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

I SEMESTER **R19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
19BS1MT02	Discrete Mathematics	3	0	0	3	3
19BS1MT03	Introductory Topics in Statistics, Probability and Calculus	3	0	0	3	3
19ES1CB01	Fundamentals of Computer Science	2	1	0	3	3
19ES1EE03	Principles of Electrical Engineering	3	0	0	3	3
19BS1PH03	Physics for Computing Science	3	0	0	3	3
19ES2CB01	Fundamentals of Computer Science Laboratory	0	0	2	2	1
19ES2EE03	Principles of Electrical Engineering Laboratory	0	0	2	2	1
19BS2PH03	Physics for Computing Science Laboratory	0	0	2	2	1
19HS2EN02	Business Communication and Value Science - I	1	0	2	3	2
Total		**15**	**1**	**8**	**24**	**20**
19MN6HS01	Induction Program	**-**	**-**	**-**	**-**	**-**

II SEMESTER **R19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
19BS1MT06	Linear Algebra	2	1	0	3	3
19BS1MT07	Statistical Modeling	3	0	0	3	3
19ES1CB02	Data Structures and Algorithms	2	1	0	3	3
19ES1EC01	Principles of Electronics Engineering	3	0	0	3	3
19HS1MG01	Fundamentals of Economics	3	0	0	3	3
19BS2MT01	Statistical Modeling Laboratory	0	0	2	2	1
19ES2CB02	Data Structures and Algorithms Laboratory	0	0	2	2	1
19ES2EC01	Principles of Electronics Engineering Laboratory	0	0	2	2	1
19HS2EN03	Business Communication and Value Science – II	1	0	2	3	2
Total		**14**	**2**	**8**	**24**	**20**
19MN6HS02	Environmental Science	2	0	0	2	0

L – Lecture T – Tutorial P – Practical D – Drawing

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19BS1MT02) DISCRETE MATHEMATICS

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

COURSE OBJECTIVES:

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

COURSE OUTCOMES: After completion of the course, the student will 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

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.

UNIT-VI:

Graph Theory Applications: 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, New Delhi, 1985.
4. Graph Theory with Applications, J. A. Bondy and U. S. R. Murty, 2nd Edition, Macmillan Press, London, 1978.
5. Mathematical Logic for Computer Science, L. Zhongwan, 2nd Edition, World Scientific, Singapore, 1998.

REFERENCES:

1. Introduction to Linear Algebra. Gilbert Strang, 5th Edition, Wellesley, 2017.
2. Introductory Combinatorics, R. A. Brualdi, North-Holland, New York, 3rd Edition, Prentice Hall, 1998.
3. Graph Theory with Applications to Engineering and Computer Science, N. Deo, Prentice Hall, Englewood Cliffs, 1974.
4. Introduction to Mathematical Logic, (Second Edition), E. Mendelsohn, Van-Nostrand, London.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19BS1MT03) INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY AND CALCULUS

COURSE PRE-REQUISITES: Permutations, Combinations and Basic Calculus

COURSE OBJECTIVES:

- To learn basic probability theory and statistical parameters
- To learn different types of probability distributions
- To learn basic objectives of statistic and classification of data
- To learn descriptive measures and frequency distributions
- To learn differential and integral calculus

COURSE OUTCOMES: After completion of the course, the student will 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 the problems involving functions of two variables
CO-5: Calculate areas and volumes of solids by applying multiple integrals

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.

UNIT-IV:
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-V:
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-VI:

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.

TEXT BOOKS:

1. Introduction of Probability Models, S. M. Ross, 11th Edition, Academic Press, N.Y., 2014.
2. Introduction to Probability and Statistics for Engineers and Scientists, Sheldon M. Ross, 4th Edition, Academic Press, 2009.
3. Fundamentals of Statistics, Vol. I & II, A. Goon, M. Gupta and B. Dasgupta, World Press, 2016.

REFERENCES:

1. Probability and Statistics for Engineers, I. R. Miller, J.E. Freund and R. Johnson, 4th Edition, PHI, 2011.
2. Introduction to the Theory of Statistics, A. M. Mood, F.A. Graybill and D.C. Boes, 3rd Edition, McGraw Hill Education, 2017.
3. Advanced Engineering Mathematics, Peter V. O'Neil, 7th Edition, Cengage learning, 2011.
4. Advanced Engineering Mathematics, M. D. Greenberg, 2nd Edition, Pearson Education, 2002.
5. Applied Mathematics, P. N. Wartikar and J. N. Wartikar, Vol. I & II, Vidyarthi Prakashan, 2010.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19BS1PH03) PHYSICS FOR COMPUTING SCIENCE

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 explain the basic concepts in quantum physics, crystallography and semiconductors
- To apply the basic principles of LASER to various laser systems and optical fibers
- To state the laws of thermodynamics and their applications

COURSE OUTCOMES: After completion of the course, the student will 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: Apply quantum mechanics to the behavior of a particle, to identify different types of crystals and importance of semiconductors
CO-4: Explain the lasing action of various laser sources and optical fiber materials
CO-5: Recall the importance of laws of thermodynamics and their applications

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:
Basic Idea of Electromagnetism: Continuity equation for current densities, Maxwell's equations in vacuum and non-conducting medium.

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.

UNIT-V:

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-VI:

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.

TEXT BOOKS:

1. Physics, Vol. 2, Halliday, Rensick and Krane, 5th Edition, John Willey & Sons, 2014.
2. Engineering Physics, R. K. Gaur and S. L. Gupta, 8th Edition, Dhanpat Rai and Sons, 2011.
3. Introduction to Semiconductor Materials and Devices, M. S. Tyagi, 3rd Edition, Wiley India, 2014.

REFERENCES:

1. A Textbook of Engineering Physics, M. N. Avadhanulu and P. G. Kshirsagar, 4th Edition, S. Chand, 2014.
2. Optics, A. Ghatak, 2nd Edition, McGraw Hill Education, 2014.
3. Introduction to Solid State Physics, Charles Kittel, 8th Edition, John Wiley & Sons, 2014.
4. Engineering Physics, B. K. Pandey and S. Chaturvedi, 5th Edition, Cengage Learning, 2015.
5. Concepts of Modern Physics, Arthur Beiser, 6th Edition, McGraw Hill Inc, 2016.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	2	**1**	**3**

(19ES1CB01) FUNDAMENTALS OF COMPUTER SCIENCE

COURSE PRE-REQUISITES: None

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 will be able to

CO-1: Understand fundamentals of computers and Illustrate the flowchart, algorithm, pseudo code for a given problem, develop programs using various data types and operators

CO-2: Apply conditional and iterative statements for a given problem

CO-3: Exercise on programs using arrays, pointers, dynamic memory management, structures and unions

CO-4: Develop solution for a given problem using modular approach and perform file handling

UNIT-I:

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

UNIT- II:

Imperative Languages: Introduction to imperative language; syntax and constructs of a specific language (ANSI C)Types 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-III:

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-IV:

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-V:

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, Multi-dimensional array and Row/column major formats, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated. Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral Structures, Table look up, typedef, Unions, Bit-fields

UNIT-VI:

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 including exit, perror and error.h, Line I/O, related miscellaneous functions. File Descriptor, Low level I/O – read and write, Open, create, close and unlink, Random access – lseek, Discussions on Listing Directory, Storage allocator. Debugging, 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, Second Edition, PHI.
2. Programming in C, B. Gottfried, Second Edition, Schaum Outline Series.

REFERENCES:

1. C: The Complete Reference, Herbert Schildt, Fourth Edition, McGraw Hill.
2. Let Us C, Yashavant Kanetkar, BPB Publications.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19ES1EE03) PRINCIPLES OF ELECTRICAL ENGINEERING

COURSE PRE-REQUISITES: None

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 will 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: Analyze the Static and dynamic characteristics of Electro-static and Electromagnetic fields
CO-5: Apply the concept of sensors in measurement of various electrical quantities and understand the electrical safety norms

UNIT-I:
Basic Circuit Concepts and Theorems: Concept of potential difference, voltage, current- Fundamental linear passive and active elements to their functional current-voltage relation, Terminology and symbols in order to describe electric networks, voltage source and current sources, ideal and practical sources, concept of dependent and independent source- Kirchhoff's laws- series and parallel connections- Network solutions using mesh and nodal analysis-star delta transformations- DC circuits: Thevinin's and Norton's theorems, Maximum power transfer theorem- Superposition theorem-Concept of work, power and energy

UNIT-II:
AC Circuit Analysis: Generation of Sinusoidal alternating currents- RMS and average values, form factor and peak factor-series RL, RC and RLC circuits, parallel RLC circuits- phasor representation in polar and rectangular form, concept of impedance, admittance - active, reactive and apparent powers, power factor-Three phase balanced circuits: Star and delta connections

UNIT-III:
Electrostatic and Electromagnetic Fields: Electrostatic Fields: electric field intensity and strength, absolute and relative permitivities, capacitors in series and parallel, energy stored in a capacitor, charging and discharging of capacitors
Electromagnetic Fields: Electricity and magnetism, magnetic field and Faraday's laws, self and mutual inductances, Ampere's law, magnetic circuit, magnetic materials and BH curve

UNIT-IV: Transformers and DC Machines:

Transformer: Single phase transformer principle, emf equation, Transformation ratio, KVA rating, Efficiency and regulation

DC Machines: Electromechanical energy conversion principle, DC generator construction, principle, emf generated, types, DC motor principle, back emf

UNIT-V:

Measurements and Transducers: Measurements and Transducers: Introduction to electrical measurements, types of instruments, indicating type instruments (MC and MI)(Elementary treatment only), integrating type instruments (Induction type Energy meter), (Elementary treatment only) , Measurement of voltage, current and power in DC and single phase AC circuits – Transducers: Piezoelectric and Thermo-couple related to electrical signals

UNIT-VI:

Electrical Wiring and Batteries: Basic layout of wiring in domestic installations, types of wiring Systems, wiring accessories,

Earthing: Need and types, safety devices) (Elementary treatment only)

Batteries: Principle, types, construction and applications

TEXT BOOKS:

1. Basic Electrical Engineering, D. C. Kulshreshtha, 2nd Edition, TMH, Revised 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, Sixteenth Edition, Khanna Publishers, 2011.

REFERENCES:

1. Basic Electrical Engineering, V. K. Mehta, S. Chand and Company Ltd., New Delhi.
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 Education, 2011.
4. Fundamentals of Electrical and Electronics Engineering, Smarjith Ghosh, Prentice Hall (India) Pvt. Ltd., 2010.
5. Basic Electrical Engineers, P. Ramana, M. Surya Kalavathi, G. T. Chandra Sekhar, S. Chand Technical Publications, 2018.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19BS2PH03) PHYSICS FOR COMPUTING SCIENCE LABORATORY

COURSE OBJECTIVES:

- To practically learn interaction of light with matter through physical phenomena like interference, diffraction and dispersion
- To understand the periodic motion and formation of standing waves and know the characteristics of the capacitors and resistors
- To study semiconductor devices
- To experience resonance phenomena
- To compare the experimental results with the class room learning

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

CO-1: Demonstrate the optical phenomena with formation of Newton Rings, pure spectrum through prism and to evaluate grating parameters

CO-2: Illustrate periodic motion by measuring rigidity modulus of a material and also discharging of a capacitor

CO-3: Asses the various characteristics semiconductor devices

CO-4: Realize tangent law of magnetism and resonance phenomenon in Melde's and Sonometer experiment

CO-5: Correlate the experimental results with the class room learning

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. Beiser A., Concepts of Modern Physics, Fifth Edition, McGraw Hill International.
2. David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics, Wiley Plus.

REFERENCES:

1. Ajoy Ghatak, Optics, Fifth Edition, Tata McGraw Hill.
2. Sears & Zemansky, University Physics, Addison-Wesley.
3. Jenkins and White, Fundamentals of Optics, Third Edition, McGraw-Hill.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19ES2CB01) FUNDAMENTALS OF COMPUTER SCIENCE LABORATORY

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 the 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: Implement programs using modular approach, file I/O
CO-4: Solve a given problem using C language

LIST OF EXPERIMENTS:

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.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19ES2EE03) PRINCIPLES OF ELECTRICAL ENGINEERING LABORATORY

COURSE OBJECTIVES:

- To design electrical systems
- To analyze a given network by applying various network theorems
- To verify phase relationships in star and delta connected three phase networks
- To study various electrical measuring instruments and transducers

COURSE OUTCOMES: After completion of the course, the student will 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: Simulate the electrical circuits using suitable software

LIST OF EXPERIMENTS:

PART-A:

1. Demonstration of electrical elements and sources
2. Demonstration of measuring instruments
3. Demonstration of transducers

PART-B:

1. Measurement of electrical quantities in DC and AC circuits
2. Determination of resistance temperature coefficient
3. Verification of KVL and KCL
4. Verification of Thevenin's and Norton's theorems
5. Verification of superposition theorem
6. Verification of maximum power transfer theorem
7. Verification of relation between phase and line quantities in a 3-phase balanced star and delta connected systems
8. Simulation of series RLC circuit (XL>XC ,and XL< XC)
9. Simulation of time response of RC circuit
10. Load test on single phase transformer

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester	**L**	**T/P/D**	**C**
	1	**2**	**2**

(19HS2EN02) BUSINESS COMMUNICATION AND VALUE SCIENCE - I

COURSE PRE-REQUISITES:

1. Basic communication in tenses (past, present, future)
2. Awareness of common words (adjectives used in daily verbal communication)
3. Basic idea of sentence formation and thereby paragraph building and writing
4. Communication according to daily and varied contextual scenarios
5. Basic communication model/channel (sender, receiver and feedback), Active and passive listening skills
6. 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 will 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 the basic communication practices in different types of communication

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- Idenity, body awareness
v) Stress- Management

UNIT-II:
Essential Grammar – I:

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:

Verbal Communication and Vocabulary Enrichment:

A. Vocabulary Enrichment:

i) Exposure to words from General Service List (GSL) by West,
ii) Academic word list (AWL) technical specific terms related to the field of technology, phrases, idioms,
iii) Significant abbreviations formal business vocabulary

B. Phonetics:

i) Pronunciation, Clarity of Speech
ii) Reduction of MTI in spoken English
iii) Importance of Questionin: Question formation with emphasis on common errors made during conversation.

UNIT-V:

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-VI:

Realities of Facing Life:

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

TEXT BOOKS:

There are no prescribed texts for semester I – there will be handouts and reference links 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:

- **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/

- **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

- **Will Smith's Top Ten rules for success**

https://www.youtube.com/watch?v=bBsT9omTeh0

Online Resources:

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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	2	**1**	**3**

(19BS1MT06) LINEAR ALGEBRA

COURSE PREREQUISITES: Matrices, Determinants, Rank and Vectors

COURSE OBJECTIVES: To learn
- Concepts of Matrices, vectors and Linear combinations.
- Rank of a matrix, Echolen form and Augmented form of a matrix.
- Concepts of vector spaces such as independence, basis, dimensions and orthogonality.
- Eigen Values, Eigen Vectors and Singular Value Decomposition.

COURSE OUTCOMES: Student will be able to
CO-1: Analyze the methods and solve a simultaneous linear system of equations**.**
CO-2: Apply the Matrix tools in solving the linear system of equations.
CO-3: Understand the Rank, Basis and Matrix Invertibility theorems to describe matrices and subspaces.
CO-4: Use eigenvectors to represent a linear transformation of a matrices.
CO-5: Apply the knowledge of singular value decomposition in applications of image processing and machine learning.

UNIT-I:
Introduction to Matrices and Determinants; Solution of Linear Equations, Cramer's rule, Inverse of a Matrix.

UNIT-II:
Vectors and linear combinations, Rank of a matrix, Gaussian elimination, LU Decomposition.

UNIT-III:
Solving Systems of Linear Equations using the tools of Matrices.

UNIT-IV:
Vector space, Dimension, Basis, Orthogonality, Projections, Gram-Schmidt orthogonalization and QR decomposition.

UNIT-V:
Eigenvalues and Eigenvectors, Positive definite matrices, Linear transformations, Hermitian and unitary matrices.

UNIT-VI:
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, Eigen

values and Eigen vectors.

TEXT BOOKS:

1. Higher Engineering Mathematics, B. S. Grewal, 43rd Edition, Khanna, 2015.

REFERENCES:

1. Advanced Engineering Mathematics, Peter V. O'Neil, 7th Edition, Cengage, 2012.
2. Advanced Engineering Mathematics, Michael. D. Greenberg, 2nd Edition, Pearson, 2017.
3. Introduction to Linear Algebra, Gilbert Strang, 5th Edition, Wellesley, 2017.
4. Applied Mathematics, Vol. I & II, P. N. Wartikar & J. N. Wartikar, Pune Vidyarthi Griha Prakashan, 2010.
5. Digital Image Processing, R. C. Gonzalez and R. E. Woods, 4th Edition, Kluwer, 1997.

WEB SOURCE:

1. https://machinelearningmastery.com/introduction-matrices-machine-learning/

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19BS1MT07) STATISTICAL MODELLING

COURSE OBJECTIVES: To learn
- Sampling techniques.
- Methods of calculating correlation and regression
- Various methods to test the hypothesis
- Basic concepts of Time series analysis.

COURSE OUTCOMES: Students will be able to
CO-1: Characterise the huge data using sampling techniques.
CO-2: Calculate correlation, regression, rank correlation coefficients.
CO-3: Apply the knowledge of different probability distributions to Test of Hypothesis.
CO-4: Use Least squares method to compute time series

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 line a regression & correlation, multiple regression & multiple correlation, Analysis of variance (one way, two way with as well as without interaction)

UNIT-III:
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:
Test of hypothesis: Concept & formulation, Type I and Type II errors, Neyman Pearson lemma, Procedures of testing

UNIT-V:
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. Tolerance region

UNIT-VI:
Basics of Time Series Analysis & Forecasting:
Stationary, ARIMA Models: Identification, Estimation and Forecasting.

TEXTBOOKS:

1. Probability and Statistics for Engineers, I. R. Miller, J. E. Freund and R. Johnson, 8th Edition, Pearson Publication, 2015
2. Probability and Statistics for Engineers and Scientists, Sheldon M. Ross, 4th Edition, Academic Press, 2009
3. The Analysis of Time Series: An Introduction, Chris Chatfield, 5th Edition, Chapman & Hall, 1996

REFERENCES:

1. Introduction to Linear Regression Analysis, D. C. Montgomery and E. Peck, 5th Edition, John Wiley & Sons, 2012
2. Introduction to the Theory of Statistics, A. M. Mood, F. A. Graybill & D. C. Boes, 3rd Edition, McGraw Hill, 1974

Applied Regression Analysis, N. Draper & H. Smith, 3rd Edition, John Wiley & Sons, 1998

DATA SOURCE:

- www.rbi.org.in

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	2	**1**	**3**

(19ES1CB02) DATA STRUCTURES AND ALGORITHMS

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 will be able to
CO-1: Analyze basic concepts of data structures, computation complexity
CO-2: Understand linear data structures, various sorting, searching techniques
CO-3: Apply various operations on linear and non-linear data structures
CO-4: Identify appropriate and efficient data structure to implement a given problem

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, Breadth First Search, Depth First Search, Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap Sort, Introduction to Hashing

UNIT-VI:
File: Organization (Sequential, Direct, Indexed Sequential, Hashed) and various types of accessing schemes.

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.

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), 31st Edition, Pat Morin.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19ES1EC01) PRINCIPLES OF ELECTRONICS ENGINEERING

COURSE PRE-REQUISITE: 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 will be able to

CO-1: Explain the principles of operation and substantiate the applications of various semiconductor devices

CO-2: Understand the effect of feedback in amplifiers

CO-3: Apply the knowledge of analog IC's

CO-4: Use several digital IC's in various applications

UNIT-I:

Semiconductors: Crystalline material: Mechanical properties, Energy band theory, Fermi levels; Conductors, Semiconductors & Insulators: electrical properties, band diagrams; Semiconductors: intrinsic & extrinsic, energy band diagram, P and N-type semiconductors, drift & diffusion currents.

UNIT-II:

Diodes and Diode Circuits: Formation of P-N junction, energy band diagram, formation of depletion zone, built-in-potential, forward and reverse biased P-N junction, V-I characteristics, Linear piecewise model, Junction capacitance, Zener breakdown, Avalanche breakdown, Zener diode and its reverse characteristics. Rectifier circuits: half wave, full wave, PIV, DC voltage and current, ripple factor, efficiency, regulation.

UNIT-III:

Bipolar Junction Transistors: Formation of PNP / NPN junctions; transistor mechanism and principle of transistors, CE, CB, CC configuration, transistor characteristics: cut-off, active and saturation mode, transistor action, injection efficiency, base transport factor and current amplification factors; Biasing and Bias stability: calculation of stability factor.

UNIT-IV:

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

UNIT-V:

Feed Back Amplifier, and Operational Amplifiers: Feed Back Amplifier : Concept of feedback, Block diagram, feedback factor, open loop gain, loop gain, properties, positive and negative feedback, topologies of feedback amplifier, effect of feedback on gain, output impedance, input impedance, sensitivities (qualitative), bandwidth stability

Operational Amplifiers: Introduction to integrated circuits, operational amplifier and its terminal properties; Application of operational amplifier; Inverting and non-inverting mode of operation, Adders, Subtractors, Constant-gain multiplier, Voltage follower, Comparator, Integrator, Differentiator.

UNIT-VI:

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, Logic ICs, 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 Publishers, 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 & TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(19HS1MG01) FUNDAMENTALS OF ECONOMICS

COURSE OBJECTIVES:

- To provide a unifying theme of managerial decision making around the theory of firm by introducing tools such as demand and supply analysis and to analyze consumer behavior w.r.t, select, buy, use and dispose goods, services and ideas based on the effects of price change, income change and substitutions.
- To get acquainted with various production theories, various costs and their role in cost minimization and various market structures such as perfect and imperfect competition.
- To gain knowledge on important elements of Nation's economic environment (National Income, National Product, Exports, Imports, Taxes, Subsidies, etc.), to evaluate economic models describing the demand and supply of money and to measure policies and paradigms which are influencing business cycle and stabilization

COURSE OUTCOMES: After completion of this course, the student will be able to:
CO-1: Explain the theory of the firm and various micro-economics tools such as demand, supply and consumer analysis that would help in forward planning and decision making.
CO-2: Summarize production theories, factors of production, various costs and revenue concepts and to apply the above conceptual knowledge to the various market structures under perfect and imperfect competition.
CO-3: Classify the components of National income with the help of income determination tools.
CO-4: Examine the policies and procedures of Government and external sectors of imports and exports in monitory operations by considering demand and supply of money.
CO-5: Compare the existing business cycles and its stabilization considering monetary policies & paradigms which are influencing price-wage rigidities and unemployment.

UNIT-I:
Principles of Demand and Supply — Supply Curves of Firms — Elasticity of Supply; Demand Curves of Households — Elasticity of Demand; Equilibrium and Comparative Statics (Shift of a Curve and Movement along the Curve); Welfare Analysis — Consumers' and Producers' Surplus — Price Ceilings and Price Floors

UNIT-II:
Consumer Behaviour — Axioms of Choice - Budget Constraints and Indifference Curves; Consumer's Equilibrium — Effects of a Price Change, Income and Substitution Effects —Derivation of a Demand Curve; Applications — Tax and Subsidies — Intertemporal Consumption — Suppliers' Income Effect

UNIT-IIII:
Theory of Production - Production Function and Iso-quants — Cost Minimization; Cost Curves — Total, Average and Marginal Costs — Long Run and Short Run Costs; Equilibrium of a Firm Under Perfect Competition; Monopoly and Monopolistic Competition

UNIT-IV:
National Income and its Components — GNP, NNP, GDP, NDP; Consumption Function; Investment; Simple Keynesian Model of Income Determination and the Keynesian Multiplier

UNIT-V:
Government Sector — Taxes and Subsidies; External Sector — Exports and Imports; Money — Definitions; Demand for Money —Transactionary and Speculative Demand; Supply of Money — Bank's Credit Creation Multiplier; Integrating Money and Commodity Markets — IS, LM Model

UNIT-VI:
Business Cycles and Stabilization — Monetary and Fiscal Policy — Central Bank and the Government; *The Classical Paradigm* — Price and Wage Rigidities — Voluntary and Involuntary Unemployment

TEXT BOOKS:

1. Microeconomics, Pindyck, Robert S., and Daniel L. Rubinfeld, 8th Edition, Pearson Education, 2017.
2. Macroeconomics, Dornbusch, Fischer and Startz, 13th Edition, McGraw-Hill, 2018.
3. Economics, Paul Anthony Samuelson, William D. Nordhaus, 19th Edition, McGraw-Hill, 2012.

REFERENCES:

1. Intermediate Microeconomics: A Modern Approach, Hal R. Varian, 9th Edition, Springer, 2014.
2. Principles of Macroeconomics, N. Gregory Mankiw, 7th Edition, Cengage India, 2012.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19BS2MT01) STATISTICAL MODELLING LABORATORY

COURSE OBJECTIVES: The objective(s) of this course is to,

- Explore various stages of data analytics life cycle and Tools used in data analytics.
- Understand the programming in R.
- Use various data analysis models like regression modelling
- Analyze the usage and importance of statistical methods in building computer applications.

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

CO-1: Understand the importance of data analytics in real life through life cycle and 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.

R statistical programming language: Introduction to R, Functions, Control flow and Loops, Working with Vectors and Matrices, Reading in Data, Writing Data, Working with Data, Manipulating Data, Simulation, Linear model, Data Frame, Graphics in R

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 Education, 1st Edition, 2017

2. R-The Statistical Programming Language, Mark Gardener, Wiley India Pvt. Ltd., 2017

REFERENCES:

1. R Programming, A. K. Verma, 1st Edition, Cengage Learning, 2017
2. Hands-on Programming with R, Garrett Grolemund, O'Reilly Media, 2014
3. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander, 2nd Edition, Addison Wesley, 2014

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19ES2CB02) DATA STRUCTURES AND ALGORITHMS LABORATORY

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 will 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: Use appropriate data structure for any given problem

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.

TEXTBOOKS:

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.

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), 31st Edition, Pat Morin.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(19ES2EC01) PRINCIPLES OF ELECTRONICS ENGINEERING LABORATORY

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 will be able to
CO-1: Analyze the characteristics of various semiconductor devices
CO-2: Apply the knowledge of semiconductors
CO-3: Understand the functionality of analog and digital IC's

LIST OF EXPERIMENTS:

Simulation of any 3 or 4 experiments using open source software

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, subtractor and comparator 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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	1	**2**	**2**

(19HS2EN03) BUSINESS COMMUNICATION AND VALUE SCIENCE – II

NATURE OF COURSE: Behavioral

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

COURSE OBJECTIVES:

- Develop effective writing, reading, presentation and group discussion skills
- Help students identify personality traits and evolve as a better team player
- Introduce them to key concepts of Morality, Behavior and beliefs, Diversity & Inclusion

COURSE OUTCOMES: After completion of the course, the student will 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

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 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
II. Types of Branding
III. Digital branding
IV. Sharing the learning with peers (Satori)
V. Branding: NGO and E-Magazine.

UNIT – V:

Diversity:

I. Diversity & Inclusion
II. Different forms of diversity in our society
III. Ethics, Morality and respect for Individual – Diversity
IV. Challenges faced by members of diverse group
V. Interviews of people from diverse groups.

UNIT -VI:

Creation of an organization - Mock NGO:

I. Three A's – Aware , Articulate and Amplify
II. Individual identification of Social Issues
III. Materials to create an identity of an organization –Vision, Mission, Values,
IV. Research on the Social cause and generate a Importance of Integrity, Responsibility, Excellence, Unity & Pioneering
V. Report writing

TEXT BOOKS:

There are no prescribed texts for semester II – there will be handouts and reference links shared.

REFERENCES:

1. Guiding Souls : Dialogues on the purpose of life; Dr. A.P.J Abdul Kalam, 2005; Co-author--Arun Tiwari
2. The Family and the Nation; Dr. A.P.J Abdul Kalam, 2015; Co- author: Acharya Mahapragya
3. The Scientific India: A twenty First Century Guide to the World around Us; Dr. A.P.J Abdul Kalam, 2011; Co-author- Y.S.Rajan
4. Forge Your Future: Candid, Forthright, Inspiring ; Dr. A.P.J Abdul Kalam, 2014

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

B.Tech. II Semester	**L**	**T/P/D**	**C**
	0	**2**	**0**

(19MN6HS02) ENVIRONMENTAL SCIENCE

COURSE PRE-REQUISITES: Basic knowledge of environmental issues

COURSE DESCRIPTION:
Environmental science is the study of patterns and processes in the natural world and their modification by human activity. We as human beings are not an entity, separate from the environment around us, rather we are a constituent seamlessly integrated and co-exist with the environment around us. To understand current environmental problems, we need to consider physical, biological and chemical processes that are often the basis of those problems. The course requires the students to identify and analyse natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. This course will survey some of the many environmental science topics at an introductory level, ultimately considering the sustainability of human activities on the planet. We are not an entity so separate from the environment that we can think of mastering and controlling it rather we must understand that each and every action of ours reflects on the environment and vice versa.

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

COURSE OUTCOMES:
CO-1: Gain a variety of experiences & acquire a basic knowledge about the environment & its allied problems
CO-2: Interpret the key components in safe guarding the environment
CO-3: Appraise the quality of environment in order to create a healthy atmosphere
CO-4: Familiarize with the individual responsibilities towards green revolution

MODULE 1: INTRODUCTION
Environmental Science: Introduction, Definition, scope and importance.

MODULE 2: AWARENESS ACTIVITIES
Small group meetings about:
- Water management
- Projects Vs Environment
- Generation of less waste
- Promotion of recycle use
- Impact of Science & Technology on Environment
- Avoiding electronic waste

MODULE 3: SLOGAN AND POSTER MAKING EVENT
- Food waste management

- Rain water harvesting
- Climate change
- Green Power
- Water conservation
- Green at work
- Role of IT in environment and human health
- Sustainable development

MODULE 4: EXPERT LECTURES ON ENVIRONMENTAL SCIENCE

- Environmental Impact Assessment
- Industrial waste treatment
- Organic farming/Vertical gardens/Hydroponics

MODULE 5: CLEANLINESS DRIVE

- Indoor air pollution
- Vehicular pollution
- Visual pollution
- Waste management at home
- Composting
- Plastic recycling

MODULE 6: CASE STUDIES

- HPCL disaster in Vizag
- Oleum gas leak in Delhi
- Mathura Refinery & Taj Mahal
- Conservation of Hussain Sagar lake
- The Cleanliest city of India-Surat
- Green Buildings in India
- KBR park in Hyderabad (Environmental protection Vs Development)
- Fluorosis
- Ecotourism & its impacts

TEXT BOOKS:

1. Environmental Studies for UG Courses, Erach Bharucha, UGC Publications, Delhi, 2004.
2. Textbook of Environmental Studies, Deeksha Dave, S. S. Katewa, Cengage Delmar Learning India Pvt., 2012.

REFERENCES:

1. Introduction to Environmental Science, Y. Anjaneyulu, BS Publications, 2004.
2. Environmental Studies, Anubha Kaushik & C. P. Kaushik, 4th Edition, New Age International Publishers.