DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

VISION OF THE DEPARTMENT

To achieve academic and research excellence in essential technologies of Computer Science and Engineering by promoting a creative environment for learning and innovation.

MISSION OF THE DEPARTMENT

- To provide dynamic, innovative and flexible curriculum which equip the students with the necessary problem driven skills to strengthen their career prospects and potential to pursue higher studies.
- To foster inquisitive-driven research among students and staff so as to reinforce the domain knowledge and address contemporary societal issues.
- To inculcate ethical values, leadership qualities and professional behaviour skills for improving the living standards of people

B.TECH.

(COMPUTER SCIENCE AND BUSINESS SYSTEMS)

B.TECH. COMPUTER SCIENCE AND BUSINESS SYSTEMS

PROGRAM EDUCATIONAL OBJECTIVES

PEO-I: To equip students with the essential knowledge, skillsets and attitude to be society and Industry ready and make a meaningful contribution to the growth of the Indian economy.

PEO-II: To prepare students with fundamental concepts of Computer Science and additionally Develop an inherent capacity for liberal arts, innovative mind-set, life values and an Appreciation of sustainability issues.

PEO-III: To prepare 'Business Engineers', a cluster of engineering talent tuned to the needs of Business 4.0.

PEO-IV: To enable students to appreciate the technologies of the future and understand the fundamental concepts of business management and develop the 'Innovation' mind-set.

PEO-V: To ensure students are future-ready with emerging topics such as Cyber Security, Machine Learning, Cloud Computing, IoT, Analytics etc. as part of the curriculum.

B.TECH. COMPUTER SCIENCE AND BUSINESS SYSTEMS

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. COMPUTER SCIENCE AND BUSINESS SYSTEMS

PROGRAM SPECIFIC OUTCOMES

PSO-1: Apply the fundamentals of mathematics, science and technology abstraction to develop computational tools and applications in the areas related to algorithms, big data analytics, machine learning, and artificial intelligence and networking.

PSO-2: Leverage new age technologies to solve contemporary challenges of varying complexity and develop 'Innovation' mind-set and entrepreneurial skills.

PSO-3: Be adept at designing business solutions using the fundamental concepts of business management, leadership and entrepreneurial skills and appreciate life values and sustainability issues.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD
B.TECH. I YEAR
COMPUTER SCIENCE AND BUSINESS SYSTEMS

I SEMESTER **R22**

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT104	Discrete Mathematics	3	0	0	3	3
22BS1MT105	Introductory Topics in Statistics, Probability and Calculus	3	0	0	3	3
22ES1CB101	Fundamentals of Computer Science	2	1	0	3	3
22ES1EE102	Principles of Electrical Engineering	3	0	0	3	3
22BS1PH103	Physics for Computing Science	3	0	0	3	3
22ES2CB101	Fundamentals of Computer Science Laboratory	0	0	2	2	1
22ES2EE102	Principles of Electrical Engineering Laboratory	0	0	2	2	1
22BS2PH103	Physics for Computing Science Laboratory	0	0	2	2	1
22HS2EN102	Business Communication and Value Science - I	1	0	2	3	2
22MN6HS101	Induction Programme	2	0	0	2	0
Total		**17**	**1**	**8**	**26**	**20**

II SEMESTER **R22**

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT106	Linear Algebra	2	1	0	3	3
22BS1MT107	Statistical Modeling	3	0	0	3	3
22ES1CB102	Data Structures and Algorithms	2	1	0	3	3
22ES1EC101	Principles of Electronics Engineering	3	0	0	3	3
22HS1MG101	Fundamentals of Management	3	0	0	3	3
22BS2MT107	Statistical Modeling Laboratory	0	0	2	2	1
22ES2CB102	Data Structures and Algorithms Laboratory	0	0	2	2	1
22ES2EC101	Principles of Electronics Engineering Laboratory	0	0	2	2	1
22HS2EN103	Business Communication and Value Science – II	1	0	2	3	2
22MN6HS102	Environmental Science	2	0	0	2	0
Total		**16**	**2**	**8**	**26**	**20**

L – Lecture T – Tutorial P – Practical D – Drawing CH – Contact Hours/Week
C – Credits SE – Sessional Examination CA – Class Assessment ELA – Experiential Learning Assessment
SEE – Semester End Examination D-D – Day to Day Evaluation LR – Lab Record
CP – Course Project PE – Practical Examination

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1MT104) DISCRETE MATHEMATICS

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE PRE-REQUISITES: Set, Relation, Mapping, Permutations and Combinations

COURSE OBJECTIVES:
- To know the concepts of sets and relation to understand Group's and Ring theory
- To know combinatorics techniques in solving the system by various methodology
- To learn Boolean expressions, operations and truth tables
- To learn graphs serving as models for many standard problems

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Represent characteristics of Sets, Groups, Rings and Fields
CO-2: Explain and exemplify tautology, contradiction and contingency
CO-3: Identify underlying combinatorial structures
CO-4: Analyse the design of various combinational & sequential logic circuits using the concepts of Boolean Algebra
CO-5: Apply graph theory-based tools in solving practical problems

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

UNIT-I:
Abstract Algebra: Sets, Finite sets, Power sets, Set Operations, Algebra of sets and duality, Partitions, Relations, Types of relations, Closure properties, Equivalence relations, Partial Ordering, Groups, subgroups, Lagrange's theorem on finite groups. Introduction to Ring, Integral domain and Field.

UNIT-II:
Logic: Propositional calculus - propositions and connectives, truth assignments and truth tables, validity and satisfiability, tautology; Logical Equivalence and normal forms; Algebra of propositions, Conditional and Bi-conditional statements, Logical implication, Quantifiers, Negation of quantified statements.

UNIT-III:

Combinatorics: Introduction, Basic counting, Factorial notation, Bionomial coefficients, generating functions, recurrence relations, pigeonhole principle, principle of mathematical induction.

UNIT-IV:

Boolean Algebra: Introduction of Boolean algebra, principle of duality, Basic logic gates, truth table, Boolean expressions, canonical form, Karnaugh map.

UNIT-V:

Graph Theory: Graphs, Types of Graphs, digraphs, adjacency matrix, isomorphism, Trees, Properties of trees, Spanning trees, Minimal Spanning trees using Kruskal's and Prims Algorithms. Eulerian paths and circuits in graphs and digraphs, Hamiltonian paths and circuits in graphs, Planar graphs, dual of a planer graph, Euler's formula, chromatic number, statement of Four-color theorem.

TEXT BOOKS:

1. Topics in Algebra, I. N. Herstein, 2nd Edition, John Wiley and Sons, 1975
2. Digital Logic & Computer Design, M. Morris Mano, 2nd Edition, Pearson, 2017
3. Elements of Discrete Mathematics, C. L. Liu, 2nd Edition, McGraw-Hill, 1985

REFERENCES:

1. Mathematical Logic for Computer Science, L. Zhongwan, 2nd Edition, World Scientific, 1998
2. Introduction to Linear Algebra, Gilbert Strang, 5th Edition, Wellesley-Cambridge Press, 2017
3. Introductory Combinatorics, R. A. Brualdi, 3rd Edition, North-Holland, Prentice Hall, 1998
4. Graph Theory with Applications to Engineering and Computer Science, N. Deo, Prentice Hall, Englewood Cliffs, 1974
5. Introduction to Mathematical Logic, E. Mendelsohn, 2nd Edition, Van-Nostrand, London

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1MT105) INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY AND CALCULUS

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE PRE-REQUISUTES: Permutations, Combinations and Basic Calculus

COURSE OBJECTIVES:
- To basic probability theory and statistical parameters
- To different types of probability distributions
- To basic objectives of statistic, classification, and descriptive measures of data
- To basic optimization techniques
- To differential and integral calculus

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Compute expected values of discrete and continuous random variables
CO-2: Identify the suitable probability distribution to solve the problems
CO-3: Classify and Analyze the given data through basic statistics
CO-4: Apply basic optimization techniques to problems involving functions of two variables
CO-5: Calculate areas and volumes of solids by applying multiple integrals

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

UNIT-I:
Basic Probability & Mathematical Expectations: Concept of experiments, sample space, event, Definition of Combinatorial Probability. Conditional Probability, Baye's Theorem. Discrete and continuous random variables, Expected values and moments: mathematical expectation and its properties, Moments (including variance) and their properties, interpretation, Moment generating function.

UNIT-II:
Probability Distributions:
Discrete Distributions: Binomial, Poisson and Geometric distribution. Continuous distributions: Uniform, Exponential, Normal, Chi-square, t and F distributions

UNIT-III:

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.

UNIT-IV:

Differential Calculus: Limit of functions, continuity, derivatives. Taylor's and Maclaurin's series expansions, Partial derivatives, Maxima and minima of function of two variables.

UNIT-V:

Integral Calculus: Length of a plane curve, Volume of solid of revolution, Area of surface of a solid of revolution (Cartesian form). Multiple Integrals- double integrals with constant and variable limits (Cartesian and polar form), change of order of integration (Cartesian form), triple integrals (Cartesian coordinates), applications of double and triple integrals: Area as double integration in Cartesian coordinates and Volume as a triple integration.

TEXTBOOKS:

1. Introduction of Probability Models, S. M. Ross, 11th Edition, Academic Press, 2014
2. Introduction to Probability and Statistics for Engineers and Scientists, Sheldon M. Ross, 4th Edition, Academic Press, 2009
3. Fundamentals of Statistics, A. Goon, M. Gupta and B. Dasgupta, Vol. I & II, World Press

REFERENCES:

1. Probability and Statistics for Engineers, I. R. Miller, J. E. Freund and R. Johnson, 4th Edition, PHI
2. Introduction to the Theory of Statistics, A. M. Mood, F. A. Graybill and D. C. Boes, McGraw-Hill Education
3. Advanced Engineering Mathematics, Peter V. O'Neil, 7th Edition, Thomson Learning
4. Advanced Engineering Mathematics, M. D. Greenberg, 2nd Edition, Pearson Education
5. Applied Mathematics, P. N. Wartikar and J. N. Wartikar, Vol. I & II, Vidyarthi Prakashan

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES1CB101) FUNDAMENTALS OF COMPUTER SCIENCE

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, 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	PSO-3
CO-1	2	2	3	1	-	-	-	-	2	2	1	-	3	-	-
CO-2	2	2	3	2	1	-	-	-	2	2	-	2	3	-	-
CO-3	2	2	3	2	1	1	-	-	2	2	-	2	3	1	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	3	1	-
CO-5	1	2	3	1	1	1	-	-	2	2	2	2	3	1	-

UNIT-I:

General Problem Solving Concepts: Algorithm, and Flowchart for problem solvingwith Sequential Logic Structure, Decisions and Loops.

Operator and Expressions with discussion of variable naming and Hungarian Notation: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation

UNIT-II:

Control Flow with Discussion on Structured and Unstructured Programming: Statements and Blocks, If-Else-If, Switch, Loops – while, do, for, break and continue, Goto Labels, structured and un- structured programming

UNIT-III:

Functions and Program Structure with Discussion on Standard Library: Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Preprocessor, Standard Library Functions and return types

UNIT-IV:

Pointers, Arrays and Structures: Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Initialization of Pointer Arrays, Command line arguments. Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral Structures, Table look up, typedef, Unions, Bit-fields

UNIT-V:

Input and Output, Unix System Interface, Programming Method: Standard I/O, Formatted Output – printf, Formatted Input – scanf, Variable length argument list, file access including FILE structure, fopen, stdin, sdtout and stderr, Error Handling , Low level I/O – read and write, Open, create, close and unlink, Random access – lseek, Discussions on Listing Directory,. Macro, User Defined Header, User Defined Library Function, make file utility.

TEXT BOOKS:

1. The C Programming Language, B. W. Kernighan and D. M. Ritchi, 2nd Edition, PHI
2. Programming in C, B. Gottfried, 2nd Edition, Schaum Outline Series
3. Let Us C, Yashavant P. Kanetkar, 16th Edition, 2019, BPB Publications

REFERENCES:

1. C: The Complete Reference, Herbert Schildt, 4th Edition, McGraw-Hill
2. Problem Solving with C, Jacqueline A. Jones and Keith Harrow, Pearson Education
3. Programming in ANSI C, E. Bal Guruswamy, 8th Edition, McGraw-Hill, 2019
4. A Book on C, Al Kelley, Ira Pohl, 4th Edition, Pearson Education
5. Stephen G. Kochan, Programming in C, CBS Publishers

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES1EE102) PRINCIPLES OF ELECTRICAL ENGINEERING

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE PRE-REQUISITES: Physics, Mathematics

COURSE OBJECTIVES:
- To understand the basic concepts of electrical and magnetic circuits
- To understand the electromechanical energy conversion process in machines
- To identify the types of sensors and measure quantities in AC and DC systems
- To study various electrical installation components and safety measures

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Understand the basic concepts and terminology of electrical quantities
CO-2: Analyze the DC circuit using various network theorems
CO-3: Analyze the electrical parameters of AC circuits with R-L-C elements
CO-4: Understand the concepts of Electro-static, Electromagnetic fields, and operation of Electrical Machines
CO-5: Understand the components of Low Voltage Electrical Installations and the safety measures

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

UNIT-I:
Basic Circuit Concepts and Theorems: Concept of voltage, potential difference, current- Fundamental linear passive and active elements to their functional current-voltage relation, independent voltage source and Independent current sources: ideal and practical sources, Kirchhoff's laws-series and parallel connections-Network solutions using mesh and nodal analysis, Theorems: Thevenin's and Norton's theorems, Superposition theorem.

UNIT-II:
AC Circuit Analysis: Representation of Sinusoidal waveform- RMS and average values, form factor and peak factor-series RL, RC and RLC circuits -phasorre presentation in polar and rectangular form, concept of impedance, admittance - active, reactive,

and apparent powers, power factor-Three phase balanced circuits: Star and delta connections (Derivation Only)

UNIT-III:

Electro Static and Electro Magnetic Fields: Electro static Fields: electric field intensity and strength, energy stored in a capacitor, charging, and discharging of capacitors absolute and relative permitivities.

Electromagnetic Fields: Magneto Motive Force, Flux Density, Faraday's laws of Electromagnetic Induction, self and mutual inductances, series magnetic circuit, magnetic materials and BHcurve.

UNIT-IV:

Transformers and DC Machines:

Transformer: Single phase transformer principle, emf equation, Transformation ratio, ideal and practical transformer, losses in a transformer, Efficiency and Voltage regulation (Elementary Treatment only)

DC Machines: DC generator construction, principle, emf generated, types of DC generators, DC motor principle, back emf.

UNIT-V:

Measurements, Electrical Installation and Safety Measures: Introduction to electrical measurements, types of instruments, indicating type instruments (MC andMI) (Elementary treatment only)

Electrical Installation and Safety Measures: 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.

TEXTBOOKS:

1. Basic Electrical Engineering, D. C. Kulshreshtha, 2nd Edition, TMH, 2019
2. Basic of Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2011
3. Electromagnetic Field Theory, K. A. Gangadhar, P. M. Ramanathan, 16th Edition, Khanna, 2011

REFERENCES:

1. Basic Electrical Engineering, V. K. Mehta, S. Chand and Company
2. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyammohan S. Palli, Tata McGraw-Hill, 2010
3. Engineering Electromagnetics, William H. Hayt, Jr. John A. Buck, 8th Revised Edition, McGraw-Hill Higher, 2011
4. Fundamentals of Electrical and Electronics Engineering, Smarjith Ghosh, Prentice Hall, 2010

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1PH103) PHYSICS FOR COMPUTING SCIENCE

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 discuss the fundamentals of oscillatory systems
- To analyze various phenomena of light- Interference, Diffraction and Polarization
- To apply the basic principles of LASER to various laser systems and optical fibers
- To explain the basic concepts in electromagnetism, quantum physics and semiconductors
- To understand the crystal structures and state the laws of thermodynamics

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Describe the fundamentals of oscillatory systems
CO-2: Extend the importance of Interference in thin films, diffraction and Polarization
CO-3: Explain the lasing action of various laser sources and optical fiber materials
CO-4: Apply the concepts of electromagnetism, quantum mechanics and semiconductors for engineering applications
CO-5: Recall the importance crystal structures and applications of thermodynamics

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

UNIT-I:
Oscillations: Periodic motion-simple harmonic motion-characteristics of simple harmonic motion-vibration of simple spring- mass system. Resonance-definition., damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators.

UNIT-II:
Wave Optics: Interference-principle of superposition-young's experiment, Temporal and Spatial Coherence, Theory of interference fringes-types of interference-Fresnel's prism-Newton's rings, Diffraction- Two kinds of diffraction-Difference between interference and diffraction-Fresnel's half period zone and zone plate-Fraunhofer diffraction at single slit-plane diffraction grating.

Polarization of Light: Polarization, Concept of production of polarized beam of light from two SHM acting at right angle; plane, elliptical and circularly polarized light, Brewster's law, double refraction.

UNIT-III:

Laser and Fiber Optics:

Properties of Laser Beams: mono-chromaticity, coherence, directionality and brightness, Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby Laser, CO2 and Neodymium lasers; laser speckles, applications of lasers in engineering.
Fiber optics, Types of optical fibers and Applications.

UNIT-IV:

Quantum Mechanics: Introduction - Planck's quantum theory- Matter waves, de-Broglie wavelength, Heisenberg's Uncertainty principle, time independent and time dependent Schrödinger's wave equation, Physical significance of wave function, Particle in a one dimensional potential box, Heisenberg Picture.
Semiconductor Physics: Basic concept of Band theory; conductor, semiconductor and Insulator.
Basic Idea of Electromagnetism: Continuity equation for current densities, Maxwell's equations in vacuum and non-conducting medium.

UNIT-V:

Crystallography: Basic terms-types of crystal systems, Bravais lattices, miller indices, d spacing, Atomic packing factor for SC, BCC, FCC and HCP structures.
Thermodynamics: Zeroth law of thermodynamics, first law of thermodynamics, brief discussion on application of 1st law, second law of thermodynamics and concept of Engine, entropy, change in entropy in reversible and irreversible processes.

TEXTBOOKS:

1. Concepts of Modern Physics, Beiser A., 5th Edition, McGraw-Hill International
2. Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker, Wiley
3. Physics for Computer Science Students: With Emphasis on Atomic and Semiconductor Physics, Damask, A., Garcia, N., Springer, 2012

REFERENCES:

1. Optics, Ajoy Ghatak, 5th Edition, Tata McGraw-Hill
2. University Physics, Sears & Zemansky, Addison-Wesley
3. Fundamentals of Optics, Jenkins and White, 3rd Edition, McGraw-Hill
4. College Physics, Urone P. P., Brooks/Cole, 1997
5. Polarized Light and Optical Systems, Young G., Lam W. S. T., Chipman R. A., CRC Press, 2018

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2CB101) FUNDAMENTALS OF COMPUTER SCIENCE 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 should 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, 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	PSO-3
CO-1	2	2	3	2	1	-	-	-	2	2	-	2	3	-	-
CO-2	2	2	3	2	1	1	-	-	2	2	-	2	3	1	-
CO-3	1	2	3	1	1	1	-	-	2	2	2	2	3	1	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	3	1	-
CO-5	2	2	2	2	1	1	-	-	2	2	2	2	3	1	-

LIST OF PROGRAMS:

WEEK 1:

Algorithm and flowcharts of small problems like GCD Structured code writing with:

WEEK 2:

Small but tricky codes

WEEK 3:

Proper parameter passing

WEEK 4:
Command line Arguments

WEEK 5:
Variable parameter

WEEK 6:
Pointer to functions

WEEK 7:
User defined header

WEEK 8:
Make file utility

WEEK 9:
Multi file program and user defined libraries

WEEK 10:
Interesting substring matching / searching programs

WEEK 11 & WEEK 12:
Parsing related assignments

TEXT BOOKS:

1. The C Programming Language, B. W. Kernighan and D. M. Ritchi, 2nd Edition, PHI
2. Programming in C, B. Gottfried, 2nd Edition, Schaum Outline Series
3. Let Us C, Yashavant P. Kanetkar, 16th Edition, BPB Publications, 2019

REFERENCES:

1. C: The Complete Reference, Herbert Schildt, 4th Edition, McGraw-Hill
2. Problem Solving with C, Jacqueline A. Jones and Keith Harrow, Pearson Education
3. Programming in ANSI C, E. Balaguruswamy, 8th Edition, McGraw-Hill, 2019
4. A Book on C, Al Kelley, Ira Pohl, 4th Edition, Pearson Education
5. Programming in C, Stephen G. Kochan, CBS Publishers

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2EE102) PRINCIPLES OF ELECTRICAL ENGINEERING LABORATORY

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 PRE-REQUISITES: Principles of Electrical Engineering

COURSE OBJECTIVES:
- To design electrical systems
- To analyse a given network by applying various network theorems
- To verify phase relationships in star and delta connected three phase networks
- To study various electrical safety precautions

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Understand the basic concepts and terminology of electrical quantities
CO-2: Analyse the DC circuits using various network theorems
CO-3: Analyse the electrical parameters of AC circuits with R-L-C elements
CO-4: Control different electrical machines and Transformers and evaluate their performance using different testing methods
CO-5: Simulate the electrical circuits using suitable software

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

LIST OF EXPERIMENTS:

1. Demonstration of safety precautions, measuring instruments and electrical installation components
2. Verification of KVL and KCL
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Verification of Superposition theorem
6. Analysis of single-phase RL, RC and RLC series circuits
7. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
8. Verification of voltage and current relationships in a star connected balanced three Phase Circuit
9. Measurement of electrical quantities in DC and AC circuits
10. Open circuit characteristics of separately excited DC generator

11. Simulation of series RLC circuit (XL>XC, and XL< XC)
12. Simulation of time response of RC circuit

TEXT BOOKS:

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

REFERENCES:

1. Basic Electrical Engineering, P. Ramana, M. Suryakalavathi, G. T. Chandrashekar, 2nd Edition, S. Chand, 2019
2. Basic Electrical Engineering, D. C. Kulshreshtha, McGraw-Hill, 2009
3. Basic Electrical and Electronics Engineering, M. S. Sukhija, T. K. Nagsarkar, 1st Edition, Oxford, 2012
4. Basic Electrical Engineering, Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, 2nd Edition, McGraw-Hill, 2021
5. Electrical and Electronics Technology, E. Hughes, Pearson, 2010

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS2PH103) PHYSICS FOR COMPUTING SCIENCE 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 verify Biot –Savart law
- To study hall co-efficient of semiconductor
- To determine Planck's and Stefan's constant
- To practically learn interaction of light with matter through physical phenomena like interference, diffraction and total internal reflection
- To compare the experimental results with the classroom learning

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

CO-1: Realize tangent law of magnetism

CO-2: Demonstrate the optical phenomena with formation of Newton Rings and to evaluate grating parameters

CO-3: Evaluate the Planck's and Stefan's constant

CO-4: Demonstrate the optical phenomena with formation of Newton Rings and to evaluate grating parameters

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. Magnetic field along the axis of current carrying coil – Stewart and Gee
2. Determination of Hall coefficient of semi-conductor
3. Determination of Plank constant
4. Determination of wavelength of light by Laser diffraction method
5. Determination of wavelength of light by Newton's Ring method
6. Determination of laser and optical fiber parameters
7. Determination of Stefan's Constant

TEXT BOOKS:

1. Physics for Computing Science Laboratory Manual/Observation, Physics Faculty of VNRVJIET

2. A Textbook of Practical Physics, S. Balasubramanian, M. N. Srinivasan, S. Chand, 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. I Semester

(22HS2EN102) BUSINESS COMMUNICATION AND VALUE SCIENCE – I

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 PRE-REQUISITES:

- Basic communication in tenses (past, present, future)
- Awareness of common words (adjectives used in daily verbal communication)
- Basic idea of sentence formation and thereby paragraph building and writing
- Communication according to daily and varied contextual scenarios
- Basic communication model/channel (sender, receiver and feedback), Active and passive listening skills
- Basic social etiquettes and knowledge of group work and communication that will enhance their professional growth

COURSE OBJECTIVES:

- To understand what life skills are and their importance in leading a happy and well-adjusted life
- To motivate students to look within and create a better version of self
- To introduce them to key concepts of values, life skills and business communication
- To enable them to practice basic communication

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

CO-1: Recognize the need for life skills and values
CO-2: Recognize own strengths and opportunities
CO-3: Apply the life skills to different situations
CO-4: Understand the basic tenets of communication
CO-5: Apply basic communication practices in real life situations

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

UNIT-I:

Overview of Leadership Oriented Learning:

i. Self Introduction
ii. Recognise the need of life Skills and Values
iii. Overview of Business Communication

iv. Identify Strengths and Opportunities- Identity, body awareness
v. Stress- Management

UNIT-II:

Essential Grammar:

i. Parts of speech
ii. Tenses
iii. Sentence Formation (General & technical)
iv. Common errors
v. Voices

UNIT-III:

Overview of Communication Skills:

i. Importance of effective communication
ii. Types of communication- verbal and non - verbal
iii. Barriers of communication, effective communication
iv. Importance of Questioning
v. Listening Skills: Law of nature- Importance of listening skills, Difference between listening and hearing; Types of listening.

UNIT-IV:

Written Communication:

i. Letter Writing –Formal and Informal letter writing, Application letters, Job application letter
ii. Summary writing
iii. Story Writing
iv. Report writing
v. Building Curriculum Vitae.

UNIT-V:

Realities of Facing Life:

i. Stress management Working with rthym and balance, Team work
ii. Need for Life skills and values, their importance, Critical life skills
iii. Multiple Intelligences- Embracing diversity
iv. Values: Leadership, Teamwork, dealing with ambiguity, motivation, creativity, result orientation.

Note: Handouts and reference links will be shared

REFERENCES:

1. Strategic Writing, Charles Marsh
2. The Seven Basic Plots, Christopher Booker
3. Business Communication, Saroj Hiremath
4. English vocabulary in Use, Alan McCarthy and O'Dell

WEB REFERENCES:

1. Train Your Mind To Perform Under Pressure, Simon Sinek, https://curiosity.com/videos/simon-sinek-on-training-your-mind-to-perform-under-pressure-capture-your-flag/
2. Brilliant Way One CEO Rallied his Team in the Middle of Layoffs https://www.inc.com/video/simon-sinek-explains-why-you-should-put-people-before-numbers.html

3. Will Smith's Top Ten Rules for Success https://www.youtube.com/watch?v=bBsT9omTeh0

ONLINE RESOURCES:

1. https://www.coursera.org/learn/learning-how-to-learn
2. https://www.coursera.org/specializations/effective-business-communication

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS1MT106) LINEAR ALGEBRA

TEACHING SCHEME		
L	T/P	C
2	1	3

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

COURSE PRE-REQUISITES: Matrices, Determinants, Rank and Vectors

COURSE OBJECTIVES:
- To learn concepts of Matrices, vectors and Linear combinations
- To determiner Rank of a matrix, Echelon form and Augmented form of a matrix
- To find out Eigen Values, Eigen Vectors and application of Cayley-Hamilton theorem
- To learn concepts of vector spaces such as independence, basis, dimensions and orthogonality
- To learn Singular Value Decomposition, PCA and its applications

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Analyze the methods and solve a simultaneous linear system of equations
CO-2: Apply the Matrix methods in solving the linear system of equations
CO-3: Use eigenvectors to represent a linear transformation of matrices
CO-4: Understand the Rank, Basis and dimension to describe the matrices and subspaces
CO-5: Apply the knowledge of singular value decomposition in applications of image processing and machine 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	1	1	1	1	-	-	-	1	-	-	1	-	1	-
CO-2	3	1	1	1	1	-	-	-	1	-	-	1	-	2	-
CO-3	3	1	1	1	1	-	-	-	1	-	-	1	-	1	-
CO-4	3	2	2	1	1	-	-	-	1	-	-	1	-	3	-
CO-5	3	1	1	1	1	-	-	-	1	-	-	1	-	3	-

UNIT-I:
Matrices: Introduction to Matrices. Elementary operations on a matrix, Determinants, Inverse of a Matrix, Vectors and linear combinations; Linear dependence; Solution of Linear Equations using Gaussian elimination and LU Decomposition method (Method of factorization);

UNIT-II:
Solving Systems of Linear Equations: Rank of a matrix, Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method

(Elementary row operations), Solving Systems of Linear Equations: Consistency of Homogeneous and Non-Homogeneous equations.

UNIT-III:

Eigenvalues and Eigenvectors: Positive definite matrices; Linear transformations; Cayley- Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem, Real and complex Matrices: Symmetric; Hermitian; Skew-Symmetric; Skew-Hermitian; orthogonal matrices and Unitary Matrices.

UNIT-IV:

Vector Spaces: Vector space; Subspace, Dimension; Basis; Orthogonality; Projections; Gram-Schmidt orthogonalization and QR decomposition.

UNIT-V:

Applications: Singular value decomposition and Principal component analysis; Introduction to their applications in Image Processing and Machine Learning.

Note:

Assignments & tutorials covering the following: Vectors and linear combinations, Matrices, Linear transformations, Complete solution to Ax = b, Determinants, Eigenvalues and Eigenvectors

TEXT BOOKS:

1. Higher Engineering Mathematics, B. S. Grewal
2. Advanced Engineering Mathematics, Peter V. O'Neil, 7thEdition,
3. Advanced Engineering Mathematics, Michael. D. Greenberg, 2nd Edition,

REFERENCES:

1. Introduction to linear algebra, Gilbert Strang, 5th Edition
2. Applied Mathematics (Vol. I & II), P. N. Wartikar & J. N. Wartikar
3. Digital Image Processing, R. C. Gonzalez and R. E. Woods
4. Introduction to Applied Linear Algebra: Vectors, Matrices, and Least Squares Vandenberghe, L., Boyd, S. United Kingdom: Cambridge University Press, 2018
5. https://machinelearningmastery.com/introduction-matrices-machine-learning

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS1MT107) STATISTICAL MODELING

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE OBJECTIVES:

- To learn sampling techniques
- To know methods of calculating correlation and regression
- To know methods of estimation
- To learn various methods to test the hypothesis
- To learn basic concepts of Time series analysis

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Characterise the huge data using sampling techniques
CO-2: Calculate correlation, regression, rank correlation coefficients
CO-3: Estimate the parameters using different methods of estimation
CO-4: Apply the knowledge of different probability distributions to Test of Hypothesis
CO-5: Use Least squares method to compute time series

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

UNIT-I:

Sampling Techniques: Random sampling, Sampling from finite and infinite populations. Estimates and standard error (sampling with replacement and sampling without replacement), Sampling distribution of sample mean, stratified random sampling.

UNIT-II:

Linear Statistical Models: Simple linear regression & correlation, multiple regression& multiple correlation, Analysis of variance (one way, two way with as well as without interaction)

UNIT-III:

Theory of Estimation: Point estimation, criteria for good estimates (un-biasedness, consistency), Methods of estimation including maximum likelihood estimation.
Sufficient Statistic: Concept & examples, complete sufficiency, their application in estimation

UNIT-IV:

Inference:

Parametric Inference: Concept & formulation, Type I and Type II errors, Neyman Pearson lemma, Procedures of testing.

Non-Parametric Inference: Comparison with parametric inference, Use of order statistics. Sign test, Wilcoxon signed rank test, Mann-Whitney test, Run test, Kolmogorov-Smirnov test. Spearman's and Kendall's test.

UNIT-V:

Basics of Time Series Analysis & Forecasting

Stationary, ARIMA Models: Identification, Estimation and Forecasting.

TEXT BOOKS:

1. Probability and Statistics for Engineers, I. R. Miller, J. E. Freund and R. Johnson, 4th Edition
2. Fundamentals of Statistics (Vol. I & Vol. II), A. Goon, M. Gupta and B. Dasgupta.
3. The Analysis of Time Series: An Introduction, Chris Chatfield

REFERENCES:

1. Introduction to Linear Regression Analysis, D. C. Montgomery & E. Peck
2. Introduction to the Theory of Statistics, A. M. Mood, F. A. Graybill & D. C. Boes
3. Applied Regression Analysis, N. Draper & H. Smith
4. An Introduction to Statistical Modelling, Krzanowski, W. J., Wiley, 2010
5. Applied Statistical Modeling and Data Analytics: A Practical Guide for the Petroleum Geosciences, Datta-Gupta A., Mishra S., Elsevier Science, 2017

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES1CB102) DATA STRUCTURES AND ALGORITHMS

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE PRE-REQUISITES: C Language

COURSE OBJECTIVES:
- To impart the basic concepts of data structures and algorithms
- 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:
*(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	-
CO-2	3	3	2	2	3	-	-	-	2	2	-	2	3	2	-
CO-3	3	3	2	2	3	-	-	-	2	2	-	2	3	2	-
CO-4	3	3	2	2	3	-	-	-	2	2	-	2	3	2	-
CO-5	3	3	3	2	3	2	2	2	3	3	1	2	3	2	1

UNIT-I:
Basic Terminologies & Introduction to Algorithm and Data Organization: Algorithm specification, Recursion, Performance analysis, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming style, refinement of coding-time-Space trade off, testing, data abstraction

UNIT-II:
Linear Data Structure: Array, Stack, Queue, Linked-list and its types, Various Representations, Operations & Applications of Linear Data Structures

UNIT-III:
Non-Linear Data Structure: Trees (Binary Tree, Threaded Binary Tree, Binary Search Tree, B& B+ Tree, AVL Tree, Splay Tree)

UNIT-IV:

Non-Linear Data Structure: Graphs (Directed, Undirected), Various Representations, Operations (search and traversal algorithms and complexity analysis) & Applications of Non- Linear Data Structures.

UNIT-V:

Searching and Sorting on Various Data Structures: Sequential Search, Binary Search, Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap Sort, Introduction to Hashing.

TEXT BOOKS:

1. Fundamentals of Data Structures, E. Horowitz and S. Sahni, 1977
2. Data Structures and Algorithms, Alfred V. Aho, John E. Hopperoft, Jeffrey D. Ullman
3. Data Structures: A Pseudo-code Approach with C, Gilberg & Forouzan, Thomson Learning

REFERENCES:

1. The Art of Computer Programming: Volume 1: Fundamental Algorithms, Donald E. Knuth
2. Introduction to Algorithms, Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein
3. Open Data Structures: An Introduction (Open Paths to Enriched Learning), Pat Morin, 31st Edition
4. An Introduction to Data Structures with Applications, Jean-Paul Tremblay & Paul G. Sorenson, Tata McGraw-Hill
5. Data Structures using C & C++, Ten Baum, Prentice-Hall International

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES1EC101) PRINCIPLES OF ELECTRONICS ENGINEERING

TEACHING SCHEME		
L	T/P	C
3	0	3

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

COURSE PRE-REQUISITES: Fundamentals of Physics

COURSE OBJECTIVES:
- To understand the principle of operation and characteristics of various semiconductor devices
- To study the applications of various semiconductor devices
- To understand the concepts of feedback in amplifiers
- To know about analog and digital IC's

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Understand the principles of operation of Diodes and its applications
CO-2: Understand the operation and biasing of BJT
CO-3: Comprehend the operation and characteristics of FET
CO-4: Analyse the effect of feedback in amplifiers and also understand the Op-Amp
CO-5: Understand the fundamentals of digital electronics

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

UNIT-I:
Diodes and its Applications: Classification of materials: Conductors, Semiconductors (Intrinsic and Extrinsic) & Insulators, Energy band diagrams, drift & diffusion currents,
Diode: Formation of P-N junction, forward and reverse biased P-N junction, V-I characteristics, Diode Equivalent circuit, Zener breakdown, Avalanche breakdown, Zener diode and its reverse characteristics.
Rectifiers: Operation and parameters of Half Wave Rectifier, Full Wave Rectifier

UNIT-II:
Bipolar Junction Transistors: Construction and Operation of npn and pnp transistors, Mode of operating regions, CE- CB- CC configurations, input and output characteristics, Relation between α, β and 'Y, Biasing, Stabiltity factor, Biasing Techniques: Fixed Bias, Self Bias.

UNIT-III:

Field Effect Transistors: Concept of Field Effect Transistors (channel width modulation), JFET operation and characteristics, MOSFET operation and characteristics, depletion and enhancement type, CS, CG, CD configurations, CMOS: Basic Principles.

UNIT-IV:

Feed Back Amplifiers: Concept of feedback, Block diagram, open loop gain, closed loop gain, positive and negative feedback, topologies of feedback amplifier, effect of feedback on amplifier characteristics.

Operational Amplifiers: Introduction to integrated circuits, operational amplifier and its terminal property, Inverting and non- inverting mode of operation, Applications of operational amplifier: Adders, Subtractors, Voltage follower, Integrator, Differentiator.

UNIT-V:

Digital Electronics Fundamentals: Difference between analog and digital signals, Boolean algebra, Basic and Universal Gates, Symbols, Truth tables, logic expressions, Logic simplification using K- map, half and full adder/subtractor, multiplexers, de-multiplexers, flip-flops, shift registers, counters.

TEXT BOOKS:

1. Millman's Integrated Electronics, Jacob Millman, Christos Halkias, Chetan Parikh, 2nd Edition, TMH, 2010
2. Op-Amps and Linear ICs, Ramakanth A. Gayakwad, 4th Edition, PHI, 2016
3. Digital Logic & Computer Design, M. Morris Mano, 4th Edition, PHI, 2016

REFERENCES:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nashelsky, 11th Edition, Pearson, 2015
2. Solid State Electronic Devices, Ben Streetman, Sanjay Banerjee, 7th Edition, PHI, 2016
3. Electronic Principle, Albert Paul Malvino, 3rd Edition, TMH, 2010.
4. Microelectronics, Jacob Millman, Arvin Grabel, 2nd Edition, TMH, 2000.
5. Electronics Devices and Circuits, S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, 2nd Edition, TMH, 2011

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22HS1MG101) FUNDAMENTALS OF MANAGEMENT

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 theories, and practices of management and to provide them with practical exposure to cases of success/failure in business
- To expose to a systematic and critical understanding of organizational structures, and design
- To create awareness on leadership role in carrying out functions of management
- To comprehend the conceptual knowledge relating to Organizational Behavior and to provide a basic understanding of the behavior of individuals and groups in the organizations
- To apply business ethics and corporate social responsibility for business success and growth

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Apply theories to improve the practice of management
CO-2: Describe and assess the basic design elements of organizational structure and design
CO-3: Create awareness of management functions and leadership role
CO-4: Analyze the behaviour of individuals and groups in organizations in terms of the key factors that influence organizational behaviour
CO-5: Evaluate ethical issues that face organizations in the fields finance, sales, and marketing

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

UNIT-I:

Management Theories: Concept and Foundations of Management, Evolution of Management Thoughts [Pre-Scientific Management Era (before 1880), Classical management Era (1880-1930), Neo-classical Management Era (1930-1950), Modern Management era (1950-on word). Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo etc.

UNIT-II:

Organizational Structures: Organizational theory and design, Organisation chart, Organizational structure - Line organisation, Line and Staff organisations, Functional organisation, Committee organisation, Divisional Structure, Matrix Structure, boundaryless structure, virtual structure and Inverted pyramid structure.

UNIT-III:

Functions of Management- Planning, Organizing, Staffing, Directing, Controlling

Leadership: Concept, Nature, Types, Importance, Attributes of a leader, developing leaders across the organization, Leadership Grid

UNIT-IV:

Organization Behavior: Introduction, Personality, Perception, Motivation, Stress Management, Decision Making, Organizational Change, and development.

UNIT-V:

Managerial Ethics: Ethics and Business, Ethics of Marketing & advertising, Ethics of Finance & Accounting, Decision – making frameworks, Corporate Governance, Corporate Social Responsibility.

TEXT BOOKS:

1. Understanding the Theory and Design of Organizations by Richard L. Daft, 11th Edition, Cengage, 2020
2. Management, James Arthur, Finch Stoner, R. Edward Freeman, and Daniel R. Gilbert, 6th Edition, Pearson Education/Prentice Hall
3. Organizational Behaviour, Stephen P. Robbins, Prentice Hall, 2013

REFERENCES:

1. Fundamentals of Management: Essential Concepts And Applications, 6th Edition, Pearson Education, 2009
2. Fundamentals of Management, Amanjot Sachdeva & Dr. Pardeep Kumar, S. Chand, 2012
3. Fundamentals of Management: Essential Concepts and Applications, Robbins S. P., DeCenzo D. A, Prentice Hall, 1995
4. Fundamentals of Management, Pathak J. P., Vikas, 2015
5. Principles of Management: Functions and Fundamentals of Effective Management, Prabhu Thankaraju, 2020

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22BS2MT107) STATISTICAL MODELING 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 explore various stages of data analytics life cycle and Tools used in data analytics
- To understand the programming in R
- To use various data analysis models like regression modelling
- To analyze the usage and importance of statistical methods in building computer applications

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

CO-1: Explore the features of R and R Studio environment

CO-2: Explore the data types and programming constructs of R with examples

CO-3: Apply and use various statistical methods in building computer applications

CO-4: Analyze the data using data models construction and using data mining techniques

CO-5: Understand the importance of data analytics in real life through life cycle

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

LIST OF EXPERIMENTS:

1. Exploring R, R-Studio Environment and Installation process. Explore the features
2. Explore the data types of R and demonstrate the basic operations on datatypes.
3. Create vectors and matrices
4. Explore the control structures of R and demonstrate with one example under eachcase.
5. Create R functions and use them with simple scripts.
6. Explore Data Analytics Life Cycle.
7. Importing & exporting the data from i) CSV file ii) ExcelFile
8. Data Visualization through i) Histogram ii) Pie Chart iii) BoxPlot iv) DensityPlots
9. Demonstrate simple linear regression analysis. Analyze results in detail.
10. Demonstrate multiple regression model. Analyze results in detail.
11. Demonstrate Logistic regression model. Analyze results in detail.

12. Demonstrate other regression model. Analyze results in detail.

TEXT BOOKS:

1. R for Beginners, Sandip Rakshit, McGraw-Hill
2. R-The Statistical Programming Language, Dr. Mark Gardner, Wiley
3. Introduction to Statistical Analysis of Laboratory Data, Bartolucci A., Singh K. P., Bae S., Wiley, 2015

REFERENCES:

1. R Programming, A. K. Verma, Cengage Learning
2. Hands-on Programming with R, Garrett Grolemund
3. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander
4. Learning R Programming, Ren K., Packt Publishing, 2016

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES2CB102) DATA STRUCTURES AND ALGORITHMS 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:

*(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	3	2	-
CO-2	3	3	2	2	3	-	-	-	2	2	-	2	3	2	-
CO-3	3	3	2	2	3	-	-	-	2	2	-	2	3	2	-
CO-4	3	2	1	2	-	-	-	-	2	2	-	1	3	2	1
CO-5	3	3	3	2	3	2	2	2	3	3	1	2	3	2	1

LIST OF EXPERIMENTS:

WEEK 1:

Towers of Hanoi using user defined stacks.

WEEK 2, 3 & 4:

Reading, writing, and addition of polynomials.

WEEK 5 & 6:

Line editors with line count, word count showing on the screen.

WEEK 7 & 8:

Trees with all operations.

WEEK 9 & 10:

All graph algorithms.

WEEK 11 & 12:

Saving / retrieving non-linear data structure in/from a file.

TEXT BOOKS:

1. Fundamentals of Data Structures, E. Horowitz and S. Sahni, 1977
2. Data Structures and Algorithms, Alfred V. Aho, John E. Hopperoft, Jeffrey D. Ullman
3. Data Structures: A Pseudo-code approach with C, Gilberg & Forouzan, Thomson Learning

REFERENCES:

1. The Art of Computer Programming: Volume 1: Fundamental Algorithms, Donald E. Knuth
2. Introduction to Algorithms, Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein
3. Open Data Structures: An Introduction (Open Paths to Enriched Learning), Pat Morin, 31st Edition
4. An Introduction to Data Structures with Applications, Jean-Paul Tremblay & Paul G. Sorenson, Tata McGraw-Hill
5. Data Structures using C & C++, Ten Baum, Prentice-Hall International

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22ES2EC101) PRINCIPLES OF 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 OBJECTIVES:
- To know the characteristics of various semiconductor devices
- To verify the functionality and applications of analog IC's
- To verify the functionality of digital IC's

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Analyze the characteristics of diodes
CO-2: Interpret the characteristics of transistors
CO-3: Apply the knowledge of semiconductor devices
CO-4: Understand the functionality of Op-amp and its applications
CO-5: Comprehend the functionality of digital IC's

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

LIST OF EXPERIMENTS:

1. Forward and Reverse Bias V-I characteristics of PN junction Diode.
2. V-I characteristics of Zener diode.
3. Full wave rectifier.
4. Characteristics of a BJT under CB configuration.
5. Characteristics of a BJT under CE configuration.
6. JFET characteristics under CS configuration.
7. MOSFET characteristics under CS configuration.
8. Inverting and Non-Inverting amplifiers using IC 741 Op-Amp.
9. Adder and subtractor using IC 741 Op-Amp.
10. Integrator and Differentiator using IC 741 Op-Amp.
11. Truth table verification of Logic gates.
12. Truth table verification of Half-Adder and Full Adder.
13. Truth table verification of Multiplexer and De-multiplexer

TEXT BOOKS:

1. Millman's Integrated Electronics, Jacob Millman, Christos Halkias, Chetan Parikh, 2nd Edition, TMH, 2010
2. Op-Amps and Linear ICs, Ramakanth A. Gayakwad, 4th Edition, PHI, 2016
3. Digital Logic & Computer Design, M. Morris Mano, 4th Edition, PHI, 2016

REFERENCES:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nashelsky, 11th Edition, Pearson, 2015
2. Solid State Electronic Devices, Ben Streetman, Sanjay Banerjee, 7th Edition, PHI, 2016
3. Electronic Principle, Albert Paul Malvino, 3rd Edition, TMH, 2010
4. Microelectronics, Jacob Millman, Arvin Grabel, 2nd Edition, TMH, 2000
5. Electronics Devices and Circuits, S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, 2nd Edition, TMH, 2011

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22HS2EN103) BUSINESS COMMUNICATION AND VALUE SCIENCE – II

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 PRE-REQUISITES: Basic Knowledge of English (verbal and written), Completion of all units from Semester 1

COURSE OBJECTIVES:
- To develop effective writing, reading, presentation and group discussion skills
- To identify personality traits and evolve as a better team player
- To introduce key concepts of Morality, Behavior and beliefs, Diversity & Inclusion

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Use tools of structured written communication and electronic/social media to share concepts and ideas
CO-2: Understand the basics of presentation and apply effective techniques to make presentations
CO-3: Understand and apply the basic concept of speed reading, skimming and scanning
CO-4: Identify individual personality types and role in a team and recognize the concepts of outward behavior and internal behavior
CO-5: Understand the basic concepts of Morality and Diversity

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

UNIT-I:
Team Building:
i. Introduction of Dr. Meredith Belbin and his research on team work
ii. Belbin's 8 Team Roles
iii. Lindgren's Big 5 personality traits
iv. Team Falcon Practical to identify individual personality traits with Belbin's 8 team player styles
v. Build a team for an NGO

UNIT-II:

Essential Grammar and Reading Skills:

i. Good and Bad Writing -Discussion
ii. Common errors, Punctuation rules
iii. Lucid writing – writing techniques
iv. Speed Reading
v. Skimming and Scanning

UNIT-III:

Presentation and Social Media Skills-1:

i. Prepared Presentation
ii. Design a street play and promote the play through social media
iii. Prepare and Publish E-magazine
iv. Use electronic/social media to launch the E-magazine
v. Capture the reviews and likes

UNIT-IV:

Branding & Satori:

i. Importance of Branding- Types of Branding-Digital branding
ii. Sharing the learning with peers (Satori)
iii. Branding: NGO and E-Magazine.

Diversity:

iv. Diversity & Inclusion- Different forms of diversity in our society
v. Ethics, Morality and respect for Individual – Diversity
vi. Challenges faced by members of diverse group

UNIT-V:

i. Creating an Organization – Mock NGO:
ii. Three A's – Aware , Articulate and Amplify
iii. Individual identification of Social Issues
iv. Materials to create an identity of an organization –Vision, Mission, Values,
v. Research on the Social cause and recognize the Importance of Integrity, Responsibility, Excellence, Unity & Pioneering
vi. Report writing

REFERENCES:

1. Organizational Behaviour, Fred Luthans, McGraw-Hill, 2013
2. Organizational Behaviour, Stephen P. Robbins, Timothy A. Judge, Nehari /kaohra, 16th Edition, Pearson Education, 2016
3. Business Ethics: Ethical Decision Making & Cases, O. C. Ferrell, John Fraedrich, Linda Ferrell, 12th Edition, Cengage, 2017
4. Business Communication, Bruckmann C., Hartley P., Taylor & Francis, 2008
5. Business Communication, R. K. Madhukar, 3rd Edition, Vikas Publishing, 2018

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester

(22MN6HS102) ENVIRONMENTAL SCIENCE

TEACHING SCHEME		
L	T/P	C
2	0	0

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

COURSE PRE-REQUISITES: Basic knowledge on environmental issues

COURSE OBJECTIVES:
- To recognize the impacts of human interventions towards environment
- To list out the benefits in creating a sustainable world
- To sketch out various activities in achieving a cleaner environment
- To emphasize the role of frontier technologies for a better planet to live

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Gain a variety of experiences & acquire a basic knowledge about the environment & its allied problems
CO-2: Interpret the key components in safeguarding the environment
CO-3: Appraise the quality of environment in order to create a healthy atmosphere
CO-4: Familiarize with the importance of emerging technologies towards green revolution

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	-	-

MODULE 1:
Introduction to Environmental Science: Importance of Environmental Science, Overview of the environment & its components, Human intervention in destruction or sustenance of environment. Relationship between environmental science & society - Influence of Industry, Innovation & infrastructure on environment

MODULE 2:
Synergy With Environment: Health & Well Being-ensuring healthy lives and promoting wellbeing at all ages. Reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. Life under water and on land-conservation & sustainable usage, measures to protect marine & coastal ecosystems from various impacts. Protect and restore terrestrial ecosystems, sustainably managing forests, combat desertification. Biodiversity a valuable resource- biological diversity as a support for food, water, medicine, shelter, cleaning of air and water and other material goods for sustaining life and increase resilience

MODULE 3:

Climate Change: Science behind climate change-factors responsible for climate change, Scientific evidence about past climate and present. Expected consequences of climate change- Impacts of climate change on growth and development. Role of greenhouse gases- Global temperature rise & its impact on environment & human health. Carbon footprint-Briefing on Paris agreement, Identify key sectors for low carbon footprint. Climate change mitigation & adaptation strategies

MODULE 4:

Moving Towards Sustainability: Eco-Audit and its importance. Sustainable agriculture-Organic farming and hydroponics. Role of AI & IOT for efficient management of environmental issues-Health, air, water, and soil. Sustainable living practices-minimizing waste, limited use of earth's natural resources, wise use of environment and ensuring quality working/living environments

MODULE 5:

Innovations in Environmental Science: Sustainable cities and communities-case study, Responsible consumption & production- Refuse, Reduce, Reuse and Recycle with examples. Innovative approaches to waste management-smart waste management, Plastic recycling-innovative ideas.

TEXT BOOKS:

1. Environmental Studies for UG Courses, Erach Bharucha, UGC Publications, 2004
2. Environmental Studies, Rajagopalan, Oxford University Press
3. Introduction to Climate Change, Andreas Schmittner, Oregon State University, 2018

REFERENCES:

1. Green Development: Environment and Sustainability in a Developing World, Bill Adams, 4th Edition, Routledge Publishers, 2021
2. Fixing Climate, Robert Kunzig & Wallace S. Broecker, Profile Books Publisher, 2009
3. Plastic Waste and Recycling-Environmental Impact, Societal Issues, Prevention and Solutions, 1st Edition, Academic Press 2020

ONLINE RESOURCES:

1. https://www.coursera.org/learn/beyond-the-sustainable-development-goals-addressing-sustainability-and-development
2. https://www.coursera.org/specialization/climatechangeandsustainableinvesting