Rishi M.S. Institute of Engineering & Technology for Women
(Approved by A.I.C.T.E., & Affiliated to J.N.T.U.H.)
(In Memory of "BHARAT RATNA" Mrs. M.S. Subbulakshmi)
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ELECTRONICS AND COMMUNICATION AND ENGINEERING
I & 11 SEM COURSE OUTCOMES FOR THE ACADEMIC YEAR: 2024-2025

S.NO.	YEAR/SEM	COURSE NAME	Course Outcomes
1	I/I	Elements of Electronics and Communication Engineering	**CO1:** Identify the different components used for electronics applications
			CO2: Measure different parameters using various measuring instruments
			CO3: Distinguish various signal used for analog and digital communications
2	I/II	Electronic Devices and Circuits	**CO1:** Acquire the knowledge of various electronic devices and their use on real life.
			CO2: Know the applications of various devices.
			CO3: Acquire the knowledge about the role of special purpose devices and their applications.
3	I/II	Electronic devices and Circuits Lab	**CO1:** Acquire the knowledge of various semiconductor devices and their use in real life.
			CO2: Design aspects of biasing and keep them in active region of the device for functional circuits
			CO3: Acquire the knowledge about the role of special purpose devices and their applications.
4	II/I	Analog Circuits	**CO1:** Learn the concepts of, load line analysis and biasing techniques
			CO2: Learn the concepts of high frequency analysis of transistors.
			CO3: To give understanding of various types of amplifier circuits

			CO4: Learn the concepts of small signal analysis of BJT and FET
			CO5: To familiarize the Concept of feedback in amplifiers so as to differentiate between negative and positive feedback.
5	**II/I**	**Digital Logic Design.**	**CO1**: Understand the numerical information in different forms and Boolean Algebra theorems.
			CO2: Understand Postulates of Boolean algebra and to minimize combinational functions.
			CO3: Design and Analyze combinational and sequential circuits.
			CO4: Know about the logic families and realization of logic gates.
6	**II/I**	**Network Analysis & Synthesis**	**CO1:** Gain the knowledge on basic RLC circuits behaviour
			CO2: Analyze the Steady state and transient analysis of RLC Circuits.
			CO3: Know the characteristics of two port network parameters
			CO4: Analyze the transmission line parameters and configurations
	II/I	**Numerical Methods and Complex Variables**	**CO1:** understand the Laplace transforms techniques for solving ode's
			CO2: find the root of a given equation.

7			**CO3:** calculate the value for the given data using interpolation
			CO4: analyze the numerical solutions for a given ode's
			CO5: analyze the complex function with reference to their analyticity, integration using cauchy'sintegral and residue theorems.
			CO6: understand taylor's and laurent's series expansions of complex function.
8	**II/I**	**Signals and Systems**	**CO1:** Defining the various signals and identifying the signal functions& relations
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems.
			CO4: Analyze the signals with different transform technique
	II/I	**Analog Circuits Laboratory**	**CO1:** Design amplifiers with required Q point and analyse amplifier characteristics
			CO2: Examine the effect multistage amplification on frequency response
			CO3: Investigate feedback concept in amplifiers and oscillator

9			**CO4:** Analyze the characteristics of FET in Common Source configuration and calculate the gm and rd. Calculate Bandwidth of BJT/FET amplifier from its frequency response.
			CO5: Obtain the characteristics of UJT.
10	**II/I**	**Digital Logic Design Lab**	**CO1:** Implement Boolean Expressions using universal logic gates .
			CO2: Design and verify Combinational logic circuits using IC's .
			CO3: Design and verify Sequential logic circuits using IC's
			CO4: Implement Counters & Shift registers using FF's
11	**II/I**	**Constitution of India**	**CO1:** Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
			CO2: Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
			CO3: Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of

			the proposal of direct elections through adult suffrage in the Indian Constitution
			CO4: Discuss the passage of the Hindu Code Bill of 1956.
12	**II/I**	**Basic Simulation Lab**	**CO1:** Synthesize a given waveform using standard test signals and sequences.
			CO2: Analyze the effect of various transformations applied on independent and dependent variables of a signal.
			CO3: Determine the symmetry (even/odd) of signals /sequences.
			CO4: Classify a system based on its characteristics and find its response for various excitations.
			CO5: Convert time domain signal into frequency domain using Fourier transform and plot its magnitude and phase spectrum.
13	**II/II**	**Probability Theory and Stochastic Processes**	**CO1:** Understand probabilities and able to solve using an appropriate sample space
			CO2: Compute various operations like expectations from probability density functions (pdfs) and probability distribution functions
			CO3: Perform Likelihood ratio tests from pdfs for statistical engineering Problems
			CO4: : Mean and covariance functions for simple random

			variables
			CO5: Understand Auto-correlation and cross correlation properties between two random variables
			CO6: Explain the concept of random process, differentiate between stochastic and ergodic processes
14	**II/II**	**Electromagnetic Fields and Transmission Lines**	**CO7**: Explain the concept of power spectral density and power density spectrum of a random process. 8. Apply the principles of a random process in system concepts.
			CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
			CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
			CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems
15	**II/II**	**Analog and Digital Communications**	**CO1:**:Analyze and design of various continuous wave and angle modulation and demodulation techniques
			CO2: Understand the effect of noise present in continuous wave and angle modulation techniques.
			CO3: Attain the knowledge about AM , FM Transmitters and Receivers
			CO4: Analyze and design the various Pulse Modulation Techniques.
			CO5: Understand the concepts of Digital Modulation Techniques and Baseband transmission
16	**II/II**	**Linear IC Applications**	**CO1**: Understand the internal operation of Op-Amp and its specifications.

			CO2: Analyze and design linear applications like adder, subs tractor, instrumentation amplifier and etc. using Op-Amp.
			CO3: Analyze and design nonlinear applications like multiplier, comparator and etc, using Op-Amp.
			CO4: Attain the knowledge of functional diagrams and applications of IC 555 and IC565 and applications
			CO5: Acquire the knowledge about the Data converters.
17	**II/II**	**Electronic Circuit Analysis**	**CO1:** Analyze single stage amplifiers at Mid-band, Low frequency and High frequency regions
			CO2: Analyze multistage amplifiers at Mid-band, Low frequency and High frequency regions.
			CO3: Design and analyze different types of feedback amplifiers and oscillators using transistors
			CO4: Analyze different types of power amplifiers and compare them in terms of efficiency.
			CO5: Analyze tuned amplifiers and the effects of cascading tuned amplifiers
18	**II/II**	**Analog and Digital**	**CO1:**Analyze the spectrum of various analog modulation techniques
			CO2: Design a multiplexing system using FDM

		Communications lab	**CO3:**Examine various pulse modulation techniques
			CO4: Analyze different digital modulation and demodulation
19	**II/II.**	**Linear and Digital IC Applications Lab**	**CO1**:Design analog circuits for practical applications using Op Amp IC-741
			CO2: Design waveform generators and PLL circuits using ICs
			CO3: Design multi vibrators using IC555 and Schmitt trigger using IC741
			CO4: Analyze the practical applications of Voltage Regulator using various ICs.
20	**II/II**	**Electronic Circuits Analysis Lab**	**CO1:**Design, simulate and verify basic amplifier circuits
			CO2: Design, simulate and verify feedback amplifiers and oscillators.
			CO3: Design, simulate and verify power amplifier circuits
			CO4: Design, simulate and verify Multivibrators and Sweep Circuits.
	II/II	**Gender Sensitization Lab**	**CO1:**Develop a better understanding of important issues related to gender in contemporary India.
			CO2: Analyze basic dimensions of the biological, sociological, psychological and legal aspects of gender.
			CO3: Develop a sense of appreciation of women in all walks of life and will be equipped to work and live

21			together as equals.
			CO4: Examine the new laws for women protection & relief, and empower students to understand and respond to gender violence
22	**III/I**	**Microcontrollers**	**CO1**: Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
23	**III/I**	**IoT Architectures and Protocals**	**CO1:**Explore the Evolution of IoT, its Growth and Applications.
			CO2: Know the components of IoT and Compare the various architectures of IoT.
			CO3: Acquire the knowledge on data management of IoT.
			CO4: Establish the knowledge on various IoT protocols like Data link, Network, Transport, Session, Service layers.
24	**III/I**	**Control Systems**	**CO1**: Explain different ways of system representations such as Transfer function CO2: Apply various time domain and frequency domain techniques to assess the system performance
			CO3: Apply various control strategies to different applications like power systems, electrical drives etc

			CO4: Design various controllers and compensators to improve system performance
			CO5: Construct the State models for continuous & discrete time systems and comment on controllability and Observability of the system
			CO6: Compute the transfer function of system by different techniques.
25	**III/I**	**Business Economics & Financial Analysis**	**CO1:**Understand the various forms of business
			CO2:contrast of demand and supply
			CO3:change production, cost market structures and pricing
			CO4:study the firm's financial position
			CO5:Relate to analyze the financial statements of a company
26	**III/I**	**Electronic Measurements and Instrumentation**	**CO1**: Identify the various electronic instruments based on their specifications for carrying out a particular task of measurement.
			CO2: Measure various physical parameters by appropriately selecting the transducers.
			CO3: Use various types of signal generators, signal analyzers for generating and analyzing Various real-time signals.
			CO4: Explain functioning, specification and applications of signal generators, signal analyzers for generating and analyzing various real-time signals.
27	**III/I**	**Microcontrollers**	**CO1:** Write programs in assembly language using the

		Lab	instruction set of 8086 through MASM software as well as using 8086 Kit.
			CO2: Interface different I/O devices with 8086 and establish communication between them.
			CO3: Write programs in assembly language using instruction set of 8051 and execute the same.
			CO4: Verify the operations of the timer, counter and serial port (UART) of 8051.
28	**III/I**	**IoT Architectures and Protocals lab**	**CO1:**Utilize the different sensors like room temperature, DHT, Humidity etc.,
			CO2: Interface the sensors and processor for transmission of data.
			CO3: Capture the images and process it on Arduino/NodeMCU/Raspberry Pi.
			CO4:know the utilization of various protocols like I2c, UART communication etc.
29	**III/I**	**Advanced Communication Skills Lab**	**CO1:**Build sound vocabulary and use functional English effectively
			CO2: Analyze the given text and respond appropriately and develop efficacious writing skills
			CO3: Develop effective speaking skills and maximize job prospects

			CO4: Plan and make different forms of presentation using various techniques.
30	**III/I**	**Intellectual Property Rights**	**CO1:** Distinguish and Explain various forms of IPRs.
			CO2: Identify criteria to fit one's own intellectual work in particular form of IPRs.
			CO3: Apply statutory provisions to protect particular form of IPRs.
			CO4: Appraise new developments in IPR laws at national and international level
31	**III/II**	**Antennas and Wave Propagation**	**CO1:** Explain radiation mechanism and various parameters of an antenna.
			CO2: Design Loop, Helical, Horn and Yagi–Uda antennas.
			CO3: Explain the working principle of Microstrip, Reflector and Lens antennas.
			CO4:. Design different types of arrays and explain the test procedures involved in Antenna Measurements.
			CO5: Explain the mechanisms of wave propagation and atmospheric effects on radio wave propagation
32	**III/II**	**Digital Signal Processing**	**CO1:** Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms
			CO3: Design a digital filter for a given specification.
			CO4: Understand the significance of various filter structures and effects of round off errors
33	**III/II**	**CMOS VLSI**	**CO1**: Explain MOS technology of NMOS, PMOS, CMOS

		Design	and BiCMOS.
			CO2: Design stick diagrams and draw the layout of a logic circuit
			CO3: Analyze the architectural issues involved in subsystem design.
			CO4:. Design building blocks of data path subsystems and analyze simple memories using MOS transistors.
			C05: Apply concepts of VLSI design methodology and explain the test principles
34	**III/II**	**Embedded System Design**	**CO1**: To understand the selection procedure of Processors in the embedded domain
			CO2: Design Procedure for Embedded Firmware.
			CO3: To visualize the role of Real time Operating Systems in Embedded Systems.
			CO4: To evaluate the Correlation between task synchronization and latency issues.
35	**III/II**	**Database management System**	**CO1:** Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data.
			CO3: Be acquainted with the basics of transaction processing and concurrency control.

			CO4: Familiarity with database storage structures and access techniques
36	**III/II**	**Digital Signal Processing lab**	**CO1:**Generate sinusoidal and noise waveforms using different approaches
			CO2: Analyze Impulse and frequency response of various digital filters.
			CO3: Verify different algorithms of DSP through simulation
			CO4: Implement various DSP algorithms in hardware.
37	**III/II**	**CMOS VLSI Design Lab**	**CO1:** Verify the functionality of digital circuits using Xilinx ISIM simulator
			CO2: Implement digital circuits on various FPGA boards using Xilinx tools
			CO3: Design layout for digital circuits and perform physical verification
			CO4: Analyze static timing, IR drop and crosstalk in digital circuit layouts
38	**III/II**	**Advanced Communication Skills Lab**	**CO1:**Build sound vocabulary and use functional English effectively
			CO2: Analyze the given text and respond appropriately and develop efficacious writing skills
			CO3: Develop effective speaking skills and maximize job prospects

			CO4: Plan and make different forms of presentation using various techniques.
39	**III/II**	**Environmental Science**	**CO1:** Understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
40	**IV/I**	**Microwave and Optical Communications**	**CO1:**Analyze various modes of microwave transmission lines.
			CO2: Examine various waveguide components and their applications.
			CO3: Analyze the characteristics of O-type and M-type microwave tubes
			CO4: Estimate S-parameters of multiport junction devices
			CO5: Measure various parameters using microwave bench
			CO6: Understand the mechanism of light propagation through Optical Fibers
41	**IV/I**	**Professional Practice, Law & Ethics**	**CO1**:understand the importance of professional practice and Law Ethics
			CO2: Define the law of contract and its key elements of valid contract

			CO3:judge arbitration and conciliation and alternative Dispute resolution
			CO4: role play the labor and construction related laws
			CO5: Explain the students rights and Responsibility as an Employee
42	**IV/I**	**Network Security and Cryptography**	**CO1:** Describe network security fundamental concepts and principles
			CO2: Encrypt and decrypt messages using block ciphers and network security technology and protocols
			CO3: Analyze key agreement algorithms to identify their weaknesses
			CO4: Identify and assess different types of threats, malware, spyware, viruses, and vulnerability.
43	**IV/I**	**Radar Systems**	**CO1**: Derive the complete radar range equation.
			CO2: Familiarize the functioning of CW, FM-CW and MTI radars
			CO3: Known various Tracking methods.
			CO4: Derive the matched filter response characteristics for

			radar receivers.
44	**IV/I**	**Operating Systems**	**CO1:** Will be able to control access to a computer and the files that may be shared
			CO2: Demonstrate the knowledge of the components of computers and their respective roles in computing.
			CO3: Ability to recognize and resolve user problems with standard operating environments.
			CO4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
45	**IV/I**	**Microwave and Optical Communications lab**	**CO1**: Analyze the characteristics of microwave sources and devices.
			CO2: Measure different parameters of various microwave devices.
			CO3: Measure the Scattering Parameters of various Tee Junctions
46	**IV/1**	**Project Stage - I**	**CO1:** Identify 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
			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.
			CO2: Select a search algorithm for a problem and estimate its time and space complexities.
			CO3: Possess the skill for representing knowledge using the appropriate technique for a given problem
			CO4: Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.
47	**IV/II**	**Artificial Intelligence**	**CO1:** Understand the basics of the theory and about intelligent agents.
			CO2: Capable of using heuristic searches, aware of knowledge based systems and expert systems.
			CO3: Apply AI techniques to real-world problems to develop intelligent systems.
			CO4: Select appropriately from a range of techniques when implementing intelligent systems

48	**IV/11**	**System on Chip Architecture.**	CO1: Remember SOC Architectural features.
			CO2: Understand to acquire the knowledge on processor selection criteria and limitations
			CO3: Apply to acquire the knowledge on processor selection limitations
			CO4: Analyze to acquires the knowledge of memory architectures on SOC.
			CO5: Evaluate to the interconnection strategies on SOC.
			CO6: Create to the interconnection strategies customization on SOC.
49	**IV/11**	**Introduction to Computer Networks**	**CO1:** Gain the knowledge of the basic computer network technology.
			CO2: Understand sub netting and routing mechanisms.
			CO3: Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
			CO4: Familiarity with the essential application protocols of computer networks
50	**IV/11**	**Project Stage – II and Seminar**	**CO1:** Identify 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

			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: Identify emerging topic specific to the programmer
			CO6: Extract the information relevant to the chosen topic.