VISION OF THE INSTITUTE

Vision:

To empower the students through Academic excellence and Ethics so as to bring about social transformation and prosperity.

MISSION OF THE INSTITUTE

Mission:

- To expand the frontiers of knowledge through quality education.
- To provide value added Research and development.
- To embody a spirit of excellence in Teaching, Creativity, Entrepreneurship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional behavior.

VISION OF EEE DEPARTMENT

Vision:

To be recognized as a Centre of Excellence in the field of Education and Research so as to produce competent & Ethical Engineers capable enough to contribute to the society.

MISSION OF EEE DEPARTMENT

Mission:

- To develop innovative, efficient and proficient electrical engineers.
- To keep the curriculum industry friendly, with due regard to the University curriculum.
- To be a place for innovative blended learning and entrepreneurship development in multidisciplinary areas.
- To promote ethical and moral values among the students so as to make them emerge as responsible professionals.

EEE DEPT PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

PEO1: To produce Electrical and Electronics Engineering graduates who have strong foundation in Mathematics, Sciences and Basic Engineering

PEO2: To provide intensive training in problem solving, laboratory skills and design skills to use modern engineering tools through higher education and research.

PEO3: Ability to pursue higher studies and to seek employment in a variety of engineering technology positions and work successfully in their chosen career aspirations and generate entrepreneurs.

PEO4: To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context through life-long learning.

PROGRAM OUTCOMES (POs) OF EEE DEPARTMENT

Program Outcomes are the statements that describe what learners will know and be able to do when they graduate from a program.

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. 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.

PO4. 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.

PO5. 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.

PO6. 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.

PO7. 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.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10.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.

PO11.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.

PO12.Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES(PSO'S) OF EEE DEPARTMENT

PSO 1: The EEE program must demonstrate knowledge and hands-on competence in the application of electrical and electronics circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry.

PSO 2: The EEE program must demonstrate that graduates can apply interdisciplinary project management techniques to electrical and electronics systems.

PSO 3: The EEE program must demonstrate that graduates can analyze, design and develop hardware and software for control systems, measurements, power electronics and power systems

Course Name	DIGITAL LOGIC DESIGN				
Year/Semester	II B.Tech/II Sem	L	T	P	C
Regulation Year	2021-22	3	0	0	3
Branch	EEE				

OBJECTIVES:

- To solve a typical number base conversion and analyze new error coding techniques.
- Theorems and functions of Boolean algebra and behavior of logic gates.
- To optimize logic gates for digital circuits using various techniques.
- Boolean function simplification using Karnaugh maps and Quine-Mc Cluskey methods.
- To understand concepts of combinational circuits.
- To develop advanced sequential circuits.

UNIT I

Review of Number Systems & Codes: Representation of numbers of different radix, conversion of numbers from one radix to another radix, r-1's complement and r's complement of unsigned numbers subtraction, problem solving. Signed binary numbers, different forms, problem solving for subtraction.

4-bit codes: BCD, EXCESS 3, 2421, Gray code.

UNIT II

Boolean Theorems and Minimization Functions: Boolean theorems, principle of complementation & duality, De-Morgan theorems. Basic logic gates and Universal gates, NAND-NAND and NOR- NOR realizations, Standard SOP and POS, Minimization techniques: minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 5 variables, tabular minimization.

UNIT III

Combinational Logic Circuits: Design of Half adder, Full adder, Half subtractor, Full subtractor, applications of Full adders, 4-bit binary adder, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit, Excess3 adder circuit, look-a-head adder circuit. Design of Encoder, Multiplexer, Decoder, Demultiplexer, Realization of Boolean Functions Using Decoders and Multiplexers, Priority Encoder, 4 bit digital comparator.

UNIT IV

PLDs: Introduction, Types of PLDs, Basics structures of PROM, PAL, PLA, Realization of Boolean function using PROM, PAL, PLA, Comparison of PLDs.

UNIT V

Sequential Logic Circuits: Classification of sequential circuits, Latches and Flip flops, Triggering, excitation tables, Asynchronous inputs, Conversion from one flip-flop to another flip flop. Registers- Types, modes of operations, bi-directional shift registers, universal shift register, Counters- synchronous & Asynchronous counters, design of mod counters, Counters using shift registers, Serial binary adder.

TEXT BOOKS:

1. Switching Theory and Logic Design by Hill and Peterson Mc-Graw Hill TMH edition.
2. Switching Theory and Logic Design by A. Anand Kumar.
3. Digital Design by Morris Mano PHI.

4. Switching and finite automata theory Zvi. KOHAVI, Niraj. K.Jha
3rdEdition,Cambridge University Press, 2009

REFERENCE BOOKS:

1. Modern Digital Electronics by RP Jain, TMH.
2. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers, 2006.
3. Micro electronics by Milliman MH edition.

OUTCOMES:

After completion of the course, the student will be able to

- ✓ Classify different number systems and apply to generate various codes.
- ✓ Use the concept of Boolean algebra in minimization of switching functions
- ✓ Design different types of combinational logic circuits.
- ✓ Apply knowledge of flip-flops in designing of Registers and counters
- ✓ The operation and design methodology for synchronous sequential circuits and algorithmic state machines.

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	Mathematics IV (Numerical Methods, Probability &Statistics)				
Branch	EEE				

Course Objectives:

To enable the students to

1. know the standard numerical methods to find roots of functionsin practical engineering problems
   and identify the concepts of interpolation, to estimate the unknown functional values.
2. identify the methods for finding the values of derivatives and finite integrals using numerical techniques
3. understand various statistical distributions
4. decide the null or alternative hypotheses using the suitable test statistic

Unit-I: Solution of Algebraic and Transcendental Equations & Interpolation

Introduction- algebraic function and transcendental function - Bisection method, Regula – Falsi Method, Iteration Method, Newton- Raphson method.

Introduction, Finite Differences, Forward,Backward and Central Differences - Newton's forward and backward formulae –Gauss's forward and backward interpolation formulae- Lagrange's Interpolation Formula.

Unit-II: Numerical Integration and Solution of Ordinary Differential Equations

Numerical Integration-Trapezoidal rule – Simpson's $1/3^{rd}$ Rule –Simpson's $3/8^{th}$ Rule. Solution by Taylor's method, Euler's & Modified Euler's method, Runge- Kutta Method (4^{th} order)

Unit-III: Probability Distributions

Basic concepts on probability, random variables (discrete and continuous)**,** probability distribution- Binomial, Poisson and Normal distributions and their properties

Unit- IV :**Sampling Theory**: Introduction – Population and samples – Sampling distribution of Means and Variance (definition only) – Central limit theorem (without proof) – Introduction to t, χ^2 and F distributions – Point and Interval estimations – Maximum error of estimate.

Unit- V :Tests of Hypothesis: Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type II errors – Level of significance – One tail and two-tail tests – Tests concerning one mean and two means (Large and Small samples) – Tests on proportions.

Text Books:

3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, reprint, 2008.
4. B. V. Ramana, Engineering Mathematics, 4th Ed., Tata McGraw Hill, New Delhi, 2009
5. S.C. Gupta, V.K. Kapoor Fundamentals of Mathematical Statistics a Modern Approach, 10th Edition 2000

References:

5. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12th Ed., S. Chand Publishers, 2014
6. S.S.Sastry, Introductory methods of Numerical Analysis, Prentice Hall of India Pvt. Ltd., 4th Ed., 2006

Course Outcomes:

After undergoing this course, students will be able to

1. apply standard numerical methods to solve fundamental and practical engineering problems and understand the concepts of interpolationto estimate the unknown functional values.
2. evaluate finite integrals and solving differential equations using numerical techniques
3. understand the discrete and continuous probability distributions and apply relevant engineering problems
4. perform inferential statistics to test hypothesis for large samples
5. apply the concept of testing hypothesis for small samples to draw the inferences and estimate the goodness of fit.

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-2021	3	0	0	3
Subject	CONTROL SYSTEMS				
Branch	EEE				

Course Objectives:

- To learn the mathematical modeling of physical systems and to use block diagram algebra and signal flow graph to determine overall transfer function.
- To analyze the time response of first and second order systems and study of controllers.
- To investigate the stability of closed loop systems using Routh's stability criterion and the analysis by root locus method.
- To present the Frequency Response approaches for the analysis of linear time invariant (LTI) systems using Bode plots, polar plots.
- To discuss basic aspects of design and compensation of linear control systems using Bode plots.
- Ability to formulate state models and analyze the systems. To present the concepts of Controllability and Observability.

UNIT – I

Mathematical modeling of control systems

Classification of control systems - Open Loop and closed loop control systems and their differences with examples. Feed - Back principle and characteristics. Definition of Transfer function, determination of transfer function of translational, rotational mechanical systems and electrical networks. Transfer Function of DC Servo motor - AC Servo motor - Synchro transmitter and receiver with block diagrams - Block diagram algebra - Signal flow graph.

UNIT-II

Time domain analysis and controllers

Standard test signals - Time response of first order systems – Time response of second order systems - Time domain specifications – Steady state response -dominant closed loop poles- Steady state errors and error constants.

Definition of Controller -Proportional (P) controller, Proportional Integral (PI) controller, proportional controller (PD) and Proportional Integral Derivative controller (PID).

UNIT – III

Absolute Stability and Root Locus

The concept of stability – Routh Hurwitz criterion – The root locus concept - construction of root loci(Simple Problems)-Effect of addition of open loop Poles & Zeros on Root Locus.

Introduction to Frequency Response and Bode Plot

Frequency domain specifications-Bode diagrams.

UNIT – IV

Relative stability analysis

Stability analysis of LTI systems using Bode Plots and Nyquist Plot - Phase margin and Gain margin – Nyquist stability criterion .

Compensators

Lag, Lead, Lead-Lag Compensators - Design of Lag, Lead, Lead-Lag Compensators-using Bode plots.

UNIT – V

State space analysis

Concepts of state, state variables and state model, State space representation of transfer function : Controllable canonical form, Observable canonical form and diagonal Canonical form, Diagonalization - Solving the time invariant state equations - State Transition Matrix and its Properties – Concepts of Controllability and Observability.

Course Outcomes:

At the end of the course student should able to

- Determine the transfer function of physical systems using block diagram algebra and signal flow graphs.
- Determine time response specifications of second order systems and error constants.
- Analyze absolute and relative stability of LTI systems using Routh's stability criterion and root locus method.
- Analyze the stability of LTI systems using frequency response methods.
- Design Lag, Lead, Lag-Lead compensators to improve system performance
- Understand the State Space Analysis of Continuous systems.

Text Books:

1. Modern Control Engineering, Katsuhiko Ogata, Prentice Hall of India, 5thEdition, 2015.
2. Automatic control systems, Benjamin C.Kuo and Farid Golnaraghi, Wiley- India, 8thEdition, 2012.

Reference Books:

1. Control Systems principles and design, M.Gopal, Tata McGraw-Hill Publications, 4thEdition, 2012.
2. Control Systems Engineering, I.J.Nagarath and M.Gopal, Newage International Publications, 6thEdition, 2017.
3. Control Systems Engineering, S.Palani, TataMcGraw-Hill Publications, 2nd Edition, 2009.

Year/Semester	II B. Tech / I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	ELECTRICAL MACHINES II				
Branch	EEE				

Course Objectives:

- To understand the principle of operation and power developed in 3-phase induction motor.
- To understand the performance and various starting methods of induction motor
- To understand the concept of double revolving field theory and applications of a.c series motor.
- To understand the armature winding designs, armature reaction and regulation concepts of synchronous generator
- To understand the performance characteristics of synchronous motor

UNIT-I:

3-phase Induction Motors:

Construction of cage and wound rotor machine – production of rotating magnetic field – principle of operation – rotor EMF and rotor frequency – rotor current and PF at standstill and running conditions – rotor power input, rotor copper loss, mechanical power developed and their interrelationship – equivalent circuit – phasor diagram – Numerical problems.

UNIT-II:

Characteristics, Starting and Testing Methods of Induction Motors:

Torque equation –expressions for maximum torque and starting torque – torque-slip characteristics – double cage and deep bar rotors – crawling and cogging – speed control of induction motor with V/f method– methods of starting – starting current and torque calculations– No load and Blocked rotor tests – circle diagram – induction generator operation (Qualitative treatment only).

UNIT – III:

Single Phase Motors:

Single phase induction motors – constructional features – problem of starting–double revolving field theory–starting methods – equivalent circuit – AC series motor.

UNIT–IV:

3-phase synchronous generator:

Constructional features of non–salient and salient pole rotor – armature windings – distributed and concentrated windings – distribution, pitch and winding factors –EMF equation–armature reaction–voltage regulation by synchronous impedance, MMFand Potier triangle methods–phasor diagrams–parallel operation with infinite bus bar and other alternators – synchronizing power – load sharing – numerical problems.

UNIT–V:

Synchronous motor operation, starting and performance:

Principle of operation – Phasor diagram – Methods of starting, variation of current and power factor with excitation (V curves) –synchronous condenser – mathematical analysis for power developed– synchronizing torque –hunting and its suppression– applications.

Course outcomes:

At the end of this course the students are

- Able to explain the operation and analyze the power developed in three phase induction motor.
- Able to analyze the torque-slip relation, performance of induction motor and various starting methods
- Able to analyze the performance of single phase induction and ac series motors.
- Able to analyze the armature winding design, armature reaction and regulation concept in synchronous generator
- Able to explain various starting methods and analyze the performance characteristics of synchronous motor

TEXT BOOKS

4. Electric Machines by P. S. Bhimbhra, Khanna Publishers, 2nd Edition, 2017.
5. Electric Machinery by A. E. Fitzgerald, Charles Kingsley, Stephen D. Umans, Mc Graw Hill Education, 6th Edition, 24th Reprint 2012.
6. The Performance and Design of Alternating Current Machines by M. G. Say, CBS Publishers, 3rd Edition, 2002.

REFERENCE BOOKS

1. Theory & Performance of Electrical Machines by J. B. Gupta, S. K. Kataria & Sons, Reprint 2013 Edition.
2. Electrical Machines by S.K. Bhattacharya, Mc Graw hill Education, 4th Edition 2017
3. Electric Machines by I. J. Nagrath & D.P. Kothari, McGraw Hill Education, 5th Edition 2017.
4. Electrical Machines by R.K.Rajput, Lakshmi publications, 6thEdition, 2016.

Year/Semester	II B. Tech / I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	Universal Human Values 2: Understanding Harmony				
Branch	EEE				

Human Values Courses

This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values 2: Understanding Harmony"is designed which may be covered in their III or IV semester.
During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

1. OBJECTIVE:

The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration aboutthemselves (human being),family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society andnature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

2. COURSE TOPICS:

The course has 28 lectures and 14 practice sessions in 5 modules:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' andExperientialValidation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment ofaspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfil the above human aspirations: understanding and living in harmony at variouslevels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
8. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of 'I' and harmony in 'I'
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physicalneeds, meaning of Prosperity in detail
12. Programs to ensureSanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation; the othersalient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution,Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- fromfamily to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" canbe used), pollution, depletion of resources and role of technology etc.

Module 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
25. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people- friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
26. Case studies of typical holistic technologies, management models and production systems
27. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.

3. READINGS:

Text Book

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books,New Delhi, 2010

Reference Books

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

4. MODE OF CONDUCT (L-T-P-C 2-1-0-3 or 2L:1T:0P 3 credits)

Lectures hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them.

Tutorial hours are to be used for practice sessions.

While analysing and discussing the topic, the faculty mentor’s role is in pointing to

essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self-exploration. Scenarios may be used to initiate discussion. The student is encouraged to take up" ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life. Depending on the nature of topics, worksheets, home assignment and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic humanvalues.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate, higher courses.

This course is to be taught by faculty from every teaching department, including HSS faculty. Teacher preparation with a minimum exposure to at least one 8-day FDP on Universal Human Values is deemed essential.

5. ASSESSMENT:

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.

Example:

Assessment by faculty mentor:
10 marksSelf-assessment: 10
marks
Assessment by peers: 10 marks
Socially relevant project/Group Activities/Assignments:
20 marksSemester End Examination: 50 marks

The overall pass percentage is 40%. In case the student fails, he/she must repeat the course.

6. OUTCOME OF THE COURSE:

By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what

they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

This is only an introductory foundationalinput. It would be desirable to follow it up by

a) faculty-student or mentor-mentee programs throughout their time with the institution
b) Higher level courses on human values in every aspect of living. E.g. as a professional

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-21	0	0	3	1.5
Subject	DATA STRUCTURES LAB				
Branch	EEE				

Course Objectives:

The objective of this lab is to demonstrate the different data structures implementation.

List of Experiments:

Exercise -1 (Searching) a) Write a program that use both recursive and non recursive functions to perform Linear search for a Key value in a given list. b) Write a program that uses both recursive and non-recursive functions to perform Binary search for a Key value in a given list.

Exercise -2 (Sorting-I) Write programs to implement various sorting techniques like Bubble sort, Selection sort, Insertion sort, Radix sort

Exercise -3(Singly Linked List) a) Write a program that uses functions to create a singly linked list b) Write a program that uses functions to perform insertion operation on a singly linked list c) Write a program that uses functions to perform deletion operation on a singly linked list d) Write a program to reverse elements of a single linked list.

Exercise -4 (Stack) a) Write a program that implements stack (its operations) using arrays b) Write a program that implements stack (its operations) using Linked list c) Write a program that uses Stack operations to evaluate postfix expression

Exercise -5(Queue) a) Write a program that implement Queue (its operations) using arrays. b) Write a program that implement Queue (its operations) using linked lists

Exercise -6 (Binary Tree) Write a recursive function for traversing a binary tree in preorder, inorder and postorder.

Exercise -7 (Binary Search Tree) a) Write a program to Create a BST b) Write a program to insert a node into a BST. c) Write a program to delete a node from a BST.

Exercise – 8 (Graphs) – Represent graphs using adjacency matrix and adjacency list

Course Outcomes:

By the end of this lab the student is able to

- Use various searching and sorting algorithms.
- Use basic data structures such as arrays and linked list.
- Implement various data structures like stacks, queues, trees & graphs, and use them for various applications

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-21	0	0	3	1.5
Subject	CONTROL SYSTEMS LAB				
Branch	EEE				

Course Objectives:

- To impart hands on experience to understand the performance of basic control system components such as magnetic amplifiers, D.C. servo motors, A.C. Servo motors, Potentiometer as Error detector, Tacho Generator, PLC and Synchros.
- To understand time and frequency responses of control systems with and without controllers and compensators.

Any 10 of the following experiments are to be conducted:

1. Time response of a Second order system.
2. Characteristics of Synchros.
3. Effect of feedback on a DC Servo motor
4. Transfer function of a DC servo motor.
5. Verification of logic gates, Boolean expressions using PLC.
6. Characteristics of magnetic amplifiers
7. Characteristics of a AC servo motor
8. Characteristics of a DC servo motor
9. Potentiometer as an error detector.
10. Root locus, Bode Plot, Nyquist Plot for different transfer functions (up to 5th order system)
    Using MATLAB.
11. Controllability and Observability test using MATLAB.
12. Design of lag and lead compensators (by Bode Plot) using MATLAB
13. Transfer function of a DC tacho generator
14. Effect of P, PI, PD and PID controllers on second order system

Course Outcomes:

After the completion of the course the student should be able to:

- Analyze the performance and working of magnetic amplifier, DC & AC servo motors and synchros.
- Design of lag, lead and lag–lead compensators
- Determine the transfer function of DC Motor
- Verify the Boolean expressions using PLC
- Test the controllability and observability.
- Judge the stability in both time and frequency domain.

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-21	0	0	3	1.5
Subject	ELECTRICAL MACHINES – II LAB				
Branch	EEE				

Course Objectives:

- To learn the speed control methods of three phase induction motor
- To understand the performance characteristics of three phase and single phase induction motors
- To understand the concept of power factor improvementin single phase induction motor
- To understand the various voltage regulation methodsin three phase alternator
- To understand the concept of slip test in synchronous machine by determining Xd and Xq

Any 10 of the following experiments are to be conducted

1. Brake test on three phase induction motor.
2. No-load &blocked rotor tests on three phase induction motor.
3. Regulation of three-phase alternator by synchronous impedance & M.M.F. methods.
4. Regulation of three-phase alternator by Potier triangle method.
5. V and Inverted V curves of three-phase synchronous motor.
6. Determination of Xd and Xq of a salient pole synchronous machine.
7. Equivalent circuit of single phase induction motor.
8. Speed control of induction motor by v/f method.
9. Determination of efficiency of three phase alternator by loading with three phase induction motor.
10. Power factor improvement of single phase induction motor by using capacitors.
11. Brake test on single phase induction motor.
12. Synchronization of three phase alternator with infinite bus bar.

Course Outcomes:

At the end of the lab the student will be able to,

- Control the speed of three phase induction motor
- Determine the performance characteristics of three phase and single phase induction motors
- Improve the power factor in single phase induction motor
- Determine the voltage regulation in three phase alternator
- Determine the Xd and Xq by conducting the slip test

Year/Semester	II B. Tech/ II Sem	L	T	P	C
Regulation Year	2020-21	0	0	4	2
Subject	SKILL ORIENTED COURSE : IOT APPLICATIONS OF ELECTRICAL ENGINEERING				
Branch	EEE				

Preamble:

The aim of this course is to introduce Internet of Things to simulate real time applications using Arduino /Raspberry Pi.

Course Objectives:

- To understand fundamentals of various technologies of Internet of Things
- To know various communication technologies used in the Internet of Things
- To know the connectivity of devices using web and internet in the IoT environment
- To understand the implementation of IoT by studying case studies like Smart Home, Smart city, etc.

List of Experiments:

Any TEN of the following Experiments are to be conducted

1. Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
2. Study of different types of Sensors- IR, LDR, Ultrasonic Sensor, Temperature, Humidity and Light Intensity Sensors.
3. Demonstration of peer to peer communication between coordinator and end device through Router.
4. To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON
   LED for 1 sec after every 2 seconds.
5. To interface Push button with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed.
6. To interface temperature sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.
7. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED
   ON/OFF when '1'/'0' is received from smart phone using Bluetooth.
8. Interfacing of Temperature sensor and LCD Display with Arduino
9. Toggling of LED using timer
10. Controlling of Relay with load using switch.
11. Reading Light intensity value from light sensor (LDR)
12. Fire Alarm Using Arduino.
13. IR Remote Control for Home Appliances.
14. Alexa based Home Automation System.

Course Outcomes:

After the completion of the course the student should be able to:

- Apply various technologies of Internet of Things to real time applications.
- Apply various communication technologies used in the Internet of Things.
- Connect the devices using web and internet in the IoT environment.
- Implement IoT to study Smart Home, Smart city, etc.

Year/Semester	II B.Tech-II Sem.	L	T	P	C
Regulation Year	R-20	2	0	0	0
Name of the Subject	**CRITICAL READING AND CREATIVE WRITING**				
Branch	All Branches (except CSBS)				

COURSE OBJECTIVES:

The students will have the ability to

1. Understand how to identify, analyze, interpret and describe critical ideas, themes, and values in literary texts

2. List the elements of a Short Story

3. Apply critical and theoretical approaches to the reading and analysis of literary texts in multiple genres

UNIT – I:

Essentials of Good Writing

1. Focus, Development, Unity, Coherence and Correctness
2. Imagery
   A. Figurative Language- Simile, Metaphor, Personification, Hyperbole, Oxymoron, Paradox, Alliteration, Assonance
   B. Sensory details
3. Point of View

UNIT – II:

Elements of a Short story

1. Plot, Setting, Character, Theme
2. Analysis of given short stories: 2 stories
   A. Good Sees the Truth but Waits by Leo Tolstoy
   B. The Cop and the Anthem by O. Henry

UNIT – III

Prose Writing:

Reflective Writing – Personal Essay

Descriptive Writing: Person/Place/Thing

UNIT – IV

Reading Comprehension

Reading for facts, contextual vocabulary, tone and inference

UNIT – V:

Speech Analysis

A. Tryst with Destiny-
   https://www.youtube.com/watch?v=lrEkYscgbqE
B. Stay Hungry, Stay Foolish –
   https://www.youtube.com/watch?v=UF8uR6Z6KLc

References

The Cambridge Companion to Creative Writing (South Asian Edition)

Creative Writing: A Beginner's Manual (Paper Back Edition)

Teaching and Developing Reading Skills: Cambridge Handbooks for Language Teachers

Web References:

https://www.skillsyouneed.com/learn/critical-reading.html

https://englishforeveryone.org

http://sixminutes.dlugan.com/speech-evaluation-1-how-to-study-critique-speech/

http://www.homeofbob.com/literature/genre/fiction/ficElmnts.html

COURSE OUTCOMES:

Upon the completion of the course, the student will be able to:

1. Understand and explain the characteristics of a literary text

2. Critically analyze the quality of a Shorty Story

3 Produce essays like personal essay or descriptive essay applying the principles of good writing

4. Identify facts, themes and critical ideas in a passage

5. Articulate an awareness of the basic elements of a speech