

DEPARTMENT OF

INFORMATION

TECHNOLOGY

VISION OF THE DEPARTMENT

To impart quality technical education that fosters critical thinking, dynamism and innovation to transform students into globally competitive IT professionals.

MISSION OF THE DEPARTMENT

- To provide quality education through innovative teaching and learning process that yields advancements in state-of-the-art information technology.
- To provide a learning environment that promotes quality research.
- To inculcate the spirit of ethical values contributing to the welfare of the society.

B.TECH.
(INFORMATION TECHNOLOGY)

B.TECH. (IT)

PROGRAM EDUCATIONAL OBJECTIVES

PEO-I: Graduates will be acquainted knowledge and to contribute theoretical, mathematical and scientific foundations which are flag stones on which Information Technologies are built, and engage in perennial learning by anticipating changing trends in Information Technology.

PEO-II: Graduates will meet the meticulous competitive admission procedure and requirements of national and international markets by exhibiting high qualifications gained through advanced training, independent learners, show team competence to design, analyze and solve real-world IT domain problems.

PEO-III: Graduates will gain research abilities to pursue their professional careers for self-advancement while meeting the requirements for professional instructors, lecturers, researchers, developers and entrepreneurs so as to cater the needs of both academic and industry.

PEO-IV: Graduates will be renowned in their preferred domains, acquire the potentiality and competency to exhibit intellectual breadth and lifelong intellectual curiosity essential to cater needs of IT industry creatively and responsibly in leading edge global and societal environments.

B.TECH. (IT)

PROGRAM OUTCOMES

PO-1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO-6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO-7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities, and norms of the engineering practice

PO-9: Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning (LLL) in the broadest context of technological change.

B.TECH. (IT)

PROGRAM SPECIFIC OUTCOMES

PSO-1: The ability to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas by understanding the core principles and concepts of Information Technology.

PSO-2: Knowledge of data management system like data acquisition, big data so as to enable students in solving problems using the techniques of data analytics like pattern recognition and knowledge discovery.

PSO-3: Basic knowledge in hardware/software methods and tools for solving real-life and R&D problems with an orientation to lifelong learning.

PSO-4: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD
B.TECH. I YEAR
INFORMATION TECHNOLOGY

I SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT101	Matrices and Calculus	3	1	0	4	4
22BS1CH102	Chemistry for Engineers	3	0	0	3	3
22ES1EE101	Basic Electrical and Electronics Engineering	3	0	0	3	3
22ES1CS101	Programming for Problem Solving	3	0	0	3	3
22ES3ME102	Engineering Drawing	0	0	4	4	2
22BS2CH101	Engineering Chemistry Laboratory	0	0	2	2	1
22ES2CS101	Programming for Problem Solving Laboratory	0	0	2	2	1
22ES2EE101	Basic Electrical and Electronics Engineering Laboratory	0	0	2	2	1
22ES2CS104	Data Analysis with Excel	0	0	2	2	1
22SD5CS101	Elements of Computer Science and Engineering	0	0	2	2	1
22MN6HS101	Induction Programme	2	0	0	2	0
Total		14	1	14	29	20

II SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT102	Ordinary Differential Equations and Vector Calculus	2	1	0	3	3
22BS1MT103	Statistical Methods for Data Analysis	3	0	0	3	3
22HS1EN101	English for Skill Enhancement	2	0	0	2	2
22ES1CS102	Data Structures	3	0	0	3	3
22BS1PH102	Applied Physics	3	0	0	3	3
22BS2PH102	Applied Physics Laboratory	0	0	2	2	1
22HS2EN101	English Language and Communication Skills Laboratory	0	0	2	2	1
22ES2CS102	Data Structures Laboratory	0	0	2	2	1
22ES2DS101	Python Programming Laboratory	0	0	2	2	1
22ES2ME102	Engineering and IT Workshop	1	0	2	3	2
22MN6HS103	Happiness and Wellbeing	2	0	0	2	0
Total		16	1	10	27	20

L – Lecture T – Tutorial P – Practical D – Drawing
 C – Credits SE – Sessional Examination CA – Class Assessment
 SEE – Semester End Examination D-D – Day to Day Evaluation
 CP – Course Project PE – Practical Examination

CH – Contact Hours/Week
 ELA – Experiential Learning Assessment
 LR – Lab Record

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1MT101) MATRICES AND CALCULUS

TEACHING SCHEME		
L	T/P	C
3	1	4

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Matrices, Differentiation, Integration

COURSE OBJECTIVES:

- To know the rank of the matrix and its application to consistency of system of linear equations
- To know Eigen values and Eigen vectors
- To know the nature of Quadratic forms
- To know maximum and minimum of a given function with several variables
- To evaluate multiple integrals and their applications

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Compute the rank of a matrix and analyze the solution of a system of linear equations

CO-2: Calculate Eigen values and Eigen vectors

CO-3: Reduce the quadratic form to its canonical form

CO-4: Solve problems involving Maxima and Minima

CO-5: Evaluate multiple integrals and its applications in areas and volumes

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

UNIT-I:

Matrices: Types of real matrices, symmetric, skew symmetric and orthogonal matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Consistency of Homogeneous and Non-Homogeneous equations, LU Decomposition method.

UNIT-II:

Eigen Values and Eigen Vectors: Eigen values and eigenvectors and their properties, Diagonalization of matrices; Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem

UNIT-III:

Complex Matrices and Quadratic Forms: Types of complex matrices; Hermitian; Skew-Hermitian, Unitary Matrices and its properties; Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical form using Linear Transformation and Orthogonal Transformation.

UNIT-IV:

Functions of Several Variables: Definitions of Limits, Continuity. Partial differentiation: partial derivatives of first and second order, Euler's theorem, Total derivative, Jacobian, Functional dependence, Taylor's theorem of two variables (without proof). Maxima and Minima of two variables, Lagrange's method of undetermined Multipliers.

UNIT-V:

Multiple Integrals with Applications: Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form), Change of variables (Cartesian to polar). Evaluation of Triple integrals, Change of variables (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals. Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals).

TEXT BOOKS:

1. Higher Engineering Mathematics, B. V. Ramana, 11th Reprint, Tata McGraw-Hill, 2010
2. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Narosa Publications
3. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley India Pvt. Ltd.

REFERENCES:

1. Linear Algebra and its Applications, Gilbert Strang, Cengage Publication
2. Matrices, A. R. Vasishtha and A. K. Vasishtha, Krishna's Educational Publishers
3. Engineering Mathematics, N. P. Bali, 4th Edition, Laxmi Publications (P) Ltd.
4. Calculus and Analytic Geometry, G. B. Thomas and R. L. Finney, 9th Edition, Pearson, 2002
5. Linear Algebra and its Applications, David C. Lay, Pearson Education India, 2003

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1CH102) CHEMISTRY FOR ENGINEERS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: General Chemistry and Basic Mathematics

COURSE OBJECTIVES:

- To analyze the quality of water for sustainable living
- To acquire the knowledge about polymer science and its applications in various fields
- To outline the importance of non-conventional energy sources and portable electric devices
- To imbibe the conceptual knowledge of corrosion science
- To recognize the significance of engineering materials for multidisciplinary environs

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Assess the specification of water regarding its usage in domestic & Industrial scenarios

CO-2: Analyze the efficacy of polymers in diverse applications

CO-3: Recognize the transformations in energy sources & battery technology

CO-4: Predict the suitable corrosion control methods in safeguarding the structures

CO-5: Interpret the role of engineering materials in various sectors

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

UNIT-I:

Water and its Treatment: Introduction- Hardness - causes, expression of hardness, units of hardness, types of hardness, Numerical problems (temporary & permanent hardness of water). Estimation of hardness by EDTA method.

Potable water and its specifications. Steps involved in the treatment of potable water – screening, sedimentation, coagulation, filtration, and disinfection methods- boiling, chlorination (By Chlorine gas, Bleaching powder, Chloramine), Breakpoint of chlorination.

Boiler troubles - boiler corrosion, caustic embrittlement, scale & sludge formation. Internal treatment- Calgon, phosphate, and colloidal conditioning, External treatment - Softening of water by ion- exchange processes. Desalination of brackish water – Reverse osmosis and its advantages.

UNIT-II:

Polymer Science: Definition – Classification of polymers with examples, Types of polymerizations, addition, and condensation polymerization with examples. Properties of polymers-crystallinity & glass transition temperature.

Plastics: Definition and characteristics-thermoplastic and thermosetting plastics, Preparation, Properties, and applications of Teflon, PMMA, PC, PET, Bakelite.

Moulding of Plastics (Compression, Extrusion, Blow moulding and Thermoforming).

Fiber reinforced plastics (FRP)-features & applications.

Conducting Polymers: Classification and applications of conducting polymers.

Shape Memory Polymers (SMPs): Definition, classification based on their mode of activation (thermo-responsive, light-responsive, electrically, magnetically Induced and water activated -brief note) and applications of SMPs in various fields.

UNIT-III:

Energy Sources & Battery Technology: Definition and characteristics of fuel, Types of fuels, analysis of coal – proximate and ultimate analysis. Petroleum and its Refining Cracking- Definition, types -moving bed catalytic cracking process. Knocking – octane and cetane rating, Gaseous fuels –Types of hydrogen fuel, generation of green hydrogen-mechanism of electrolysis of water.

Battery Technology: Definition, Characteristics of a good battery, Classification of batteries- primary, secondary, reserve and fuel cells with examples.

Primary Batteries: Zn-air battery-Construction and working.

Rechargeable batteries: Construction and working of lithium-ion battery and its importance in electric vehicles.

Fuel Cell: Definition, construction, working, principle, and applications of methanol-oxygen fuel cell.

UNIT-IV:

Corrosion and its Control: Introduction causes and effects of corrosion, mechanism of chemical and electrochemical corrosion. Types-differential aeration corrosion (Pitting and waterline corrosion), differential metal corrosion (Galvanic corrosion).

Factors affecting corrosion-nature of metal (position, passivity, purity, areas of anode and cathode) & nature of environment (temperature, pH, humidity).

Corrosion control methods - cathodic protection-Sacrificial anodic and impressed current cathodic protection, comparison of galvanizing and tinning.

UNIT-V:

Engineering Materials:

Nanomaterials: Definition, Synthesis of nanomaterials- Top-down and bottom-up approaches. Characterization techniques of Nanomaterials – STM and AFM working principle, advantages, and limitations.

Self-Healing Materials: Features, principle, and applications.

Biosensors: Definition, characteristics, classification-, construction & working, applications and advantages of biosensors. Biochips -Definition, advantages, and applications.

Lubricants: Definition and need for lubricants, types- liquid, semi-solid, solid, mechanisms of lubrication-thick film lubrication, thin film lubrication and extreme pressure lubrication. Properties of lubricants-viscosity, cloud and pour point, flash and fire point, their definition and significance.

TEXT BOOKS:

1. Engineering Chemistry, P. C. Jain and M. Jain, Dhanpat Rai Publishing Company, 2010

2. Engineering Chemistry, Rama Devi, Venkata Ramana Reddy and Rath, Cengage Learning, 2016

REFERENCES:

1. Engineering Chemistry, Shikha Agarwal, Cambridge University Press, 2015
2. Engineering Chemistry, Shashi Chawla, Dhanpat Rai, 2011
3. A Textbook of Engineering Chemistry, M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021
4. Textbook of Engineering Chemistry, Jaya Shree Anireddy, Wiley Publications

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES1EE101) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To understand the use of electrical energy in different engineering fields
- To analyze electrical circuits using different network reduction techniques
- To know the working & construction of electrical machines, electronic devices and components
- To identify different LT electrical installation components and know the safety measures

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Appreciate the role of electrical energy in various engineering branches and analyze the DC circuits using various network reduction techniques

CO-2: Analyze the various electrical parameters of AC circuits with R-L-C elements

CO-3: Understand the operation of various Electrical Machines

CO-4: Know about low voltage electrical installation components and the safety measures

CO-5: Get familiarized with different electronic components and to find their suitability in the relevant fields of engineering

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-	-
CO-2	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-	-
CO-3	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-	-
CO-4	1	1	1	1	1	3	3	1	1	1	1	1	-	-	-	-
CO-5	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-	-

UNIT-I:

Introduction to Electrical Energy and DC Circuits: The role of Electrical Energy in modern life and various engineering branches- Circuit Concept – Types of Elements- R-L-C parameters – Voltage and Current sources – Independent and dependent sources- Kirchhoff's laws – network reduction techniques: series, parallel, series parallel, star/delta transformations, Superposition theorem, Thevenin's theorem.

UNIT-II:

Steady State AC Circuits: Representation of sinusoidal waveforms, average and RMS values, form factor and peak factor, phasor representation, Analysis of single-phase

AC circuits consisting of R, L, C, series RL, RC, RLC combinations, real power, reactive power, apparent power, power factor - Three-phase balanced circuits, voltage and current relations in star and delta connections (Derivation only).

UNIT-III:

Transformers and DC Machines: Transformer principle, Ideal and Practical Transformers, Equivalent circuit, Regulation and Efficiency, Basic Construction of DC machine, DC generator principle, Emf equation, DC motor principle, back Emf, Load characteristics and speed control of separately excited DC motor.

UNIT-IV:

Alternating Current Machines: Three phase induction motor, types, principle, torque Slip characteristics, Working principle of Synchronous generator.

Electrical Installations and Batteries: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, MCCB, Types of Wiring, Earthing: Need of earthing, Types (Pipe and Plate earthing), classification of batteries, working and electrical characteristics of Lead Acid battery.

UNIT-V:

Semi-Conductor Devices and Data Acquisition: P-N junction diode, symbol, V-I Characteristics, Diode Applications: Half wave, Full wave rectifiers. Bipolar Junction Transistor construction (NPN and PNP transistors), Common-Emitter configuration, Transistor as an amplifier. A/D and D/A converters, Data Acquisition and Control.

TEXT BOOKS:

1. Basic Electrical Energy for Engineers, V. Ramesh Babu, BS Publications, 2023
2. Basic Electrical Engineering, D. C. Kulshreshtha, 2nd Edition, TMH, 2019
3. Basic Electrical Engineering, P. Ramana, M. Suryakalavathi, G. T. Chandra Sekhar, 1st Edition, S. Chand, 2018

REFERENCES:

1. Electronic Devices and Circuits, S. Salivahanan and N. Suresh Kumar, 3rd Edition TMH, 2019
2. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010
3. Electrical and Electronics Measurements and Instrumentation, A. K. Sawhney, 3rd Edition, Dhanpat Rai & Co., 1983
4. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, 3rd Edition, Tata McGraw-Hill, 2010
5. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8th Edition, McGraw-Hill, 2013

ONLINE RESOURCES:

<https://nptel.ac.in/courses/108108076>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES1CS101) PROGRAMMING FOR PROBLEM SOLVING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To relate basics of programming language constructs and problem-solving techniques
- To classify and implement control structures and derived data types
- To analyze and develop effective modular programming
- To construct mathematical problems and real time applications using C Language

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Illustrate the flowchart, algorithm, pseudo code for a given problem

CO-2: Execute programs using various data types and operators

CO-3: Implement programs using conditional and iterative statements for a given problem

CO-4: Exercise on programs using arrays, pointers, dynamic memory management, structures and unions

CO-5: Develop solution for a given problem using modular approach and perform file handling

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	3	1	-	-	-	-	2	2	1	-	-	-
CO-2	2	2	3	2	1	-	-	-	2	2	-	2	-	-
CO-3	2	2	3	2	1	1	-	-	2	2	-	2	-	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-5	1	2	3	1	1	1	-	-	2	2	2	2	-	-

UNIT-I:

Introduction to Programming:

Compilers, compiling and executing a program.

Representation of Algorithm, Flowchart/ Pseudocode with examples, Program design and structure of C programming.

Variables, Data types Operators, expressions and precedence, Expression evaluation, Storage classes, type conversion.

I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

Conditional Branching: Branching with if, if-else, nested if-else, else-if ladder, switch-case, goto,

UNIT-II:

Loops, Arrays, Strings:

Loops: Iteration with for, while, do- while loops, break and continue statements.

Arrays: One and two dimensional arrays, creating, accessing and manipulating elements of arrays

Strings: Introduction to strings, handling strings as array of characters, string functions available in C arrays of strings.

UNIT-III:

Searching, Sorting, Functions:

Searching: Basic searching in an array of elements (linear and binary search techniques)

Sorting: Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value. Recursion with examples. Some C standard functions and libraries.

UNIT-IV:

Structures and Pointers:

Structures: Defining structures, initializing structures, unions, Array of structures,

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Passing arrays to functions and structures to functions. Dynamic memory allocation, self-referential structures

UNIT-V:

Preprocessor Directives and File Handling in C:

Preprocessor Directives: Symbolic constants, macro expansion and file inclusion.

User Defined Data Types: enum, typedef

Files: Text and Binary files, file input/output operations, Error Handling in Files, random access of files, command line arguments.

TEXT BOOKS:

1. The C Programming Language , Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India
2. C Programming and Data Structures, B. A. Forouzan and R. F. Gilberg, 3rd Edition, Cengage Learning
3. C: The Complete Reference, Herbert Schildt, 4th Edition, McGraw-Hill

REFERENCES:

1. Problem Solving and Program Design in C, Jeri R. Hanly and Elliot B. Koffman, 7th Edition, Pearson
2. Computer Fundamentals and C, E. Balagurusamy, 2nd Edition, McGraw-Hill
3. Let us C, Yashavant Kanetkar, 18th Edition, BPB
4. How to Solve it by Computer, R. G. Dromey, 16th Impression, Pearson
5. Programming in C, Stephen G. Kochan, 4th Edition, Pearson Education

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/106105171>
2. https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/307

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES3ME102) ENGINEERING DRAWING

TEACHING SCHEME		
L	T/P	C
0	4	2

EVALUATION SCHEME				
D-D	SE	CP	SEE	TOTAL
10	20	10	60	100

COURSE OBJECTIVES:

- To understand the importance of engineering curves
- To learn to use the orthographic projections for points, lines and planes
- To Understand the Projections of Solids in different positions
- To learn the importance of Isometric Projections and its conversions

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Apply the concepts of engineering curves and its construction using AutoCAD

CO-2: Solve the problems of projections of points, lines and planes in different positions using AutoCAD

CO-3: Solve the problems of Projections of Solids using AutoCAD

CO-4: Solve the problems on Conversion of Isometric views to Orthographic Views & Orthographic to Isometric Views using AutoCAD

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-2	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-3	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-4	3	2	2	1	3	-	-	-	3	2	2	-	-	-

Introduction to AutoCAD Software:

The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line, The Status Bar, Different methods of zoom as used in CAD, Select and erase objects

UNIT-I:

Introduction to Engineering Drawing: Principles of Engineering drawing and their significance and Conventions

Engineering Curves: Construction of Ellipse, Parabola and Hyperbola – General and Special methods; Cycloidal curves- Epicycloids and Hypocycloids

UNIT-II:

Orthographic Projections, Projections of Points & Straight Lines: Principles of Orthographic Projections – Conventions; Projections of Points in all positions; Projections of lines inclined to both the planes

UNIT-III:

Projections of Planes: Projections of Planes- Surface Inclined to both the Planes

UNIT-IV:

Projections of Regular Solids: Projections of Regular Solids inclined to both the Planes – Prisms, Pyramids, Cylinder and Cone

UNIT-V:

Isometric Projections: Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions

TEXT BOOKS:

1. Engineering Drawing, N. D. Bhatt, 53rd Edition, Charotar Publishing House, 2016
2. Textbook on Engineering Drawing, K. L. Narayana & P. Kannaiah, Scitech Publishers, 2010
3. Engineering Drawing and Computer Graphics, M. B. Shah & B. C. Rana, Pearson Education, 2010

REFERENCES:

1. Mastering AutoCAD 2021 and AutoCAD LT 2021, George Omura and Brian C Benton (AutoCAD 2021), 1st Edition, John Wiley & Sons

ONLINE RESOURCES:

1. <https://www.classcentral.com/course/swayam-engineering-graphics-5305>
2. <https://www.mooc-list.com/tags/engineering-drawing>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS2CH101) ENGINEERING CHEMISTRY LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE PRE-REQUISITES: Basic Knowledge of Volumetric Analysis and Mathematics

COURSE OBJECTIVES:

- To understand the preparation of standard solutions and handling of instruments
- To determine and evaluate the water quality
- To measure physical properties like absorption of light, surface tension, pH, conductance and viscosity of various liquids
- To conduct and collect the experimental data using different laboratory techniques
- To summarize the data and find the applicability to real world scenario

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Learn and apply the basic laboratory methodologies for the preparation of the standard solutions and handling of instruments

CO-2: Estimate the ions / metal ions present in domestic and industrial water

CO-3: Utilize the instrumental techniques to assess the physical properties of oils and water

CO-4: Analyze the experimental data to predict solutions for complex engineering problems

CO-5: Apply the skills gained to solve societal issues related to real world scenario

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

LIST OF EXPERIMENTS:

1. Estimation of hardness of water by complexometric method using EDTA.
2. Determination of chloride content in the given sample water using Argentometric method.
3. Estimation of copper present in the given solution by colorimetric method.
4. Conductometric titration of Acid vs Base.
5. Titration of Acid vs Base using pH metric method.
6. Conductometric titration of mixture of strong acid and weak acid by strong base
7. Determination of viscosity of sample oil by Redwood Viscometer-I.

8. Estimation of acid value of given lubricant oil.
9. Determination of surface tension of a liquid by drop method using Stalagmometer.
10. Synthesis of a Polymer-Bakelite/Nylon.

VIRTUAL LAB EXPERIMENTS:

11. Basic operations of Transmission Electron Microscope (Imaging and Diffraction Pattern)
12. Polymer processing technology- study construction and working of compression moulding.
13. Basics of Scanning Electron Microscopy: Secondary Electron and BSE imaging mode.
14. Batteries for electrical vehicles

TEXT BOOKS:

1. Laboratory Manual on Engineering Chemistry, S. K. Bhasin and Sudha Rani, Dhanpat Rai Publications
2. College Practical Chemistry V. K. Ahluwalia, Sunitha Dhingra, Adargh Gulati, University Press Pvt. Ltd.
3. Practical Chemistry, Dr. O. P. Pandey, D. N. Bajpai, and Dr. S. Giri, S. Chand Publications

REFERENCES:

1. Vogel's Text Book of Quantitative Chemical Analysis, G. N. Jeffery, J. Bassett, J. Mendham and R. C. Denny, Longmann, ELBS
2. Advanced Practical Physical Chemistry, J. D. Yadav, Goel Publishing House
3. Practical Physical Chemistry, B. D. Khosla, R. Chand and Sons

ONLINE RESOURCES: (Virtual labs)

1. <https://emb-iitk.vlabs.ac.in/exp/transmission-electron-microscope>
2. http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/polymer_process/experimentlist.html
3. <https://emb-iitk.vlabs.ac.in/exp/sem-basics/>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2CS101) PROGRAMMING FOR PROBLEM SOLVING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To gain a working knowledge of C programming to write modular, efficient and readable C programs by Identifying the structural elements and layout of C source code
- To declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions
- To use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions
- To manipulate character strings in C programs. Utilize pointers to efficiently solve problems

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Use various data types for a specified problem

CO-2: Design, implement, debug a given problem using appropriate language constructs

CO-3: Execute the programs using derived and user defined data types

CO-4: Implement programs using modular approach and file I/O

CO-5: Solve a given problem using C language

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	3	2	1	-	-	-	2	2	-	2	-	-
CO-2	2	2	3	2	1	1	-	-	2	2	-	2	-	-
CO-3	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-5	2	2	2	2	1	1	-	-	2	2	2	2	-	-

LIST OF PROGRAMS:

WEEK 1:

- Programs on input, output statements
- Programs on various operators
- Programs on expression evaluation

WEEK 2:

- Program that converts one given data type to another using auto conversion and casting. Take the values from standard input.

- b. Programs on conditional statements- Simple if, if-else, Nested if-else, Else-if ladder, switch case

WEEK 3:

- a. Programs on simple loops- while, for, do. while
- b. Programs on Nested loops- while, for, do. while
- c. Programs to understand goto, break, continue

WEEK 4:

- a. Programs on 1-D arrays
- b. Programs on linear, binary searching
- c. Programs on bubble, selection and insertion sorting

WEEK 5:

- a. Programs on 1-D strings
- b. Programs using string handling functions

WEEK 6:

- a. Programs on 2-D arrays
- b. Programs on 2-D strings

WEEK 7:

- a. Programs on user defined functions
- b. Programs on passing arrays and strings to functions

WEEK 8: Internal Lab Exam -1

WEEK 9:

- a. Programs on recursion
- b. Programs on structures – simple structure, array of structures, array within structure, nested structure
- c. Programs on Unions

WEEK 10:

Programs on pointers to variables

- a. Programs on pointers to arrays(1-D, 2-D)

WEEK 11:

- a. Program to understand call by value and call by address
- b. Programs on pointers to strings
- c. Programs on pointers to structure
- d. Programs using malloc, calloc , realloc, free

WEEK 12:

- a. Programs on macros, file inclusion, enum , typedef
- b. Programs on sequential file accessing

WEEK 13:

- a. Programs on error handling functions in files
- b. Programs on Random file accessing
- c. Programs on command line arguments

WEEK 14: Lab Internal Exam -2

TEXT BOOKS:

1. The C Programming Language, Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India
2. C Programming and Data Structures, B. A. Forouzan and R. F. Gilberg, 3rd Edition, Cengage Learning
3. C: The Complete Reference, Herbert Schildt, 4th Edition, McGraw-Hill

REFERENCES:

1. Problem Solving and Program Design in C, Jeri R. Hanly and Elliot B. Koffman, 7th Edition, Pearson
2. Computer Fundamentals and C, E. Balagurusamy, 2nd Edition, McGraw-Hill
3. Let us C, Yashwant Kanetkar, 18th Edition, BPB
4. How to Solve it by Computer, R. G. Dromey, Pearson, 16th Impression
5. Programming in C, Stephen G. Kochan, 4th Edition, Pearson Education

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/106105171>
2. https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/307

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2EE101) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE PRE-REQUISITES: Basic Electrical and Electronics Engineering

COURSE OBJECTIVES:

- To understand the construction of electrical equipment and operation of electronic devices
- To recognize different circuit reduction techniques
- To practice the techniques to control and assess electrical machines
- To know different electric safety measures

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Identify different parts of electrical equipment and appreciate their purpose

CO-2: Apply different network reduction techniques to solve and analyze electrical circuits

CO-3: Realize the compatibility of electrical machines in different engineering fields

CO-4: Control different electrical machines and evaluate their performance

CO-5: Appreciate the operation of various electronic devices

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-
CO-2	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-
CO-3	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-
CO-4	1	1	1	1	1	3	3	1	1	1	1	1	-	-	-
CO-5	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-

LIST OF EXPERIMENTS:

1. Demonstration of safety precautions, measuring instruments, electrical and electronic components
2. Demonstration of LT switchgear components
3. Verification of KVL & KCL
4. Verification of superposition theorem
5. Verification of thevenin's theorem
6. Analysis of series RL, RC and RLC circuits
7. Load test on 1- ϕ transformer
8. Speed Control of DC Shunt motor
9. Brake test on 3- ϕ induction motor
10. Control of synchronous generator voltage through its field excitation
11. P-N junction diode characteristics

12. Transistor CE characteristics (Input and Output)

TEXT BOOKS:

1. Basic Electrical Engineering, D. C. Kulshreshtha, 2nd Edition, TMH, 2019
2. Basic Electrical Engineering, P. Ramana, M. Suryakalavathi, G. T. Chandra Sekhar, 1st Edition, S. Chand, 2018
3. Electronic Devices and Circuits, S. Salivahanan and N. Suresh Kumar, 3rd Edition TMH, 2019

REFERENCES:

1. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010
2. Electrical Engineering Fundamentals, Vincent Deltoro, 2nd Edition, Prentice Hall India, 1989
3. Electrical and Electronics Measurements and Instrumentation, A. K. Sawhney, 3rd Edition, Dhanpat Rai & Co., 1983
4. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, 3rd Edition, Tata McGraw-Hill, 2010
5. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8th Edition, McGraw-Hill, 2013

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2CS104) DATA ANALYSIS USING EXCEL

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To install Microsoft Office 2002 or 2003 or 2007
- To edit worksheets and worksheet features
- To customize Excel worksheets and workbooks
- To handle pivot tables and pivot table charts
- To create 2D and 3D graphs

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Import and export data from the Internet and merge the data into Excel

CO-2: Use functions for SUM, AVERAGE, MIN, and MAX, IF

CO-3: Summarize data in worksheets and workbooks

CO-4: Develop the skill to analyze data using pivot tables

CO-5: Explore named ranges and create charts

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	3	2	3	3	2	-	1	2	2	2	3	3	3	3	-
CO-2	3	3	3	2	2	3	-	1	2	2	2	3	3	3	3	-
CO-3	3	2	3	2	3	2	-	1	3	2	2	3	3	3	3	-
CO-4	3	3	2	2	3	2	-	1	3	2	2	3	3	2	2	-
CO-5	3	3	2	2	3	3	-	2	3	2	3	3	3	2	3	-

LIST OF EXERCISES:

EXERCISE 1: Getting to Know Excel & Entering Data

- Excel Orientation and Spreadsheet Basics
- Excel Data Types
- Entering Data
- Spreadsheet Setup

EXERCISE 2: Navigate in Worksheets and Workbooks

- Search for data within a workbook
- Navigate to a named cell, range, or workbook element
- Cell, Row, Column, Range/Array, Name box
- Formatting of cells (Wrap Text, Number, Text, Cell formatting, commenting, etc)
- Ribbon, Formula bar, Status bar

- Basic operators (+,-,/,*,%,>,<,>=,<=,(),{ },[],&,' ', "" "" ,!))
- Insert and remove hyperlinks

EXERCISE 3: Format Worksheets and Workbooks

- Change worksheet tab color
- Rename a worksheet
- Change worksheet order
- Insert and delete columns or rows
- Change workbook themes
- Adjust row height and column width
- Insert headers and footers

EXERCISE 4: Format and Modify Text by using Functions

- Format text by using RIGHT, LEFT, and MID functions
- Format text by using UPPER, LOWER, and PROPER functions
- Format text by using the CONCATENATE function

EXERCISE 5: Summarize Data by using Functions

- Perform calculations by using the SUM function
- Perform calculations by using MIN and MAX functions
- Perform calculations by using the COUNT function
- Perform calculations by using the AVERAGE function
- Perform logical operations by using the IF function
- Perform logical operations by using the SUMIF function
- Perform logical operations by using the AVERAGEIF function
- Perform statistical operations by using the COUNTIF function

EXERCISE 6: Anchoring data

- Referencing, Named ranges and its uses
- Absolute, Relative, Mixed referencing
- Name Manager, named ranges, Creating Tables
- Create functions using named ranges AND/OR referencing

EXERCISE 7: Referring data from different tables

- Various types of Lookups, Nested IF
- Lookup, Vlookup, Nested Vlookup, Hlookup, Index, Index with Match function
- If, If with combination of AND/OR (multiple ways to get the output), IFERROR

EXERCISE 8: Referring data from different tables Advanced functions

- rank, rand, rand between
- indirect with address & match, offset

EXERCISE 9: Data Handling: Data cleaning, Data type identification, Data restrictions

- len, left, right, mid, concatenate, concat, find, substitute, text, trim
- second, minute, hour, day, week, month, quarter, year, workdayintl
- isnumber, isna, isnontext, iseven, isodd, isformula, iserror

EXERCISE 10: Data Handling: Formatting and Filtering

- Conditional formatting (Icon sets/Highlighted color sets/Data bars/custom formatting),
- Sort, Advanced Sort, Filtering

EXERCISE 11: Data validation

- Number Date & Time Validation
- Text and List Validation
- Custom validations based on formula for a cell
- Dynamic Dropdown List Creation using Data Validation – Dependency List
- Protecting cell, Array, range, sheet, Workbook

EXERCISE 12: Pivot Tables

- Creating Simple Pivot Tables
- Basic and Advanced Value Field Setting
- Classic Pivot table
- Choosing Field
- Filtering PivotTables
- Modifying PivotTable Data
- Grouping based on numbers and Dates
- Calculated Field & Calculated Items

EXERCISE 13: Pivot Tables

- Arrays Functions
- What are the Array Formulas, Use of the Array Formulas?
- Basic Examples of Arrays (Using ctrl+shift+enter).
- Array with if, len and mid functions formulas.
- Array with Lookup functions.
- Advanced Use of formulas with Array

EXERCISE 14: Create and Format Charts

- Various Charts i.e. Bar Charts / Pie Charts / Line Charts
- Create a new chart
- Add additional data series
- Switch between rows and columns in source data
- Analyze data by using Quick Analysis
- Resize charts
- Add and modify chart elements
- Apply chart layouts and styles
- Move charts to a chart sheet

TEXT BOOKS:

1. Microsoft Excel 2019 Formulas and Functions, Paul McFedries, Microsoft Press Publications
2. Excel 2019, Michael Alexander, Richard Kusleika, John Walkenbach, Wiley Publications
3. Professional Excel Development, Rob Bovey, Dennis Wallentin, Stephen Bullen, John Green, Addison Wesley Publications

REFERENCES:

1. Excel VBA Programming for Dummies, Michael Alexander and John Walkenbach
2. Excel Basics In 30 Minutes, Ian Lamont
3. Learn Excel 2016 Essential Skills, Mike Smart

ONLINE RESOURCES:

1. Microsoft Excel Tutorial for Beginners, [freeCodeCamp.org](https://www.freecodecamp.org)
2. Introduction to MS Excel, Simplilearn

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22SD5CS101) ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME						
D-D	PE	LR	CP	VV	SEE	TOTAL
10	10	10	10	10	-	50

COURSE OBJECTIVES:

- To study/demonstrate the concepts of computer with respect to it's hardware
- To identify the importance of software engineering principles and software process framework
- To introduce operating systems, database management concepts and to give the description of structure of database systems
- To configure a network and build the web pages using HTML, CSS, XML
- To learn autonomous systems and the need of artificial intelligence

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Analyze the working principles of functional units of a basic computer

CO-2: Understand program development, the use of data structures and algorithms in problem solving

CO-3: Know the need and types of operating system, database systems

CO-4: Apply the significance of networks, internet, and WWW and cyber security

CO-5: Investigate the autonomous systems and application of artificial intelligence

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	1	1	1	1	2	-	-	-	-	-	1	3	3	2	2	-
CO-2	2	3	3	2	2	-	-	2	2	2	2	3	3	3	3	-
CO-3	2	2	2	2	2	-	-	2	2	2	1	3	3	3	2	-
CO-4	2	2	2	-	2	2	2	2	2	-	1	3	3	2	2	-
CO-5	2	2	2	3	2	2	2	2	2	-	2	3	3	3	3	-

LIST OF EXERCISES:

WEEK 1: Identify the different components of Computer

WEEK 2: Demonstrate the assembling and disassembling of Hardware

WEEK 3: Usage of PowerPoint, Word, and Excel sheet

WEEK 4: Design and understand the need of Flowcharts and Algorithms

WEEK 5: Demonstrate the installation and features of Windows

WEEK 6: Demonstrate the installation and features of LINUX Operating Systems

WEEK 7: Understand & Implement the DDL

WEEK 8: Understand & Implement the DML commands

WEEK 9: Analyse the IP Address, LAN Setting and Network Crimping.

WEEK 10: Usage of Basic Networking commands

WEEK 11: Create Web pages using basic tags of HTML, XML & CSS

WEEK 12: Case Study: Design a sample Student webpage using basic tags of HTML, XML & CSS

WEEK 13: Implement Image and Video Processing Tools

WEEK 14: Internal Lab Exam

TEXT BOOKS:

1. Invitation to Computer Science, G. Michael Schneider, Macalester College, Judith L. Gersting University of Hawaii, Hilo, Contributing author: Keith Miller University of Illinois, Springfield
2. Elements of Computer Science, Cengage

REFERENCES:

1. Fundamentals of Computers, Reema Thareja, Oxford Higher Education, Oxford University Press
2. Introduction to Computers, Peter Norton, 8th Edition, Tata McGraw-Hill
3. Computer Fundamentals, Anita Goel, Pearson Education, 2010

ONLINE RESOURCES:

1. https://onlinecourses.swayam2.ac.in/cec19_cs06/preview
2. https://onlinecourses.swayam2.ac.in/nou20_cs03/preview

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS1MT102) ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

TEACHING SCHEME		
L	T/P	C
2	1	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Differentiation, Integration, Vectors, Vector Point Function

COURSE OBJECTIVES:

- To methods of solving first order differential equations and learn about its applications to basic engineering problems
- To methods of solving higher order differential equations and learn about its applications to basic engineering problems
- To application of Laplace transforms in solving differential equations
- To basic properties of vector point function and their applications to line, surface and volume integrals

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Formulate and solve the problems of first order differential equations

CO-2: Solve the problems of second and higher order differential equations

CO-3: Apply knowledge of Laplace transform to solve differential equations

CO-4: Find the gradient, divergence, curl and its physical interpretations

CO-5: Transform line integral to surface and surface to volume integrals

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-	-

UNIT-I:

First Order, First Degree ODE and its Applications:

Differential Equations of First Order and First Degree: Exact and non-exact differential equations, Linear and Bernoulli differential equations, Applications of differential equations of first order and first degree: Newton's law of cooling, Law of natural growth and decay.

UNIT-II:

Second and Higher Order Ordinary Differential Equations: Higher order linear differential equations with constant coefficients - Solution of Homogenous, Non homogeneous differential equations-Non-Homogeneous terms of the type e^{ax} , $\sin(ax)$, $\cos(ax)$, polynomials in x , $e^{ax}V(x)$, $xV(x)$. Variable coefficient differential equations-Method of variation of parameters, Euler-Cauchy differential equation.

UNIT-III:

Laplace Transforms: Laplace transforms, Existence condition, Laplace transform of Elementary functions, Properties of Laplace transforms (Without Proofs), Laplace transform of special functions (Unit step function, Dirac delta function and Periodic function). Inverse Laplace transform and its properties, Convolution theorem (without proof) and its applications, solving linear differential equations with constant coefficients using Laplace transform.

UNIT-IV:

Vector Differential Calculus: Vector point functions and scalar point functions. Gradient and its physical interpretation, Angle between the two surfaces, Directional derivatives, Divergence, Curl and their physical interpretations, Solenoidal vectors and Irrotational vectors, Scalar potential functions, Vector Identities (without proofs).

UNIT-V:

Vector Integral Calculus

Line Integrals: Work done by force and circulation, Evaluation of Surface and Volume Integrals. Vector integral theorems: Green's theorem, Gauss-Divergence theorem, Stokes theorem (without proofs) and their problems.

TEXT BOOKS:

1. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Narosa Publications
2. Higher Engineering Mathematics, B.V. Ramana, 11th Reprint, Tata McGraw-Hill, 2010
3. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley

REFERENCES:

1. Advanced Engineering Mathematics, Peter 'O' Neil, Cengage Learning
2. Engineering Mathematics, N. P. Bali, 4th Edition, Laxmi Publications
3. Calculus and Analytic Geometry, G. B. Thomas and R. L. Finney, 9th Edition, Pearson, 2002

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS1MT103) STATISTICAL METHODS FOR DATA ANALYSIS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To elementary ideas in basic probability
- To different types of probability distribution functions
- To develop problem-solving skills using R programming
- To present about the basic role of various methods to collect the data
- To develop a greater understanding of the importance of Data Visualization techniques

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Solve problems involving basic probability

CO-2: Evaluate statistical parameters of different probability distributions

CO-3: Examine a real-world problem and solve the same with the Knowledge gained from various distributions study through R Programming

CO-4: Develop the skills to collect and analyze the data

CO-5: Develop various visualizations of the data in hand and communicate results of analysis effectively

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-	-

UNIT-I:

Basic Probability: Sample space and events, Probability- The axioms of probability, some elementary theorems, conditional probability, Baye's theorem. Random variables - discrete and continuous distributions - Expectation of Random Variables.

UNIT-II:

Probability Distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions –related properties.

UNIT-III:

Introduction to R: Introduction, Installing R and Data Types in R, Programming using R: Operators, Conditional Statements, Looping, Scripts, Function creation.

UNIT-IV:

Lists and Data Frames: Introduction, Creating list, List operations, Recursive list, creating a data frame, operations on data frame, Import-Export and Data Visualization.

UNIT-V:

Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in various branches of science with examples. Collection of Data: Internal and external data, Primary and secondary Data. Population and sample, Representative sample. Descriptive Statistics: Classification and tabulation of univariate data, graphical representation, Frequency curves. Descriptive measures - central tendency and dispersion. Bivariate data. Summarization, marginal and conditional frequency distribution.

TEXT BOOKS:

1. Introduction to Probability and Statistics for Engineers and Scientists, Sheldon M. Ross, 4th Edition, Academic Press, 2009
2. Statistical Methods, S. P. Gupta, 42nd Revised Edition, Sultan Chand & Sons, 2012
3. R for Beginners, Sandip Rakshit, McGraw-Hill

REFERENCES:

1. R-The Statistical Programming Language, Dr. Mark Gardner, Wiley India, 2013
2. Introduction to the Theory of Statistics, A. M. Mood, F. A. Graybill and D. C. Boes, 3rd Edition, McGraw-Hill, 2017
3. Introduction of Probability Models, S. M. Ross, 11th Edition, Academic Press, 2014

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22HS1EN101) ENGLISH FOR SKILL ENHANCEMENT

TEACHING SCHEME		
L	T/P	C
2	0	2

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To enhance vocabulary through word formation processes
- To read and comprehend different kinds of texts (tone, tenor, sound, sense, diction, etc. - sub-skills)
- To write clear, concise, and correct sentences and paragraphs to produce appropriate technical prose
- To improve coherence and cohesion in writing and speaking
- To recognize and practice the use of rhetorical elements necessary for the successful practice of scientific and technical communication

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Use vocabulary contextually and effectively

CO-2: Employ reading skills to comprehend different kinds of texts. (tone, tenor, sound, sense, diction, etc.

CO-3: Apply principles of critical thinking and problem-solving for clarity, conciseness and accuracy of expression in academic and professional communication

CO-4: Demonstrate improved competence in Standard Written English, including grammar, sentence and paragraph structure and coherence, and use this knowledge to accurately communicate technical information

CO-5: Employ appropriate rhetorical patterns of discourse in scientific and technical communication

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	1	1	1	1	-	2	1	1	2	3	2	2	-	-
CO-2	2	2	2	2	2	2	2	1	3	3	2	2	-	-
CO-3	2	2	2	2	1	3	2	1	3	3	2	2	-	-
CO-4	1	1	1	1	1	2	2	1	2	3	2	2	-	-
CO-5	1	1	1	1	-	2	1	1	2	2	1	1	-	-

UNIT-I:

1. Reading: On the Conduct of Life by William Hazlitt
2. Grammar: Conjunctions and Prepositions
3. Vocabulary: Word Formation (Affixation, Compounding, Conversion, Blending, Borrowing)
4. Writing: Punctuation, Clauses and Sentences Transitional Devices- Paragraph Writing- Process

UNIT-II:

1. Reading: How I Became a Public Speaker by G.B. Shaw
2. Grammar: Articles, Noun-Pronoun Agreement, Concord
3. Vocabulary: Word Formation- (Prefixes, Suffixes, Root Words)
4. Writing Skills: Principles of Good Writing-Coherence, Cohesion Essay Writing - Descriptive, Argumentative, Expository

UNIT-III:

1. Reading: Muhammad Yunus
2. Grammar: Misplaced Modifiers
3. Vocabulary: Synonyms and Antonyms
4. Writing Skills: Letter Writing- Formal Letters - Letter of Complaint, Letter of Requisition, Email Writing; Email Etiquette

UNIT-IV:

1. Reading: Politics and the English Language by George Orwell
2. Grammar: Cliches, Redundancies
3. Vocabulary: Common Abbreviations
4. Writing Skills: Summary Writing; Job Application; Resume

UNIT-V:**Organizational Patterns for writing**

1. Patterns of Writing: Comparison and Contrast Pattern
2. Patterns of Writing: Cause and Effect Pattern
3. Patterns of Writing: Classification Pattern
4. Patterns of Writing: Problem-Solution Pattern

TEXT BOOKS:

1. Language and Life: A Skills Approach, Orient Black Swan
2. Technical Communication Rebecca E. Burnett, 6th Edition, Cengage Learning

REFERENCES:

1. Communication Skills, Pushplata and Kumar, Sanjay, OU Press, 2015
2. Remedial English Grammar, Wood F. T., Macmillan, 2007
3. Study Writing, Hamp, Liz., Lyons and Heasley, Ben, C U Press, 2006
4. Practical English Usage, Swan, Michael, OU Press, 1995
5. Longman Dictionary of Common Errors, Turton N. D. and Heaton J. B., 1991

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES1CS102) DATA STRUCTURES

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To introduce various searching and sorting techniques
- To demonstrate operations of linear and non-linear data structure
- To develop an application using suitable data structure

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Understand basic concepts of data structures and analyse computation complexity

CO-2: Apply linear data structures to implement various sorting, searching techniques

CO-3: Solve the given problem using linear data structures

CO-4: Execute the given problem using non-linear data structures

CO-5: Analyze appropriate and efficient data structure to implement a given problem

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	3	-	-	3	-	-	-	-	2	-	2	3	2	2
CO-2	3	3	2	2	3	-	-	-	2	2	-	2	2	3	2
CO-3	3	3	2	2	3	-	-	-	2	2	-	2	2	3	3
CO-4	3	3	2	2	3	-	-	-	2	2	-	2	2	3	3
CO-5	3	3	3	2	3	2	2	2	3	3	1	2	3	3	3

UNIT-I:

Introduction to Data Structures: Abstract Data Types (ADT), Asymptotic Notations. Time- Space trade off. Searching: Linear Search and Binary Search Techniques and their time complexities.

Linear Data Structures: Stacks - ADT Stack and its operations: Applications of Stacks: Recursion, Expression Conversion and evaluation.

UNIT-II:

Linear Data Structures: Queues - ADT queue, Types of Queue: Linear Queue, Circular Queue, Double ended queue, operations on each types of Queues

Linked Lists: Singly linked lists: Representation in memory, Operations: Traversing, Searching, insertion, Deletion from linked list; Linked representation of Stack and Queue.

Doubly Linked List, Circular Linked Lists: All operations

UNIT-III:

Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Binary Search Tree, AVL Tree; Tree Operations on each of the trees and their algorithms with time complexities.

B-Trees: Definition, Operations.

UNIT-IV:

Priority Queue: Definition, Operations and their time complexities.

Sorting: Objective and properties of different sorting algorithms: Quick Sort, Heap Sort, Merge Sort; Radix sort

UNIT-V:

Dictionaries: Definition, ADT, Linear List representation, operations- insertion, deletion and searching, Hash Table representation, Hash function-Division Method, Collision Resolution Techniques-Separate Chaining, open addressing-linear probing, quadratic probing, double hashing, Rehashing.

Graphs: Graph terminology –Representation of graphs –Graph Traversal: BFS (breadth first search) –DFS (depth first search) –Minimum Spanning Tree.

TEXT BOOKS:

1. Fundamental of Data Structure, Horowitz and Sahani, Galgotia Publication
2. Data Structure, Lipschutz, Schaum Series
3. Data Structures and Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman

REFERENCES:

1. Algorithms, Data Structures, and Problem Solving with C++, Mark Allen Weiss, Addison-Wesley Publishing Company
2. How to Solve it by Computer, 2nd Impression, R. G. Dromey, Pearson Education
3. Introduction to Algorithms, Cormen, Leiserson and Rivest
4. Data Structures: A Pseudo-code Approach with C, Gilberg & Forouzan, Thomson Learning
5. Data Structures using C & C++, Ten Baum, Prentice-Hall International

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/106102064>
2. https://onlinecourses.swayam2.ac.in/cec19_cs04/preview

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS1PH102) APPLIED PHYSICS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: 10+2 Physics

COURSE OBJECTIVES:

- To apply the principles of lasers for various laser systems and optical fibers
- To understand the principles of quantum physics and band theory of solids
- To explain various types of semiconductors and semiconductor devices
- To study the fundamental concepts related to the dielectric and magnetic materials
- To identify the importance of energy materials and nanomaterials

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Explain various aspects of lasers, optical fiber and their applications in diverse fields.

CO-2: Apply quantum mechanics to behavior of a particle and classify solids based on band gap

CO-3: Identify the role of semiconductor devices in science and engineering applications.

CO-4: Illustrate applications of dielectric, magnetic materials.

CO-5: Explore the features and applications of energy materials and nanomaterials.

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	1	-	1	1	-	1	1	-	1	-	-	-
CO-2	3	2	1	-	1	1	-	-	1	1	-	1	-	-	-
CO-3	3	2	2	1	-	2	-	-	1	1	-	1	-	-	-
CO-4	3	2	1	1	-	1	-	-	1	1	-	1	-	-	-
CO-5	3	2	2	1	1	2	2	-	1	1	-	1	-	-	-

UNIT-I:

Laser and Fiber Optics: Lasers: Laser beam characteristics-Three quantum processes (Absorption, Spontaneous emission & Stimulated emission), Lifetime, Metastable state, Population inversion, Pumping methods- Lasing action -Block diagram of laser-Einstein coefficients and their relations, Ruby laser, He-Ne laser, Applications of laser.

Fiber Optics: Introduction to optical fiber- Advantages of optical fibers - Total internal reflection, Construction of optical fiber - Acceptance angle - Numerical aperture-Classification of optical fibers. fiber optic laser - Applications.

UNIT-II:

Quantum Physics and Band Theory of Solids:

Quantum Physics: Introduction to quantum physics-Planck's law, Wave-particle duality, de-Broglie hypothesis, Matter waves, Davisson and Germer experiment – Heisenberg uncertainty principle and its applications - Born interpretation of the wave function – Time independent Schrodinger wave equation - Particle in one dimensional infinite potential well.

Band Theory Solids: Free electron theory (Drude & Lorentz.)-Electrical Conductivity-Verification of Ohm's law -Bloch's theorem -Kronig-Penney model (qualitative) – E-k diagram, Effective mass of electron -Origin of energy bands- Classification of solids.

UNIT-III:

Semiconductors and Devices:

Semiconductors: Intrinsic Semiconductors-Intrinsic carrier concentration, Extrinsic semiconductors (Qualitative), Fermi level and its temperature dependence, Hall effect-Hall coefficient, Applications of Hall effect.

Semiconductor Devices: Direct and indirect band gap semiconductors-Formation and characteristics of P-N junction diode, construction, working principle, Characteristics and applications of LED, and Solar cell, Construction and working principle of Laser diode.

UNIT-IV:

Dielectric and Magnetic Materials:

Dielectric Materials: Basic definitions- Types of polarizations (qualitative) -Frequency dependence of polarization, Local field, Clausius-Mossotti relation, Ferroelectric, Piezoelectric, and Pyroelectric materials – Applications.

Magnetic Materials: Basic definitions- Types of Magnetic materials, Antiferro and ferri magnetic materials, Weiss-Domain theory of ferromagnetism, Hysteresis - Soft and hard magnetic materials, Multiferroics – Applications.

UNIT-V:

Energy Materials and Nanotechnology:

Energy Materials: Introduction to energy materials, Electrolytes for super capacitors - Rechargeable ion batteries, Solid fuel cells.

Nanotechnology: Introduction, Quantum confinement, Surface to volume ratio, Physical properties, Bottom-up approach: Sol-gel, Top-down approach: Ball milling - Characterization techniques – Average crystallite size using X-ray diffraction pattern, Scanning electron microscopy - Applications of nanomaterials.

TEXT BOOKS:

1. A Text Book of Engineering Physics, M. N. Avadhanulu, P. G. Kshirsagar & T. V. S. Arun Murthy, 11th Edition, S. Chand Publications, 2019
2. Engineering Physics, B. K. Pandey and S. Chaturvedi, 2nd Edition, Cengage Learning, 2022
3. Engineering Physics, P. K. Palanisamy, Scitech Publications

REFERENCES:

1. Essentials of Nanoscience & Nanotechnology, K. Narasimha Reddy, 1st Edition, Nano Digest, 2021

2. Fundamentals of Physics, Halliday, Resnick and Walker, 11th Edition, John Wiley & Sons, 2018
3. Introduction to Solid State Physics, A. C. Kittel, Wiley Eastern, 2019
4. Nano Materials, A. K. Bhandhopadhya, 1st Edition, New Age International, 2007
5. Energy Materials A Short Introduction to Functional Materials for Energy Conversion and Storage, A. S. Bandarenka, 1st Edition, CRC Press, Taylor & Francis Group Energy Materials, 2022

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS2PH102) APPLIED PHYSICS LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To understand the working principle of lasers and optical fibers
- To analyze the characteristics of semiconductor devices and resonance phenomena
- To measure the time constant of RC circuit and dielectric constant of material
- To study the behavior of magnetic materials and understand least square method
- To compare the experimental results with the classroom learning

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Demonstrate the total internal reflection in optical fiber using lasers

CO-2: Realize importance of optoelectronics and resonance in daily life

CO-3: Illustrate discharging of a capacitor and polarizability of dielectric material

CO-4: Identify the importance of least square fitting and applications of magnetic materials

CO-5: Correlate the experimental results with the classroom learning

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-	-

LIST OF EXPERIMENTS:

1. Torsional pendulum: understanding the method of least squares
2. Determination of acceptance angle and numerical aperture of an optical fiber
3. Determination of wavelength of given LASER using grating
4. Determine the width of given wire- using LASER
5. Determination of energy gap of a semiconductor
6. V-I characteristics of light emitting diode (LED)
7. V-I Characteristics of solar cell
8. Measurement of dielectric constant
9. Study the B-H curve of magnetic material
10. Determination of time constant of RC circuit
11. Melde's Experiment
12. AC frequency sonometer

TEXT BOOKS:

1. Applied Physics Laboratory Manual/Observation, Physics Faculty of VNRVJIE
2. A textbook of Practical Physics, S. Balasubramanian, M. N. Srinivasan, S. Chand Publishers, 2017

ONLINE RESOURCES:

1. <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>
2. <https://vlab.amrita.edu/index.php?sub=1&brch=280&sim=1518&cnt=1>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22HS2EN101) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To train students to use neutral accent through phonetic sounds, symbols, stress and intonation
- To provide practice in vocabulary usage & grammatical construction
- To provide ample practice in LSRW skills and train the students in oral presentations, public speaking, role play, and situational dialogue
- To provide practice in defining technical terms and describing processes
- To equip students with excellent writing skills and information transfer skills

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Speak fluently with a neutral accent

CO-2: Use contextually apt vocabulary and sentence structures

CO-3: Make Presentations with great confidence

CO-4: Define technical terms and describe processes

CO-5: Write accurately, coherently, and lucidly

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	-	-	-	-	-	-	-	-	2	3	1	1	-	-
CO-2	1	1	1	1	3	1	1	1	2	3	1	1	-	-
CO-3	1	1	-	-	-	2	2	-	3	3	3	1	-	-
CO-4	2	2	2	2	-	2	2	-	2	3	1	1	-	-
CO-5	1	1	1	1	-	2	1	-	2	3	2	1	-	-

LIST OF EXERCISES:

1. Self-Introduction
2. Phonetics- Identifying sounds-Word stress- Intonation
3. Reading Comprehension – Reading for Gist & for Specific Details; Making inferences
4. Story Telling
5. Making Short Oral Presentations
6. Listening Comprehension- Listening for Global meaning & specific details; note taking
7. Learning vocabulary from context
8. Book Review
9. Writing Resume and CV
10. Information Transfer

11. Social Media Skills – Writing a Blog
12. Defining Technical Terms and Describing Processes

TEXT BOOKS:

1. Technical Communication, Rebecca E. Burnett, 6th Edition, Cengage Learning

REFERENCES:

1. Practical English Usage, Swan, Michael, Oxford University Press, 1995
2. Remedial English Grammar, F. T. Wood, Macmillan, 2007
3. Exercises in Spoken English, Parts I-III, CIEFL, Hyderabad, Oxford University Press
4. Fowler's Modern English Usage-Revised, R. W. Burchfield
5. Technical Communication, Raman, Meenakshi and Sharma, Sangeeta, Oxford University Press, 2005

ONLINE RESOURCES:

1. <https://caw.ceu.edu/academic-skills>
2. <https://www.biz-e-training.com/resources-for-learners/academic-writing-online-resources/>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES2CS102) DATA STRUCTURES LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To impart the basic concepts of data structures and algorithms
- To learn the concepts about searching and sorting
- To understand the basic concepts about stacks, queues, lists
- To know the concepts of trees and graphs

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Implement all operations on different linear data structures

CO-2: Develop all operations on different Non- linear data structures

CO-3: Apply various searching and sorting techniques

CO-4: Understand the complexity analysis of linear and non linear data structures

CO-5: Use appropriate data structure for any given problem

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	3	2	-	3	-	-	-	2	2	-	2	2	2	2
CO-2	3	3	2	2	3	-	-	-	2	2	-	2	2	3	2
CO-3	3	3	2	2	3	-	-	-	2	2	-	2	2	3	2
CO-4	2	2	1	2	-	-	-	-	2	2	-	1	3	3	3
CO-5	3	3	3	2	3	2	2	2	3	3	1	2	3	3	3

LIST OF EXPERIMENTS:

WEEK 1:

Implement Stack using Array

WEEK 2:

- Program to convert infix expression to postfix expression.
- Program to postfix evaluation.

WEEK 3:

Implement the following

- Linear Queue using Array
- Circular Queue using Array

WEEK 4:

Implement Dequeue using Array

WEEK 5:

Implement Single Linked List operations

WEEK 6:

Implement following

a) Circular Linked List Operations b) Double Linked List Operations

WEEK 7:

Implement following

a) Stack using Linked List b) Queue using Linked List

WEEK 8: Lab Internal - 1**WEEK 9:**

Implement BST operations

WEEK 10:

Implement B Tree operations

WEEK 11:

Implement following sorting techniques

a) Merge b) Heap c) Radix d) Quick

WEEK 12:

Implement following Hashing Techniques

a) Separate Chaining b) Linear Probing

WEEK 13:

Implement following Graph traversals

a) BFS b) DFS

WEEK 14: Internal Lab -2**TEXT BOOKS:**

1. Fundamental of Data Structure, Horowitz and Sahani, Galgotia Publication
2. Data Structure, Lipschutz, Schaum Series
3. Data Structures and Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman

REFERENCES:

1. Algorithms, Data Structures, and Problem Solving with C++, Mark Allen Weiss, Addison-Wesley
2. How to Solve it by Computer, 2nd Impression, R. G. Dromey, Pearson Education
3. Introduction to Algorithms, Cormen, Leiserson and Rivest
4. Data Structures: A Pseudo-code Approach with C, Gilberg & Forouzan, Thomson Learning
5. Data Structures using C & C++, Ten Baum, Prentice Hall International

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/106102064>
2. https://onlinecourses.swayam2.ac.in/cec19_cs04/preview

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES2DS101) PYTHON PROGRAMMING LABORATORY

TEACHING SCHEME		
L	T/P	C
1	2	2

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To install and run the Python interpreter
- To learn control structures
- To understand Lists, Dictionaries in python
- To handle strings and files in Python
- To acquire programming skills in core Python

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Develop the application specific codes using Python

CO-2: Understand strings, lists, tuples and dictionaries in Python

CO-3: Verify programs using modular approach, file I/O, Python standard library

CO-4: Implement digital systems using Python

CO-5: Develop the skill of designing graphical user interfaces in Python

COURSE ARTICULATION MATRIX:

(Define Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	3	2	3	2	2	1	2	2	2	3	3	2	3
CO-2	3	2	3	3	2	3	3	2	1	2	3	3	2	3	3
CO-3	3	2	3	1	2	3	2	3	2	1	2	3	2	1	2
CO-4	3	2	3	2	3	2	3	2	2	2	3	3	3	2	1
CO-5	3	2	3	3	3	3	3	2	3	3	2	3	1	2	3

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

WEEK-1: Basics

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 purposefully raise Indentation Error and correct it
4. i) Write a program to calculate compound interest when principal, rate and number of periods are given.
- ii) Given coordinates (x_1, y_1) , (x_2, y_2) find the distance between two points
5. Read name, address, email and phone number of a person through keyboard and print the details.

WEEK-2: Operations

1. Print the below triangle using for loop.

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

2. Write a program to check whether the given input is digit or lowercase character or uppercase

character or a special character (use 'if-else-if' ladder)

3. Python Program to Print the Fibonacci sequence using while loop

4. Python program to print all prime numbers in a given interval (use break)

5. Write a program to compute LCM of two numbers by taking input from the user

6. Write a program add.py that takes 2 numbers as command line arguments and prints its sum

WEEK-3: Lists & Tuples

1. i) Write a program to convert a list and tuple into arrays.

ii) Write a program to find common values between two arrays.

2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.

3. 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.

4. Find mean, median, mode for the given set of numbers in a list.

5. Write a Python program to create a tuple.

6. Write a Python program to create a tuple with different data types.

7. Write a Python program to check whether an element exists within a tuple.

WEEK-4: Sets, Dictionaries and Strings

1. 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.

2. 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.

i). 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.

ii). The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add

"l", "a", and the empty string.

iii). 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.

3. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'

ii) Remove the given word in all the places in a string?

iii) 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 lower case without using a built-in function?

4. Writes a recursive function that generates all binary strings of n-bit length
5. Write a Python program to implement all set operations
6. Write a program to check whether a string is palindrome or not

WEEK-5: Functions and Multi-D Lists

1. i) Write a python program that defines a matrix and prints
ii) Write a python program to perform addition of two square matrices
iii) Write a python program to perform multiplication of two square matrices
2. Simple Calculator program by making use of functions
3. Find the factorial of a number using recursion
4. Write a function cumulative_product to compute cumulative product of a list of numbers.
5. Write a function reverse to print the given list in the reverse order.

WEEK-6: Exceptions in Python

1. Write a program that detects an Exception
2. Write a program that raise an Exception (divide by zero error,voter's age validity)
3. Write a program that raise an Exception as string(), student mark range validation)
4. Use the structure of exception handling all general purpose exceptions.
5. Write a python code to read a phone number and email-id from the user and validate it for correctness.

WEEK-7: Modules and Inheritance

1. 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.
2. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
b. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.
c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.
3. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritance.

WEEK-8: Files

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file file1 and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

5. Write a program to print each line of a file in reverse order.

WEEK-9: Exploration of NumPy Package

1. Import numpy, and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program for slicing arrays using numpy
4. Write a program for Math operations on array using numpy
5. Write a program for searching
6. Write a program for sorting

WEEK-10: Exploration of Pandas Package

1. Import Pandas and Plotpy and explore their functionalities
2. Python Data Frame
3. Python series

WEEK-11: Exploration of SciPy and GUI

1. Import SciPy and explore their functionalities
2. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

WEEK-12: Digital Logic Systems

1. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
2. Write a program to implement Half Adder, Full Adder, and Parallel Adder

TEXT BOOKS:

1. Supercharged Python: Take Your Code to the Next Level, Overland
2. Learning Python, Mark Lutz, O'Reilly
3. Python for Data Analysis, Wes McKinney, 2nd Edition Orielly

REFERENCES:

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. Programming with Python, A User's Book, Michael Dawson, Cengage Learning
4. Think Python, Allen Downey, Green Tea Press
5. Core Python Programming, W. Chun, Pearson

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES2ME102) ENGINEERING AND IT WORKSHOP

TEACHING SCHEME		
L	T/P	C
1	2	2

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To provide hands-on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field
- To study different hand operated power tools, uses and their demonstration
- To provide training on PC Hardware, Installation of Operating system, Internet & World Wide Web
- To study productivity tools including Word, PowerPoint, and Publisher

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Identify and apply suitable tools for different trades of Engineering processes

CO-2: Apply basic electrical engineering knowledge for house wiring practice

CO-3: Understand Hardware components, Operating system and inter dependencies
Safeguard computer systems from viruses/worms

CO-4: Apply the basic knowledge on Document/PowerPoint Preparation

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	3	1	2	1	2	1	2	1	2	1	1	3	-	-	-
CO-2	3	1	2	1	2	1	2	1	2	1	1	3	-	-	-
CO-3	3	2	3	2	3	1	2	1	2	1	1	3	2	1	-
CO-4	3	2	3	2	3	1	2	1	2	3	2	3	2	-	-

LECTURES & VIDEOS:

1. Additive Manufacturing
2. Robots
3. Power Tools
4. Electrical & Electronics
5. Tin smithy
6. Joining Process
7. PC Hardware
8. Installation of Operating System
9. Internet and World Wide Web
10. Latex
11. Word
12. Power point

ENGINEERING WORKSHOP:

1. TRADES FOR EXERCISES

House-wiring:

1. Parallel & Series connection
2. Two-way Switch and Tube Light connection

Tin-Smithy:

1. Rectangular scoop
2. Rectangular Tray

Joining Practice:

1. Arc Welding
2. Soldering

2. EQUIPMENT/TOOLS FOR DEMONSTRATION & EXPOSURE:

1. 3D printer
2. Power tools

IT WORKSHOP:

1. PC Hardware

- i. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.
- ii. Every student should individually install MS windows on the personal computer using Virtual Machine. Lab instructor should verify the installation and follow it up with a Viva.
- iii. Every student should install Linux on the computer using Virtual Machine. This computer should have windows installed. The system should be configured as dual boot with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

2. Internet & World Wide Web

- i. **Web Browsers, Surfing the Web:** Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop-up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.
- ii. **Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.
- iii. **Cyber Hygiene:** Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

3. LaTeX and WORD

- i. **Word Orientation:** The mentor needs to give an overview of LaTeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of LaTeX and MS office or equivalent (FOSS) tool Word 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.
- ii. 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 Colours, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.
- iii. 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.
- iv. Creating a Newsletter: Features to be covered- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

4. PowerPoint

- i. Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.
- ii. Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts, Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

TEXT BOOKS:

1. Workshop Practice, B. L. Juneja, Cengage
2. Workshop Manual, K. Venugopal, Anuradha
3. IT Essentials PC Hardware and Software Companion Guide, Davis Anfinson and Ken Quamme, 3rd Edition, CISC Press, Pearson Education
4. PC Hardware and A+ Handbook, Kate J. Chase, PHI (Microsoft)

REFERENCES:

1. Workshop Manual, P. Kannaiah, K. L. Narayana, Scitech
2. Workshop Manual, Venkat Reddy, B. S. Publications
3. LaTeX Companion, Leslie Lamport, PHI/Pearson
4. The Complete Computer Upgrade and Repair Book, 3rd Edition, Cheryl A. Schmidt, Wiley Dreamtech
5. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education

ONLINE RESOURCES:

1. <http://ecoursesonline.iasri.res.in/course/view.php?id=86>
2. <https://alison.com/course/fundamentals-of-workshop-technology>
3. <https://www.youtube.com/watch?v=ctAVC2JwEwI>
4. <https://www.youtube.com/watch?v=ZXAPCy2c33o>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22MN6HS103) HAPPINESS AND WELLBEING

TEACHING SCHEME		
L	T/P	C
2	0	0

EVALUATION SCHEME			
SE-I	SE-II	SEE	TOTAL
50	50	-	100

COURSE OBJECTIVES:

- To learn sustainable strategies to develop positive attitude and happy heart
- To develop self-awareness and self-discipline to meet the needs of happiness
- To practice good health & mindfulness for wellbeing
- To adapt personality attributes of happiness and success strategies
- To nature happiness development index for better living

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Recognize what is happiness in life and how to sustain it

CO-2: Focus on interpersonal skills for a mindful approach

CO-3: Develop to mindfulness to handle challenging situations

CO-4: Recognize the importance of positive attitude for personal and professional development

CO-5: Interpret the need for nurturing happiness development index through Indicators

COURSE ARTICULATION MATRIX:

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CO-2	-	-	-	-	-	3	-	3	1	-	-	3	-	-	-
CO-3	-	-	-	-	-	1	-	1	1	-	-	3	-	-	-
CO-4	-	-	-	-	-	2	-	2	1	-	-	3	-	-	-
CO-5	-	-	-	-	-	3	-	1	1	-	-	3	-	-	-

UNIT-I:

Introduction to Happiness: Definition & theories of happiness: Hedonism theory, Desire theory, Objective list theory. Identifying potential barriers of happiness: Devaluing happiness, chasing superiority, being needy, being overly control-seeking, distrusting others, distrusting life, and ignoring the source within. Strategies for overcoming the potential barriers

UNIT-II:

Power of Emotions & Relationships: Role of emotional intelligence, self-awareness, and empathy in creating harmonious relationship with ourselves and others. Balancing emotions. Hormones that promote happiness. The importance of social connections

for happiness. Role of share & care, gratitude, forgiveness & kindness in building relationships

UNIT-III:

Health and Well-being: The link between health & happiness-exercise regularly, eat a healthy diet, get enough sleep for physical fitness. Mental wellbeing-Take notice, keep learning, stay connected with nature, and financial wellbeing. The practice of mindfulness and its benefits for mental and physical health. Moving from restlessness to restfulness- meditation and yoga to increase awareness and reduce stress

UNIT-IV:

Re-Wirement for Wellbeing: Abundance in life, freedom of choice, accepting change, ways of implementation for wellbeing: practicing habits-be proactive, begin with end-in-mind, put-first things-first, think win-win, seek first to understand then to be understood, synergize, sharpen the saw, and effectiveness to greatness

UNIT-V:

Nurturing Happiness Development Index: Exploring the sources of temporary joy and lasting happiness. Acceptance, Appreciation, forgiveness, gracefulness, and creative procrastination. Time management with four D's (delete, delay, delegate, do). Developing happiness index-track changes in happiness levels over time and identify the indicators

TEXT BOOKS:

1. The How of Happiness: A Scientific Approach to Getting the Life You Want, Sonja Lyubomirsky, Penguin Books, 2008
2. Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment, Martin Seligman, Atria Books, 2004
3. The Book of Joy: Lasting Happiness in a Changing World, Dalai Lama, Desmond Tutu, and Douglas Abrams, Avery, 2016

REFERENCES:

1. 7-Habits of Highly Successful People, Stephen Covey, Simon & Schuster, 2020
2. Mindfulness Book of Happiness: Mindfulness and Meditation, Aimen Eman, Publish Drive Edition, 2018
3. Mindfulness at Work: How to Avoid Stress, Achieve More, and Enjoy Life, Dr. Stephen McKenzie, Exisle Publishing, 2014
4. The 8th Habit: From Effectiveness to Greatness, Stephen R. Covey, Free Press, 2004

ONLINE RESOURCES:

1. Life of Happiness and Fulfillment, Indian School of Business, Coursera
<https://in.coursera.org/learn/happiness>
2. Science of Wellbeing, Yale University, Coursera
<https://www.coursera.org/learn/the-science-of-well-being>