VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Aziz Nagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

COURSE SYLLABUS

R-25

For

B. Tech (Computer Science and Engineering)

B. TECH FIRST YEAR COURSE STRUCTURE

B. Tech I Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A251002	Mathematics-I (Matrices and Calculus)	3	1	0	4
2	A251004	Engineering Chemistry	3	0	0	3
3	A251302	Engineering Drawing and computer aided drafting	2	0	2	3
4	A251401	Basic Electronics	3	0	0	3
5	A251503	Programming for Problem Solving	3	0	0	3
6	A251083	Engineering Chemistry Lab	0	0	2	1
7	A251583	Programming for Problem Solving Lab	0	0	2	1
8	A251381	Engineering Work Shop	0	0	2	1
9		Induction Program				
		Total	**14**	**1**	**8**	**19**

B. Tech I Year II Semester

Sl. No	Course Category	Course Title	L	T	P	Credits
1	A252002	Mathematics – II (Ordinary Differential Equations & Vector Calculus)	3	0	0	3
2	A252003	Advanced Engineering Physics	3	0	0	3
3	A252001	English for Skill Enhancement	3	0	0	3
4	A252201	Basic Electrical Engineering	3	0	0	3
5	A252501	Data Structures	3	0	0	3
6	A252082	Advanced Engineering Physics Lab	0	0	2	1
7	A252501	Data Structures Lab	0	0	2	1
8	A252583	Python Programming Lab	0	0	2	1
9	A252281	Basic Electrical Engineering Lab	0	0	2	1
10	A252081	English Language & Communication Skills Lab	0	0	2	1
11	A252585	IT Workshop	0	0	2	1
		Total	**15**	**0**	**12**	**21**

B. TECH SECOND YEAR COURSE STRUCTURE

B. Tech II Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A253004	Discrete Mathematics	3	0	0	3
2	A253501	Computer Organization and Architecture	3	0	0	3
3	A253502	Object Oriented Programming through java	3	0	0	3
4	A253503	Operating Systems	3	0	0	3
5	A253504	Database Management Systems	3	0	0	3
6	A253005	Innovation and Entrepreneurship	2	0	0	2
7	A253582	Object Oriented Programming through java Lab	0	0	2	1
8	A253583	Operating Systems Laboratory	0	0	2	1
9	A253584	Database Management Systems Laboratory	0	0	2	1
10	A253585	Django Laboratory	0	0	2	1
11	A253105	Environmental Science	1	0	0	1
		Total	**18**	**0**	**8**	**22**

B. Tech II Year II Semester

Sl. No	Course Category	Course Title	L	T	P	Credits
1	A254003	Probability and Statistics	3	0	0	3
2	A254501	Full Stack Development	3	0	0	3
3	A254502	Algorithm design and Analysis	3	0	0	3
4	A254503	Computer Networks	3	0	0	3
5	A254504	Machine Learning	3	0	0	3
6	A254081	Computational Mathematics Laboratory	0	0	2	1
7	A254582	Full Stack Development Laboratory	0	0	2	1
8	A254583	Computer Networks Laboratory	0	0	2	1
9	A254584	Machine Learning Laboratory	0	0	2	1
10	A254585	Data Visualization - Power BI	0	0	2	1
		Total	**15**	**0**	**10**	**20**

MATHEMATICS-I (MATRICES & CALCULUS)

B.Tech I Year I Semester
Course Code: A251002

L	T	P	C
3	1	0	4

Course Outcomes:

At the end of the course, student will be able to:

1. Formulate the matrix representation of a given set of linear equations and analyze the solution of the system using appropriate methods.
2. Compute the eigenvalues and determine the corresponding eigenvectors of a given matrix. Transform a quadratic form into its canonical form using orthogonal transformations.
3. Apply the mean value theorems to solve real-world and mathematical problems also to discuss the curve tracing process.
4. Determine the extreme values of functions of two variables with and without constraints.
5. Evaluate multiple integrals and apply them to calculate areas and volumes.

UNIT-I

Matrices: Rank of a matrix by Echelon form and Normal form — Inverse of Non-singular matrices by Gauss-Jordan method. System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations.

UNIT-II

Eigen values and Eigen vectors: Linear Transformation and Orthogonal Transformation: Eigen values — Eigen vectors and their properties – Diagonalization of a matrix – Cayley-Hamilton Theorem (without proof) – Finding inverse and power of a matrix by Cayley-Hamilton Theorem. Quadratic forms and Nature of the Quadratic Forms – Reduction of Quadratic form to canonical form by Orthogonal Transformation.

UNIT-III

Single Variable Calculus: Limit and Continuous of functions and its properties. Mean value theorems: Rolle's theorem — Lagrange's Mean value theorem with their Geometrical Interpretation and applications – Cauchy's Mean value Theorem — Taylor's Series (All the theorems without proof).
Curve Tracing: Curve tracing in Cartesian coordinates.

UNIT-IV

Multivariable Calculus (Partial Differentiation and applications): Definitions of Limit and continuity – Partial Differentiation: Total derivative – Jacobian — Functional

dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V

Multivariable Calculus (Integration): Evaluation of Double Integrals (Cartesian and polar coordinates) – change of order of integration (only Cartesian form) — Change of variables for double integrals (Cartesian to polar). Evaluation of Triple Integrals — Change of variables for triple integrals (Cartesian to Spherical and Cylindrical polar coordinates).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

ENGINEERING CHEMISTRY

B.Tech I Year I Semester
Course Code: A251004

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Identify and explain the fundamental properties of water and its applications in domestic and industrial systems.
2. Describe the principles of electrochemical processes and demonstrate basic methods of corrosion prevention.
3. Explain the working of batteries and energy sources and analyze their relevance in engineering and entrepreneurial applications.
4. Define and classify polymers and other engineering materials based on their structure, properties, and applications.
5. Apply the principles of material properties and analyze analytical techniques for engineering and environmental problem-solving

UNIT-I

Water and its treatment: Introduction- Hardness, types, degree of hardness and units. Estimation of hardness of water by complexometric method - Numerical problems. Potable water and its specifications (WHO) - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and breakpoint chlorination. Defluoridation - Nalgonda technique. Boiler troubles: Scales, Sludges and Caustic embrittlement. Internal treatment of boiler feed water - Calgon conditioning, Phosphate conditioning, Colloidal conditioning. External treatment methods - Softening of water by ion- exchange processes. Desalination of brackish water – Reverse osmosis.

UNIT-II

Electrochemistry and Corrosion: Introduction- Electrode potential, standard electrode potential, Nernst equation (no derivation), electrochemical cell - Galvanic cell, cell representation, EMF of cell - Numerical problems. Types of electrodes, reference electrodes - Primary reference electrode - Standard Hydrogen Electrode (SHE), Secondary reference electrode - Calomel electrode. Construction, working and determination of pH of unknown solution using SHE, Quinhydrone electrode and Calomel electrode.

Corrosion: Introduction- Definition, causes and effects of corrosion – Theories of corrosion, chemical and electrochemical theories of corrosion, Types of corrosion: galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion - Nature of the metal (Position of metal in galvanic series, Purity of metal, Nature of corrosion product), Nature of the corroding environment (Temperature, Humidity, and pH). Corrosion control methods - Cathodic protection Methods - Sacrificial anode and impressed current methods.

UNIT-III

Energy sources:

Batteries: Introduction – Classification of batteries - Primary, secondary and reserve batteries with examples. Construction, working and applications of Zn-air and Lithium-ion battery. Fuel Cells – Differences between a battery and a fuel cell, Construction and applications of Direct Methanol Fuel Cell (DMFC).

Fuels: Introduction, classification and characteristics of a good fuel, Calorific value – Units - HCV, LCV- Dulongs formula - Numerical problems.

Fossil fuels: Introduction, Petroleum - Refining of Crude oil, Cracking - Types of cracking - Moving bed catalytic cracking. LPG and CNG composition and uses.

Synthetic Fuels: Fischer-Tropsch process, Introduction and applications of Hythane and Green Hydrogen

UNIT-IV

Polymers: Definition - Classification of polymers: Based on origin and tacticity with examples – Types of polymerization - Addition (free radical addition mechanism) and condensation polymerization. Plastics, Elastomers and Fibers: Definition, preparation, properties and applications of PVC, Buna-S, Nylon-6,6. Differences between thermoplastics and thermo setting plastics, Fiber reinforced plastics (FRP).

Conducting polymers: Definition and Classification with examples - Mechanism of conduction in transpoly-acetylene and applications of conducting polymers.

Biodegradable polymers: Polylactic acid and its applications.

UNIT-V

Engineerisng Materials:

Lubricants: Definition and Characteristics of a good lubricant- thin film mechanism of lubrication, properties of lubricants- viscosity, cloud and pour point, flash and fire point.

Biosensor - Definition, Classification, Amperometric Glucose monitor sensor.

Interpretative spectroscopic applications of UV-Visible spectroscopy for Analysis of pollutants in dye industry, IR spectroscopy in night vision-security, Pollution Under Control- CO sensor (Passive Infrared detection).

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010.
2. Engineering Chemistry by Rama Devi, Dr. P. Aparna and Rath, Cengage learning, 2025.

REFERENCE BOOKS:

1. Engineering Chemistry: by Thirumala Chary Laxminarayana & Shashikala, Pearson Publications (2020)
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi 2011.
3. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi 2015.

4. Challenges and Opportunities in Green Hydrogen by Editors: Paramvir Singh, Avinash Kumar Agarwal, Anupma Thakur, R.K Sinha.
5. E-Content- https://doi.org/10.1142/13094 | October 2023
6. E-books: https://archive.org/details/EngineeringChemistryByShashiChawla/page/n11/mode/2u

ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING

B.Tech I Year I Semester
Course Code: A251302

L	T	P	C
2	0	2	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and apply the fundamental principles of engineering graphics.
2. Apply orthographic projections to points, lines, and planes using conventional and computer-aided methods.
3. Analyze projections and sectional views of regular solids using conventional and computer-aided methods.
4. Develop surfaces of basic solids like prism, cylinder, pyramid, and cone.
5. Create isometric projections and convert between isometric and orthographic views.

UNIT-I

Introduction to Engineering Graphics (Conventional): Principles of Engineering Graphics and their Significance, Geometrical Constructions, Scales, Plain and Diagonal, Conic Sections including the Rectangular Hyperbola, General method only. Cycloid, Epicycloid and Hypocycloid.

UNIT-II

Orthographic Projections (Conventional and Computer Aided): Principles of Orthographic Projections, Conventions, Projections of Points and Lines, Projections of Plane regular geometric figures. Auxiliary Planes. Computer aided orthographic projections, points, lines and planes. Introduction to Computer aided drafting, views, commands and conics.

UNIT-III

Projections of Regular Solids (Conventional and Computer Aided): Auxiliary Views, Sections or Sectional views of Right Regular Solids, Prism, Cylinder, Pyramid, Cone, Auxiliary views, Computer aided projections of solids, sectional views.

UNIT-IV

Development of Surfaces (Conventional): Prism, Cylinder, Pyramid and Cone.

UNIT-V

Isometric Projections (Conventional and Computer Aided): Principles of Isometric Projection, Isometric Scale, Isometric Views, Conventions, Isometric Views of Lines, Plane Figures, Simple and Compound Solids, Isometric Projection of objects having non, isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice- versa, Conventions. Conversion of orthographic projection into isometric view.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhatt, Charotar, 54th Edition,2023.
2. Engineering Drawing and graphics Using AutoCAD, T. Jeyapoovan and Vikas, S. Chand and company Ltd., 3rdEdition,2010.

REFERENCE BOOKS:

1. Engineering Drawing, Basant Agrawal and C.M. Agrawal, McGraw Hill,3rd Edition,2019.

BASIC ELECTRONICS

B.Tech I Year I Semester
Course Code: A251401

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Analyze the electrical characteristics and models of semiconductor diodes and apply them in rectifier and clipping circuits.
2. Evaluate the operation and configurations of Bipolar Junction Transistors (BJTs) and analyze their input and output characteristics.
3. Design appropriate biasing networks for BJTs and determine the operating point for amplifier applications.
4. Analyze transistor amplifier circuits using h-parameter models and assess performance for various configurations.
5. Analyze the structure, working, and characteristics of JFETs, MOSFETs.

UNIT-I

Diode Characteristics and Applications: PN junction diode – I-V characteristics, Diode resistance and capacitance, Diode models (Ideal, Simplified, Piecewise Linear), Rectifiers – Half-wave, Full- wave (Center-tap and bridge), Capacitor filter for rectifiers, Clippers and clampers, Zener diode – I-V characteristics and voltage regulation.

UNIT-II

Bipolar Junction Transistor (BJT): Structure and working principle of BJT, Current components and transistor action, Configurations: Common Base (CB), Common Emitter (CE), Common Collector (CC), Input and output characteristics, Determination of h-parameters from transistor characteristics.

UNIT-III

BJT Biasing: Need for biasing and stabilization, Load line and operating point, Biasing techniques: Fixed bias, Collector-to-base bias, Voltage divider bias, Stability factors and thermal runaway.

UNIT-IV

Transistor Amplifiers: Transistor as a small-signal amplifier, h-parameter equivalent circuit, CE, CB, CC amplifier analysis using h-parameters, Approximate CE model – with and without emitter bypass capacitor.

UNIT-V

Special Purpose Diodes and Field Effect Transistors: Principle of Operation of – SCR, Tunnel Diode, Varactor Diode, Photo Diode, Solar Cell, LED and Schottky Diode, JFET:

Structure, operation, and characteristics, MOSFET: Enhancement and Depletion modes – Structure, operation, and characteristics.

TEXT BOOKS:

1. Boylestad, Robert L., and Louis Nashelsky. Electronic Devices and Circuit Theory. Pearson, 11th edition, 2013.
2. Millman, Jacob, and Christos C. Halkias. Electronic Devices and Circuits. Tata McGraw-Hill, 1991.
3. Bell, David A. Electronic Devices and Circuits. Oxford University Press, 5th ed., 2008

REFERENCE BOOKS:

1. Neamen, Donald A. Electronic Circuit Analysis and Design. McGraw-Hill, 2nd ed., 2001.
2. Salivahanan, S., and N. Suresh Kumar. Electronic Devices and Circuits. McGraw-Hill Education, 4th ed., 2017.
3. Razavi, Behzad. Fundamentals of Microelectronics. Wiley, 2nd ed., 2013.
4. Taur, Yuan, and Tak H. Ning. Fundamentals of Modern VLSI Devices. Cambridge University Press, 2nd ed., 2009.

PROGRAMMING FOR PROBLEM SOLVING

B.Tech I Year I Semester
Course Code: A251503

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Write algorithms, draw flowcharts and convert them into modular C programs using variables, control structures, and loops.
2. Apply arrays and functions to design structured and reusable programs.
3. Use pointers and string manipulation techniques to develop modular C programs
4. Implement recursive solutions and create programs using structures, unions, and enumerated types.
5. Perform file handling operations and implement basic searching and sorting algorithms.

UNIT-I

Overview of C: C Language Elements, Variable Declarations and Data Types, Executable Statements, General Form of a C Program, Arithmetic Expressions, Formatting Numbers in Program Output.

Selection Structures: Control Structures, Conditions, if Statement, if Statements with Compound Statements, Decision Steps in Algorithms.

Loop Statements: Repetition in Programs, Counting Loops and the while Statement, Computing a Sum or Product in a Loop, for Statement, Conditional Loops, Loop Design, Nested Loops, do-while Statement.

UNIT-II

Arrays: Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Multidimensional Arrays.

Top-Down Design with Functions: Building Programs from Existing Information, Library Functions, Top-Down Design and Structure Charts, Functions without Arguments, Functions with Arguments, Using Array Elements as Function Arguments.

UNIT-III

Pointers and Modular Programming: Pointers and the Indirection Operator, Functions with Output Parameters, Multiple Calls to a Function with Input/ Output Parameters, Scope of Names, Formal Output Parameters as Actual Arguments.

Strings: String Basics, String Library Functions: Assignment and Substrings, Longer Strings-Concatenation and Whole-Line Input, String Comparison.

UNIT-IV

Recursion: The Nature of Recursion, Tracing a Recursive Function,

Structure and Union Types: User-Defined Structure Types, Structure Type Data as Input

and Output Parameters, Union Types, Enumerated Types.

UNIT-V

Text and Binary File Pointers: Input/ Output Files, Binary Files.

Sorting and Searching: Basic searching in an array of elements (linear and binary search techniques), Basic algorithms to sort array of elements (Bubble and Insertion algorithms).

TEXT BOOKS:

1. Jeri R. Hanly and Elliot B. Koffman, Problem solving and Program Design in C 7th Edition, Pearson.
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition).

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-Hall of India.
2. E. Balagurusamy, Computer Fundamentals and C, 2nd Edition, McGraw-Hill.
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB.
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, McGraw-Hill, 4th Edition.
7. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

ENGINEERING CHEMISTRY LAB

B.Tech I Year I Semester
Course Code: A251083

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Determine water quality parameters and lubricant properties through volumetric and viscometric methods, and analyze their relevance in industrial applications.
2. Apply electrochemical techniques such as conductometry and potentiometry to estimate concentrations of acids and assess chemical reactions.
3. Examine the corrosion behavior of metals under various conditions and evaluate the effect of inhibitors on corrosion rate.
4. Illustrate the synthesis and applications of advanced materials like Thiokol rubber, fuel cells, and smart biomedical materials using real and virtual lab tools.

List of Experiments:

1. Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.
2. Determination of rate of corrosion of mild steel in the presence and absence of inhibitor.
3. Estimation of the concentration of strong acid by Conductometry.
4. Estimation of the concentration of strong and weak acid in an acid mixture by Conductometry.
5. Estimation of concentration of strong acid with strong base by Potentiometry using quinhydrone
6. Preparation of Thiokol rubber.
7. Estimation of acid value of given lubricant oil.
8. Estimation of viscosity of lubricant oil using Ostwald's Viscometer.
9. Construction of Fuel cell and it's working. (Virtual lab)
10. Smart materials for Biomedical applications (Virtual lab)

REFERENCE BOOKS:

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publications.
4. College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).

PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech I Year I Semester
Course Code: A251583

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Apply algorithms, flowcharts, and control structures to solve numeric and expression-based problems in C.
2. Develop programs using arrays, pointers, and functions to perform computations and implement modular solutions.
3. Implement string manipulation operations and apply file handling techniques for data processing in C.
4. Design and test programs using user-defined functions and apply structured programming principles for problem solving.
5. Implement sorting & searching techniques and analyze their efficiency through programming.

PRACTICE SESSIONS:

Simple numeric problems:

a) Write a program for finding the max and min from the three numbers.
b) Write the program for the simple, compound interest.
c) Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:

   5x1=5
   5x2=10
   5x3=15

d) Write a program that shows the binary equivalent of a given positive number between 0 to 255.

Expression Evaluation:

a) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement).
b) Write a program that finds if a given number is a prime number.
c) Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
d) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

Arrays, Pointers, and Functions:

a) Write a C program to find the minimum, maximum, and average in an array of integers.
b) Write a C program that uses functions to perform the following:
   i) Addition of Two Matrices ii) Multiplication of Two Matrices.
c) Write a program for reading elements using a pointer into an array and displaying the values using the array.
d) Write a program to display values in reverse order from an array using a pointer.

Files:

a) Write a C program that copies one file to another, replacing all lowercase characters with their uppercase equivalents.
b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

Strings:

a) Write a C program that uses functions to perform the following operations:
   I. To insert a sub-string into a given main string from a given position.
   II. To delete characters from a given position in a given string.
b) Write a C program to determine if the given string is a palindrome or not (Spelled the same in both directions, with or without a meaning, like madam, civic, noon, abcba, etc.).
c) Write a C program that displays the position of a character 'ch' in the given string 'S' or -1 if 'S' doesn't contain 'ch'.
d) Write a C program to count the lines, words, and characters in a given text.

Sorting and Searching:

a) Write a C program that uses a non-recursive function to search for a key value in a given list of integers using the linear search method.
b) Write a C program that uses a non-recursive function to search for a key value in a given sorted list of integers using the binary search method.
c) Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.
d) Write a C program that sorts the given array of integers using the selection sort in descending order.
e) Write a C program that sorts the given array of integers using the insertion sort in ascending order.
f) Write a C program that sorts a given array of names.

TEXTBOOKS:

1. Jeri R. Hanly and Elliot B. Koffman, Problem Solving and Program Design in C, 7th Edition, Pearson.
2. B.A. Forouzan and R.F. Gilberg, C Programming and Data Structures, Cengage Learning, (3rd Edition).

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-Hall of India.
2. E. Balagurusamy, Computer Fundamentals and C, 2nd Edition, McGraw-Hill.
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB.
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, McGraw-Hill, 4th Edition.
7. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

ENGINEERING WORKSHOP

B.Tech I Year I Semester
Course Code: A251381

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Understanding the tools and methods of using to fabricate Engineering Components.
2. Applying the methods to read and interpret work shop drawings.
3. Evaluating various methods and trades of workshop in the component building.

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

I. Carpentry: T-Lap Joint, Dovetail Joint, Mortise and Tenon Joint
II. Fitting: V-Fit, Dovetail Fit and Semi-circular fit
III. Tin Smithy: Square Tin, Rectangular Tray and Conical Funnel
IV. Foundry: Preparation of Green S and Mould using Single Piece and Split Pattern
V. Welding Practice: Arc Welding and Gas Welding
VI. House wiring: Parallel and Series, Two-way Switch and Tube Light
VII. Lathe: Facing and Step Turning

2. TRADES FOR DEMONSTRATION AND EXPOSURE

Plumbing, Machine Shop, Power tools in construction and Wood Working

TEXTBOOKS:

1. Elements of Workshop Technology, Hajra Choudhury S. K., Hajra Choudhury A. K. and Nirjhar Roy S.K., Vol.I 2008andVol.II2010, Media promoters and publishers private limited, Mumbai.
2. Workshop Practice Manual, K. Venkata Reddy, BS Publication,6th Edition, Rpt.2025.

REFERENCE BOOKS:

1. Workshop Manual, K. Venugopal, Anuradha Publications,2012th edition,2012

MATHEMATICS – II (Ordinary Differential Equations & Vector Calculus)

B.Tech I Year II Semester

Course Code: A252002

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Apply the concept of first order differential equations to solve real world problems
2. Solve higher differential equation and apply the concept of differential equation to real world problems.
3. Use the Laplace Transforms techniques for solving Ordinary Differential Equations.
4. Apply the concepts of vector differentiation to compute gradient, divergence, and curl, and interpret their physical significance in engineering problems.
5. Evaluate line, surface, and volume integrals, and apply vector integration theorems such as Green's, Gauss's, and Stokes's to solve engineering problems.

UNIT-I

First Order Ordinary Differential Equations: Exact differential equations – Equations reducible to exact differential equations – linear and Bernoulli's equations – Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling — Law of natural growth and decay.

UNIT-II

Ordinary Differential Equations of Higher Order: Higher order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax}, sin ax , cos ax, polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$ – Method of variation of parameters.

UNIT-III

Laplace Transforms: Laplace Transforms: Laplace Transform of standard functions — First and second shifting theorems — Laplace transforms of functions multiplied by 't' and divided by 't' — Laplace transforms of derivatives and integrals of function — Evaluation of integrals by Laplace transforms — Laplace transform of periodic functions — Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV

Vector Differentiation: Vector point functions and scalar point functions — Gradient — Directional derivatives — Divergence — Solenoidal Vector — Curl — Irrotational vectors – Vector Identities.

UNIT-V

Vector Integration: Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

ADVANCED ENGINEERING PHYSICS

B.Tech I Year II Semester
Course Code: A252003

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Analyze crystal structures and apply XRD technique or material characterization.
2. Classify various wave optics techniques and explain their phenomena and applications.
3. Apply quantum mechanical principles to explain particle behaviour and discrete energy levels in materials.
4. Understand quantum computing concepts, use quantum gates, and explain basic quantum measurements.
5. Explain the principles of lasers and fibre optics and their applications in various communications.

UNIT-I

Crystallography & Materials Characterization: Introduction: Unit cell, Space lattice, Basis, Lattice parameters; Crystal structures, Bravais lattices, Atomic radius, Number of atoms per unit cell, Coordination number, Distance of nearest neighbourhood, packing factor of Simple cubic (SC), Body Centered Cubic (BCC), Face Centered Cubic (FCC) structure; Miller indices, Inter-planar distance. Concept of Nanomaterials: Surface area to Volume ratio, X -ray diffraction: Bragg's law, Powder method, Calculation of average crystallite size using Debye Scherrer formula.

UNIT-II

Wave Optics: Principle of superposition, Coherence, Interference - Interference in thin films by reflection, Newton's rings. Diffraction – Fresnel and Fraunhofer diffraction, Fraunhofer diffraction due to single slit, Plane diffraction grating, Resolving power of grating (qualitative treatment), Polarization – Polarization of light waves, Plane of vibration, Plane of polarization, Double refraction, Nicol's Prism, Applications of polarization.

UNIT-III

Quantum Mechanics: Introduction: de-Broglie hypothesis, Heisenberg uncertainty principle, Postulates of quantum mechanics: Operators in quantum mechanics, Eigen values and Eigen functions, Expectation value, Physical significance of wave function, Schrödinger's time independent wave equation, Application of Schrödinger's time independent wave equation for a particle in a1-D box: Expression for solution of wave function and derivation for Eigen energy states, Band Theory of solids, Classification of solids based on Band theory.

UNIT-IV

Quantum Computing: Introduction to Quantum Computing, Mathematical Tools: Linear Algebra Basics, Tensor Product, Dirac Notation (Bra-Ket) and Properties, Hilbert Space,

Bloch Sphere, Superposition, Classical Bits vs Quantum Bits (Qubits), Multiple Qubit Systems and Entanglement, Quantum Evolution and Measurements. Quantum Gates: Hadamard Gate, CNOT, Pauli-X gate, Swap Gate and Quantum Circuits. Future of Quantum Computing.

UNIT-V

Laser and Fiber Optics:

Introduction to interaction of radiation with matter: Absorption, Spontaneous emission and Stimulated emission, Einstein coefficients and their relations, Characteristics of a laser, Population inversion, Components of a laser: active medium, pumping source, optical resonator, Construction and working of Ruby laser, He-Ne laser, Applications of lasers.

Introduction to Optical Fibers: Total internal reflection, Construction of optical fiber, Acceptance angle and Numerical aperture, Classification of optical fibers (step and graded index fibers), Block diagram of optical fiber communication system, Applications of optical fibers.

TEXT BOOKS:

1. Engineering Physics, Rajendran; McGraw Hill Education.
2. Engineering Physics by B K Pandey and S Chaturvedi; CENGAGE Learning.
3. Introduction to Classical and Quantum Computing, by Thomas G. Wong; Rooted Grove.

REFERENCE BOOKS:

1. Quantum computing: A Gentle Introduction by Rieffel and Polak; The MIT Press.
2. Introduction to Solid State Physics, Charles Kittel, John Wiley & Sons, Inc.
3. Optics, Ajoy K. Ghatak, McGraw Hill Education India.

ENGLISH FOR SKILL ENHANCEMENT

B.Tech I Year II Semester
Course Code: A252001

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Choose appropriate vocabulary in their oral and written communication.
2. Demonstrate their understanding of the rules of functional grammar and sentence structures.
3. Develop comprehension skills from known and unknown passages.
4. Write paragraphs, essays, précis and draft letters.
5. Write abstracts and reports in various contexts.

UNIT-I

Theme : Perspectives

Lesson on 'The Generation Gap' by Benjamin M. Spock from the prescribed textbook titled **English for the Young in the Digital World** published by Orient Black Swan Pvt. Ltd

Vocabulary : The Concept of Word Formation-The Use of Prefixes and Suffixes-Words Often Misspelt - Synonyms and Antonyms

Grammar : Identifying Common Errors in Writing with Reference to Parts of Speech particularly Articles and Prepositions—Degrees of Comparison

Reading : Reading and Its Importance-Sub Skills of Reading–Skimming and Scanning.

Writing : Sentence Structures and Types -Use of Phrases and Clauses in Sentences-Importance of Proper Punctuation-Techniques for Writing Precisely–Nature and Style of Formal Writing.

UNIT-II

Theme : Digital Transformation

Lesson on 'Emerging Technologies' from the prescribed textbook titled **English for the Young in the Digital World published by** Orient Black Swan Pvt. Ltd.

Vocabulary : Homophones, Homonyms and Homographs

Grammar : Identifying Common Errors in Writing with Reference to Noun- pronoun Agreement and Subject-verb Agreement.

Reading : Reading Strategies-Guessing Meaning from Context Identifying Main Ideas – Exercises for Practice

Writing : Paragraph Writing—Types, Structures and Features of a Paragraph - Creating Coherence—Linkers and Connectives - Organizing Principles in a Paragraph— Defining- Describing People, Objects, Places and Events—Classifying- Providing Examples or Evidence - Essay Writing - Writing Introduction and Conclusion

UNIT-III

Theme : Attitude and Gratitude

Poems on' Leisure' by William Henry Davies and 'Be Thankful' Unknown Author from the prescribed textbook titled **English for the Young in the Digital World published** by Orient Black Swan Pvt. Ltd.

Vocabulary : Words Often Confused-Words from Foreign Languages and their Use in English.

Grammar : Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading : Sub-Skills of Reading – Identifying Topic Sentence and Providing Supporting Ideas - Exercises for Practice.

Writing : Format of a Formal Letter-Writing Formal Letters E.g. Letter of Complaint, Letter of Requisition, Job Application with CV/ Resume– Difference between Writing a Letter and an Email - Email Etiquette.

UNIT-IV

Theme : Entrepreneurship

Lesson on 'Why a Start-Up Needs to Find its Customers First 'by Pranav Jain from the prescribed text book titled **English for the Young in the Digital World** published by Orient Black Swan Pvt. Ltd.

Vocabulary : Standard Abbreviations in English–Inferring Meanings of Words through Context– Phrasal Verbs—Idioms.

Grammar : Redundancies and Clichés in Written Communication – Converting Passive to Active Voice and Vice-Versa.

Reading : Prompt Engineering Techniques–Comprehending and Generating Appropriate Prompts - Exercises for Practice

Writing : Writing Practices-Note Making-Précis Writing.

UNIT-V

Theme : Integrity and Professionalism

Lesson on 'Professional Ethics' from the prescribed textbook titled **English for the Young in the Digital World published by Orient Black Swan Pvt. Ltd.**

Vocabulary: Technical Vocabulary and their Usage–One Word Substitutes– Collocations.

Grammar : Direct and Indirect Speech**-**Common Errors in English (Covering all the other aspects of grammar which were not covered in the previous units)

Reading : Survey, Question, Read, Recite and Review (SQ3R Method) – Inferring the Meaning and Evaluating a Text-Exercises for Practice

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

TEXT BOOKS:

1. Board of Editors.2025. English for the Young in the Digital World. Orient Black Swan Pvt.Ltd.

REFERENCE BOOKS:

1. Swan, Michael.(2016).Practical English Usage .Oxford University Press. New Edition.
2. Karal,Rajeevan.2023 .English Grammar Just for You .Oxford University Press .New Delhi
3. 2024. Empowering with Language: Communicative English for Undergraduates. Cengage Learning India Pvt. Ltd. New Delhi
4. Sanjay Kumar & Pushp Lata. 2022. Communication Skills – A Workbook. Oxford University Press. New Delhi
5. Wood, F.T.(2007).Remedial English Grammar. Macmillan.
6. Vishwamohan, Aysha.(2013).English for Technical Communication for Engineering Students. McGraw- Hill Education India Pvt.

BASIC ELECTRICAL ENGINEERING

B.Tech I Year II Semester
Course Code: A252201

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Explain basic principles of electrical elements.
2. Apply the concepts of AC circuits to various elements and combinations.
3. Examine principle and tests of transformer.
4. Contrast the working of DC machines and induction motors.
5. Assess working principle of AC generator and electrical installations.

UNIT-I

D.C. Circuits: Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin's and Norton's Theorems – simple problems.

UNIT-II

A.C. Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase series ac circuits consisting of R, L, C, RL, RC, RLC combinations – simple problems, resonance in series R-L-C circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III

Transformers: Construction and working of Single-Phase Transformer, Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Working Principle and applications of Auto-transformer.

UNIT-IV

Electrical Machines: Construction of DC Machine, working principle of DC Motor, performance characteristics of DC Shunt motor. Construction and working of a Three-phase induction motor – Torque – Speed Characteristics, Construction and working of Single-phase induction motor, Construction and working of Three Phase Alternator – No Load Characteristics.

UNIT-V

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, battery backup.

TEXT BOOKS:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.

2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2nd Edition, 2008.

REFERENCE BOOKS:

1. P. Ramana, M. Suryakalavathi, G.T. Chandrasheker, "Basic Electrical Engineering", S. Chand, 2nd Edition, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009 M. S. Sukhija, T. K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1st Edition,

DATA STRUCTURES

B.Tech I Year II Semester
Course Code: 252501

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Ability to select the data structures that efficiently model the information in a problem.
2. Understand the concepts of trees and implementing the trees with real time applications
3. Implement and know the application of algorithms for Heap and searching
4. Ability to have knowledge of graph concepts and summarize sorting techniques
5. Outline the concepts of hashing, collision and its resolution methods using hash functions.

UNIT-I

Introduction to Data Structures: Basic Terminology, Classification of Data Structures, Operation on Data Structures, abstract data types, Linear list -Introduction, singly linked list, Circular Linked Lists, Doubly Linked List, Stacks- Operations, Stack algorithm, Stack ADT, Stack applications, Queues- operations, Queue Algorithm, Queue ADT, Queue Applications.

UNIT-II

Trees: Introduction, Types of Trees, Representation of Trees, traversing a Binary Tree.
Binary Search Trees (BST): BST Operations - Searching, Insertion and Deletion, BST ADT, BST Applications, Threaded Binary Trees.

UNIT-III

Advanced Trees: AVL Trees, Red-Black Trees
Multi-way Search Trees: Introduction, B Trees, B^+ Trees – properties, B Trees Vs B^+ Trees.
Heaps: Binary Heaps, (Min and Max heap).
Searching: Introduction, Interpolation Search, Jump search.

UNIT-IV

Graphs: Introduction, Directed Graphs, Representation of Graphs, Graph Traversal Algorithms, Graph ADT, Applications of Graphs.
Sorting: Radix Sort, Heap Sort.

UNIT-V

Hashing and Collision: Introduction, Hash Tables, Hash Functions, Different Hash Functions - Division Method, Multiplication Method, Mid-square Method, Folding Method;
Collisions: Collision Resolution by Open Addressing, Collision Resolution by Chaining.

TEXT BOOKS:

1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning
2. Data Structure using C– Reema Thareja, 3rd Edition, Oxford University Press.

REFERENCE BOOKS:

1. Data Structures using C – A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

ADVANCED ENGINEERING PHYSICS LAB

B.Tech I Year II Semester
Course Code: A252082

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Determine fundamental constants such as Planck's constant and the energy gap of a semiconductor.
2. Analyze the optical phenomena including interference, diffraction, and dispersion through experimental study.
3. Evaluate the electrical and optical characteristics of semiconductor devices such as LEDs, photodiodes, and solar cells.
4. Demonstrate working knowledge of lasers through wavelength determination using single-slit and diffraction grating methods.
5. Determine the numerical aperture and bending losses of optical fibers, and apply scientific methods for accurate data collection and reporting.

List of Experiments:

1. Determination of work function and Planck's constant using the photoelectric effect.
2. Determination of the energy gap of a semiconductor.
3. Determination of the radius of curvature of a plano-convex lens by forming Newton's rings.
4. Determination of the wavelength of a given monochromatic light source using a plane diffraction grating.
5. Determination of the dispersive power of a given prism.
6. Determination of the operating point for maximum efficiency of a given LED.
7. Determination of the operating point of a photodiode under varying illumination levels
8. Determination of the optimum load for maximum power output of a given solar cell.
9. (a)Determination of the wavelength of a laser using a single slit.
   (b) Determination of the wavelength of a laser using a diffraction grating (N-slits).
10. (a)Determination of the numerical aperture of a given optical fiber.
    (b) Determination of the bending losses in a given optical fiber.

Note: Any 8 experiments are to be performed.

TEXT BOOKS:

1. Laboratory Manual of Engineering Physics, Aparna and K. Venkateswara Rao, V.G.S. Publishers.

DATA STRUCTURES LAB

B.Tech I Year II Semester
Course Code: A252581

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Develop C programs to perform various operations on linked list.
2. Implement stacks and queues using static and dynamic representation.
3. Implement different sorting algorithms.
4. Design binary trees and its operations.
5. Develop programs on graph traversal and hashing techniques

List of Experiments

1. Write a program that uses functions to perform the following operations on a singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
2. Write a program that uses functions to perform the following operations on a doubly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
3. Write a program that uses functions to perform the following operations on a circular linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
4. Write a program that implements a stack (its operations) using:
   i) Arrays ii) Linked Lists
5. Write a program that implements a queue (its operations) using:
   i) Arrays ii) Linked Lists
6. Write a program that implements the following sorting methods to sort a given list of integers in ascending order:
   i) Radix Sort ii) Heap Sort
7. Write a program to implement the tree traversal methods (Recursive and Non-Recursive).
8. Write a program to implement:
   i) Binary Search tree ii) AVL Trees
9. Write a program to implement the graph traversal methods.
10. Write a program to implement the following Hash Functions:
    i) Division Method ii) Multiplication Method

TEXT BOOKS:

1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
2. Data Structures using C – A. S. Tanenbaum, Y. Langsam, and M. J. Augenstein, PHI/Pearson Education.

REFERENCE BOOK:

1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R. F. Gilberg and B. A. Forouzan, Cengage Learning.

PYTHON PROGRAMMING LAB

B.Tech I Year II Semester
Course Code: A252583

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Develop application-specific codes using Python.
2. Understand strings, lists, tuples, and dictionaries in Python.
3. Write programs using functions and modules.
4. Illustrate file I/O operations, and Exception Handling.
5. Apply different data visualization using Python standard libraries.

Note: The lab experiments will be like the following experiment examples.

List of Experiments

1. I. Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.

   II. Start the Python interpreter and type help() to start the online help utility.
2. Start a Python interpreter and use it as a calculator.
3. Write a program to calculate compound interest when principal, rate and number of periods are given.
4. Read the name, address, email and phone number of a person through the keyboard and print the details.
5. Print the below triangle using a for loop:
   5
   44
   333
   2222
   11111
6. Write a program to check whether the given input is a digit or a lowercase character or an uppercase character or a special character (use 'if-else-if' ladder).
7. Python program to print all prime numbers in a given interval (use break).
8. Write a program to convert a list and a tuple into arrays.
9. Write a program to find common values between two arrays.
10. Write a function called palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len() to check the length of a string.
11. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.

12. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
13. Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
14. The word list provided words.txt doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
15. Write a python code to read dictionary values from the user. Construct a function to invert its content i.e., keys should be values and values should be keys.
16. Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
17. Remove the given word in all the places in a string ?
18. Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lowercase without using a built-in function ?
19. Write a recursive function that generates all binary strings of n-bit length.
20. Write a python program that defines a matrix and prints it.
21. Write a python program to perform multiplication of two square matrices.
22. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
23. Use the structure of exception handling in all general-purpose exceptions.
24. Write a python code to read a phone number and an email id from the user and validate it for correctness.
25. Write a Python code to merge two given file contents into a third file.
26. Write a Python code to open a given file and construct a function to check for given words present in it and display if found.
27. Write a Python code to read text from a text file, find the word with the most number of occurrences.
28. Write a function that reads a file and displays the number of words, number of vowels, blank spaces, lowercase letters and uppercase letters.
29. Import numpy, Plotpy and Scipy and explore their functionalities.
30. Install NumPy package with pip and explore it.

TEXT BOOKS:

1. Super charged Python: Take your code to the next level, Overland
2. Learning Python, MarkLutz, O'reilly

REFERENCE BOOKS:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Python Programming: A Modular Approach with Graphics, Database, Mobile and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson

3. Introduction to Python Programming, Gowrishankar S, Veena A, CRC Press
4. Programming with Python: A User's Book, Michael Dawson, Cengage Learning, India Edition
5. Python for Data Science, Dr. Mohd Abdul Hameed, Wiley publications
6. Core Python Programming, Dr. R. Nageswara Rao, Dreamtech press
7. Introduction to Python, Gowrishankar S, Veena A, CRC Press

BASIC ELECTRICAL ENGINEERING LAB

B.Tech I Year II Semester
Course Code: A252281

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Explain basic principles of electrical elements.
2. Apply the concepts of AC circuits to various elements and combinations.
3. Examine principle and tests of transformer.
4. Contrast the working of DC machines and induction motors.
5. Assess working principle of AC generator and electrical installations.

Any Ten experiments should be conducted:

1. Verification of Ohm's Law
2. Verification of KVL and KCL
3. Verification of Superposition theorem.
4. Verification of Thevenin's theorem
5. Verification of Norton's theorem
6. Calculations and Verification of Impedance and Current of RL and RC series circuits
7. Transient Response of Series RL and RC Circuits for DC Excitation.
8. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
9. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
10. Performance Characteristics of a DC Shunt Motor
11. Torque-Speed Characteristics of a Three-phase Induction Motor.
12. No-Load Characteristics of a Three-phase Alternator

TEXT BOOKS:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2nd Edition, 2008.

REFERENCE BOOKS:

1. P. Ramana, M. Suryakalavathi, G.T.Chandrasheker,"Basic Electrical Engineering", S. Chand, 2nd Edition, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009
3. M. S. Sukhija, T. K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1st Edition, 2012.

ENGLISH LANGUAGE & COMMUNICATION SKILLS LAB

B.Tech I Year II Semester
Course Code: A252081

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Listen actively and identify important information in spoken texts
2. Interpret the speech and infer the intention of the speaker
3. Improve their accent for intelligibility
4. Speak fluently with clarity and confidence
5. Use the language in real life situations

Exercise – I:

CALL Lab:

Instruction: Speech Sounds- Listening Skill-Importance – Purpose- Types-Barriers- Active Listening
Practice: Listening to Distinguish Speech Sounds (Minimal Pairs)-Testing Exercises

ICS Lab:

Diagnostic Test–Activity titled 'Express Your View'
Instruction: Spoken and Written language - Formal and Informal English - Greetings - Introducing Oneself and Others
Practice: Any Ice-Breaking Activity

Exercise – II:

CALL Lab:

Instruction: Listening vs. Hearing-Barriers to Listening
Practice: Listening for General Information - Multiple Choice Questions - Listening

ICS Lab:

Instruction: Features of Good Conversation–Strategies for Effective Communication
Practice: Role Play Activity-Situational Dialogues –Expressions used in Various Situations –Making Requests and Seeking Permissions—Taking Leave- Telephone Etiquette

Exercise – III:

CALL Lab:

Instruction: Errors in Pronunciation– Tips for Neutralizing Mother Tongue Influence(MTI)
Practice: Differences between British and American Pronunciation –Listening Comprehension Exercises

ICS Lab:

Instruction: Describing Objects, Situations, Places, People and Events
Practice: Picture Description Activity– Looking at a Picture and Describing Objects, Situations, Places, People and Events

Exercise – IV:
CALL Lab:

Instruction: Techniques for Effective Listening

Practice: Listening for Specific Details-Listening-Gap Fill Exercises-Listening Comprehension Exercises

ICS Lab:

Instruction: How to Tell a Good Story –Story Star-Sequencing-Creativity
Practice: Activity on Telling and Retelling Stories-Collage

Exercise – V:
CALL Lab:

Instruction: Identifying the literal and implied meaning
Practice: Listening for Evaluation –Write the Summary–Listening Comprehension Exercises

ICS Lab:
Instruction: Understanding Non-Verbal Communication
Practice: Silent Speech-Dumb Charades Activity

- **Post-Assessment Test on 'Express Your View'**

Suggested Software:

- Cambridge Advanced Learners 'English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley.
- Punctuation Made Easy by Darling Kindersley.
- Oxford Advanced Learner's Compass, 10th Edition.
- English in Mind (Series1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).

IT WORKSHOP

B.Tech I Year II Semester
Course Code: A252585

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Perform Hardware troubleshooting
2. Understand Hardware components and interdependencies
3. Document/Presentation preparation
4. Perform calculations using spreadsheets
5. Query successful

PC Hardware

Task 1: 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 it to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also, students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as a dual-boot with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.

Internet & World Wide Web

Task 1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process, they configure the TCP/IP setting. Finally, students should demonstrate to the instructor how to access websites and email. If there is no internet connectivity, preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Search Engines & Netiquette: Students should know what search engines are and how to use them. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

LaTeX and WORD

Task 1: Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office or equivalent (FOSS) tools. The importance of LaTeX and MS

Office or equivalent (FOSS) tools as word processors, details of the four tasks and features that would be covered in each, using LaTeX and word - accessing, overview of toolbars, saving files, using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered: - Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Task 3: Creating project abstract Features to be covered: - Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter. Features to be covered: - Table of Content, Newspaper columns, Images from files and clip art, Drawing toolbar and Word Art, Formatting Images, Text boxes, Paragraphs and Mail Merge in word.

Excel

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel - Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, autofill, Formatting Text.

Task 2: Calculating GPA - Features to be covered: - Cell Referencing, Formulae in excel - average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP.

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting.

PowerPoint

Task 1: Students will be working on basic PowerPoint utilities and tools which help them create basic PowerPoint presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide sorter, notes etc) and Inserting Background textures, Design Templates, Hidden slides.

REFERENCE BOOKS:

1. Comdex Information Technology Course tool kit, Vikas Gupta, WILEY Dreamtech.
2. The Complete Computer upgrade and repair book, 3rd edition, Cheryl A. Schmidt, WILEY Dreamtech.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft).
5. LaTeX Companion, Leslie Lamport, PHI/Pearson.
6. IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme - CISCO Press, Pearson Education.
7. IT Essentials PC Hardware and Software Labs and Study Guide, Third Edition by Patrick Regan - CISCO Press, Pearson Education.

DISCRETE MATHEMATICS

B.Tech II Year I Semester
Course Code: A253004

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and construct precise mathematical proofs.
2. Apply logic and set theory to formulate precise statements.
3. Analyze and solve counting problems on finite and discrete structures.
4. Describe and manipulate sequences.
5. Apply graph theory in solving computing problems

UNIT-I

Mathematical logic: Introduction, Statements and Notation, Connectives & Truth Tables, Normal Forms (DNF, CNF, PDNF, PCNF).

UNIT-II

Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

Set theory: Introduction, Basic Concepts of Set Theory,

Relations: Special Properties of Binary Relations, Partially ordered relations, Hasse diagrams, Lattices.

UNIT-III

Functions: Composition of functions Inverse Functions

Algebraic Structures: Algebraic Systems-Examples and General Properties, Semi groups and Monoids, groups, sub groups, homomorphism, Isomorphism.

UNIT-IV

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

UNIT-V

Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science: J.P. Tremblay, R. Manohar, McGraw-Hill, 1st ed.
2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe l. Mott, Abraham Kandel, Teodore P. Baker, Prentis Hall of India, 2nd ed.

REFERENCE BOOKS:

1. Discrete and Combinatorial Mathematics - an applied introduction: Ralph. P. Grimald, Pearson education, 5th edition.
2. Discrete Mathematical Structures: Thomas Kosy, Tata McGraw Hill Publishing co.

COMPUTER ORGANIZATION AND ARCHITECTURE

B.Tech II Year I Semester
Course Code: A253501

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the basics of instruction sets and their impact on processor design.
2. Demonstrate an understanding of the design of the functional units of a digital computer system.
3. Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
4. Design a pipeline for consistent execution of instructions with minimum hazards.
5. Recognize and manipulate representations of numbers stored in digital computers

UNIT-I

Boolean Algebra and Logic Gates: Binary codes, Binary Storage and Registers, Binary logic, Digital logic gates.

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture.

UNIT-II

Combinational Logic: Combinational Circuits, Analysis procedure Design procedure, Binary Adder Subtractor Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

Sequential Logic: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, state Reduction and Assignment, Design Procedure. Registers, shift Registers, Ripple counters, synchronous counters, other counters.

UNIT-III

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input – Output and Interrupt.

UNIT-IV

Microprogrammed Control: Control memory, Address sequencing, micro program example, design of control unit.

Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

UNIT-V

Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

TEXT BOOKS:

1. Digital Design – M. Morris Mano, Third Edition, Pearson/PHI.
2. Computer System Architecture – M. Morris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Switching and Finite Automata Theory, ZVI. Kohavi, Tata Mc Graw Hill.
2. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, 5th Edition, McGraw Hill.
3. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
4. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

B.Tech II Year I Semester
Course Code: A253502

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
2. Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
3. Use multithreading concepts to develop inter process communication.
4. Understand the different types of file I/O, Exploring String, usage of Container classes
5. Develop web applications using Servlets and JDBC.

UNIT-I

Object oriented thinking and Java Basics- OOP concepts, History of Java, Java buzzwords, data types, variables, operators, expressions, control statements, arrays, type casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, object Class and wrapper classes.

UNIT-II

Inner classes in Java: Types of inner classes, Creating static / non-static inner classes, Local and anonymous inner classes.

Inheritance, Interfaces and Packages– Types of Inheritance, benefits of inheritance, super, final keyword with inheritance, method overriding, abstract classes. Defining and implementing interfaces.

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

UNIT-III

Exception handling and Multithreading-- Concepts of exception handling, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, User Defined Exceptions. Differences between multithreading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication, thread groups, daemon threads.

UNIT-IV

Exploring String, StringBuffer, StringBuilder classes and StringTokenizer.

Java.io package: File, Byte Streams: InputStream, OutputStreams, FileInputStream, FileOutputStream, Character Streams: Reader, Writer, FileReader, FileWriter, BufferedReader, BufferedWriter, InputStreamReader.

java.util package- Collection Interfaces: List, Set, Map. Collection classes: LinkedList, TreeSet, HashMap, Enumerator, Iterator, ListIterator, Calendar, Random, Scanner, Comparator, Comparable.

UNIT-V

Java Servlets: Overview of Java Servlet, Servlet Life cycle, Request and Response methods, Servlet Configuration, Servlet Context, Approaches to Session tracking, Servlet Collaboration.

Database Connections: Introduction to JDBC, JDBC Drivers, Connecting to a Database using JDBC.

TEXT BOOKS:

1. Java the complete reference, 13th edition, Herbert schildt, Dr. Denny Coward, Mc Graw Hill.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson education.

REFERENCE BOOKS:

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John Wiley & sons.
2. An Introduction to OOP, third edition, T. Budd, Pearson education.
3. Introduction to Java programming, Y. Daniel Liang, Pearson education.
4. An introduction to Java programming and object-oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S. Horstmann and Gary Cornell, eighth Edition, Pearson Education.

OPERATING SYSTEMS

B.Tech II Year I Semester
Course Code: A253503

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamental concepts, structures of operating systems, and process management techniques.
2. Analyze CPU scheduling, process management, and synchronization mechanisms.
3. Explain memory management techniques and virtual memory concepts with page replacement algorithms.
4. Explain and apply interprocess communication mechanisms and file system interfaces using appropriate system calls
5. Analyze deadlock situations and apply suitable prevention, avoidance, detection, and recovery techniques

UNIT-I

Operating System: Introduction, Structures - Simple Batch, Multiprogrammed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls

Process: Process concepts, Process Control block (PCB), Operations on processes, Cooperating Processes, Threads

UNIT-II

CPU Scheduling: Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling, System call interface for process management-fork, exit, wait, waitpid, exec

Process Management and Synchronization: The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors

UNIT-III

Memory Management and Virtual Memory: Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT-IV

Interprocess Communication Mechanisms: IPC between processes on a single computer system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.

File System Interface and Operations: Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, write, close, lseek, stat, ioctl system calls.

UNIT-V

Deadlocks: System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
2. Advanced programming in the UNIX environment, W.R. Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems- Internals and Design Principles, William Stallings, Fifth Edition–2005, Pearson Education/PHI
2. Operating System A Design Approach- Crowley, TMH.
3. Modern Operating Systems, Andrew S. Tanenbaum 2nd edition, Pearson/PHI
4. UNIX programming environment, Kernighan and Pike, PHI/ Pearson Education
5. UNIX Internals -The New Frontiers, U. Vahalia, Pearson Education.

DATABASE MANAGEMENT SYSTEMS

B.Tech II Year I Semester
Course Code: A253504

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Gain knowledge of fundamentals of DBMS, database design.
2. Apply basic SQL concepts for effective retrieval and management of data.
3. Analyze various Normal Forms to carry out the concepts of Schema Refinement.
4. Understand the basics of transaction processing and concurrency control.
5. Understand the database storage structures and access techniques

UNIT-I

Database System Applications: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS

Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model

UNIT-II

Introduction to the Relational Model: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views.

Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT-III

SQL: QUERIES, CONSTRAINTS, TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active databases.

Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multivalued dependencies, FOURTH normal form, FIFTH normal form.

UNIT-IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols.

UNIT-V

Hashing: Hash Based Indexing, Tree based Indexing, Comparison of File Organizations, Indexes- Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM)

B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, McGraw hill, V edition.3rd Edition
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education
3. Introduction to Database Systems, C. J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

B.Tech II Year I Semester
Course Code: A253582

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Apply object-oriented programming concepts to develop Java Programs for solving real-world problems.
2. Implement Java programs using abstract classes and related OOP principles.
3. Develop multithreaded Java applications to handle concurrent execution
4. Utilize the Java Collections Framework to efficiently manage and process data.
5. Create basic web applications using Java Servlets and JDBC for database connectivity.

List of Experiments:

1. Implement a Java Program to accept Student Name and Roll Number as command Line Arguments and Display the output.
2. Implement a Java Program that prompts the user for an integer and then prints out all prime numbers up to that integer.
3. Implement a Java Program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
4. Implement a Java Program to create an Employee class to read and display the data (emp_id, emp_name, Department, salary, experience) using constructor and method.
5. Implement a Java Program to illustrate method and constructor overloading.
6. Implement a Java Program to multiply two given matrices by passing objects as parameters.
7. Implement a Java Program to illustrate different types of inheritances.
8. Implement a java Program to illustrate Method Overriding.
9. Implement a Java Program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
10. Implement a Java Program to illustrate the use of Creating and Importing Packages.
11. Implement a Java Program to handle Multiple Exceptions.
12. Implement a Java Program to create User Defined Exceptions.
13. Implement a Java Program that implements a multi-thread application that has three threads. The first thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.

14. Implement a Java Program that implements the Producer – Consumer Problem using the concept of Inter Thread Communication.
15. Implement a Java Program to list all the files in a directory including the files present in all its subdirectories.
16. Implement a Java Program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record is separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).
17. Implement a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers
18. Implement a Java Program to make frequency count of words in a given text
19. Implement a Java Program to establish Database connection and execute queries using JDBC.
20. Installation and Configuration of Tomcat and deploy a simple "Hello World" Servlet.

TEXTBOOKS:

1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10th Edition Pearson education.
2. Thinking in Java, Bruce Eckel, Pearson Education.

REFERENCE BOOKS:

1. Java Programming, D. S. Malik and P. S. Nair, Cengage Learning.
2. Core Java, Volume 1, 9th edition, Cay S. Horstmann and G Cornell, Pearson.

OPERATING SYSTEMS LAB

B.Tech II Year I Semester
Course Code: A253583

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Simulate and analyze CPU scheduling algorithms and evaluate their performance based on scheduling criteria.
2. Apply UNIX/Linux system calls to implement file handling, process creation, and inter-process control.
3. Implement synchronization solutions such as Producer–Consumer using semaphores to handle concurrency issues.
4. Simulate memory management techniques and page replacement policies to understand efficient memory utilization.
5. Implement C program Banker's Algorithm for deadlock avoidance method

LIST OF EXPERIMENTS:

1. Implement C programs to simulate the following CPU Scheduling algorithms
   a) FCFS b) SJF c) Round Robin d) priority
2. Implement programs using the I/O system calls of UNIX/LINUX operating system (open, read, write, close, lseek, stat, fork, exit)
3. Implement a C program to implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls.
4. Implement C programs to simulate the following memory management techniques
   a) Paging b) Segmentation
5. Implement C programs to simulate Page replacement policies
   a) FCFS b) LRU c) Optimal
6. Implement C programs to illustrate the following IPC mechanisms
   a) Pipes b) FIFOs c) Message Queues d) Shared Memory
7. Implement a C program to simulate Bankers Algorithm for Deadlock Avoidance.

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Advanced programming in the Unix environment, W. R. Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems – Internals and Design Principles, William Stallings, Fifth Edition–2005, Pearson Education/PHI.
2. Operating System - A Design Approach-Crowley, TMH.

3. Modern Operating Systems, Andrew S Tanenbaum, 2nd edition, Pearson/PHI.
4. UNIX Programming Environment, Kernighan and Pike, PHI/Pearson Education.
5. UNIX Internals: The New Frontiers, U. Vahalia, Pearson Education.

DATABASE MANAGEMENT SYSTEMS LAB

B.Tech II Year I Semester
Course Code: A253584

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Apply conceptual database design principles using the E–R model.
2. Apply DDL commands to create and modify database schemas and use DML commands to manipulate data in relational databases.
3. Execute SQL queries using joins, constraints, set operations and nested and correlated subqueries.
4. Develop and use database programming components using triggers
5. Develop solutions for database applications using procedures, cursors.

List of Experiments:

1. Concept design with E-R Model
2. Relational Model
3. Normalization
4. Practicing DDL commands
5. Practicing DML commands
6. A) Querying (using ANY, ALL, UNION, INTERSECT, JOIN, Constraints etc.)
   B) Nested, Correlated subqueries
7. Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.
8. Triggers (Creation of insert trigger, delete trigger, update trigger)
9. Procedures
10. Usage of Cursors

TEXTBOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill,3rd Edition
2. Database System Concepts, Silberschatz, Korth, McGraw Hill, V edition.

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education
3. Introduction to Database Systems, C.J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S. Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

DJANGO LAB

B.Tech II Year I Semester
Course Code: A253585

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Design and Develop a responsive Web Application using HTML & CSS.
2. Build a responsive Web Application using Java Script, CSS, Flex & Grid.
3. Demonstrate understanding of the Django Framework
4. Implement Mailing, Cache and Session Management in Django Framework
5. Analyze, Design, Develop and Implement complete Web Applications using Django Framework

LIST OF EXPERIMENTS:

1. Build a Responsive Web Application for Registration Form, which contains User Name, Password, Date of Birth, Gender, Mail-id, Contact Number, Address and Submit Button.
2. Implement a JavaScript Program to Validate Registration Page using Regular Expression.
3. Build a Responsive Web Application for Shopping Cart with Registration, Login, Catalog and Cart Pages using CSS3 features, Flex and Grid.
4. Basics of Django Framework & Installation of required Software's.
5. Create a shopping cart web application and add a customized admin page for product catalog management for Experiment 3
6. Demonstrate Cache, Session Management for Student Login Application.
7. Create a Quiz Application using Django Framework along with SQLite3.
8. Create a Django application using generic views and forms
9. Create an Application for Working with Mails using Django Framework
10. Create an application that fetches the weather information from openweathermap.org and the display the current and historical weather information using graphical representation using chart.js implement using Django
11. **Case Study:** Django Application for VJIT Student Portal and deploy it into GitHub.

REFERENCE BOOKS:

1. "Web Technologies: HTML, CSS, JavaScript" *Uttam K. Roy*
2. "Django for Beginners: Build Websites with Python and Django" *William S. Vincent*
3. "Python Web Development with Django" *Jeff Forcier, Paul Bissex, Wesley Chun*

Web URLs:

1. W3Schools Web Development Tutorials
   https://www.w3schools.com
2. JavaScript Regular Expressions Guide – MDN
   https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Regular_Expressions
3. Python Official Documentation
   https://www.python.org/doc/
4. Python Tutorial (W3Schools)
   https://www.w3schools.com/python/
5. Django Official Documentation
   https://docs.djangoproject.com
6. Django Tutorials
   https://djangoproject.com/start/

FULL STACK DEVELOPMENT

B.Tech II Year II Semester
Course Code: A254501

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Design aesthetically appealing and responsive web pages using HTML and CSS.
2. Develop real-world React web applications and utilize related development tools.
3. Apply agile methodologies for rapid and efficient project development.
4. Build complete end-to-end applications from scratch using Node.js.
5. Understand and implement logical relationships between documents using MongoDB.

UNIT-I

Introduction to Full Stack: MVC pattern, Web Fundamentals. **HTML 5.0:** Basic tags, HTML DOM, Images, Tables, Lists, Forms, Layout, Graphics, span and div tags. **Cascading Style Sheets (CSS):** Types of CSS, CSS Selectors, CSS BOX Model, Text and Font, Color, CSS Positioning and CSS floating, CSS Grid layout Module, CSS Media Queries.

UNIT-II

JavaScript: Data Types & Type Conversion, JSON, Events, String and Date Functions, Local Storage, Object Oriented Programming (OOP) in JS, Arrow Functions, Async/Await, JavaScript Regular Expressions. **Bootstrap:** Introduction of Bootstrap, Container and Container-fluid, Bootstrap Carousel. **Bootstrap Components:** Button, Grid, Table, Form, Alert, Image, Tabs/Pill, Navbar, Modals.

UNIT-III

React JS: Introduction to React, React with JSX, Actual DOM vs React VDOM, Components, Lifecycle, State, Props, Fragments, Events, Router, Forms, Pagination, Tables, Portals, Hook, Signals, React 18 New Features.

Integration of Google MAP API and GPS Location Tracking: Incorporating Google MAP API and GPS Location Tracking for location-based services.

UNIT-IV

Node JS: Modules, Node Package Manager (npm), Creating Web Server, Sending Requests and Handling HTTP requests, Handling User Authentication with NodeJS, File System, Writing a file asynchronously and Other I/O Operations. **Events:** Event Emitter class, Inheriting Events and Returning event emitter. **Express JS:** Introduction to the

Express framework – Server-side rendering with Templating Engines, Routing, Middleware, Custom Middleware, JWT Authentication.

UNIT-V

Mongo DB: Introduction, Importance of NoSQL databases, JSON Vs BSON, Data types and examples. CRUD Operations, Data Modelling & Schema Design, Indexing and Aggregation, MongoDB Replication and Sharding.

TEXT BOOKS:

1. Vasan Subramanian, "Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node", Second Edition, Apress Publications, 2019.
2. David Hows, Peter Membrey, Eelco Plugge – "MongoDB Basics", Apress, 2014.

SUGGESTED READING:

1. Ethan Brown, "Web Development with Node and Express", O'Reilly Publishers, First Edition, 2014.

WEB RESOURCES:

1. https://web.stanford.edu/class/cs142/index.html
2. https://nodejs.org/en/docs/
3. https://www.mongodb.com/
4. https://reactjs.org/
5. https://getbootstrap.com/docs/5.0/utilities/api/
6. https://edu.anarcho-copy.org/Programming%20Languages/Node/

ALGORITHMS DESIGN AND ANALYSIS

B.Tech II Year II Semester
Course Code: A254502

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Apply space and time complexity analysis using asymptotic notations.
2. Design divide-and-conquer algorithms and critically assess their runtime and space trade-offs.
3. Device backtracking and dynamic programming solutions.
4. Apply greedy methods and graph traversal algorithms
5. Analyse and Design branch-and-bound algorithms for NP-hard problems

UNIT-I

Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity, Asymptotic Notations- Big oh notation, Omega notation, Theta notation, and Little oh notation.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT-II

Disjoint Sets: Disjoint set operations, union and find algorithms, Priority Queue- Heaps, Heapsort

Backtracking: General method, applications, n-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-III

Dynamic Programming: General method, applications- Optimal binary search tree, 0/1 knapsack problem, All pairs shortest path problem, Traveling salesperson problem, Reliability design.

UNIT-IV

Greedy method: General method, applications- Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem.
Basic Traversal and Search Techniques: Techniques for Binary Trees, Techniques for Graphs, Connected components, Biconnected components.

UNIT-V

Branch and Bound: General method, applications - Travelling salesperson problem, 0/1 knapsack problem - LC Branch and Bound solution, FIFO Branch and Bound solution.
NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard and NP-Complete classes, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni, and Rajasekaran, University Press.

REFERENCE BOOKS:

1. Design and Analysis of algorithms, Aho, Ullman, and Hopcroft, Pearson education.
2. Introduction to Algorithms, second edition, T. H. Cormen, C.E. Leiserson, R. L. Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.
3. Algorithm Design: Foundations, Analysis and Internet Examples, M.T. Goodrich and R. Tamassia, John Wiley and Sons.

COMPUTER NETWORKS

B.Tech II Year II Semester
Course Code: A254503

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Gain the knowledge of the basic computer network technology.
2. Gain the knowledge of the functions of each layer in the ISO-OSI and TCP/IP reference model.
3. Obtain the skills of subnetting and routing mechanisms.
4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
5. Understanding working of the protocols through traces captured by a packet sniffer

UNIT-I

Introduction: The Internet, Protocol, Network Edge, Access Networks, Network Core, Packet Switching, Circuit Switching, Delay, Loss, and Throughput in Packet-Switched Networks, Protocol reference models: ISO-OSI, TCP/IP, Types of Network attacks, History of Computer Networking and the Internet.

UNIT-II

Application Layer: Principles of Network Applications, Network Application Architectures, Processes Communicating, Transport Services Available to Applications, Transport Services Provided by the Internet, Application-Layer Protocols, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, SMTP, DNS, Peer-to-Peer Applications, Socket Programming: Creating Network Applications.

UNIT-III

Transport Layer: Transport-Layer Services, Multiplexing and Demultiplexing, Connectionless Transport: UDP, Principles of Reliable Data Transfer, Building a Reliable Data Transfer Protocol, Pipelined Reliable Data Transfer Protocols, Go-Back-N (GBN), Selective Repeat (SR), Connection-Oriented Transport: TCP, The TCP Connection, Segment Structure, Round-Trip Time Estimation and Timeout, Reliable Data Transfer, Flow Control, TCP Connection Management, Principles of Congestion Control, TCP Congestion Control, Fairness.

UNIT-IV

Network Layer: Data and Control plane, Forwarding and Routing, Network Service Models, Virtual Circuit and Datagram Networks, Router working, The Internet Protocol (IP): Forwarding and Addressing in the Internet, Datagram Format, IPv4 Addressing, Internet Control Message Protocol (ICMP), IPv6, IP Security, Routing Algorithms- The Link-

State (LS) Routing Algorithm, The Distance Vector (DV) Routing Algorithm, Hierarchical Routing, Routing in the Internet-Intra-AS Routing in the Internet: RIP, Intra-AS Routing in the Internet: OSPF, Inter-AS Routing: BGP, Broadcast and Multicast Routing, Broadcast Routing Algorithms, Multicasting.

UNIT-V

The Link Layer: The Services Provided by the Link Layer, Error-Detection and Correction Techniques- Parity Checks, Checksum Methods, Cyclic Redundancy Check (CRC), Hamming code, Multiple Access Links and Protocols, Channel Partitioning Protocols, Random Access Protocols, and ARP, Ethernet, Link-Layer Switches, Virtual Local Area Networks (VLANs), Data Center Networking, Wireless LAN.

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach – James F.Kurose, Keith W. Ross, Pearson
2. Computer Networks -- Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson/PHI

REFERENCE BOOKS:

1. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

MACHINE LEARNING

B.Tech II Year II Semester
Course Code: A254504

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the basic concepts of Machine Learning.
2. Apply Different Dimensionality Reduction techniques on datasets by learning feature selection process.
3. Analyze the concepts of regression and classification models used on datasets.
4. Design an ensemble model to increase the classification accuracy
5. Understand the principles of RL evolutionary computing algorithms

UNIT-I

Introduction to Machine Learning: Types of Human learning, machine learning process, Well-posed learning problem, Types of machine learning and comparison, applications of machine learning.

Model Preparation, Evaluation and feature engineering: Machine learning activities, Types of data in machine learning, dataset understanding, plotting and exploration, checking data quality, remediation, data pre-processing, selecting a model, predictive and descriptive models, supervised learning model training, cross-validation and boot strapping, lazy vs eager learner, interpreting the model- underfitting, overfitting, bias-variance trade-off.

UNIT-II

Feature Engineering: Feature transformation - feature construction, feature extraction by PCA, SVD, LDA. Feature subset selection – feature relevancy and redundancy measures. Feature selection process and approaches.

Review of Probability concepts: joint probability, conditional probability, bayes rule, Common discrete and continuous distributions, dealing with multiple random variables, Bayesian belief network.

UNIT-III

Supervised Learning: Introduction to supervised learning,

Regression: Introduction of regression, Regression algorithms: Simple linear regression, Multiple linear regression, Polynomial regression model, Logistic regression, Maximum likelihood estimation.

Classification: Classification model and learning steps, Classification algorithms: Naïve Bayes classifier, Distance measures, k-Nearest Neighbor (kNN), Decision tree, Support vector machines, Kernel trick, Random Forest.

UNIT-IV

Unsupervised Learning: Introduction to unsupervised learning, Unsupervised vs supervised learning, Application of unsupervised learning, Clustering and its types,

Partitioning method: k-Means and KMedoids, Hierarchical clustering, Density-based methods – DBSCAN.
Parameter for evaluating performance of classification, regression, and clustering model. Improving performance of a model.

UNIT-V

Artificial Neural Network: Biological neuron, Artificial neuron, Weights, Bias, Activation functions – linear, sigmoid, tanh, softmax, ReLU, LeakyReLU, Swish, Neural network architecture, Perceptron – Single layer and Multilayer Perceptron, Learning process in ANN- Feedforward Learning Process, Back Propagation algorithm.

TEXT BOOKS:

1. Saikat Dutt, S. Chjandramouli, Das – Machine Learning, Frist Edition, Pearson
2. M N Murty, Anathanarayana V S – Machine Learning, First Edition, University Press
3. Tom M Mitchell, —Machine Learning, First Edition, McGraw Hill Education, 2013.

REFERENCE BOOKS:

1. Stephen Marsland, —Machine Learning – An Algorithmic Perspective, Second Edition,
2. Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
3. Artificial Neural Networks, B. Yegnanarayana, PHI Learning Pvt. Ltd., 2009

FULL STACK DEVELOPMENT LAB

B.Tech II Year II Semester
Course Code: A254582

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Apply HTML5 and CSS effectively to design and develop dynamic web pages.
2. Explain and utilize JavaScript concepts in real-world applications.
3. Develop single-page applications using the React framework.
4. Implement server-side application development using Node.js.
5. Design and develop real-time database applications based on system requirements.

List of Experiments:

1. Design a responsive Login Page using HTML, CSS (Media Query), and JavaScript with client-side validation and password toggle.
2. Design a chessboard pattern using HTML and CSS.
3. Design a calculator application using JavaScript.
4. Create a responsive web page of your class timetable using the Bootstrap Grid System.
5. Create a timer component to start, pause, and reset using ReactJS.
6. Create a React component that checks the strength of a password and displays the result to the user.
7. Design authorized endpoints using JWT (JSON Web Token).
8. Develop a backend application with REST API to perform CRUD operations on student data (use Postman tool).
9. Design a replica set of the student database, insert records in the primary node, and display the records in secondary nodes.
10. Implement MongoDB Sharding to distribute and access student records across multiple shards for improved scalability.

TEXTBOOKS:

1. Vasan Subramanian, "Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node", Second Edition, Apress Publications, 2019.
2. David Hows, Peter Membrey, Eelco Plugge – "MongoDB Basics", Apress, 2014.

SUGGESTED READING:

1. Ethan Brown, "Web Development with Node and Express", O'Reilly Publishers, First Edition, 2014.

WEB RESOURCES:

1. https://web.stanford.edu/class/cs142/index.html

2. https://nodejs.org/en/docs/
3. https://www.mongodb.com/
4. https://reactjs.org/

COMPUTER NETWORKS LAB

B.Tech II Year II Semester
Course Code: A254583

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Implement data link layer farming methods
2. Analyze error detection and error correction codes.
3. Implement and analyze routing and congestion issues in network design.
4. Implement Encoding and Decoding techniques used in presentation layer
5. To be able to work with different network tools

LIST OF EXPERIMENTS:

1. **Wireshark**
   i. Packet Capture Using Wire shark
   ii. Starting Wire shark
   iii. Viewing Captured Traffic
   iv. Analysis and Statistics & Filters.
      1. How to run Nmap scan
      2. Operating System Detection using Nmap
2. Implement Dijsktra's algorithm to compute the shortest path through a network
3. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
4. Implement distance vector routing algorithm for obtaining routing tables at each node
5. Implement a program for congestion control using Leaky bucket algorithm.
6. Implement a program for frame sorting techniques used in buffers.
7. Implement the data link layer framing methods such as character stuffing and bit stuffing
8. Implement a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCI, hamming code algorithm.
9. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism
10. Configure the LAN using Packet Tracer.

TEXT BOOKS:

1. Computer Networks, Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks, S.Keshav, 2nd Edition, Pearson Education
2. Data Communications and Networking – Behrouz A. Forouzan. 3rd Edition, TMH.

MACHINE LEARNING LAB

B.Tech II Year II Semester
Course Code: A254584

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Understand modern notions in predictive data analysis
2. Select data, model selection, model complexity and identify the trends
3. Apply different Python standard libraries for ML Applications
4. Understand a range of machine learning algorithms along with their strengths and weaknesses
5. Build predictive models from data and analyze their performance

LIST OF EXPERIMENTS:

1. Implement a python program to compute Central Tendency Measures: Mean, Median, Mode, Measure of Dispersion: Variance, Standard Deviation
2. Study of Python Basic Libraries such as Statistics, Math, Numpy and Scipy
3. Study of Python Libraries for ML application such as Pandas and Matplotlib
4. Implement a Python program to implement Simple Linear Regression
5. Implementation of Multiple Linear Regression for House Price Prediction using sklearn
6. Implementation of Decision tree using sklearn and its parameter tuning
7. Implementation of KNN using sklearn
8. Implementation of Logistic Regression using sklearn
9. Implementation of K-Means Clustering
10. Performance analysis of Classification Algorithms on a specific dataset (Mini Project)

TEXT BOOKS:

1. Machine Learning – Tom M. Mitchell, - MGH.

REFERENCE BOOKS:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis.

DATA VISUALIZATION – POWER BI LAB

B.Tech II Year II Semester
Course Code: A254585

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Understand How to import data into Tableau.
2. Understand Tableau concepts of Dimensions and Measures.
3. Develop Programs and understand how to map Visual Layouts and Graphical Properties.
4. Create a Dashboard that links multiple visualizations.
5. Use graphical user interfaces to create Frames for providing solutions to real world problems.

LAB PROBLEMS:

1. Understanding Data, What is data, where to find data, Foundations for building Data Visualizations, Creating Your First visualization?
2. Getting started with Tableau Software using Data file formats, connecting your Data to Tableau, creating basic charts(line, bar charts, Tree maps),Using the Show me panel.
3. Tableau Calculations, Overview of SUM, AVR, and Aggregate features, Creating custom calculations and fields.
4. Applying new data calculations to your visualizations, Formatting Visualizations, Formatting Tools and Menus, Formatting specific parts of the view.
5. Editing and Formatting Axes, Manipulating Data in Tableau data, Pivoting Tableau data.
6. Structuring your data, Sorting and filtering Tableau data, Pivoting Tableau data.
7. Advanced Visualization Tools: Using Filters, Using the Detail panel, using the Size panels, customizing filters, Using and Customizing tooltips, Formatting your data with colors.
8. Creating Dashboards & Storytelling, creating your first dashboard and Story, Design for different displays, adding interactivity to your Dashboard, Distributing & Publishing your Visualization.
9. Tableau file types, publishing to Tableau Online, Sharing your visualizations, printing, and Exporting.
10. Creating custom charts, cyclical data and circular area charts, Dual Axis charts

REFERENCE BOOKS:

1. Microsoft Power BI cookbook, Brett Powell, 2nd edition.
2. R Programming for Data Science by Roger D. Peng (References)
3. The Art of R Programming by Norman Matloff Cengage Learning