

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

B.TECH ELECTRONICS AND CONTROL ENGINEERING

III YEAR – I SEMESTER

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
	Computer Organization	4+1*	-	4
	Prime Movers and Mechanical Components	4+1*	-	4
	Principles of Communications	4+1*	-	4
	Power Electronics	4+1*	-	4
	Linear and Digital IC Applications	4+1*	-	4
	Process Control	4+1*	-	4
	IC Applications Lab	-	3	2
	Advanced English Communication Skills Lab	-	3	2
	Total	30	6	28

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

B.TECH ELECTRONICS AND CONTROL ENGINEERING

IV YEAR – I SEMESTER

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
	Neural Networks and Fuzzy Logic	4+1*	-	4
	Object Oriented Programming	4+1*	-	4
	Digital Control Systems	4+1*	-	4
	Adaptive Control Systems	4+1*	-	4
	ELECTIVE – I	4+1*	-	4
	Database Management Systems			
	Robotics and Automation			
	Instrumentation and Control in Manufacturing Systems			
	ELECTIVE – II	4+1*	-	4
	Software Engineering			
	Hydraulic and Pneumatic Control Systems			
	Embedded and Real Time Systems			
	JAVA Lab	-	3	2
	Control Systems Lab-II	-	3	2
	Total	30	6	28

NOTE: All University Examinations (Theory and Practical) are of 3 hours duration.

* : Tutorials

T : Theory periods per week P: Practical /Drawing Periods per week

C : Total Credits for the subject

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

COMPUTER ORGANIZATION

UNIT I :

BASIC STRUCTURE OF COMPUTERS : Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT II :

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS : Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Microoperations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT III :

MICRO PROGRAMMED CONTROL : Control memory, Address sequencing, microprogram example, design of control unit Hard wired control. Microprogrammed control

UNIT IV :

COMPUTER ARITHMETIC : Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT V :

THE MEMORY SYSTEM : Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID.

UNIT-VI

INPUT-OUTPUT ORGANIZATION : Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT VII :

PIPELINE AND VECTOR PROCESSING : Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

UNIT VIII :

MULTI PROCESSORS : Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. InterProcessor Communication and Synchronization Cache Coherence. Shared Memory Multiprocessors.

TEXT BOOKS :

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, Illrd Edition, Pearson/PHI

REFERENCES :

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - Sivarama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

PRIME MOVERS AND MECHANICAL COMPONENTS

UNIT – I: HYDRAULIC TURBINES

Impact of Jets, Classification – Pelton wheel – Francis and Kaplan turbines – working principle – Specific speed – Performance and Characteristic curves of turbines.

UNIT – II: HYDRAULIC PUMPS

Reciprocating pumps – Types – main components – working principle – air vessels – slip – indicator diagrams – centrifugal pumps – main components – working principle – performance and characteristic curves of centrifugal pump.

UNIT – III: STEAM GENERATORS:

Introduction – classification of boilers – comparison between “Fire – Tube and watertube boilers – selection of boiler – Essentials of a good steam boiler – fire tube boilers – simple vertical boiler, Cochran boiler, Cornish boiler, Lancashire-boiler, locomotive boiler, scotch boiler – water tube boilers – Babcock and Wilcox water – tube boiler – high pressure boilers – Lamon boiler, Loefflar boiler, Benson boiler, Velox Boiler – Super Critical boilers – Super – Charged boilers.

UNIT – IV: BOILER MOUNTINGS AND ACCESSORIES

Introduction – Boiler Mountings – Water level indicator, pressure gauge, safety valves, high steam and low water safety valve, fusible plug, blow – off cock, feed check valve, Junction or stop valve – Boiler accessories – Feed pumps, Injector, Economizer, Air Preheater, Super heater, Steam separator, Steam trap, Steam Condensers.

UNIT-V: STEAM TURBINES

Carnot, Rankine and Joule cycles. Classification – Impulse and Reaction Turbines – Mechanical Details – Principle of Operation – Simple Impulse Turbine – Methods to reduce rotor speed, velocity compounding, pressure compounding and pressure – velocity compounding.

UNIT – VI: GAS TURBINES

Introduction – Classification – gas turbine – simple gas turbine plant – principle of working – ideal and actual cycles – open closed turbines.

UNIT-VII: HYDRAULIC ACTUATING SYSTEMS

Hydraulics- Hydraulic Systems, Hydraulic pump dutychek Control valves, Hydraulic Cylinders, Rotary Actuators.

UNIT – VIII: MECHANICAL ACTUATING SYSTEMS

Mechanical Actuating Systems – Types of Motion, Freedom and Constraints, Loading and Kinematics chains, Slider Change Mechanism

TEXT BOOKS:

1. Hydraulics and fluid mechanics including hydraulic machines - Bansal
2. Thermal engineering - R.S.Kurmy

REFERENCES:

1. Hydraulics and fluid mechanics including hydraulic machines by R.P.N.Modi & dr. S.M.Seth
2. Thermal engineering by 1.R.K.Rajput, 2. D.S.Kumar
3. Mechanical details for production design: Greenwood

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

PRINCIPLES OF COMMUNICATIONS

UNIT I

Introduction : Block diagram of Electrical communication system, Radio communication : Types of communications, Analog, pulse and digital Types of signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Autocorrelation, correlation, convolution.

UNIT II

Amplitude Modulation : Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM : Diode detector, Product demodulation for DSB SC & SSB SC.

UNIT III

Angle Modulation : Frequency & Phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

UNIT IV

Pulse Modulations : Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Division Multiplexing, Frequency Division Multiplexing, Asynchronous Multiplexing.

UNIT V

Digital Communication : Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

UNIT VI

Digital Modulation : ASK, FSK, PSK, DPSK, QPSK demodulation, coherent and incoherent reception, Modems.

UNIT VII

Information Theory : Concept of information, rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shanon-Fano and Huffman coding.

UNIT VIII

Error control coding : Introduction, Error detection and correction codes, block codes, convolution codes.

TEXTBOOKS

1. Communication Systems Analog and Digital – R.P. Singh and SD Sapre, TMH, 20th reprint, 2004.
2. Principles of Communications – H. Taub and D. Schilling, TMH, 2003.

REFERENCES

1. Electronic Communication Systems – Kennedy and Davis, TMH, 4th edition, 2004.
2. Communication Systems Engineering – John. G. Proakis and Masoud Salehi, PHI, 2nd Ed. 2004.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

POWER ELECTRONICS

Objective :

With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization. This course introduces the basic concepts of power semiconductor devices, converters and choppers and their analysis.

UNIT – I POWER SEMI CONDUCTOR DEVICES

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points

UNIT – II DEVICES AND COMMUTATION CIRCUITS

Two transistor analogy – SCR - UJT firing circuit — Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – III SINGLE PHASE HALF CONTROLLED CONVERTERS

Phase control technique – Single phase Line commutated converters – Mid point and Bridge connections – Half controlled converters with Resistive, RL loads and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Free wheeling Diode – Numerical problems

UNIT – IV SINGLE PHASE FULLY CONTROLLED CONVERTERS

Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters -Active and Reactive power inputs to the converters without and with Free wheeling Diode, Effect of source inductance – Derivation of load voltage and current – Numerical problems.

UNIT – V THREE PHASE LINE COMMUTATED CONVERTERS

Three phase converters – Three pulse and six pulse converters – Mid point and bridge connections average load voltage With R and RL loads – Effect of Source inductance–Dual converters (both single phase and three phase) - Waveforms –Numerical Problems.

UNIT – VI AC VOLTAGE CONTROLLERS & CYCLO CONVERTERS

AC voltage controllers – Single phase two SCR's in anti parallel – With R and RL loads – modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor wave forms – Firing circuits -Numerical problems -Cyclo converters – Single phase mid point cyclo converters with Resistive and inductive load (Principle of operation only) – Bridge configuration of single phase cyclo converter (Principle of operation only) – Waveforms

UNIT – VII CHOPPERS

Choppers – Time ratio control and Current limit control strategies – Step down choppers Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression Morgan's chopper – Jones chopper and Oscillation chopper (Principle of operation only) Waveforms — AC Chopper – Problems.

UNIT – VIII INVERTERS

Inverters – Single phase inverter – Basic series inverter – Basic parallel Capacitor inverter bridge inverter – Waveforms – Simple forced commutation circuits for bridge inverters – Mc Murray and Mc Murray – Bedford inverters - Voltage control techniques for inverters Pulse width modulation techniques – Numerical problems.

TEXT BOOKS :

1. Power Electronics – by M. D. Singh & K. B. Kanchandhani, Tata Mc Graw – Hill Publishing company, 1998.
2. Power Electronics : Circuits, Devices and Applications – by M. H. Rashid, Prenties Hall of India 2nd edition, 1998

REFERENCE BOOKS :

1. Power Electronics – by Vedam Subramanyam, New Age International (P) Limited, Publishers
2. Power Electronics - by V.R.Murthy , 1st edition -2005, OXFORD University Press
3. Power Electronics-by P.C.Sen,Tata Mc Graw-Hill Publishing.
Thyristorised Power Controllers – by G. K. Dubey, S. R. Doradra, A. Joshi and R. M. K. Sinha, New Age International (P) Limited Publishers, 1996.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

LINEAR AND DIGITAL IC APPLICATIONS

UNIT I

INTEGRATED CIRCUITS

Classification, chip size and circuit complexity, basic information of Op-amp, ideal and practical Op-amp, internal circuits, Op-amp characteristics, DC and AC characteristics, 741 op-amp and its features, modes of operation-inverting, non-inverting, differential.

UNIT II

OP-AMP APPLICATIONS

Basic application of Op-amp, instrumentation amplifier, ac amplifier, V to I and I to V converters, sample & hold circuits, multipliers and dividers, Differentiators and Integrators, Comparators, Schmitt trigger, Multivibrators, introduction to voltage regulators, features of 723.

UNIT III

ACTIVE FILTERS & OSCILLATORS

Introduction, 1st order LPF, HPF filters. Band pass, Band reject and all pass filters. Oscillator types and principle of operation – RC, Wien and quadrature type, waveform generators – triangular, sawtooth, square wave and VCO.

UNIT IV

TIMERS & PHASE LOCKED LOOPS

Introduction to 555 timer, functional diagram, monostable and astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks of 565.

UNIT V

D-A AND A- D CONVERTERS

Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC specifications.

UNIT VI

Classification of Integrated circuits, comparison of various logic families, standard TTL NAND Gate-Analysis & characteristics, TTL open collector O/Ps, Tristate TTL, MOS & CMOS open drain and tristate outputs, CMOS transmission gate, IC interfacing- TTL driving CMOS & CMOS driving TTL .

UNIT VII

Design using TTL-74XX & CMOS 40XX series, code converters, decoders, Demultiplexers, decoders & drives for LED & LCD display. Encoder, priority Encoder, multiplexers & their applications, priority generators/checker circuits. Digital arithmetic circuits-parallel binary adder/subtractor circuits using 2's, Complement system. Digital comparator circuits.

UNIT VIII

SEQUENTIAL CIRCUITS

Flip-flops & their conversions. Design of synchronous counters. Decade counter, shift registers & applications, familiarities with commonly available 74XX & CMOS 40XX series of IC counters. Memories: ROM architecture, types & applications, RAM architecture, Static & Dynamic RAMs, synchronous DRAMs.

TEXT BOOKS

1. Linear Integrated Circuits –D. Roy Chowdhury, New Age International (p) Ltd, 2nd Ed., 2003.
2. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 1987.
3. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Edition, 2005.

REFERENCES:

1. Operational Amplifiers and Linear Integrated Circuits – R.F. Coughlin and Fredrick F. Driscoll, PHI, 1977.
2. Operational Amplifiers and Linear Integrated Circuits: Theory and Applications –Denton J. Daibey, TMH.
3. Design with Operational Amplifiers and Analog Integrated Circuits - Sergio Franco, McGraw Hill, 3rd Ed., 2002.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

PROCESS CONTROL

UNIT – I: INTRODUCTION TO PROCESS CONTROL

Definition-Elements of process control-Process variables-degree of freedom- Characteristics of liquid system, gas system and thermal system- Mathematical model of liquid process , gas process, thermal process- Batch process and continuous process- Self regulation.

UNIT II BASIC CONTROL ACTIONS

Characteristics of ON-OFF, proportional , integral, derivative control modes-composite control modes – PC, PI and PID modes- two position control- Single speed floating control – Ziegler Nichols method.

UNIT III: MEASURING ELEMENTS

Types of measuring means –Temperature elements-liquid level measurements – fluid flow measurements –pneumatic transmission- electric transmission –first order and second order response to measuring elements.

UNIT IV : CONTROLLING ELEMENTS

Self operated controllers –pneumatic proportional controllers (displacement and force type)- Air supply for pneumatic systems- Hydraulic controllers –Electrical proportional controllers-Electronic proportional controllers- Theory of automatic controllers circuits.

UNIT V : ADVANCED CONTROL TECHNIQUES

Ratio control systems – Dynamic compensatory- adding feedback-principle areas of feed forward control - Economic considerations.

Properties of inner loop , External feedback –Tuning cascade controllers , Final Control Elements - Pneumatic actuators –Electro-pneumatic actuators –Hydraulic actuators –Electric motor actuators –Two position motor actuators –Sliding steam control valves- Rotating shaft control valves-control valve sizing.

APPLICATIONS OF PROCESS CONTROL:

UNIT VI : ENERGY TRANSFER

Heat transfer-heat exchangers without phase change-Boiling liquids and condensing vapors-combustion control of fuel and air –fired heaters –steam plant control systems –drum level control-drum pressure control- steam temperature control.

UNIT VII CHEMICAL REACTIONS AND CONVERSIONS

Principles of governing the conduct of reactions-chemical equilibrium-reaction rate- Stability of exothermic reactors – continuous reactors-apporting reactant flow-temperature control-maximizing procedure- controlling conversion.

UNIT VIII : MASS TRANSFER OPERATIONS

Modeling the process- relative gain analysis-configuring the controls composition – Feedback pressure control methods – controlling at constraints – side steam columns material –balance control –vapor compression – Evaporation barometric condensers – rate of drying inferential controls-optimum air flow - Nuclear power plant & Operations.

TEXT BOOKS:

1. Automatic Process Control- Donal.P.Eckman(Willey Eastern)
2. Process Control- Peter Harriot for units (T.M.H)

REFERENCES:

1. Process Control Systems –F.G Shirskey (Mc Graw Hill)
2. Instrument Engineering Hand Book- Liptak & Venezel(Chilton Randor)
3. Process system analysis and control by D.R Coughanowr, 2nd edition McGraw Hill.
4. Chemical Process control by G.Stephaonopolom, PHI Publications (1998)

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T	P	C
0	3	2

IC APPLICATIONS LAB

1. 741 OPAMP Characteristics
2. Adder, Integrator and differentiator using 741 OPAMP
3. Function Generator using 741 OP AMP
4. IC 555 Timer –Astable Operation
5. IC 555 Timer – Monostable Operation
6. Study of Logic Gates
7. Study of Flip-Flops using ICs
8. Half Adder, Full Adder and Subtractor
9. Counters and Shift Registers & 7490 Counter
10. BCD to 7 Segment decoder using IC 7447
11. Voltage Regulator using IC 723
12. D/A Converter
13. A/D Converter
14. Multiplexer and Demultiplexer

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

III YEAR B.TECH E.Cont.E I-Sem

T P C
0 3 2

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

1. Introduction

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

The English Language Lab shall have two parts:

- i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
 - **Preparing for being Interviewed,**
 - **Positive Thinking,**
 - **Interviewing Skills,**
 - **Telephone Skills,**
 - **Time Management**
 - **Team Building,**
 - **Decision making**

- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron's/cup
9. **IELTS series with CDs** by Cambridge University Press.
10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL Test** by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

NEURAL NETWORKS AND FUZZY LOGIC

Objective :

This course introduces the basics Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components. The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work.

Unit – I: Introduction to Neural Networks

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

Unit- II: Essentials of Artificial Neural Networks

Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

Unit-III: Single Layer Feed Forward Neural Networks

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

Unit- IV: Multilayer Feed forward Neural Networks

Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

Unit V: Associative Memories

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network

Summary and Discussion of Instance/Memory Based Learning Algorithms, Applications.

Unit – VI: Classical & Fuzzy Sets

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT VII: Fuzzy Logic System Components

Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT VIII: Applications

Neural network applications: Process identification, control, fault diagnosis and load forecasting.

Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

TEXT BOOK:

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Neural Networks using MATLAB 6.0 - S.N.Sivanandam, S.Sumathi, S.N.Deepa, TMH, 2006

REFERENCE BOOKS:

1. Neural Networks – James A Freeman and Davis Skapura, Pearson, 2002.
2. Neural Networks – Simon Hakens , Pearson Education
3. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
4. Neural Networks and Fuzzy Logic System by Bart Kosko, PHI Publications.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

OBJECT ORIENTED PROGRAMMING

UNIT-I:

Introduction: Creation of Java, importance of Java to internet, byte code, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, type conversion and casting, compiling and running of simple Java program.

UNIT-II:

Classes and Objects: Concepts of classes and objects, class fundamentals
Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion, nested classes and inner classes, exploring the String class.

UNIT-III:

Inheritance: Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class.

UNIT-IV:

Packages and Interfaces: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V:

Exception Handling and Multithreading: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT-VI:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.
AWT: Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics.

UNIT-VII:

AWT Controls: Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border, Grid, Card and Gridbag.
Swing – JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.
Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

UNIT-VIII:

Networking and Java Library: Basics of Networking, InetAddress, TCP/IP sockets, Datagrams, URL, URL connection, String handling, java.util, java.io and java.net packages.

TEXT BOOKS:

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi./PHI
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

REFERENCES:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education.
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. Beginning in Java 2, Iver Horton, Wrox Publications.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

DIGITAL CONTROL SYSTEMS

UNIT – I SAMPLING AND RECONSTRUCTION

Introduction, Examples of Data control systems – Digital to Analog conversion and Analog to Digital conversion, sample and hold operations.

UNIT-II THE Z – TRANSFORMS

Introduction, Linear difference equations, pulse response, Z – transforms, Theorems of Z – Transforms, the inverse Z – transforms, Modified Z- Transforms

UNIT-III Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM

Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT – IV STATE SPACE ANALYSIS

State Space Representation of discrete time systems, Pulse Transfer Function Matrix solving discrete time state space equations, State transition matrix and it's Properties, Methods for Computation of State Transition Matrix, Discretization of continuous time state – space equations

UNIT – V CONTROLLABILITY AND OBSERVABILITY

Concepts of Controllability and Observability, Tests for controllability and Observability. Duality between Controllability and Observability, Controllability and Observability conditions for Pulse Transfer Function

UNIT – VI STABILITY ANALYSIS

Mapping between the S-Plane and the Z-Plane – Primary strips and Complementary Strips – Constant frequency loci, Constant damping ratio loci, Stability Analysis of closed loop systems in the Z-Plane. Jury stability test – Stability Analysis by use of the Bilinear Transformation and Routh Stability criterion.

UNIT – VII DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS

Transient and steady – State response Analysis – Design based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers.

UNIT – VIII STATE FEEDBACK CONTROLLERS AND OBSERVERS

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.
State Observers – Full order and Reduced order observers.

TEXT BOOKS:

1. Discrete-Time Control systems - K. Ogata, Pearson Education/PHI, 2nd Edition

REFERENCE BOOKS:

1. Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.
2. Digital Control and State Variable Methods by M.Gopal, TMH

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

ADAPTIVE CONTROL SYSTEMS

UNIT I INTRODUCTION

Concept of Adaptive Control, Definitions, Types of adaptivity, Effects of process variation, Control Essentials, Ratio of Adaptive Control, and Adaptive Systems.

UNIT II REAL TIME PARAMETER ESTIMATION

Introduction to Parameter Estimation, Least Squares and Regression Models – Least Squares Estimation, Recursive Computation, Continuous-Time Models, Estimation Parameters in Dynamical Systems – Finite Impulse Response (FIR) Models, Transfer Function Models.

UNIT III DETERMINISTIC SELF TUNING REGULATORS

Introduction, Block Diagram, Pole Placement Design, Indirect Self Tuning Regulators(STR), Continuous – Time Self Tuners, Direct Self Tuning Regulators

UNIT IV STOCHASTIC SELF TUNING REGULATORS

Design of Minimum Variance and Moving Average Controllers – Minimum Variance Control, Nonminimum phase System, Moving Average Controller, LQG control, Stochastic Self Tuning Regulators, Unification of Direct Self Tuning Regulators, Linear Quadratic STR

UNIT V STABILITY ANALYSIS

Introduction to Stability, Definitions, Theorems, Lyapunov theory on stability, Bounded Input – Bounded Output Stability.

UNIT VI MODEL REFERENCE ADAPTIVE SYSTEMS (MRAS)

Introduction – The MIT rules, Determination of Adaptation Gain, Design of MRAS using Lyapunov Theory, Output Feedback, Relations between MRAS and STR.

UNIT VII AUTO-TUNING

Introduction, PID Control, Auto-Tuning Techniques, Transient Response Methods, Methods based on Relay feedback, Relay oscillations.

UNIT VIII GAIN SCHEDULING

Introduction, The principle, Design of Gain-Scheduling controllers, Nonlinear Transformations.

TEXT BOOKS:

1. Adaptive control by Karl.J.Astrom, Bjorn Wittenmark, Pearson Education, 2003.

REFERENCES:

1. Adaptive control systems by Misthkin and Braun – McGraw Hill
2. Digital control systems by P.N.Paraskevopoulos Prentice Hall.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**DATABASE MANAGEMENT SYSTEMS
(ELECTIVE-I)**

Objective:

Learn about database design concepts, data models (Entity-Relationship and Relational Model), the database query language SQL and components of a database management system. Further topics include query processing and optimization techniques, transaction management, and storage and file structures

UNIT – I:

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT – II:

Relational Model: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra and Calculus: Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT – III:

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOTR – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL 0 Triggers and Active Data bases.

UNIT – IV:

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.

UNIT – V:

Overview of Transaction Management: ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

UNIT – VI:

Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions – Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking. Crash recovery: Introduction to ARIES – the Log – Other Recovery related Structures – the Write-Ahead Log Protocol – Check pointing – recovering from a System Crash – Media recovery – Other approaches and Interaction with Concurrency control.

UNIT – VII:

Overview of Storage and Indexing: Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning.

UNIT – VIII:

Storing data: Disks and Files: - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats. Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure. Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Exendble vs. Liner hashing.

Text Books:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, Mc.Graw hill, IV edition.

References:

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Systems design, Implementation, and Management, Rob & Coronel 5th Edition.Thomson
3. Data base Management System, Elmasri Navrate Pearson Education
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**ROBOTICS AND AUTOMATION
(ELECTIVE-I)**

UNIT – I BASIC CONCEPTS

Automation and Robotics – An over view of Robotics – present and future applications – classification by coordinate system and control system, Dynamic stabilization of Robotics.

UNIT – II POWER SOURCES AND SENSORS

Hydraulic, Pneumatic and electric drivers – Determination HP of motor and gearing ratio, variable speed arrangements, Path Determination - Machinery Vision – Ranging – Laser – Acoustic, Magnetic Fiber Optic and Tactile Sensor

UNIT – III MANIPULATORS

Construction of Manipulators, Manipulator Dynamic and Force Control, Electronic and Pneumatic manipulators.

UNIT – IV ACTUATORS AND GRIPPERS

Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effector, Various types of Grippers, Design consideration.

UNIT – V TRANSFORMATION AND DYNAMICS

Differential transformation and manipulators, Jacobians – problems. Dynamics: Lagrange – Euler and Newton – Euler formations – Problems.

UNIT VI KINEMATICS

Forward and Inverse Kinematic Problems, Solutions of Inverse Kinematic problems, Multiple Solution, Jacobian Work Envelop – Hill Climbing Techniques.

UNIT VII PATH PLANNING

Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion – straight line motion – Robot programming, languages and software packages.

UNIT VIII CASE STUDY

Multiple Robots – Machine Interface – Robots in Manufacturing and Non-Manufacturing applications – Robot Cell Design Selection of a Robot.

TEXT BOOKS:

1. Industrial Robotics / Groover M P / Pearson Edu.
2. Robotics / Fu K S/ McGraw Hill.

REFERENCES:

1. Robotics and Control / Mittal R K & Nagrath I J / TMH.
2. An Introduction to Robot Technology, / P. Coiffet and M. Chaironze / Kogam Page Ltd. 1983 London.
3. Robotic Engineering / Richard D. Klafter, Prentice Hall
4. Introduction to Robotics / John J Craig / Pearson Edu.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(ELECTIVE – I)**

UNIT I

Introduction to manufacturing operations and systems :

Manufacturing industries and products, manufacturing operations, product/production relationships, production concepts, and mathematical models, costs of manufacturing operations, Components of a manufacturing systems, classifications of manufacturing systems, overview of the classification scheme, manufacturing progress functions (learning curves)

UNIT II

Introduction to automation & Industrial control Systems :

Basic elements of aim automated system, advanced automation functions, levels of automation, process industries, verse discrete manufacturing industries, continuous verses discrete control, computer process control, forms of computer process control,

UNIT – III

Numerical Control and Discrete Control Using PLC's, fundamental of NC technology, computer numerical, DNC, applications of numerical control, discrete process control, ladder logic diagrams, programmable logic controllers, personal computers using soft logic.

UNIT –IV

Industrial Robotics :

Robot anatomic and related attributes, robot control systems, end effectors, sensors in robotics, industrial robot applications, robot programming, Engineering analysis of industrial robots.

UNIT –V :

Flexibile manufacturing Systems :

What is an FMS ?, FMS Components, FMS applications, and benefits, FMS planning and implementation issues, fundamentals of automated assembly systems, design for auto0mated assembly, quantitative analysis of assembly systems.

UNIT –VI :

Quality assurance and statistical process control :

Quality defined, traditional and modern quality control, taguchi methods in quality engineering, ISO 9000, process variability, and process capability, and control charts, other SPC tools, implementing statistical process control.

UNIT –VII :

Quality inspection technologies :

Inspection metrology, contact verses non contact inspection techniques, conventional measuring and gauging techniques and coordinate measuring machines, surface measurement, machine vision, other optical inspection techniques, non-contact non-optical inspection technologies.

UNIT –VIII :

Process and Production Planning :

Process planning, computer- aided process planning (CAP), concurrent engineering and design for manufacturing, aggregate production planning and the master production scheduled, material requirements planning (MRP), capacity planning, shop floor control, inventory control.

TEXT BOOKS :

1. Mikell P.Grover, Automation, Production Systems and Computer Prentice Hall of India Pvt.Ltd. 1995.

REFERENCES:

1. A.Troitsky Principles of Automation and Automated Production Mir Publ., 1976.
2. C.Ray Astaihe, Robots and Manufacturing automation, John Wile and Sons, New York.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**SOFTWARE ENGINEERING
(ELECTIVE – II)**

UNIT-I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT-II

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT-III

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT-IV

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT-VI

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT-VII

Metrics for Process and Products: Software Measurement, Metrics for software quality.

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT-VIII

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES:

1. Software Engineering- K.K. Aggarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz.
3. Systems Analysis and Design- Sheely Cashman Rosenblatt, 3rd edition, Galgotia Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**HYDRAULIC AND PNEUMATIC CONTROL SYSTEMS
(ELECTIVE – II)**

UNIT – I:

Introduction to Fluid Power, merits and utility of Fluid Power in industries. Difference between Hydraulic Systems & Pneumatic Systems. Fluid Power Components: Construction and operation of – Pump, Relief valve, Non-return valve, Pilot operated relief valve, Series and Parallel compensator of flow valve, Pressure compensated pump, motor, actuators, Seals used in the control systems.

UNIT – II:

Symbolic representation of Hydraulic and pneumatic Elements. Compressor and air line installations. Various types of Pumps used in hydraulic systems. Hydraulic Fluid and Effective contamination control. Purpose of Air-filters and types in Pneumatic systems.

UNIT – III:

Transmission System: Transmission of Fluid Power through various type of cylinders. Compressibility and inertia loading. Hydraulic stiffness, stiffness of pneumatic system. Component effectiveness, breakage, constant torque load, constant power load, inertia load, viscous damping.

UNIT –IV:

Valve controlled Systems: Flow through a single speed control valve, Series Pressure Compensation, combined directional and flow rate control valve, Steady reaction and Transient Reaction force.

UNIT – V:

Hydraulic and pneumatic circuits for different controls like – Sequencing circuit, counter balancing, indexing, linear motion, rotation & Hydro copying circuit. Electro-Pneumatics & Electro-Hydraulic controls, Hydro-Pneumatics, Cartridge valve design.

UNIT – VI:

Analysis of Accumulator Systems: Accumulator system dynamics, Thermodynamics, Thermodynamics consideration. Accumulator as Absorber of pressure shocks. Construction, operation and applications of Intensifier.

UNIT – VII:

Feed back Systems: Pressure control, Position control, Pump/motor systems. Control with variable capacity pumps. Pump stroke mechanisms. Position control using metering valve Double acting actuators.

UNIT – VIII:

Speed control, Inertia Load position control systems. Programmable sequential control using modular elements. Servo control systems. Trouble shooting and remedial measures in Hydraulic & Pneumatic Systems.

TEXT BOOKS:

1. Fluid Power Systems, by A.B. Goodinain, McMillan Press Ltd.
2. The Control of Fluid Power, by McCloy & Martin, Longman Publications.

REFERENCES:

1. Mechatronics, by Prof. C.V. Venkataramana, SBS Publishers and Distributors.
2. Production Drawing Practice, by Dr.P.Narsimha Reddy, T.A.Janardhan Reddy & C. Srinivas Rao, The Hi-Tech Publishers.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
4+1*	0	4

**EMBEDDED AND REAL TIME SYSTEMS
(ELECTIVE – II)**

UNIT I

INTRODUCTION : Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT II

GENERAL PURPOSE PROCESSORS : Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT III

STATE MACHINE AND CONCURRENT PROCESS MODELS : Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT IV

COMMUNICATION INTERFACE : Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT V

EMBEDDED / RTOS CONCEPTS – I : Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex.

UNIT VI

EMBEDDED/RTOS CONCEPTS – II : Mailboxes , Message Queues, Event Registers, Pipes, Signals

UNIT VII

EMBEDDED / RTOS CONCEPTS – III : Timers, Memory Management, Priority inversion problem, Embedded operating systems Embedded Linux, Real-time operating systems, RT Linux, Handheld operating systems, Windows CE.

UNIT VIII

DESIGN TECHNOLOGY : Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS :

1. Embedded System Design – A Unified Hardware/Software Introduction - Frank Vahid, Tony D. Givargis, John Wiley, 2002.
2. Embedded / Real Time Systems – KVKK Prasad, Dreamtech Press, 2005.

REFERENCES :

1. Embedded Microcomputer Systems – Jonathan W. Valvano, Brooks / Cole, Thompson Learning.
2. An Embedded Software Primer – David E. Simon, Pearson Ed., 2005.
3. Introduction to Embedded Systems – Raj Kamal, TMS, 2002.
4. Embedded Real Time Systems Programming – Sri Ram V Iyer, Pankaj Gupta, TMH, 2004.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
0	3	2

JAVA LAB

1. Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.
2. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that. Integer.
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program to multiply two given matrices.
7. Write a Java Program that reads a line of integers, and then displays each integers, and the sum of all the integers (use StringTokenizer class)
8. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
9. Write a Java program that reads a file and displays a file and displays the file on the screen, with a line number before each line.
10. Write a Java program that displays the number of characters, lines and words in a text file.
11. Write a Java program that:
 - a) Implements stack ADT.
 - b) Converts infix expression into Postfix form.
12. Write an applet that displays a simple message.
13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Otherwise the interest rate is annual.
14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - * / % operations. Add a text field to display the result.
15. Write a Java program for handling mouse events.
16. Write a Java program for creating multiple threads
17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
18. Write a Java program that lets users create Pie charts. Design your own user

interface (with swings & AWT)

19. Write a Java program that allows the user to draw lines, rectangles and Ovals.

20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

21. Write a Java program that illustrates how run time polymorphism is achieved.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

IV YEAR B.TECH E.Cont.E I-Sem

T	P	C
0	3	2

CONTROL SYSTEMS LAB – II

1. Open loop control of a relay servomechanism (ON-OFF control of a temperature in a heater bath).
2. Operation of Pneumatically operated pressure control system using pressure sensitive – bellows and LVDT as sensors.
3. Determination of the control characteristics of AC servomotor.
4. Transfer function of armature controlled DC servomotor with inertia and viscous damping.
5. DC motor speed control with regenerative and degenerative feedback and with tachogenerator in the feedback path.
6. DC position control system-output control with variation of control loop gain.
7. System identification for the frequency response of a filter (band pass+band elimination filter).
8. Pick and plan assignment of robot manipulator with microcontroller.
9. 4-1 line multiplexer with digital logic gates.
10. Design of phase lead and phase lag compensators using Bode plots.
11. Transfer function of a sample and zero order hold circuit.
12. Amplitude modulation of a low frequency, signal recovery after demodulation (effect of modulating frequency on the signal-noise ratio).