



**RAMIREDDY SUBBARAMI REDDY
ENGINEERING COLLEGE**

(Promoted by RAMIREDDY SUBBARAMI REDDY EDUCATIONAL TRUST)
Approved by AICTE & Affiliated to JNTUA
An ISO 9001:2015 Certified Institution



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

**COURSE OUTCOMES (COS) OF ALL COURSES
FRAMED UNDER
JNTUA-R20 REGULATION**

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List of all courses offered by the institution for the regulation R20, JNTUA

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2.	20A56201T	Applied Physics	
3.	20A52101T	Communicative English	
4.	20A02101T	Fundamentals of Electrical Circuits	
5.	20A03101T	Engineering Drawing	
6.	20A03101P	Engineering Graphics Lab	
7.	20A56201P	Applied Physics Lab	
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10.	20A54201	Differential Equations and Vector Calculus	I-II Sem
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S.No	Course Code	Course Name	Year & Sem
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I B. Tech, I Sem ECE COs (R20-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-I	20A54101	Linear Algebra and Calculus	4101.1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)
			4101.2	Utilize mean value theorems to real life problems (L3)
			4101.3	Familiarize with functions of several variables which is useful in optimization (L3)
			4101.4	familiarize with Two dimensional and Three Dimensional ordinate systems (L2)
			4101.5	Learn the Utilization of special functions. (L2)
Year& Sem	Course Code	Course Name	CO's	
I-I	20A56201T	Applied Physics	6201T:1	Explain the need of coherent sources and the conditions for sustained interference (L2)
			6201T:2	Explain various types of emission of radiation (L2)
			6201T:3	Explain the concept of dielectric constant and polarization in dielectric materials (L2)
			6201T:4	Describes the dual nature of matter (L1)
			6201T:5	Classify the energy bands of semiconductors (L2)

Year & Sem	Course Code	Course Name	CO's	
I-I	20A52101T	Communicative English	2101T.1	Train and prepare themselves to seek and find employment in the corporate, media, English language teaching and content writing sectors(L6)
			2101T.2	Develop their communicative competence(L1)
			2101T.3	Find employment opportunities, challenges and job roles(L5)
			2101T.4	Conduct independent surveys, collect and analyze data, prepare and present reports and projects(L6)
			2101T.5	Create self-employment strategies(L3)

Year & Sem	Course Code	Course Name	CO's	
I-I	20A02101T	Fundamentals of Electrical Circuits	2101T.1	Determine the equivalent impedance of given network by using network reduction techniques and determine the current, voltage and power in any element(L3)
			2101T.2	Explain basic graph theory definitions, loop and nodal methods of analysis of electrical circuits(L2)
			2101T.3	To understand voltage, current and power relationships in 1- ϕ AC circuits with basic elements R,L,C (L2)
			2101T.4	Apply the network theorems suitably(L3)
			2101T.5	Analyze 3-phase electrical circuits, understand the procedure of power measurement in 1-ph and 3-ph electrical circuits(L3)

Year& Sem	Course Code	Course Name	CO's	
I-I	20A03101T	Engineering Drawing	3101T.1	Construct various curves applied in engineering.[L1]
			3101T.2	Show projections of solids and sections graphically.[L2]
			3101T.3	Show projections of solids and sections graphically.[L2]
			3101T.4	Visualize multiple types of objects in different positions and also draw the sectional views.[L3]
			3101T.5	Improve their visualization skills in the development of new products[L4]

Year& Sem	Course Code	Course Name	CO's	
I-I	20A03101P	Engineering Graphics Lab	3101P:1	Use computers as a drafting tool. (L2)
			3101P:2	Draw isometric and orthographic drawings using CAD packages. (L3)
			3101P:3	Analyzing 3dimentional objective (L4)

Year& Sem	Course Code	Course Name	CO's	
I-I	20A56201P	Applied Physics Lab	6201P:1	Operate optical instruments like microscope and spectrometer (L2) Determine thickness of a hair/paper with the concept of interference (L2)
			6201P:2	Estimate the wavelength of different colors using diffraction grating and dispersive power (L2)
			6201P:3	Evaluate the acceptance angle of an optical fiber and numerical aperture (L3)
			6201P:4	Calculate the band gap of a given semiconductor (L3)
			6201P:5	Plot the intensity of the magnetic field of circular coil carrying current with distance (L3)

Year& Sem	Course Code	Course Name	CO's	
I-I	20A52101P	Communicative English Lab	2101P:1	Understand different accents spoken by native speakers of English(L2)
			2101P:2	Employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information(L3)
			2101P:3	Learn specific vocabulary to describe different persons, places and objects(L4)
			2101P:4	Produce a structured and short talks extemporarily on general topics(L5)
			2101P:5	Participate in debates and speak clearly using appropriate discourse markers(L6)

Year& Sem	Course Code	Course Name	CO's	
I-I	20A02101P	Fundamentals of Electrical Circuits Lab	2101P.1	Remember, understand and apply various theorems and verify practically [L2]
			2101P.2	Understand and analyze active, reactive power measurements in three phase balanced & unbalanced circuits.[L2 &L3]
			2101P.3	Remember, understand and apply various theorems and verify practically [L2]
			2101P.4	Understand and analyze active, reactive power measurements in three phase balanced & unbalanced circuits.[L2 &L3]
			2101P.5	Remember, understand and apply various theorems and verify practically [L2]

I B. Tech, II Sem ECE COs (R20-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A54201	Differential Equations and Vector Calculus	4201.1	Solve the differential equations related to various engineering fields (L6)
			4201.2	Identify solution methods for partial differential equations that model physical processes (L3)
			4201.3	Learn the applications of PDEs (L2)
			4201.4	Interpret the physical meaning of different operators such as gradient, curl and divergence (L5)
			4201.5	Estimate the work done against a field, circulation and flux using vector calculus (L6)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A05201T	C-Programming & Data Structures	5201T.1	Analyze the basic concepts of C Programming language[L3].
			5201T.2	Design applications in C, using functions, arrays, pointers and structures[L1]
			5201T.3	Apply the concepts of Stacks and Queues in solving the problems[L4]
			5201T.4	Explore various operations on Linked lists[L4]
			5201T.5	Demonstrate various tree traversals and graph traversal techniques and Design searching and sorting methods[L3]

Year& Sem	Course Code	Course Name	CO's	
I-II	20A51101T	Chemistry	1101T.1	Discuss the MOT, Apply Schrodinger wave equation to H. (L3)
			1101T.2	Demonstrate the application of Fullerene, CNT and Nanoparticles(L2)
			1101T.3	Differentiate between pH metry, Potentiometry (L2)
			1101T.4	Discuss BUNA-S and BUNA-N Elastomers (L2)
			1101T.5	Understand the principles of analytical instruments (L2)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A04101T	ELECTRONIC DEVICES & CIRCUITS	4101T.1	Understand the basic concepts of semiconductors, diodes, and transistors (L1)
			4101T.2	Analyze various applications of diode circuits (L3)
			4101T.3	Understand the principle of operation, and V-I characteristics in various BJT & MOSFET configurations. (L1)
			4101T.4	Design rectifier circuits using diodes and amplifier circuit using BJT (L4)
			4101T.5	Solve problems on biasing circuits of BJT and small signal equivalent model of MOSFET (L2).

Year& Sem	Course Code	Course Name	CO's	
I-II	20A03202	Engineering Workshop	3202.1	Apply wood working skills in real world applications. [L3]
			3202.2	Build different parts with metal sheets in real world applications. [L3]
			3202.3	Apply fitting operations in various applications. [L3]
			3202.4	Apply different types of basic electric circuit connections. [L3]
			3202.5	Preparation of moulds and castings. [L3]

Year& Sem	Course Code	Course Name	CO's	
I-II	20A05202	IT Workshop	5202.1	Identify the Peripherals of computer and analyze the assembling and disassembling of digital computer. [L2]
			5202.2	Design the Documents using Word processors and prepare spread sheets for calculations. Using excel and also the documents using Latex. [L6]
			5202.3	Develop the Slide presentations using the presentation tool. [L6]
			5202.4	Discuss the concepts of Networking, OS installation and Antivirus. [L2]
			5202.5	Demonstrate the concept of Internet and analyze how to sharing and browse information in it. [L3]

Year& Sem	Course Code	Course Name	CO's	
I-II	20A05201P	C-Programming & Data Structures Lab	5201P.1	Demonstrate basic concepts of C programming language. (L2)
			5201P.2	Develop C programs using functions, arrays, structures and pointers. (L6)
			5201P.3	Illustrate the concepts Stacks and Queues. (L2)
			5201P.4	Design operations on Linked lists. (L6))
			5201P.5	Apply various Binary tree traversal techniques. (L3)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A51101P	Chemistry Lab	1101P.1	Determine the cell constant and conduct of the solutions. (L3)
			1101P.2	Estimate the ferrous iron and Strength of an acid in battery. (L2)
			1101P.3	Prepare the advanced materials and analyses the properties. (L3)
			1101P.4	Analyse the IR and NMR spectroscopy. (L3)
			1101P.5	Analyse the separation method of HPLC and TLC (L3)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A04101P	Electronic Devices & Circuits Lab	4101P.1	Understand the basic characteristics and applications of basic electronic devices(L1)
			4101P.2	Analyze the characteristics of UJT, BJT and MOSFET (L3)
			4101P.3	Design BJT /MOSFET based amplifiers for the given specifications (L4)
			4101P.4	Simulate all circuits using multisim/PSPICE(L5)
			4101P.5	Understand the basic characteristics and applications of basic electronic devices (L1)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A99201	Environmental Science	9201.1	Understand the various natural resources (L2)
			9201.2	Describe about the Biodiversity and Ecosystem (L 2)
			9201.3	Discuss about the pollution aspects (L3)
			9201.4	To know about the social issues related to environment and their protection acts (L1)
			9201.5	Describe about the population explosion and welfare programme (L2)

Year & Sem	Course Code	Course Name	CO's	
I-II	20A54302	COMPLEX VARIABLES AND TRANSFORMS	4302.1	Understand the analyticity of complex functions and conformal mappings (L1)
			4302.2	Apply Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals (L2)
			4302.3	Understand the usage of Laplace transform (L1)
			4302.4	Evaluate the Fourier series expansion of periodic functions (L4)
			4302.5	Understand the use of Fourier transforms and apply z-transforms to solve difference equations (L1)

II B. Tech, I Sem ECE COs (R20-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
II-I	20A04301T	SIGNALS AND SYSTEMS	4301T.1	Understand different types of signals and systems and describe vector analysis (L2)
			4301T.2	Examine the spectral properties of periodic and aperiodic signals using Fourier Series and Fourier Transform and understand process of sampling (L3).
			4301T.3	Understand different types of signals and system with Laplace Transform (L2).
			4301T.4	Describe system properties based on Impulse response and Fourier analysis (L1).
			4301T.5	Examine the spectral properties of signals using Discrete Time Fourier Transform and Z-Transforms (L3)
CO's				
II-I	20A02303T	ELECTRICAL ENGINEERING	2303T.1	Acquires knowledge on transient response of R-L, R-C, R-L-C series circuits for D.C and A.C excitations(L3)
			2303T.2	solve the problems on R L C circuits for different excitations using different approaches (L4)
			2303T.3	Analyze the complex circuits of R L C circuits (L3)
			2303T.4	Solve the problems the e.m.f. generated on DC Generator (L4)
			2303T.5	Acquires knowledge about how to determine the efficiency and regulation of single-phase transformer and synchronous machine (L3)

Year& Sem	Course Code	Course Name	CO's	
II-I	20A04302T	ANALOG CIRCUITS	4302T.1	Understand the Characteristics of Differential Amplifiers, multistage Amplifiers, feedback and power Amplifiers. (L2)
			4302T.2	Examine the frequency response of multistage and differential amplifier circuits using BJT & MOSFETs at low and high frequencies. (L3)
			4302T.3	Investigate different feedback and power amplifier circuits based on the application. Derive the expressions for frequency and condition of oscillations of RC and LC oscillator circuits. (L4)
			4302T.4	Evaluate the performance of different tuned Amplifiers and Multivibrators. (L5)
			4302T.5	Design analog circuits for the given specifications and application. (L6)
CO's				
II-I	20A52301	MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS	2301.1	Get the basic inputs of Managerial Economics and demand concept and able to estimate the future demand of a product. (L2)
			2301.2	Explain the concepts of cost and production and can calculate the breakeven point. (L2)
			2301.3	Learn how to take effective decisions under various market situations and also about different forms of business organizations. (L2)
			2301.4	Get the inputs of accounting concepts and analyze the financial statements. (L4)
			2301.5	Know how to take an effective investment decision. (L2)

Year & Sem	Course Code	Course Name	CO's	
II-I	20A04301P	SIMULATION LAB	4301P.1	Understand the use of MATLAB software and know syntax of MATLAB programming (L2).
			4301P.2	Understand how to simulate different types of signals and system response (L2).
			4301P.3	Compute the Fourier Transform of a given signal and plot amplitude and phase characteristics (L3).
			4301P.4	Analyze the response of different systems when they are excited by different signals and plot power spectral density of signals (L4).
			4301P.5	Generate/Simulate different random signals for the given specifications (L6).

Year & Sem	Course Code	Course Name	CO's	
II-I	20A02303P	ELECTRICAL ENGINEERING LAB	2303P.1	Understands the responses of basic electrical parameters (L2)
			2303P.2	To determine the various parameters experimentally (L5).
			2303P.3	To understand various characteristics of DC generators and DC motors (L2).
			2303P.4	To predetermine the efficiency and regulation of a 1- ϕ transformer (L3).

Year & Sem	Course Code	Course Name	CO's	
II-I	15A04701	ANALOG CIRCUITS LAB	4302P.1	Know about the usage of equipment/components/software tools used to conduct the experiments in analog circuits. (L2)
			4302P.2	Conduct the experiment based on the knowledge acquired in the theory about various analog circuits using BJT/MOSFETs to find the important parameters of the circuit (viz. Voltage gain, Current gain, bandwidth, input and output impedances etc.) experimentally. (L2)
			4302P.3	Analyze the given analog circuit to find required important metrics of it theoretically. (L3)
			4302P.4	Draw the relevant graphs between important metrics of the system from the observed measurements. (L3)
			4302P.5	Compare the experimental results with that of theoretical ones and infer the conclusions.(L2)

Year & Sem	Course Code	Course Name	CO's	
II-I	20A05305	APPLICATION DEVELOPMENT WITH PYTHON	5305.1	Identify the issues in software requirements specification and enable to write SRS documents for software development problems (L3)
			5305.2	Explore the use of Object-oriented concepts to solve Real-life problems (L6)
			5305.3	Design database for any real-world problem (L6)
			5305.4	Solve mathematical problems using Python programming language (L3)

Year & Sem	Course Code	Course Name	CO's	
II-I	20A52201	UNIVERSAL HUMAN VALUES	2201.1	Identify the issues in software requirements specification and enable to write SRS documents for software development problems (L3)
			2201.2	Explore the use of Object-oriented concepts to solve Real-life problems (L6)
			2201.3	Design database for any real-world problem (L6)
			2201.4	Solve mathematical problems using Python programming language (L3)

II B. Tech, II Sem ECE COs (R20-JNTUA)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A54403	PROBABILITY THEORY & STOCHASTIC PROCESSES	4403.1	Understanding the concepts of probability, random variables, random process, probability distribution and density functions, Noise, random process random process, band pass process (L1)
			4403.2	Evaluate the single and multiple random variables concepts to expectation, variance and moments (L4)
			4403.3	Apply different operations on multiple random variables (L2)
			4403.4	Analyze the spectral characteristics of random process (L3)
			4403.5	Derive the response of Linear system with random signals as inputs (L3)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04303T	DIGITAL LOGIC DESIGN	4303T.1	Understand the properties of boolean algebra and boolean functions using Karnaugh map. (L2)
			4303T.2	Analyze to use the concepts to solve the problems related to logic circuits (L4)
			4303T.3	Analyze the combinational and sequential circuits(L4)
			4303T.4	Design various logic circuits using boolean algebra, combinational and logic circuits(L6)
			4303T.5	Develop digital circuits using HDL(L6)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04401	EM WAVES AND TRANSMISSION LINES	4401.1	Explain basic laws of electromagnetic fields and know the wave concept (L2)
			4401.2	Analogy between electric and magnetic fields(L5)
			4401.3	Solve the problems related to Electro magnetic fields(L3)
			4401.4	Derive Maxwell's equations for static and time varying fields(L3)
			4401.5	Explain the transmission lines with equivalent circuit and explain their characteristic with various lengths(L2)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04402T	COMMUNICATION SYSTEMS	4402T.1	Recognize the basic terminology used in analog and digital communication techniques for transmission of information/data. (L1)
			4402T.2	Discuss various modulation and demodulation techniques of analog and digital communication systems at baseband and passband level. (L6)
			4402T.3	Compute various parameters of baseband and passband transmission schemes by applying basic engineering knowledge. (L4)
			4402T.4	investigate the performance of different modulation & Demodulation techniques to solve complex problems in the presence of noise. (L3)
			4402T.5	Evaluate the performance of all analog and digital modulation techniques to know the merits and demerits of each one of them in terms of bandwidth and power efficiency. (L5)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04403T	LINEAR AND DIGITAL IC APPLICATIONS	4403T.1	Understanding the basic building blocks of linear integrated circuits (L2)
			4403T.2	Discuss the linear and non – linear applications of operational amplifiers(L2)
			4403T.3	Analyse the theory & application of active filters(L4)
			4403T.4	Evaluate of voltage regulators and converters(L5)
			4403T.5	Design the circuits using Digital ICs (L6)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04303P	DIGITAL LOGIC DESIGN LAB	4303P.1	Understand the pin configuration of various digital Ics in the lab(L2)
			4303P.2	Analyze the properties of various logic circuits(L4)
			4303P.3	Analyze the sequential circuits(L4)
			4303P.4	Analyze the combinational circuits(L4)
			4303P.5	Design sequential and combinational circuit using HDL(L6)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04402P	COMMUNICATION SYSTEMS LAB	4402P.1	Identify the basic components of Analog and Digital communication systems(L1)
			4402P.2	Understand the transmission and detection of Analog and Digital signals(L2)
			4402P.3	Analyze different Analog and Digital modulation techniques. (L3)
			4402P.4	Design and implement different modulation and demodulation techniques. (L6)
			4402P.5	Observe the performance of system by plotting graphs & Measure radio receiver characteristics. (L2)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A04403P	LINEAR AND DIGITAL IC APPLICATIONS LAB	4403P.1	Understanding the pin configuration of each Linear ICs and its functional diagram (L 2)
			4403P.2	Conduct the experiment and obtain the expected results. (L2)
			4403P.3	Analyze the given circuit and verify the practical observations with the result (L4)
			4403P.4	Design the circuits for the given specifications using Linear and Digital ICs (L6)
			4403P.5	Familiarity with the Lab equipment about operation and its use. (L 4)

Year & Sem	Course Code	Course Name	CO's	
II-II	20A52401	SOFT SKILLS	2401.1	Memorize various elements of effective communicative skills (L1)
			2401.2	Interpret people at the emotional level through emotional intelligence (L2)
			2401.3	Apply critical thinking skills in problem solving (L3)
			2401.4	Analyze the needs of an organization for team building (L4)
			2401.5	Judge the situation and take necessary decisions as a leader. (L4).

Year & Sem	Course Code	Course Name	CO's	
II-II	20A99401	DESIGN THINKING FOR INNOVATION	9401.1	Understanding the concepts related to design thinking (L2)
			9401.2	Explain the fundamentals of Design Thinking and innovation(L2)
			9401.3	Apply the design thinking techniques for solving problems in various sectors(L3)
			9401.4	Analyze to work in a multidisciplinary environment(L4)