JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., Act. No. 30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

Revised Course Structure for B.Tech.- R13 Regulations

ELECTRONICS & COMMUNICATION ENGINEERING

B.Tech III - II Semester

S.No	Course code	Subject	Theory	Tu	Lab	Credits
1.	13A52501	Managerial Economics & Financial Analysis	3	1		3
2.	13A04601	Microprocessors & Microcontrollers	3	1		3
3.	13A04602	Digital Signal Processing	3	1	-	3
4.	13A04603	Microwave Engineering	3	1	-	3
5.	13A04604	Electronic Measurements & Instrumentation	3	1	-	3
6.	13A04605 13A04606 13A04607	**Choice Based Credit Courses** 1. Telecommunication Switching Networks 2. Television and Video Engineering 3. Artificial Neural Networks and Fuzzy Systems	3	1		3
7.	13A04608	Digital Signal Processing Lab	-		3	2
8.	13A04609	Microprocessors & Microcontrollers Lab	-		3	2
9.	13A52502	Advanced Communication skills Lab (Audit course)			3	
10	13A04610	Comprehensive Online Examination	-	-	-	1
		Total	18	6	9	23

DIRECTOR
Academic & Planning
JNT University Anantapur,
Ananthapuramu-515 002.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A52501) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

Course Objective:

The objectives of this course are to equip the student with the basic inputs of Managerial Economics and Economic Environment of business and to enrich analytical skills in helping them take sound financial decisions for achieving higher productivity.

Learning Outcome:

The thorough understanding of Managerial Economics and Analysis of Financial Statements facilitates the Technocrats – cum – Entrepreneurs to take-up decisions effectively and efficiently in the challenging Business Environment.

UNIT I

INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics - Definition, nature and scope – contemporary importance of Managerial Economics - Demand Analysis: Determinants- Law of Demand - Elasticity of Demand. Significance – types – measurement of elasticity of demand - Demand forecasting- factors governing demand forecasting- methods of demand forecasting –Relationship of Managerial Economics with Financial Accounting and Management.

UNIT II

THEORY OF PRODUCTION AND COST ANALYSIS

Production Function – Short-run and long- run production - Isoquants and Isocosts, MRTS, least cost combination of inputs - Cobb-Douglas production function - laws of returns - Internal and External economies of scale - **Cost Analysis**: Cost concepts - Break-Even Analysis (BEA) - Managerial significance and limitations of BEA - Determination of Break Even Point (Simple Problems)

UNIT III

INTRODUCTION TO MARKETS AND NEW ECONOMIC ENVIRONMENT

Market structures: Types of Markets - Perfect and Imperfect Competition - Features, Oligopoly - Monopolistic competition. Price-Output determination - Pricing Methods and Strategies. Forms of Business Organization – Sole Proprietorship- Partnership – Joint Stock Companies – Public Sector Enterprises – New Economic Environment- Economic systems – Economic Liberalization – Privatization and Globalization

UNIT IV

CAPITAL AND CAPITAL BUDGETING

Concept of Capital - Over and Under capitalization – Remedial measures - Sources of Short term and Long term capital - Estimating Working Capital requirement – Capital budgeting – Features of Capital budgeting proposals – Methods and Evaluation of Capital budgeting – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

UNIT V

INTRODUCTION TO FINANCIAL ACCOUNTING AND ANALYSIS

Financial Accounting – Concept - emerging need and importance - Double-Entry Book Keeping-Journal - Ledger – Trial Balance - Financial Statements - - Trading Account – Profit & Loss Account – Balance Sheet (with simple adjustments). Financial Analysis – Ratios – Techniques – Liquidity, Leverage, Profitability, and Activity Ratios (simple problems).

Text Books:

1. *Aryasri: Managerial Economics and Financial Analysis, 4/e, TMH, 2009.*
2. *Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.*

Reference Books:

1. *Premchand Babu, Madan Mohan: Financial Accounting and Analysis, Himalaya, 2009*
2. *S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International,. 2009.*
3. *Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.*
4. *Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2009.*
5. *H.L.Ahuja: Managerial* Economics, S.Chand, 3/e, 2009

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A04601) MICROPROCESSORS AND MICROCONTROLLERS

***Course Objectives*:**

- To understand the architecture of8086 MICROPROCESSOR.
- To learn various 8086 Instruction set and Assembler Directives.
- To become skilled in 8086 Assembly Language programming.
- To understand programmable peripheral devices and their Interfacing.
- To understand and learn 8051 microcontroller.
- To learn 8051 assembly Language programming

***Learning Outcomes*:**

- Becomes skilled in various 8086 Instruction set and Assembler Directives
- Able to write8086 Assembly Language programs.
- Able to understand programmable peripheral devices and their Interfacing.
- Able to write 8051 assembly Language programs.

UNIT-I 8085 ARCHITECTURE

Introduction-8085 Architecture-Block Diagram, Flag Register, Pin Diagram, Timing and Control Signals, System Timing Diagram, Instruction Set of 8085- Instruction & Data Formats-Addressing Modes- Instructions.

UNIT-II 8086 ARCHITECTURE

8086 Over View-Internal Architecture- Register Organization, Memory Segmentation, Flag Register, Pin Configuration, Physical Memory Organization, General Bus Operation- Minimum and Maximum Mode Signals, Timing Diagrams - Interrupts Of 8086.

UNIT-III INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMMING OF 8086

Instruction Formats -Addressing Modes-Instruction Set, Assembler Directives-Macros, Programs Involving Logical, Branch Instructions – Sorting and Evaluating Arithmetic Expressions - String Manipulations-Simple ALPs.

UNIT-IV INTERFACING DEVICES

8255 PPI- Block Diagram, Various Modes of Operation-Programmable Interval Timer 8254-Architecture,Operating Modes – Key Board/Display Controller 8279- Architecture, Modes of Operation, Command Words and Key Code and Status Data Formats-Programmable Communication Interface8251 USART-Architecture, Description Of Operating Modes-DMA Controller 8257- Internal Architecture and Signal Description .

UNIT-V INTRODUCTION TO MICRO CONTROLLERS 8051

Introduction, Architecture, Registers, Pin Description, Connections, I/O Ports, Memory Organization, Addressing Modes, Instruction Set, Architectural features of Intels 16 bit Micro Controller.

TEXT BOOKS:

1. A.K.Ray and Bhurchandi, "Advanced Microprocessors and Peripherals", 2nd Edition, TMH Publications.
2. Ajay V. Deshmukh, "Microcontrollers, Theory and applications", Tata McGraw-Hill Companies – 2005

REFERENCE BOOKS:

1. Douglas V.Hall, "Microprocessors and Interfacing", 2nd Revised Edition, TMH Publications.
2. Liu & Gibson, "Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design", 2nd ed., PHI
3. Kenneth j.Ayala, Thomson, "The 8051 Microcontrollers", Asia Pte.Ltd
4. Krishna Kant, "Microprocessors and Microcontrollers", PHI Publishers

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A04602) DIGITAL SIGNAL PROCESSING

Course Objectives:

- To use Z transforms and discrete time Fourier transforms to analyze a digital system.
- To design and understand simple finite impulse response filters
- To understand stability of FIR filters
- To know various structures used in the implementation of FIR and IIR filters
- Window method design structure for implementation.

Learning Outcomes:

At the end of the course, the student should be able to:

- Describe the Sampling Theorem and how this relates to Aliasing and Folding.
- Determine if a system is a Linear Time-Invariant (LTI) System and Take the Z-transform of a LTI system.
- Find the frequency response of FIR and IIR filters through analysis.
- Understand the relationship between poles, zeros, and stability and determine the spectrum of a signal using the DFT, FFT, and spectrogram.
- Design, analyze, and implement various digital filters.

UNIT-I

Introduction: Review of discrete-time signals and systems – Time domain analysis of discrete-time signals & systems, Frequency domain analysis of discrete-time signals and systems. Discrete Fourier Transform: Frequency-domain sampling and reconstruction of discrete-time signals, Discrete Fourier Transform (DFT), The DFT as a linear transformation, Relationship of the DFT to other transforms, Properties of DFT, Linear filtering methods based on DFT, Frequency analysis of signals using the DFT.

UNIT-II

Fast Fourier Transform Algorithms (FFTA): Efficient computation of the DFT – Direct computation of DFT, Divide and conquer approach to computation of DFT, Radix-2, Radix-4, and Split radix FFT algorithms, Implementation of FFT algorithms, Applications of FFT algorithms – Efficient computation of the DFT of two real sequences, 2N point real sequences, Use of the FFT algorithm in linear filtering and correlation, A linear filtering approach to computation of the DFT- the Goertzel, and the Chirp-z transform algorithms, Quantization errors in the computation of DFT.

UNIT-III

Implementation of Discrete-Time Systems: Structures for the realization of discrete-time systems, Structures for FIR systems - Direct form, Cascade form, Frequency sampling, and Lattice structures, Structures for IIR systems – Direct form, Signal flow graphs & Transposed, Cascade form, Parallel form and Lattice structures, Conversion from Lattice structure to direct form, lattice –Ladder structure.

UNIT-IV

Design of Digital Filters: General considerations – Causality and its implications, Characteristics of practical Frequency Selective Filters, Design of Finite Impulse Response (FIR) filters – Symmetric and asymmetric FIR filters, Design of linear phase FIR filters using windows, Design of linear phase FIR filters by the frequency sampling method, Design of optimum equi-ripple linear phase FIR filters, Comparison of design methods for linear phase FIR filters, Design of Impulse Invariance Response (IIR) filters from analog filters – IIR filter design by approximation of derivatives, by Impulse invariance, and by bilinear transformation methods, Characteristics of commonly used analog filters, Design examples of both FIR and IIR filters, Frequency transformation in the analog and digital domains, Illustrative problems.

UNIT-V

Multirate Digital Signal Processing: Introduction, Decimation, and interpolation, Sampling rate conversion by a rational factor, Implementation of sampling rate conversion, Multistage implementation of sampling rate conversion, Sampling rate conversion of bandpass signals, Sampling rate conversion by arbitrary factor, Applications of multirate signal processing.

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, "Digital signal processing, principles, Algorithms and applications," Pearson Education/PHI, 4th ed., 2007.
2. Sanjit K Mitra, "Digital signal processing, A computer base approach," Tata McGraw Hill, 3rd edition, 2009.

REFERENCES:

1. A.V.Oppenheim and R.W. Schaffer, & J R Buck, "Discrete Time Signal Processing," 2nd ed., Pearson Education, 2012.
2. B. P. Lathi, "Principles of Signal Processing and Linear Systems," Oxford Univ. Press, 2011.
3. Li Tan, Jean Jiang, "Digital Signal Processing, Fundamentals and Applications," Academic Press, Second Edition, 2013.
4. Andreas Antoniou, "Digital Signal Processing," TATA McGraw Hill, 2006.
5. Schaum's outlines M H Hayes, "Digital Signal Processing," TATA Mc-Graw Hill, 2007.
6. A. Anand Kumar, "Digital Signal Processing," PHI Learning, 2011.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A04603) MICROWAVE ENGINEERING

Course Objectives:

- To analyze micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
- To Use S-parameter terminology to describe circuits.
- To explain how microwave devices and circuits are characterized in terms of their "S" Parameters.
- To give students an understanding of microwave transmission lines.
- To Use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc..
- To give students an understanding of basic microwave devices (both amplifiers and oscillators).
- To expose the students to the basic methods of microwave measurements.

Learning Outcomes:

At the end of the semester, students are provided learning experiences that enable them to:

- Analyze micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
- Understand the various principles involved in various Microwave oscillators and amplifiers such as Klystron tubes, TWTs, Magnetrons, Gunn diode etc.
- Use S-parameter terminology & to describe the characteristics of microwave circuits through scattering parameters.
- Ability to understanding of microwave transmission lines and how to use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
- Set up the microwave benches for measurement of various parameters such as microwave frequency, VSWR, Impedance of unknown load etc.
- Verify the characteristics of Microwave devices through measurements.

UNIT-I

Waveguides & Resonators: Introduction, Microwave spectrum and bands, applications of Microwaves, Rectangular Waveguides-Solution of Wave Equation in Rectangular Coordinates, TE/TM mode analysis, Expressions for fields, Cutoff frequencies, filter characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross-section, Mode characteristics - Phase and Group velocities, wavelengths and impedance relations, Circular Waveguides - Dominant mode (qualitative treatment only), Rectangular Waveguides – Power Transmission and Power Losses, Impossibility of TEM Modes, losses, Q-factor, Cavity resonators-introduction, Rectangular and cylindrical cavities, dominant modes and resonant frequencies, Q-factor and coupling coefficients, Illustrative Problems.

UNIT-II

Waveguide Components: Scattering Matrix - Significance, Formulation and properties, Coupling mechanisms - Probe, Loop, Aperture types, Wave guide discontinuities - waveguide Windows, tuning screws and posts, matched loads, Waveguide attenuators - Resistive card, rotary vane Attenuators, waveguide phase shifters-dielectric, rotary vane phase shifters, Wave guide multiport junctions - E plane and H plane Tees, Magic Tee, Directional couplers-2 hole, Bothe hole types, Ferrites-composition and characteristics, Faraday rotation, Ferrite components - Gyrator, Isolator, Circulator, S Matrix calculations for 2-port junction, E plane and H plane Tees, Magic Tee, Directional coupler, circulator and Isolator, Illustrative Problems.

UNIT-III

Linear beam Tubes: Limitations and losses of conventional tubes at microwave frequencies, Classification of Microwave tubes, O type tubes - 2 cavity klystrons-structure, Reentrant cavities, velocity modulation process and Applegate diagram, bunching process and small signal theory-Expressions for o/p power and efficiency, Reflex Klystrons-structure, Velocity Modulation, Applegate diagram, mathematical theory of bunching, power output, efficiency, oscillating modes and o/p characteristics, Effect of Repeller Voltage on Power o/p, Significance, types and characteristics of slow wave structures, structure of TWT and amplification process (qualitative treatment), Suppression of oscillations, Gain considerations.

UNIT - IV

Cross-field Tubes & Microwave Semiconductor Devices: Introduction, Cross field effects, Magnetrons-different types, cylindrical travelling wave magnetron-Hull cutoff and Hartree conditions, modes of resonance and PI-mode operation, separation of PI-mode, O/P characteristics, Introduction to Microwave semiconductor devices, classification, applications, Transfer Electronic Devices, Gunn diode - principles, RWH theory, Characteristics, Basic modes of operation - Gunn oscillation modes, LSA Mode, Varactor diode, Parametric amplifier, Introduction to Avalanche Transit time devices (brief treatment only), Illustrative Problems.

UNIT-V

Microwave Measurements: Description of Microwave bench-different blocks and their features, errors and precautions, Microwave power measurements, Measurement of attenuation, frequency, VSWR (low, medium, high), Measurement of 'Q' of a cavity, Impedance measurements.

TEXT BOOKS:

1. Samuel Y. Liao, "Microwave devices and circuits," Pearson, 3rd Edition, 2003.
2. Herbert J. Reich, J. G. Skalnik, P. F. Ordung and H. L. Krauss, "Microwave principles," CBS publishers and distributors, New Delhi, 2004.

REFERENCES:

1. R. E. Collin, "Foundations for microwave engineering," IEEE press, John Wiley, 2nd Edition, 2002.
2. Om. P. Gandhi, "Microwave Engineering and Applications," Pergamon, 1981.
3. David M. Pozer, "Microwave Engineering," Wiley India Pvt. Ltd., 3rd Edition, 2010.
4. Rajeswari Chatterjee, "Elements of Microwave Engineering," Ellis Horwood Ltd., Publisher, 1986.
5. Peter A.Rizzi, "Microwave Engineering Passive Circuits," PHI, 1999.
6. F. E. Terman, "Electronic and Radio Engineering," McGraw-Hill, 4th Edition, 1995.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)

T	Tu	C
3	1	3

(13A04604) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Course Outcomes:

After the completion of the course the students will be able to

- Understand basic principles involved in the meters for measuring voltage, current, resistance, frequency and so on.
- Employ CRO for measuring voltage, current, resistance, frequency and so on.
- Understand principles of measurements associated with different bridges.
- Get complete knowledge regarding working of advanced instruments such as logic analyzers and spectrum analyzers.

UNIT-I

Performance characteristics of Instruments: Static characteristics, Accuracy, Precision, Resolution, Sensitivity, static and dynamic calibration, Errors in Measurement, and their statistical analysis, dynamic characteristics-speed of Response, fidelity, Lag and dynamic error. DC ammeters, DC voltmeters-multirange, range extension/solid state and differential voltmeters, AC voltmeters –multirange, range extension. Thermocouple type RF ammeter, ohm meters, series type, shunt type, multimeter for voltage, current and resistance measurements.

UNIT-II

Oscilloscopes: Standard specifications of CRO,CRT features, derivation of deflection sensitivity, vertical and horizontal amplifiers, horizontal and vertical deflection systems, sweep trigger pulse, delay line, sync selector circuits, probes for CRO – active, passive, and attenuator type, triggered sweep CRO, and Delayed sweep, dual trace/beam CRO, Measurement of amplitude, frequency and phase (Lissajous method).Principles of sampling oscilloscope, storage oscilloscope, and digital storage oscilloscope, Digital frequency counters, time & Period measurements.

UNIT-III

Signal generator-fixed and variable, AF oscillators, function generators, pulse, random noise, sweep, and arbitrary waveform generators, their standards, specifications and principles of working (Block diagram approach).Wave analyzers, Harmonic distortion analyzers, Spectrum analyzers, and Logic analyzers.

UNIT-IV

Review of DC Bridges: Wheatstone bridge, Wein Bridge, errors and precautions in using bridges, AC bridges: Measurement of inductance-Maxwell's bridge, Anderson Bridge. Measurement of capacitance- Schearing Bridge. Kelvin Bridge, Q-meter, EMI and EMC, Interference and noise reduction techniques.

UNIT-V

Sensors and Transducers - Active and passive transducers: Measurement of displacement (Resistance, capacitance, inductance; LVDT) Force (strain gauges) Pressure (piezoelectric transducers) Temperature (resistance thermometers, thermocouples, and thermistors), Velocity, Acceleration, Vibration, pH measurement Signal Conditioning Circuits.

TEXT BOOKS:

1. H.S.Kalsi, "Electronic instrumentation", second edition, Tata McGraw Hill, 2004.
2. K. Lal Kishore, "Electronic Measurements & Instrumentations", Pearson Education, 2009.

REFERENCES:

1. A.D. Helfrick and W.D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 5th Edition, 2002.
2. Ernest O Doebelin and Dhanesh N Manik, "Measurement Systems Application and Design", TMH, 5th Edition, 2009.
3. Oliver and Cage, "Electronic Measurement and Instrumentation", TMH.
4. Robert A.Witte, "Electronic Test Instruments, Analog and Digital Measurements", Pearson Education, 2nd Ed., 2004.
5. David A. Bell, "Electronic Instrumentation & Measurements", PHI, 2nd Edition, 2003.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A04605) TELECOMMUNICATION SWITCHING NETWORKS

Course Outcomes:

- Able to understand the concepts of Frequency and Time division multiplexing.
- Able to analyze the concepts of space switching, time switching and combination switching.
- Able to acquire knowledge needed for network synchronization, network control and management issues.
- Able to apply concepts of statistical modeling for telephone traffic and to characterize blocking probability holding service time distributions for in speech and data networks.

UNIT I MULTIPLEXING: Transmission Systems, FDM Multiplexing and modulation, Time Division Multiplexing, Digital Transmission and Multiplexing: Pulse Transmission, Line Coding, Binary N-Zero Substitution, Digital Biphase, Differential Encoding, Time Division Multiplexing, Time Division Multiplex Loops and Rings, SONET/SDH: SONET Multiplexing Overview, SONET Frame Formats, SONET Operations, Administration and Maintenance, Payload Framing and Frequency Justification, Virtual Tributaries, DS3 Payload Mapping, E4 Payload Mapping, SONET Optical Standards, SONET Networks. SONET Rings: Unidirectional Path-Switched Ring, Bidirectional Line-Switched Ring.

UNIT II DIGITAL SWITCHING: Switching Functions, Space Division Switching, Time Division Switching, twodimensional Switching: STS Switching, TST Switching, No.4 ESS Toll Switch, Digital Cross-Connect Systems, Digital Switching in an Analog Environment. Elements of SS7 signaling.

UNIT III NETWORK SYNCHRONIZATION CONTROL AND MANAGEMENT: Timing: Timing Recovery: Phase-Locked Loop, Clock Instability, Jitter Measurements, Systematic Jitter. Timing Inaccuracies: Slips, Asynchronous Multiplexing, Network Synchronization, U.S. Network Synchronization, Network Control, Network Management.

UNIT IV DIGITAL SUBSCRIBER ACCESS: ISDN: ISDN Basic Rate Access Architecture, ISDN U Interface, ISDN D Channel Protocol. High-Data-Rate Digital Subscriber Loops: Asymmetric Digital Subscriber Line, VDSL. Digital Loop Carrier Systems: Universal Digital

Loop Carrier Systems, Integrated Digital Loop Carrier Systems, Next-Generation Digital Loop Carrier, Fiber in the Loop, Hybrid Fiber Coax Systems, Voice band Modems: PCM Modems, Local Microwave Distribution Service, Digital Satellite Services.

UNIT V TRAFFIC ANALYSIS: Traffic Characterization: Arrival Distributions, Holding Time Distributions, Loss Systems, Network Blocking Probabilities: End-to-End Blocking Probabilities, Overflow Traffic, Delay Systems: Exponential service Times, Constant Service Times, Finite Queues.

TEXTBOOK:

1. J. Bellamy, "Digital Telephony", John Wiley, 2003, 3rd Edition.
2. 2. JE Flood, "Telecommunications Switching, Traffic and Networks", Pearson.
3. Viswanathan. T., "Telecommunication Switching System and Networks", Prentice Hall of India Ltd., 1994.

REFERENCES:

1. R.A.Thomson, "Telephone switching Systems", Artech House Publishers, 2000.
2. W. Stalling, " Data and Computer Communications", Prentice Hall, 1993.
3. T.N.Saadawi, M.H.Ammar, A.E.Hakeem, "Fundamentals of Telecommunication Networks", Wiley Interscience, 1994.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)	T	Tu	C
	3	1	3

(13A04606) TELEVISION AND VIDEO ENGINEERING

Course Objectives:

- To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver Picture tubes and Television Camera Tubes.
- To study the various Color Television systems with a greater emphasis on television standards.
- To study the advanced topics in digital television and High definition television.

Course Outcome:

- Able to understand the transmission of video signals and importance of television standards to effectively work with broadcasting applications.
- Able to acquire sound knowledge of latest topics in digital video transmission.
- Able to analyze various Color Television systems with a greater emphasis on television standards.
- Able to understand advanced topics in digital television and High definition television.

UNIT I: Television Fundamentals Scanning-Interlaced-Progressive-Synchronizing Pulses-Composite video waveform-Common image format-Active line-Aspect ratio-Pixels & Bandwidth-Video Bandwidth-Television Broadcasting-Modulation-Frequency Spectrum-Channel allocation- Light and colour-The sensation of colour-Primary colours-The colour triangle-Saturation and hue-Colour temperature.

UNIT II: Color Television Signal and Systems Color Characteristics-Chromaticity diagram-Color Cameras- Color Signal Generation and Encoding; Color Television Standards-NTSC-Encoder-Decoder-SECAM-Encoder-Decoder-PAL Systems-Encoder-Decoder;

UNIT III: Display Device Technologies. Color picture display devices-Trinitron- -Plasma displays- Introduction to Flat panel displayResolution: flat panel versus CRT-Plasma operation-Scanning: Sequential and Interlaced LCD displays- Polarization-Principles of operation of LC cell-Reflective and Transmissive-The TN Transmissive LCD- -TFT cell drive-Response time-Polarity inversion-Grayscale and colour generation

UNIT IV: Television Receivers The analogue TV receiver-The front end-RF oscillator-Mixer-oscillator-Complete tuner-The phase-locked loop-Synthesized tuning-The IF stage-The IF response curve-The vision detectorSynchronous demodulator- Flat panel television receivers-Video formatting-Scan-rate conversion-Image scaling-De-gamma correction and error and diffusion -Digital video interfaceHigh definition multimedia interface

UNIT V: Digital and High Definition Television Principles of digital video broadcasting-Digitizing the TV picture-SDTV sampling rate-Video sampling-Sampling structure-The bit rate-HDTV common interface format-Intra-frame (spatial) prediction-Intra-blocks and modes-Size and mode selection-Intra-prediction operation-AVC motion compensation-Motion compensation block sizes-Motion vector prediction.

Text Books:

1. Gulati.R.R, "Modern Television Practice", New Age International Publishers, 2nd Edition(2006)
2. M. Dhake,"Television and Video Engineering", 2nd Edition, Tata-McGraw Hill publications (2003).

Reference Books:

1. Herve Benoit, "Digital TV for Satellite Broadcasting", Elsevier Publication, 4th Edition (2005).
2. Lars Ingemar Lundstrom, "Understanding Digital Television", Elsevier Publications 1st Edition (2006).
3. K.F Ibrahim, "Television and Video Technology", 4th Edition, Newnes Publications (2007).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)

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3	1	3

(13A04607) ARTIFICIAL NEURAL NETWORKS AND FUZZY SYSTEMS

Course Objectives:

- Understand neural networks fundamentals and pattern classification theory.
- Express the functional components of neural network classifiers and
- Develop and implement a basic fuzzy logic theory and classifiers.
- Develop and implement fuzzy logic system.
- Understand the programming concept of Pattern classification using neural network and Apply fuzzy set operations and defuzzification for control system applications.

Course Outcomes:

- Generate logic functions like AND,OR, XOR using learning rules and apply Hebb rule and perception learning rule for pattern classification problem.
- Develop back propagation algorithm and other basic training algorithms for feed forward networks.
- Implemented a basic fuzzy logic theory and classifiers.
- Apply the rules of fuzzy logic for fuzzy controller.
- Apply fuzzy set operations and defuzzification for control system applications and Applications of neural nets in different fields

UNIT I INTRODUCTION: Basic building blocks of ANN, ANN terminologies, comparison between Artificial & Biological neural networks, Learning Rules, Network Architectures, Fundamental Models of ANN, Neural Net for Pattern Classification- Hebb Net, Perceptron , Adaline., examples. Madaline network – Architecture, training algorithm.

UNIT II FEED FORWARD AND FEEDBACK NETWORKS: Back propagation network-Architecture, training algorithm, Discrete Hopfield network –architecture, training algorithm and energy analysis, Radial Basis Function network -Architecture, training algorithm. Associative neural network- Hetero associative neural net architecture and Auto associative net architecture, Examples with missing and mistake data

UNIT III FUZZY SET THEORY: Fuzzy vs crisp sets, crisp sets, Operations on crisp sets, properties of crisp sets, partition and covering. Membership function, Basic fuzzy set operations, properties of Fuzzy sets, Crisp relations and Fuzzy relations.

UNIT IV FUZZY SYSTEMS: Crisp logic: Laws of propositional logic, inference in propositional logic. Predicate logic: Interpretations of predicate logic formula, inference in predicate logic. Fuzzy logic: Fuzzy Quantifiers, Fuzzy inference. Fuzzy rule based system, defuzzification. Applications: Greg Viot's Fuzzy cruise controller, Air conditioner controller.

UNIT V APPLICATIONS: Pattern classification using Hebb net and McCulloch – Pitts net, Pattern recognition using Perceptron Networks, Applications of neural nets in different fields ,Implementation of all fuzzy operations on both discrete and continuous fuzzy sets, Defuzzification, Fuzzy inference system.

TEXT BOOKS:

1. S. Rajasekaran, G.A. VijayalakshmiPai, "Neural Networks, Fuzzy logic and Genetic algorithms", PHI, 2003.
2. Timothy Ross, "Fuzzy Logic with Engineering Applications", John Wiley and Sons,2004.
3. S. N. Sivanandam, S. Sumathi, S N Deepa , "Introduction to Neural Networks using Matlab 6.0", Tata McGraw Hill, 2006.

REFERENCE BOOKS:

1. Jacek M. Zurada , "Introduction to Artificial Neural Systems", Jaico Publishing House.
2. Fundamentals of Neural Networks, Architectures, Algorithms, and Applications, Laurene Fausett, Pearson Educaation,2004
3. B.Kosko, "Neural Networks and Fuzzy systems, Prentice Hall, 1991.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)

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(13A04608) DIGITAL SIGNAL PROCESSING LAB

Course Objectives:

- To design real time DSP systems and real world applications.
- To implement DSP algorithms using both fixed and floating point processors.
- To generate the basis function of different transforms.

Learning Outcomes:

- Able to design real time DSP systems and real world applications.
- Able to implement DSP algorithms using both fixed and floating point processors.

List of Experiments: (Minimum of 5 experiments are to be conducted from each part)

Software Experiments (PART – A)

1. Generation of random signal and plot the same as a waveform showing all the specifications.
2. Finding Power and (or) Energy of a given signal.
3. Convolution and Correlation (auto and cross correlation) of discrete sequences without using built in functions for convolution and correlation operations.
4. DTFT of a given signal
5. N – point FFT algorithm
6. Design of FIR filter using windowing technique and verify the frequency response of the filter.
7. Design of IIR filter using any of the available methods and verify the frequency response of the filter.
8. Design of analog filters.

Using DSP Processor kits (Floating point) and Code Composure Studio (CCS) (PART – B)

1. Generation of random signal and plot the same as a waveform showing all the specifications.
2. Finding Power and (or) Energy of a given signal.
3. Convolution and Correlation (auto and cross correlation) of discrete sequences without using built in functions for convolution and correlation operations.
4. DTFT of a given signal
5. N – point FFT algorithm
6. Design of FIR filter using windowing technique and verify the frequency response of the filter.

7. Design of IIR filter using any of the available methods and verify the frequency response of the filter.
8. Design of analog filters.

Equipment/Software Required:

1. Licensed MATLAB software with required tool boxes for 30 users.
2. DSP floating Processor Kits with Code Composure Studio (8 nos.)
3. Function generators
4. CROs
5. Regulated Power Supplies.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E)

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(13A04609) MICROPROCESSORS & MICROCONTROLLERS LAB

***Course Objectives*:**

- To become skilled in 8086 Assembly Language programming.
- To understand programmable peripheral devices and their Interfacing.
- To understand and learn 8051 microcontroller.
- To learn 8051 assembly Language programming

***Learning Outcomes*:**

- Able to write8086 Assembly Language programs.
- Able to understand programmable peripheral devices and their Interfacing.
- Able to write 8051 assembly Language programs.

Minimum **Ten** Experiments to be conducted (**Five** from each section)

I) 8086 Microprocessor Programs using MASM/8086 kit.

1. Introduction to MASM Programming.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Length of the string, String comparison.

Interfacing:

1. 8259 – Interrupt Controller and its interfacing programs
2. 8255 – PPI and its interfacing programs (A /D, D/A, stepper motor,)
3. 7-Segment Display.

II) Microcontroller 8051 Trainer kit

1. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation.
2. Logic operations – Shift and rotate.
3. Sorting- Ascending and descending order.

Interfacing using 8051 Trainer kit:

1. Key board Interfacing
2. Seven Segment display
3. Switch Interfacing
4. Relay Interfacing
5. UART

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech-III-II sem (E.C.E) L 3

(13A52502) ADVANCED COMM. SKILLS LAB (AUDIT COURSE)

Introduction:

The introduction of the Advanced Communication Skills 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 a laboratory course to enable students to use 'good' English and perform the following:

- *Gathering ideas and information to organise ideas relevantly and coherently.*
- *Engaging in debates.*
- *Participating in group discussions.*
- *Facing interviews.*
- *Writing project/research reports/technical reports.*
- *Making oral presentations.*
- *Writing formal letters.*
- *Transferring information from non-verbal to verbal texts and vice-versa.*
- *Taking part in social and professional communication.*

Course Objective:

This Lab focuses on using multi-media 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.*
- *To prepare all the students for their placements.*

Learning Outcome:

- *Accomplishment of sound vocabulary and its proper use contextually*
- *Flair in Writing and felicity in written expression.*
- *Enhanced job prospects.*
- *Effective Speaking Abilities*

The following course content to conduct the activities is prescribed for the Advanced English Language Communication Skills (AELCS) Lab:

UNIT I

COMMUNICATIVE COMPETENCY

1. Reading Comprehension
2. Listening comprehension
3. Vocabulary for competitive purpose
4. Spotting errors

UNIT II

TECHNICAL WRITING

1. Report writing
2. Curriculum vitae
3. Covering letter
4. E-mail writing

UNIT III

PRESENTATIONAL SKILLS

1. Oral presentation
2. Power point presentation
3. Poster presentation
4. Stage dynamics

UNIT IV

CORPORATE SKILLS

1. Dress code
2. Telephonic skills
3. Net Etiquettes

UNIT V

GETTING READY FOR JOB

1. Group discussions
2. Interview skills
3. Psychometric tests

Minimum Requirement:

The Advanced English Language Communication Skills (AELCS) Laboratory shall have the following infra-structural facilities to accommodate at least 60 students in the lab:

- *Spacious room with appropriate acoustics.*
- *Round Tables with movable chairs*
- *Audio-visual aids*
- *LCD Projector*
- *Public Address system*
- *P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ*
- *T. V, a digital stereo & Camcorder*
- *Headphones of High quality*

Suggested Software:

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

K-VAN SOLUTIONS-Advanced communication lab

1. *DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.*
2. *TOEFL & GRE(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)*
3. *Train2success.com*

References:

1. *Objective English For Competitive Exams, Hari Mohana Prasad, 4th edition, Tata Mc Graw Hill.*
2. *Technical Communication by Meenakshi Raman & Sangeeta Sharma, O U Press 2009.*
3. *Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press.2012.*
4. *Soft Skills for Everyone, Butterfield Jeff, Cengage Publications, 2011.*
5. *Practice Psychometric Tests: How to familiarize yourself with genuine recruitment tests, 2012.*
6. *Management Shapers Series by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.*
7. *Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.*
8. *English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill 2009.*
9. *Word Power Made Handy, Shalini Verma, S Chand Publications, 2011.*
10. *Effective Technical Communication, Ashrif Rizvi, TataMcGrahill, 2011.*