Program: B.Tech
Semester: Eight
Course: Applied Control Theory
Course Code: 6.451

Course Objective:

- To understand the fundamentals of non-linear control systems.
- To use describing function and phase plain analysis in design and stability analysis of control systems.
- To understand lyapunov theory concept.
- To apply the state variable approach in design of control system.

Unit I:
Concepts of State, State Variables: Development of state-space models. State and state equations, State equations from transfer function Transfer function from state equations. State transition matrix, Solution of State equation, Transfer Matrix, State variables and linear discrete time systems

Unit II:

Unit III:

Unit IV:

Suggested Readings:

Program: B.Tech  
Semester: Eight  
Course: Applied Control Theory  
Course Code: 6P.451

List of Experiments

1. Obtain creates a state-space model object representing the continuous-time state-space model with matrix A, B, C, D.
2. Obtain the number of poles and rank in the given state equation.
3. Conversion of the state space model to the transfer function model and then transfer function to state space model.
4. Obtain the simulation output for the state space diagram obtained from the state space representation.
5. Find the controllability and observability of the given state equations.
6. Design using pole placement in state feedback.
7. Obtain the state transition matrix in MATLAB.
8. Design of controller using state observer technique.
Program: B.Tech  
Semester: Eight  
Course: Utilization of Electrical Power  
Course Code: 6.452

Course Objective:

- Able to maintain electric drives used in an industries.
- Able to identify a heating/ welding scheme for a given application.
- Able to maintain/ Trouble shoot various lamps and fittings in use.
- Able to figure-out the different schemes of traction schemes and its main components.
- Able to design a suitable scheme of speed control for the traction systems.
- Able to identify the job/higher education / research opportunities in Electric Utilization industry.

Unit I:  

Unit II:  
**Heating & Welding:** Introduction, Different methods of electrical heating, Construction Details and performance of resistance heating furnace. Temperature control of resistance furnace, Induction heating, Dielectric heating, electric welding, Different welding methods, current control of welding transformer, Ultrasonic and laser welding.

Unit III:  

Unit IV:  
**Refrigeration and Air Conditioning:** Refrigeration systems, Domestic refrigerator, Water cooler, Types of Air Conditioning, Windows air conditioner.

**Electrolyte Process:** Principles of electro deposition, Laws of electrolysis, applications of electrolysis. Motor Control Circuit Components, Interlocking methods for reversing control, Sequence control, Schematic and wiring diagram for motor control circuits, Remote control operation of an IM, Motor driven pump for a water tank, automatic water level control, Sequence operation of motors with interlocking arrangements.

Suggested Readings:

Program: B.Tech  
Semester: Eight  
Course: Antenna & Wave Propagation  
Course Code: 6.453

Course Objective:

- To analyze the fundamentals of antenna theory.
- To understand the applications of the electromagnetic waves in free space.
- To apply the fundamentals to design different types of antennas.
- Understand the different types of antennas and the radiation mechanism.
- Frequencies from LF to Microwave applications.
- To expose students to examples of applications and various antenna types.
- Identify the atmospheric and terrestrial effects on radio wave propagation.

Unit-I  

Unit-II  
Antenna Arrays: Two Element Array, Horizontal Patterns in Broadcast Arrays, Linear Arrays, Multiplication of Patterns, effect of the earth on vertical patterns, Binomial array.

Unit-III  
Wave Propagation: Modes of Propagation, Plane Earth Reflection. Space wave and Surface Wave, Reflection and refraction waves by the ionosphere. Tropospheric Wave. Ionosphere Wave Propagation in the Ionosphere, Virtual Height, MUF Critical frequency, Skip Distance, Duct Propagation, Space wave.

Unit-IV  

Suggested Readings:

Course Objectives:

- Introduce a relatively new computing paradigm for creating intelligent machines useful for solving complex real-world problems.
- Insight into the tools that make up the soft computing technique: fuzzy logic, artificial neural networks, and hybrid systems techniques.
- To create awareness of the application areas of soft computing techniques.
- Provide alternative solutions to the conventional problem solving techniques in image/signal processing, pattern recognition/classification, control system.

Unit-I:

**Fuzzy Logic and Fuzzy Rules:**


Unit-II:

**Artificial Neural Networks (ANN):**

Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Difference between ANN and human brain, Architecture, Back Propagation and feed Forward Networks, Offline Learning, Online Learning.

Unit-III:

**Genetic Algorithm**

Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications

Unit-IV:

**Learning Process of Neural Networks:**

**Supervised Learning:** Introduction, Perceptrons, Adaline, Back Propagation Multilayer Perceptrons, Back Propagation Learning Rules

**Unsupervised Learning:**

Competitive Learning Networks, Kohonen self-organising networks, Hebbian Learning

Suggested Readings:

2. N.P. Padhy, ”Artificial Intelligence and Intelligent Systems” Oxford University Press.
3. Simon Haykin, ”Neural Networks Prentice Hall” of India.
4. Timothy J. Ross, “Fuzzy Logic with Engineering Applications Wiley India
Program: B.Tech
Semester: Eight
Course: Human Values & Ethics
Course Code: 40B.451

Course Objective:

- To develop students’ sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of human beings.
- To introduce students to information about some key aspects of Indian culture and ethics.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.

1. VALUE CRISIS IN CONTEMPORARY INDIAN SOCIETY
   1.1 Value Crisis at the Individual Level
   1.2 Societal Level
   1.3 Intellectual Level
   1.4 Cultural Level
   1.5 Value – What are they?
   1.6 The Indian Concept of Values.
   1.7 Modern Approach to the Study of Values.
   1.8 Aesthetic Sensibilities

2. MORAL AND ETHICAL HUMAN VALUES
   2.1 Bases for Moral Judgment
   2.2 Some Canons of Ethics.
   2.3 Virtue Ethics.
   2.4 Ethics of Duty.
   2.5 Ethics of Responsibility
   2.6 Factors to be considered in Making Ethical Judgments.
   2.7 Different Meanings of Human Values
   2.8 A New Approach to Human Value, Freedom, Creativity Love & Wisdom

3. MORAL VALUES IN PROFESSION
   3.1 What is a Profession?
   3.2 Professional Ethos
   3.3 Code of Professional Ethics
   3.4 Practicing the Code
   3.5 Corporate Social Responsibility
   3.6 The Larger Domain of Human Values
   3.7 Institutionalizing Ethics and Human Values
4. GENDER SENSITIZATION
4.1 Socialisation of women
4.2 Just Relationships, being together as equals
4.3 Declining sex ratio, demographic consequences
4.4 Women’s work, its politics and economics, fact and fiction, unrecognized and
    Unaccounted work
4.5 Domestic violence, eve teasing and harassment. Is home a safe place?

Recommended Texts:

- Dr. Rajan Mishra, Human Values: Laxmi Publications Pvt. Ltd.
- S. Dinesh Babu, Professional Ethics and Human Values; Laxmi Publications Pvt. Ltd.
- P.S. Rathore. Business Ethics And Communication; S.Chand Publishing
- Dr. K.Alex. Managerial Skills; S. Chand Publishing.
- Dr. M. Adithan, Study Skills For Professional Students For Higher Education , S.Chand
  Publishing
- Govindarajan M “Professional Ethics and Human Values.”
- R.R. Gaur and R. Sangal “A Foundation Course in Human Values and Professional Ethics”
Program: B.Tech
Semester: Eight
Course: Project II
Course Code: 6P.445

Course Objective:

- To apply the knowledge gained throughout the courses in a practical and illustrative way.
- To develop the workability in a collaborative manner with a group of students.
- To develop abilities in problem solving and critical judgment
- To demonstrate ability to effectively collect, analyze and organize scientific information
- To develop the ability to write & prepare synopsis & dissertation.
- To develop the ability of presentation skill.
- To improve thinking ability.