (Handle exceptions)

b. Write a program return a list in which the duplicates are removed and the items are sorted from a given input list of strings.

7. a. Write a program to test whether given strings are anagrams are not.

b. Write a program to implement left binary search.

Note: Left binary search returns the left most element when a search key repeats.

For e.g if input is [1,2,3,3,4,4,5] and I search 3, it should return 2 as index 2 is the left most occurrence of 3.

8. a. Write a class Person with attributes name, age, weight (kgs), height (ft) and takes them through the constructor and exposes a method get_bmi_result() which returns one of "underweight", "healthy", "obese"

b. Write a program to convert the passed in positive integer number into its prime factorization form.

Note: If number = a1 ^ p1 * a2 ^ p2 ... where a1, a2 are primes and p1, p2 are powers >=1 then we represent that using lists and tuples in python as [(a1, p1), (a2, p2), ...]

e.g.[(2,1), (5,1)] is the correct prime factorization of 10

DEPARTMENT OF MECHANICAL ENGINEERING

B.Tech.

I-SEM   **1**   **Engineering Graphics**

1. basic engineering constructions
2. conics
3. cycloids, epicycloids, hypocycloids
4. projections of points
5. projections of lines-1
6. projections of lines-2
7. projections of planes-1
8. projections of planes-2
9. projections of solids
10. sections of solids
11. development of surfaces
12. orthographic projections
13. isometric projections

II-SEM   **1**   **Mechanical Engineering Workshop**

1. Half – Lap joint
2. Mortise and Tenon joint
3. Corner Dovetail joint or Bridle joint
4. Tapered tray
5. Conical funnel
6. Elbow pipe
7. V-fit
8. Dovetail fit
9. Semi-circular fit
10. Parallel and series
11. Two way switch
12. Tube light
13. Residential house wiring using fuse, switch, indicator, lamp and energy meter
14. Bicycle
15. Flush Tank
16. Wall Clock

III-SEM   **1**   **Materials Testing Lab**

1. Direct tension test Maxwell's reciprocal theorem-verification
2. Bending test on i) Simply supported beam ii) Cantilever beam
3. Hardness test a) Brinell hardness test b) Rockwell hardness test
4. Test on springs
5. Compression test on cube
6. Impact test a) Izod Impact Test b) Charpy Impact Test
7. Maxwell's reciprocal theorem-verification

1. Preparation and study of microstructure of pure metals i) Copper ii) Aluminum
2. Preparation and study of microstructure of pure metals i) Brass ii) Bronze quench test.
3. Preparation and study of microstructure of low, medium and high carbon steels.
4. Preparation and study of micro structure of Grey Cast Iron and Spheroidal Graphite Iron

5. Preparation and study of microstructure of White and Malleable cast irons

6. Simple heat treatment of steels and study of the microstructure of heat treated steels

7. Hardenability by Jominy end quench test.

2 Manufacturing Technology-I Lab

1. Pattern design and making (2 exercises)
2. Sand properties testing (2 exercises)
3. Moulding, melting and casting
4. Arc welding for lap joint and butt joint
5. Spot welding
6. Gas welding
7. TIG welding
8. Gas cutting
9. Pipe bending
10. Injection moulding
11. Blow moulding

IV-SEM   1   COMPUTER AIDED MACHINE DRAWING

1. Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears,webs, ribs, dimensioning types, lines and rules of dimensioning.

2. Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned. pipe joint.

3. Popular forms of Screw threads, bolts, and nuts.
4. Cotter joint and knuckle joint.
5. Riveted joints for plates
6. Spigot and socket joint
7. Journal bearing and foot step bearing.
8. Part modeling & views views and sections
9. Assembly of stuffing box
10. Assembly of screw jack
11. Assembly of engine connecting rod and piston assembly
12. Assembly of lathe tailstock.
13. Assembly of feed check valve
14. Drafting of assembled components showing various

V-SEM   1   Thermal Engineering Lab

1. I. C. Engines valve/port timing diagrams.
2. I.C Engines performance Test on four-stroke Diesel Engines.
3. I.C Engines performance Test on two-stroke Petrol Engine.

4. Evaluation of engine friction by conducting Morse test on 4-Stroke Multi Cylinder Petrol engine retardation and motoring test on 4 stroke - diesel engine.

5. I. C. Engines heat balance sheet.
6. I.C Engines AJF Ratio and volumetric efficiency.
7. Performance test on a variable compression ratio engine.
8. Performance test on 2stage reciprocating air--compressor unit
9. COP of a refrigeration Unit.
10. Study of boilers

11. Disassembly / assembly of engines

12. Performance of air-conditioning system

VI-SEM   **1**   **Manufacturing Technology–II Lab**

1. Plain Turning and Step Turning on Lathe.

2. Taper Turning and Knurling on Lathe.

3. Thread Cutting and Knurling on Lathe.

4. Internal Taper Boring on Lathe.

5. V-block Machining on Shaper.

6. Machining Hexagonal Block on Shaping Machine.

7. Spur Gear Cutting on Milling Machine.

8. Helical Gear Cutting on Milling Machine.

9. Effect of cutting parameters on cutting force in turning.

10. Effect of speed and feed on the surface finish while grinding surface finish.

11. Grinding of single point cutting tool on Tool and cutter grinder.

12. Torque measurement on drilling machine.

13. Force measurement on milling machine.

14. Measurement of cutting tool temperature in turning.

15. Determination of Shear angle experimentally in turning.

2   **Heat Transfer Lab**

1. Heat transfer from a pin fin under forced convection conditions.

2. Estimation of critical heat flux in pool boiling of water.

3. Natural convection heat transfer from a vertical cylinder.

4. Forced convection heat transfer to air in tube flow.

5. Estimation of thermal conductivity of the given metal rod.

6. Parallel flow heat exchanger-Estimation of effectiveness and overall heat transfer coefficient.

7.Heat transfer from a pin fin under natural convection conditions.

8. Estimation of emissivity of a surface.

9. Heat transfer through composite slab.

10. Heat transfer through composite sphere.

11. Counter flow heat exchanger- Estimation of effectiveness and overall heat transfer coefficient.

12. Transient heat conduction-Estimation of Biot and Fourier numbers.

13. Determination of Stefan-Boltzman constant.

14.Determination of heat transfer rate in drop and film wise condensation.

VII-SEM   **CAD/CAM LAB**

Static analysis of2D truss

Static analysis of comer bracket

Static analysis of beams

Analysis of pressure vessel

Steady state heat transfer analysis

Simulation of drilling operation

Simulation of milling operation

Simulation of turning operation

CNC part program for plane and step turning on CNC lathe

CNC part program for taper turning on CNC lathe

CNC part program for threading on CNC lathe

CNC part program on CNC milling

2 Mechanical Measurements Lab

1. Measurement of bores by internal micrometers and dial bore indicators.
2. Angle and taper measurements by Bevel protractor, Sine bars
3. Use of spirit level in finding the flatness of surface plate.
4. Use of gear tooth vernier calipers checking the chordal addendum and chordal height of spur gear
5. Toolmakers microscope and its application.
6. Thread measurement by Two wire/Three wire method.
7. Surface roughness measurement using Talysurf.
8. Machine tool alignment test on the lathe
9. Calibration of pressure gauges
10. Calibration of thermistor for temperature measurement.
11. Study and calibration of LVDT transducer for displacement measurement.
12. Calibration of thermocouple for temperature measurement.
13. Study and calibration of photo and magnetic speed pickups for the measurement of speed.
14. Calibration of resistance temperature detector for temperature measurement.
15. Study and measurement of vibration of stretched string.
16. Study and calibration of Mcleod gauge for low pressure

M.Tech(CAD/CAM)

I-SEM   1   FINITE ELEMENT ANALYSIS LAB

1. Modeling of machine components-I
2. Modeling of machine components-II
3. Assembly of machine components-I
4. Assembly of machine components-II
5. Static analysis with link elements
6. Static analysis with beam elements
7. Static analysis with shell elements
8. Static analysis with solid elements
9. Static analysis with Axi-symmetric triangular elements
10. Bulking analysis of pressure vessel
11. Modal analysis of shaft
12. Harmonic analysis of plate
13. Steady-state thermal analysis of a cylinder
14. Transient thermal analysis of a cylinder
15. Analysis of beam using ANSYS workbench
16. Size optimization of beam

2   MECHANICAL VIBRATIONS LAB

1. Tension test on mild steel specimen
2. Bending test on mild steel specimen
3. Numerical analysis of tension test
4. Numerical analysis of bending test
5. Free vibration analysis of spring mass system
6. Numerical (Modal and Harmonic) of spring mass system
7. Forced vibration analysis on spring mass damper system
8. Fatigue test on rotating shaft
9. Experimental analysis of gyroscope couple
10. Multi plane balancing of given masses

11. Dynamic balancing of rotating machines

12. Natural frequency test using FFT analyzer and Impact Hammer

13. Forced vibration analysis using FFT analyzer and Impact Hammer
14. Fault diagnosis of rotating machines using FFT analyzer and Impact Hammer
15. Noise and vibration analysis of axial fan using FFT analyzer
16. Single plane balancing of axial fan using FFT analyzer

II-SEM   1   Computer Aided Manufacturing and Robotics Lab

1. Creating a 2D part model using CAM software

2. Tool path simulation and NC code generation for drilling operations using CAM software

3. Tool path simulation and NC code generation for milling operations using CAM software

4. Tool path simulation and NC code generation for turning operations using CAM software
5. Mode selection and tool offsetting on CNC lathe
  6. CNC part program for facing and step turning on CNC lathe machine

7. CNC part program for taper and circular turning on CNC lathe machine
8. CNC part program for threading on CNC lathe machine
9. CNC part program on milling machine
10. Design and build a simple solid model using 3D printing
11. Drilling on 2-DOF PKM
12. Contouring on 3-DOF PKM
13. Programming on 4-DOF SCARA robot
14. Programming on 6-DOF Articulated robot

2   COMPUTATIONS LAB

1. Basic commands like representing arrays, matrices, reading elements of a matrix, row and columns of matrices, random numbers.

2. Transpose, determinant, inverse, Eigenvalues and Eigenvectors of a matrix.

3. Plotting tools for 2 dimensional and 3 dimensional plots, putting legends, texts, using subplot tool for multiple plots.

4. Write a program for finding the roots of an equation using (1) Bisection (2) Newton methods.

5. Write a program for solving system of linear equations using Gauss elimination method.

6. Write a program for finding natural cubic spline that interpolates a table of values.

7. Write a program for determining least square polynomial fit of degree m for given data.

8. Write a program for solving ordinary differential equation by numerical methods.

9. Training and testing data using neural networks
10. Interpretation of data using fuzzy logic toolbox
 11. Solve optimization problems using genetic algorithms

 12. Design a simple mechanical system using Simulink/SimMechanics.

M.Tech(Thermal Engineering)

I-SEM   1   Thermal Engineering Lab

1. Compressibility factor measurement of different real gases .
2. Dryness fraction estimation of steam.
3. Performance test on a variable compression ratio (VCR) diesel engine.
4. Performance of an air-conditioning system.
5. COP of refrigeration system.
6. Performance of heat pipe.
7. Double pipe heat exchanger with parallel/counter flow.
8. Finned tube heat exchanger.
9. Exhaust gas analysis with gas analyzer.
10. Pin fin experiment under natural/forced convection heat transfer conditions.
11. Measurement of thermal efficiency of a solar air heater.
12. Determination of moisture removal rate from agricultural products using a solar air heater

II-SEM   1   Computational Fluid Dynamics Lab

1. Steady state one-dimensional heat conduction in a composite wall
2. Transient one dimensional heat conduction in a slab
3. Heat transfer from a circular fin.
4. Parallel flow heat exchanger
5. Counter flow heat exchanger.
6. Natural convection heat transfer
7. Transient 1-D heat conduction in a slab by Crank-Nicolson implicit method by FDM discretization
8. Steady state 1-D heat transfer in an insulated rod with heat generation by FVM discretisation

9. Steady state 1-D heat transfer in a cylindrical fin by FVM discretization
10. One-dimensional heat transfer by convection-diffusion by FVM discretisation. Use central differencing scheme in discretisation..
11. One-dimensional heat transfer by convection-diffusion by FVM discretisation. Use upwind differencing scheme in discretisation.
12. Solve three simultaneous algebraic equations by Guassian elimination method.

DEPARTMENT OF PHYSICS

APPLIED PHYSICS LAB

The following are the list of experiments conducting in the Physics Lab under **Applied Physics Lab** for Circuit branches.

1. Diffraction grating-Minimum Deviation method

2. Newton's Rings

3. Particle size determination

4. Wave length of laser light using grating

5. B-H curve

6. Strain Gauge sensor

7. Stewart and Gee method

8. Four probe method -I

9. Four probe method- II

10. Dielectric constant

11. Energy gap of a semiconductor diode

12. Thermistor

ENGINEERING PHYSICS LAB

The following are the list of experiments conducting in the Physics Lab under **Engineering Physics Lab** for Non-Circuit branches.

1. Torsional pendulum

2. Compound pendulum

3. Particle size determination

4. Wave length of laser light using grating

5. Stewart and Gee method

6. Strain Gauge sensor

7. Lee's method

8. Fly Wheel

9. Flat spiral spring

10. Dielectric constant

11. B-H Curve

12. Ultrasonic interferometer

DEPARTMENT OF CHEMISTRY

LIST OF EXPERIMENTS:

1. Distribution of iodine between Carbon Tetrachloride or Chloroform and Water
2. Distribution of benzoic acid between benzene and water
3. Determination of rate constant and order of ester hydrolysis.
4. Determination of rate constant and order of reaction between persulfate and iodide
5. Conductometric titration of strong acid versus strong base
6. Conductometric titration of weak acid versus strong base
7. pH metric titration of strong acid versus strong base
8. Potentiometric determination of solubility of sparingly soluble salt (AgCl).
9. Colorimetric determination of Manganese in Steel
10. Determination of iron in cement by spectrophotometric method
11. Study of inversion of sucrose by polarimetry.
12. Potentiometric determination of Fe(II) using potassium dichromate.
13. Determination of total hardness of water sample.
14. Determination of dissolved oxygen.
15. Preparation of Biodiesel from vegetable oil
16. Preparation of gold nanoparticles