SANTHIRAM ENGINEERING COLLEGE:: NANDYAL

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NH-40, Nandyal – 518501 :: Kurnool Dist. A.P.

DEPARTMENT:- ELECTRONICS & COMMUNICATION ENGINEERING

				COURSE OUTCOMES	REGULATION : R15	
Year/Sem.	S.No.	Subject Name	SUB CODE		**COURSE OUTCOMES**	
	1	MATHEMATICS-III	15A54301	CO1	Explain the concepts of matrices and its applications	
				CO2	Able to solve the algaebraic and transcendental equations using numerical methods	
				CO3	Able to understand inter polation and extra polation and apply the appropriate methods to solve the problems	
				CO4	Construct the different types of curves by using the different numerical techniques.	
				CO5	Solve the ordinary differential equations by applying the various numerical techniques	
	2	ELECTRONIC DEVICES AND CIRCUITS	15A04301	CO1	Analyze the Junction Diode Characteristics, Special Semiconductor Diodes characteristics and applications.	
				CO2	To understand the concept of Rectifiers and analyze using Filters	
				CO3	Design and analyze the DC bias circuitry of BJT and FET.	
				CO4	To understand and analyze Transistor Biasing and Thermal Stabilization for BJT and FET.	
				CO5	To understand and apply Small Signal Low Frequency Transistor Amplifier Models	
	3	SWITCHING THEORY AND LOGIC	15A04302	CO1	To understand and analyze the different types of number systems and the Boolean algebra and its simplification.	
				CO2	To understand and analyze the K – map and tabular simplification techniques	
				CO3	To understand the concepts and study the procedures for the analysis and design of combinational circuits	

II YEAR- I SEM		DESIGN		CO4	To understand the concepts and study the procedures for the analysis and design of synchronous and asynchronous sequential circuits
				CO5	To understand the concepts different memory systems and study the procedures for the analysis and design of Programmable logic devices
	4	SIGNALS AND SYSTEMS	15A04303	CO1	To Understand Signals and systems and make use of Integer & differential equations.
				CO2	Analysis of signals using Continuous time Fourier Transform and Fourier series
				CO3	To Understand concept of convolution for Signal Transmission Through linear Sytems
				CO4	Analysis of signals using Discrete Fourier Transform
				CO5	To Understand and anlalyze discrete time signals using Z-transform.
	5	PROBABILITY THEORY & STOCHASTICP ROCESSES	15A04304	CO1	To understand the concept of a Random Variable and operations that may be performed on a single Random variable
				CO2	To understand the concept of a Multiple Random Variable and operations that may be performed on a single Multiple Random variable
				CO3	To determine the temporal characteristics of random signal response of a given linear system.
				CO4	To determine the spectral characteristics of random signal response of a given linear system
				CO5	To understand Linear Systems with Random inputs
	6	ELECTRICAL TECHNOLOGY	15A02306	CO1	To Understand DC Generators and its operation
				CO2	To Understand D.C. Motors, and its operation
				CO3	To Understand Single Phase transformers.
				CO4	To Understand3-Phase Induction Motors
				CO5	To Understand Synchronous Machines
	7	ELECTRICAL TECHNOLOGY AND BASIC SIMULATION LABORATORY	15A02307	CO1	perform the Characteristics of D.C.Shunt Generator
				CO2	Perform various operations on signals
				CO3	Verify the properties of LTI system and its response for different inputs.
				CO4	Analyze the signals using various transforms

				CO5	Analyze the characteristics of signals in noisy environment.
	8	ELECTRONIC DEVICES AND CIRCUITS LABORATORY	15A04305	CO1	Get knowledge about Semiconductor devices and also learn the current and voltage characteristics of various devices.
				CO2	Get knowledge about different types rectifiers and filters along with their efficiency and ripple factors.
				CO3	Learn about different types of BJT Transistor configurations along with current and voltage characteristics
				CO4	Learn about different types of FET Transistor configurations along with current and voltage characteristics
				CO5	Get knowledge about small signal low frequency BJT Transistor amplifiers along with their h-parameters.
	1	COMPUTER ORGANIZATION	15A05402	CO1	Describe fundamental organization and functional components of computer.
				CO2	Explain addressing modes, Instruction formats and program control statements.
				CO3	To understand basic concepts of Micro programmed control, and Binary arithmetic operations.
				CO4	Describe the organization of Various parts of Memory Hierarchy.
				CO5	To understand the fundamentals of pipelining and vector processing.
	2	SOCIAL VALUES & ETHICS	15A99501	CO1	Able recall family,and human values and compare his family with others and analyse the
				CO2	Classify the fundamental Rights and fundamental duties of citizen Influence the factors affecting youth crime..
				CO3	Explain the Environmental issues and Justify the objectives of civil defense.
				CO4	Demonstrate Gender inequality, Domestic violence and Appraise the government schemes ,laws.
				CO5	Importance the games ,sports,and benefits of exercise, Recommend the yoga asanas ,mudras and pranayama .
				CO1	To Approximateparametricequationsforthecalculationinthefarfieldregion.

III YEAR I-SEM	3	ANTENNA &WAVE PROPAGATION	15A04501	**CO2**	Remember and apply parametric integral expressions for a given current source.
				CO3	Understand and Evaluate electromagnetic fields for a given vector potential.
				CO4	Analyze and create pattern multiplication principle for array antennas.
				CO5	To understand and analyze Wave Propagation
	4	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	15A04503	**CO1**	To Understand the basic building blocks of linear integrated circuits and its characteristics.
				CO2	To Analyzethelinear,non-linearandspecializedapplicationsofoperational amplifiers.
				CO3	To Realize the importance of Operational Amplifier.
				CO4	To Analyze and Understand the importance of Oscillators
				CO5	To Understand the concept of ADC and DAC
	5	DIGITAL COMMUNICATION SYSTEM	15A04502	**CO1**	To Understand the elements of DCS & the fundamentals concepts of sampling theorem along with different coding and modulation techniques
				CO2	To Understand the basic principles of baseband and pass band digital modulation schemes
				CO3	To Analyze probability of error performance of digital systems and are able to design digital communication systems.
				CO4	To Analyze and Understand Pass band Data Transmission.
				CO5	To understand and apply Channel Coding
	6	MEMS & MICRO SYSTEMS	15A04506	**CO1**	Describe about introduction to mems and Microsystems and properties and materials for MEMS devices
				CO2	Explain about different micro maching technique and fabrication of Mems devices
				CO3	Explain about different micro sensors and applications of Mems Sensors.
				CO4	Describe different Mems accelerometer and case study on Mems applications.
				CO5	Explain about Mems applications
		DIGITAL		**CO1**	Capable of using Computer-aided design tools to model, simulate, verify, analyze, and synthesize complex digital logic circuits.
				CO2	To Efficiently design any Digital System using basic structure ICs

7	SYSTEM DESIGN	15A04504	CO3	To Able to design and prototype with standard cell technology and programmable logic	
			CO4	To Apply design test for digital logic circuits, and design fortest ability.	
			CO5	To Design examples using VHDL	
8	IC Applications Laboratory	15A04507	CO1	Classify different storage devices and indexing methods.	
			CO2	Design analog circuits for practical applications using Op Amp IC-741	
			CO3	Design waveform generators and PLL circuits using ICs	
			CO4	Design multi vibrators using IC555 and Schmitt trigger using IC741	
			CO5	Analyze the practical applications of Voltage Regulator using various ICs.	
9	Digital Communication Systems Laboratory	15A04508	CO1	The students will be able to experience real time behavior of different digital modulation schemes	
			CO2	Experiment with the principle of PCM, DPCM, DM, ADM and TDM	
			CO3	Analyze different digital modulation and demodulation schemes.	
			CO4	Analyze Spectral characteristics of PAM, PWM and QAM	
			CO5	Experiment with OFDM generation and detection	
1	EMBEDDED SYSTEMS	15A04702	CO1	To Design & Understanding of embedded systems leading to 32-bit application development.	
			CO2	Analyze and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world.	
			CO3	Understand hardware-interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations.	
			CO4	Analyze and Create Microcontroller to communicate with external sensors and actuators in real world.	
			CO5	Understand Embedded Networking and IoT concepts based upon connected MCUs and Apply it in RTOS	
2	OPTICAL FIBER COMMUNICA TION	15A04701	CO1	Understand basic fundamental theory of fiber optics.	
			CO2	Discuss the channel impairments like attenuation, scattering losses, bending losses and dispersion.	
			CO3	Demonstrate basic mechanism of light generation.	
			CO4	Analyze the detection of light.	

				CO5	Design architectures of optical fiber communication systems
IV YEAR I SEM	3	MICROWAVE ENGINEERING	15A04703	**CO1**	Ability to analyze micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
				CO2	Ability to Use S-parameter terminology to describe circuits and to explain how microwave devices and circuits are characterized in terms of their "S"-Parameters.
				CO3	Ability to understanding of microwave transmission lines and how to Use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
				CO4	Ability to understanding of microwave solid state devices
				CO5	Ability to understanding of microwave measurements
	4	RADAR SYSTEMS	15A04705	**CO1**	To understand the basic concepts of RADAR and Derive the Basic Radar Range equation.
				CO2	To understand the basic concepts of CW RADAR and FM-CW Radar.
				CO3	Understanding the various radars like MTI, Pulse Doppler radars.
				CO4	Describe the Basic concepts of Tracking in Radar and different types of Tracking techniques..
				CO5	Understanding the detection of radar signals in noise and Different types of Radar displays ,Duplexers.
	5	DATA COMMUNICATIONS AND NETWORKING	15A04704	**CO1**	Understand and explain the concept of Data Communication and networks, layered architecture and their applications.
				CO2	Analyze and Set up protocol designing issues for Communication networks.
				CO3	Evaluate data communication link considering elementary concepts of data link layer protocols for error detection and correction.
				CO4	Apply various network layer techniques for designing subnets and super nets and analyze packet flow on basis of routing protocols.
				CO5	Understand and design application layer protocols and internet applications such as network security, Email and DNS,
				CO1	Able to apply the Image processing concept for various fields of engineering and real life to process as per needs &specifications.

6	DIGITAL IMAGE PROCESSING	15A04708	CO2	Get the skills to Heuristically develop new techniques to process images of any context	
			CO3	Can experiment, analyze & interpret image data /processing data.	
			CO4	Can Categorize various compression techniques.	
			CO5	Learnt different techniques employed for the enhancement of images	
7	Microwave and Optical Communication Laboratory	15A04711	CO1	Capable of Applying microwave Concepts/ Microwave components and test them	
			CO2	Able to design and analyse an optical fiber communications link	
			CO3	Measure different parameters of various microwave devices.	
			CO4	Measure the Scattering Parameters of various Tee Junctions	
			CO5	Measure the Antenna Patterns	
8	VLSI & Embedded Systems Laboratory	15A04711	CO1	Design and draw the internal structure of the various digital integrated circuits	
			CO2	Develop VHDL/Verilog HDL source code, perform simulation using relevant simulator andanalyze the obtained simulation results using necessary synthesizer.	
			CO3	Verify the logical operations of the digital IC''s (Hardware) in the laboratory	
			CO4	Design and Implement Combinational Logic Circuits on FPGAs	
			CO5	Design and Implement Sequential Logic Circuits on FPGAs.	
1	MATHEMATICS-IV	15A54402	CO1	Able to get knowledge inbeta and gamma functionsand Techniques of Beta andGamma functions to improper integrals, Expressing complex functions in power series, Conformal mappings and bilinear transformations	
			CO2	Develop skills in Analyzing the properties exhibited by complex functions in Argand plane, Properties of real integrals through complex variable techniques, The properties of improper integrals through residue theory, Conformal transformations of complex valued functions for inferences.	
			CO3	Develop skills in designing mathematical models involvingIntegrals of complex variable functions, Improper integrals using beta and gamma functions, Residue theory of complex functions	

				CO4	Develop analytical skills in providing solutions for problems involving Integration of complex functions, Improper real integrals
				CO5	Use relevant Complex variable techniques for Residues and integrals of complex functions, Improper real integrals through complex functions
II YEAR II SEM	2	ELECTRONIC CIRCUIT ANALYSIS	15A04401	CO1	Demonstrate different feedback amplifiers including Voltage series, Voltage shunt, Current series and Current shunt Feedback amplifiers
				CO2	Analyze the frequency response of the BJT amplifiers at high frequencies
				CO3	Illustrate the parameters of Single stage and multistage amplifiers.
				CO4	Design and analyze different types of power amplifiers including Class-A, Class-B, Class-AB & Class –D power amplifiers and compare them in terms of Efficiency
				CO5	Design and analyze different types of Tuned Amplifiers
	3	DATA STRUCTURES	15A05201	CO1	Ability to analyze algorithms and algorithm correctness.
				CO2	Ability to summarize searching and sorting techniques
				CO3	Ability to describe stack, queue and linked list operation.
				CO4	Ability to have knowledge of tree and graphs concepts
				CO5	Ability to have knowledge of algorithms
	4	ANALOG COMMUNICA TION SYSTEMS	15A04402	CO1	Understand the basic concepts of the Analog communication systems.
				CO2	Identify and Evaluate characteristics of various analog modulation schemes including AM,FM and PM such as modulation index, bandwidth and power requirements.
				CO3	List and Analyze various analog continuous wave and analog pulse modulation and demodulation techniques including AM FM and PM and radio receiver characteristics.
				CO4	Evaluate the performance of the communication system in the presence of noise.
				CO5	Discuss about Information and Channel Capacity
				CO1	Understand basic laws of static electric fields, Maxwell's equations for electrostatic fields, problems applying laws of electrostatics.
				CO2	Understand basic laws of static magnetic fields, Maxwell's equations for static magnetic fields, problems applying laws of magneto statics.

5	ELECTROMAG NETIC THEORY AND TRANSMISSIO N LINES	15A04403	CO3	Analyze electric and magnetic fields at the interface of different media, Understand concept of wave propagation through the Maxwell's equations.
			CO4	Understand principles of reflections and refraction for different incidences, concept of power flow using Poynting vector, Brewster angle, and surface impedance.
			CO5	Describes the transmission lines with equivalent circuit and explain their characteristic with various lengths.
6	CONTROL SYSTEMS ENGINEERING	15A02303	CO1	Understand & Evaluate the transfer function of physical systems, block diagrams and signal flow graphs
			CO2	Remember and Analyze the transient & Steady state responses and its specifications their characteristics
			CO3	Determine the absolute and relative stability of a system using RH and Root loci concepts.
			CO4	Analyse& Evaluate the stability of the system and design of Bode, polar, Nyquist and compensation networks
			CO5	Describe the state variable representation of physical system and solve the state equation
7	Analog Communication Systems Laboratory	15A04404	CO1	Design analog modulation circuits as amplitude and frequency modulation.
			CO2	Understand the operations of analog and pulse modulation & demodulation techniques
			CO3	Design the circuit to sample an analog signal.
			CO4	Design of communication circuits such as AM, SSB-SC, DSB-SC, FM.
			CO5	Design various pulse modulation techniques as PAM, PPM, PWM.
8	Electronic Circuit Analysis Laboratory	15A04405	CO1	The ability to analyze and design single and multistage amplifiers at low, mid and high frequencies.
			CO2	Designing and analyzing the transistor at high frequencies.
			CO3	Design, simulate and verify feedback amplifiers and oscillators.
			CO4	Design, simulate and verify power amplifier circuits.
			CO5	Design, simulate and verify Multivibrators and Sweep Circuits.

				CO1	To understand the basic Concepts and Architecture of 8086 Microprocessor.
1	MICROPROCE SSORS AND MICRO CONTROLLER S	15A04601		CO2	To understand various 8086 Instruction set, Assembler directives and able to programming with 8086.
				CO3	To understand the basic concepts of MSP 430 microcontroller and embedded systems on it.
				CO4	To understand the concepts of low power aspects of MSP 430, RTC, PWM control, DC and comparator in MSP 430.
				CO5	To understand the concepts of serial, synchronous, Asynchronous communications and different inter facing using MSP 430
2	ELECTRONIC MEASUREME NT & INSTRUMENT ATION	15A04602		CO1	Explains about static & dynamic char's and different types of meters for measurement of voltage, current and resistance
				CO2	Explains and analysis about functionality of Cathode Ray Oscilloscope and sampling oscilloscope and storage oscilloscope
				CO3	Explains about different types of signal generators and signal analyzers
				CO4	Explains about ac &dc bridges for measurement of resistance, capacitance, inductance.
				CO5	Understand different types of transducers for the measurement of displacement, R,L,C, velocity and pressure
3	VLSI DESIGN	15A04604		CO1	To acquire Complete Knowledge about Fabrication process of ICs and To understand electrical properties of MOS circuits
				CO2	To understand the basic circuits concepts and to understand the VLSI circuit design processes
				CO3	To understand and able to design VLSI circuits as per specifications given, at gate level and to understand the physical design
				CO4	Capable of optimizing the design of Arithmetic / logic building Blocks at all levels of Design/Fabrication and to understand the VLSI design styles
				CO5	To understand the synthesis, simulation and verification tools and process of testing
	MANAGERIAL ECONOMICS			CO1	The student will able to understand various aspects of Managerial Economics
				CO2	To Analyze the financial statements and inputs.

III YEAR II SEM	4	ECONOMICS AND FINANCIAL ANALYSIS	15A52301	CO3	To Understand the sound and effective decisions under different economic environment and market situations
				CO4	To Remember and Apply the Profitability, and Activity Ratios (simple problems).
				CO5	Methods and Evaluation of Capital Budgeting Projects
	5	DIGITAL SIGNAL PROCESSING	15A04603	CO1	Formulate engineering problems in terms of DSP tasks.
				CO2	Apply engineering problems solving strategies to DSP problems.
				CO3	Design and test DSP algorithms.
				CO4	Analyze digital and analog signals and systems.
				CO5	Analyze and compare different signal processing strategies
	6	MATLAB PROGRAMMI NG	15A04605	CO1	To able to familiarize the MATLAB Windows, syntaxes for basic computing.
				CO2	To understand and familiarize of Numeric, Cell and structure arrays and their operations
				CO3	To apply built-in and user defined functions concepts in writing MATLAB scripts in developing the solutions
				CO4	To use various data operators, flow controls and advanced plotting commands in writing MATLAB scripts.
				CO5	To differentiate underdetermined and overdetermined systems and use appropriate MATLAB commands to provide the solutions of each.
	7	Microprocessors & Microcontrollers Laboratory	15A04607	CO1	Can Ensure the completely use of MASM programming environment.
				CO2	Debug assembly language programs using 8086 assembler.
				CO3	Analyze the interfacing between external peripherals and 8086 microprocessor using development kit.
				CO4	Debug msp430 assembly language programs using CCS
				CO5	Analyze the interfacing between external peripherals and MSP 430 microcontroller using development kit.
				CO1	Find the response of a Linear time invariant discrete time system.
				CO2	Analyze the frequency spectrum of a discrete time signal

	8	Digital Signal Processing Laboratory	15A04608	CO3	Determine the spectrum of a real world signal using Fast Fourier Transform algorithm
				CO4	Design real time DSP systems and real world applications.
				CO5	Implement DSP algorithms using both fixed and floating point processors
IV YEAR II SEM	1	ADVANCED DIGITAL SIGNAL PROCESSING-MULTIRATE & WAVELET	15A04801	CO1	To Get complete knowledge regarding various algorithms associated with Digital signal processing and multirate signal processing.
				CO2	To Verify & Analyze the power spectral estimation by using Barlett, Welch & Blackman & Turkey methods.
				CO3	To Understand the effects of finite word length in fixed-point DSP systems by using ADC and FFT algorithms
				CO4	To Understand the JourneyfromtheCWTtotheDWT.
				CO5	To Understand Efficient signal design and realization of signals
	2	PATTERN RECOGNITION & APPLICATIONS	15A04803	CO1	To Understand the concept of a pattern and the basic approach to the development of pattern recognition and machine intelligence algorithms
				CO2	To Understand the basic methods of feature extraction, feature evaluation, and data mining
				CO3	To Understand and apply both supervised and unsupervised classification methods to detect and characterize patterns in real-world data
				CO4	To Develop prototype pattern recognition algorithms that can be used to study algorithm behavior and performance against real-world multivariate data
				CO5	To Understand the Time Varying pattern Recognitions & applications.
	3	Technical Seminar	15A04806	CO1	Identify emerging topic specific to the programme.
				CO3	Deliver the knowledge using multimedia.
				CO4	Answer the queries with appropriate explanation and elaboration.
				CO5	Compile an effective technical report, providing conclusions and proposing an appropriate future scope.
				CO1	Indentify problem, conduct relevant literature survey and formalize it.

				CO2	Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools(if necessary) and processes
4	Project Work	15A04807		CO3	Implement the design and demonstrate the functionality of developed model
				CO4	Evaluate the results to derive the conclusion and provide scope for future enhancement.
				CO5	Exhibit good interpersonal and leadership skills in meeting project deadlines with individual contribution towards progress of the project.

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