



# 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 ELECTRICAL & ELECTRONICS ENGINEERING

## **COURSE OUTCOMES (COS) OF ALL COURSES FRAMED UNDER JNTUA-R15 REGULATION**

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

(Until II-II Semester Only)

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<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Year &amp; Sem</b>
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**I B.Tech, I Sem EEE COs (R20-JNTUA)**

Year & Sem	Course Code	Course Name	CO's	
I-I	20A5410	Linear Algebra and Calculus	4101.1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications (BTL6)
			4101.2	Utilize mean value theorems to real life problems (BTL3)
			4101.3	Familiarize with functions of several variables which is useful in optimization (BTL3)
			4101.4	Familiarize with Two dimensional and Three Dimensional Co ordinate systems (BTL2)
			4101.5	Learn the Utilization of special functions. (BTL2)

Year & Sem	Course Code	Course Name	CO's	
I-I	20A56201T	Applied Physics	6201T.1	<b>Explain</b> the need of coherent sources and the conditions for sustained interference (BTL2)
			6201T.2	<b>Explain</b> various types of emission of radiation (BTL2)
			6201T.3	<b>Explain</b> the concept of dielectric constant and polarization in dielectric materials (BTL2)
			6201T.4	<b>Describes</b> the dual nature of matter (BTL1)
			6201T.5	<b>Classify</b> the energy bands of semiconductors (BTL2)
<b>CO's</b>				
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(BTL6)
			2101T.2	Develop their communicative competence(BTL1)
			2101T.3	Find employment opportunities, challenges and job roles(BTL5)
			2101T.4	Conduct independent surveys, collect and analyze data, prepare and present reports and projects(BTL6)
			2101T.5	Create self-employment strategies(BTL3)

**I B.Tech, I Sem EEE COs (R20-JNTUA)**

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(BTL3)
			2101T.2	Explain basic graph theory definitions, loop and nodal methods of analysis of electrical circuits(BTL2)
			2101T.3	To understand voltage, current and power relationships in 1- $\phi$ AC circuits with basic elements R,L,C (BTL2)
			2101T.4	Apply the network theorems suitably(BTL3)
			2101T.5	Analyze 3-phase electrical circuits, understand the procedure of power measurement in 1-ph and 3-ph electrical circuits(BTL3)
<b>CO's</b>				
I-I	20A03101T	Engineering Drawing	3101T.1	Construct various curves applied in engineering.[BTL1]
			3101T.2	Show projections of solids and sections graphically.[BTL2]
			3101T.3	Show projections of solids and sections graphically.[BTL2]
			3101T.4	Visualize multiple types of objects in different positions and also draw the sectional views.[BTL3]
			3101T.5	Improve their visualization skills in the development of new products[BTL4]
Year& Sem	Course Code	Course Name	CO's	
I-I	20A03101P	Engineering Graphics Lab	3101P.1	Use computers as a drafting tool. (BTL 2)
			3101P.2	Draw isometric and orthographic drawings using CAD packages. (BTL 3)
			3101P.3	Analyzing 3dimensional objective(BTL 4)

**I B.Tech, I Sem EEE COs (R20-JNTUA)**

Year& Sem	Course Code	Course Name	CO's	
I-I	20A56201P	Applied Physics Lab	6201P.1	<b>Operate</b> optical instruments like microscope and spectrometer (BTL2). <b>Determine</b> thickness of a hair/paper with the concept of interference (BTL2)
			6201P.2	<b>Estimate</b> the wavelength of different colors using diffraction grating and dispersive power (BTL2)
			6201P.3	<b>Evaluate</b> the acceptance angle of an optical fiber and numerical aperture (BTL3)
			6201P.4	<b>Calculate</b> the band gap of a given semiconductor (BTL3)
			6201P.5	<b>Plot</b> the intensity of the magnetic field of circular coil carrying current with distance (BTL3)

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(BTL2)
			2101P.2	Employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information(BTL3)
			2101P.3	Learn specific vocabulary to describe different persons, places and objects(BTL4)
			2101P.4	Produce a structured and short talks extemporarily on general topics(BTL5)
			2101P.5	Participate in debates and speak clearly using appropriate discourse markers(BTL6)

CO's				
I-I	20A02101P	Fundamentals of Electrical Circuits Lab	2101P:1	Remember, understand and apply various theorems and verify practically [BTL2]
			2101P:2	Understand and analyze active, reactive power measurements in three phase balanced & unbalanced circuits.[BTL2 &BTL3]

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

Year& Sem	Course Code	Course Name	CO's	
I-II	20A54201	Differential Equations and Vector Calculus	4201.1	Solve the linear differential equations with constant coefficients by appropriate method (BTL3)
			4201.2	Apply a range of techniques to find solutions of standard pdes (BTL3)
			4201.3	Learn the applications of PDEs (BTL2)
			4201.4	Apply del to Scalar and vector point functions (BTL3)
			4201.5	Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals (BTL3)
<b>CO's</b>				
I-II	20A51101T	Chemistry	1101T.1	Discuss the MOT, Apply Schrodinger wave equation to H. (BTL3)
			1101T.2	Demonstrate the application of Fullerene, CNT and Nanoparticles(BTL2)
			1101T.3	Differentiate between pH metry, Potentiometry (BTL2)
			1101T.4	Discuss BUNA-S and BUNA-N Elastomers (BTL2)
			1101T.5	Understand the principles of analytical instruments (BTL2)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A05101T	C-Programming & Data Structures	5201T.1	Analyze the basic concepts of C Programming language [BTL3].
			5201T.2	Design applications in C, using functions, arrays, pointers and structures[BTL1]
			5201T.3	Apply the concepts of Stacks and Queues in solving the problems[BTL4]
			5201T.4	Explore various operations on Linked lists[BTL4]
			5201T.5	Demonstrate various tree traversals and graph traversal techniques and Design searching and sorting methods[BTL3]

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

<b>I-II</b>	<b>20A04101T</b>	<b>ELECTRONIC DEVICES &amp; CIRCUITS</b>	4101T.1	Understand the basic concepts of semiconductors, diodes, and transistors (BTL1)
			4101T.2	Analyze various applications of diode circuits (BTL3)
			4101T.3	Understand the principle of operation, and V-I characteristics in various BJT & MOSFET configurations. (BTL1)
			4101T.4	Design rectifier circuits using diodes and amplifier circuit using BJT (BTL4)
			4101T.5	Solve problems on biasing circuits of BJT and small signal equivalent model of MOSFET (BTL2).

<b>Year &amp; Sem</b>	<b>Course Code</b>	<b>Course Name</b>	<b>CO's</b>	
<b>I-II</b>	<b>20A03202</b>	<b>Engineering Workshop</b>	3202.1	Apply wood working skills in real world applications.[BTL3]
			3202.2	Build different parts with metal sheets in real world applications. [BTL3]
			3202.3	Apply fitting operations in various applications. [BTL3]
			3202.4	Apply different types of basic electric circuit connections.[BTL3]
			3202.5	Preparation of moulds and castings.[BTL3]

**CO's**

<b>I-II</b>	<b>20A05202</b>	<b>IT Workshop</b>	5202.1	Identify the Peripherals of computer and analyze the assembling and disassembling of digital computer.[BTL2]
			5202.2	Design the Documents using Word processors and prepare spread sheets for calculations. Using excel and also the documents using Latex.[BTL6]
			5202.3	Develop the Slide presentations using the presentation tool.[BTL6]
			5202.4	Discuss the concepts of Networking, OS installation and Antivirus.[BTL2]
			5202.5	Demonstrate the concept of Internet and analyze how to sharing and browse information in it.[BTL3]



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

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. (BTL2)
			5201P.2	Develop C programs using functions, arrays, structures and pointers. (BTL6)
			5201P.3	Illustrate the concepts Stacks and Queues. (BTL2)
			5201P.4	Design operations on Linked lists. (BTL6))
			5201P.5	Apply various Binary tree traversal techniques. (BTL3)

**CO's**

I-II	20A51101P	Chemistry Lab	1101P.1	Determine the cell constant and conduct of the solutions.(BTL3)
			1101P.2	Estimate the ferrous iron and Strength of an acid in battery. (BTL2)
			1101P.3	Prepare the advanced materials and analyse the properties. (BTL3)
			1101P.4	Analyze the IR and NMR spectroscopy. (BTL3)
			1101P.5	Analyze the separation method of HPLC and TLC (BTL3)

Year& Sem	Course Code	Course Name	CO's	
I-II	20A02404	Electronic Devices & Circuits Lab	4101P.1	Understand the basic characteristics and applications of basic electronic devices(BTL1)
			4101P.2	Analyze the characteristics of UJT, BJT and MOSFET (BTL3)
			4101P.3	Design BJT /MOSFET based amplifiers for the given specifications (BTL4)
			4101P.4	Simulate all circuits using multisim/PSPICE(BTL5)
			4101P.5	Understand the basic characteristics and applications of basic electronic devices(BTL1)

**CO's**

II-II	20A99201	Environmental Science	9201.1	Understand the various natural resources (BTL2)
			9201.2	Describe about the Biodiversity and Ecosystem (BTL 2)
			9201.3	Discuss about the pollution aspects (BTL3)
			9201.4	To know about the social issues related to environment and thir protection acts (BTL1)
			9201.5	Describe about the population explosion and welfare programme(BTL2)

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

Year & Sem	Course Code	Course Name	CO's	
II-I	20A54302	COMPLEX VARIABLES AND TRANSFORMS	4302.1	Understand the analyticity of complex functions and conformal mappings[BTL2]
			4302.2	Apply Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals along contours[BTL3]
			4302.3	Understand the usage of Laplace transforms, Fourier transforms and z transforms. [BTL2]
			4302.4	Evaluate the Fourier series expansion of periodic functions. [BTL2]
			4302.5	Understand the use of Fourier transforms and apply z transforms to solve difference equations[BTL2]

Year & Sem	Course Code	Course Name	CO's	
II-I	20A02301T	ELECTRICAL CIRCUIT ANALYSIS	2301T.1	Analyze series and parallel resonance circuits [BTL-3]
			2301T.2	Analyze two port networks[BTL-3]
			2301T.3	Calculate the transient response of R-L, R-C, R-L-C circuits for D.C. and A.C. excitations [BTL-3]
			2301T.4	Apply Fourier transforms to electrical circuits excited by non-sinusoidal sources [BTL-3]
			2301T.5	Analyze different types of filters [BTL-3]
<b>CO's</b>				
II-I	20A02302T	DC MACHINES & TRANSFORMERS	2302T.1	Understand about various magnetic materials, properties and applications, illustrate the principles of electromechanical energy conversion (BTL2)
			2302T.2	Able to understand the construction, operation and armature windings of a DC generator, analyze the characteristics of DC generators (BTL2)
			2302T.3	Gain Knowledge on Principle of DC motors, analyze the characteristics of DC motors, analyze speed control of DC motors, testing methods of DC machines (BTL1)
			2302T.4	Understand the construction, operation and parallel operation of transformer, predetermine the efficiency and regulation of a transformer (BTL2)
			2302T.5	Understand the principles of a three-phase transformer, analyze the phase conversions, Analyze the tap changing of transformers (BTL2)

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

Year & Sem	Course Code	Course Name	CO's	
II-I	20A04303T	DIGITAL LOGIC DESIGN	4303T.1	Understand the properties of Boolean algebra and Boolean functions using Karnaugh map(BTL2)
			4303T.2	Able to use the concepts to solve the problems related to logic circuits(BTL3)
			4303T.3	Analyze the combinational and sequential circuits(BTL4)
			4303T.4	Design various logic circuits using Boolean algebra, combinational and logic circuits(BTL6)
			4303T.5	Develop digital circuits using HDL (BTL6)
<b>CO's</b>				
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.(BTL2)
			2301.2	Explain the concepts of cost and production and can calculate the breakeven point. (BTL2)
			2301.3	Learn how to take effective decisions under various market situations and also about different forms of business organizations. (BTL2)
			2301.4	Get the inputs of accounting concepts and analyze the financial statements.(BTL4)
			2301.5	Know how to take an effective investment decision. (BTL2)

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

Year & Sem	Course Code	Course Name	CO's	
II-I	20A02301P	ELECTRICAL CIRCUIT ANALYSIS LAB	2301P.1	Understand and experimentally verify various resonance phenomenon [BTL-2]
			2301P.2	Understand and analyze various current locus diagrams [BTL-2]
			2301P.3	Apply and experimentally analyze two port network parameters [BTL-2]
			2301P.4	Apply computer mathematical and simulation programs to solve various real life disciplinary topics through circuit solution[BTL-1]
			2301P.5	Acquire knowledge on Transient response of RL, RC, RLC series circuits[BTL-2]
<b>CO's</b>				
II-I	20A02302P	DC MACHINES & TRANSFORMERS LAB	2302P.1	Able to understand and analyze magnetization characteristics of DC shunt generator, conduct and analyze load test on DC shunt generators[BTL2]
			2302P.2	Conduct and Analyze Direct and Indirect Tests on DC shunt motor[BTL2]
			2302P.3	Understand and predetermine efficiency and regulation of single phase Transformers, Analyze the Parallel operation of two single phase transformers[BTL2]
			2302P.4	Conduct and analyze load test on DC short shunt and long shunt compound generators[BTL2]
			2302P.5	Understand and analyze speed control techniques and efficiency of DC machines[BTL2]

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

Year& Sem	Course Code	Course Name	CO's	
II-I	20A04303P	DIGITAL LOGIC DESIGN LAB	4303P.1	Understand the pin configuration of various digital Ics in the lab(BTL2)
			4303P.2	Analyze the properties of various logic circuits(BTL4)
			4303P.3	Analyze the sequential circuits(BTL4)
			4303P.4	Analyze the combinational circuits(BTL4)
			4303P.5	Design sequential and combinational circuit using HDL(BTL6)
<b>CO's</b>				
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 (BTL3)
			5305.2	Explore the use of Object oriented concepts to solve Real-life problems (BTL6)
			5305.3	Design database for any real-world problem (BTL6)
			5305.4	Solve mathematical problems using Python programming language (BTL3)

Year& Sem	Course Code	Course Name	CO's	
II-I	20A52201	UNIVERSAL HUMAN VALUES	2201.1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)[BTL2]
			2201.2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.[BTL5]
			2201.3	They would have better critical ability.[BTL4]
			2201.4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).[BTL5]
			2201.5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in[BTL3]

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

Year & Sem	Course Code	Course Name	CO's	
II-II	20A54402	NUMERICAL METHODS & PROBABILITY THEORY	4402.1	Apply numerical methods to solve algebraic and transcendental equations [BTL2]
			4402.2	Derive interpolating polynomials using interpolation formulae [BTL2]
			4402.3	Solve differential and integral equations numerically [BTL2]
			4402.4	Apply Probability theory to find the chances of happening of events[BTL2]
			4402.5	Understand various probability distributions and calculate their statistical constants.[BTL2]
<b>CO's</b>				
II-II	20A04404T	ANALOG ELECTRONIC CIRCUITS	4404T.1	Analyze various multistage amplifiers (BTL3)
			4404T.2	Design various types of negative feedback and oscillator circuits (BTL4)
			4404T.3	Explain the operation of various types of large signal amplifiers (BTL2)
			4404T.4	Discuss the operation of op-amp and its applications (BTL2)
			4404T.5	Explain the operation of special purpose ICs like IC 555, VCO 566 and PLL565 (BTL2).

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

Year & Sem	Course Code	Course Name	CO's	
II-II	20A02401T	POWER ELECTRONICS	2401T.1	To <b>Construct</b> the I-V Characteristics of Basic Power Switching Devices and to <b>Interpret</b> the Firing and Commutation Circuits of Thyristor (BTL5 and BTL2 )
			2401T.2	To <b>Elaborate</b> the Operation of Single-Phase and Three-Phase Rectifiers and to <b>Analyze</b> the same using C-Filter (BTL-L6 and BTL-L4)
			2401T.3	To <b>Examine</b> a basic chopper, its principles and to <b>Discuss</b> the operation of Buck, Boost and Buck-Boost Converters. (BTL6 and BTL4)
			2401T.4	To <b>Inspect</b> the Single-phase Voltage source inverters, their control and modulation techniques and to <b>Explain</b> the operation of Basic Series and Parallel Inverters. (BTL4 and BTL5)
			2401T.5	To <b>Examine</b> the operation of AC Voltage controller and Cyclo-Converter using different loads and to <b>Discuss</b> the modes of operation of a TRIAC. (BTL6 and BTL4)
<b>CO's</b>				
II-II	20A02402T	AC MACHINES	2402T.1	To understand the fundamentals of AC machine windings, construction, principle of working equivalent circuit of induction and synchronous machines. (BTL2)
			2402T.2	To analyze the phasor diagrams of induction and synchronous machine, parallel operation of alternators, synchronization and load division of synchronous generator. (BTL4)
			2402T.3	Apply the concepts to determine V and inverted V curves and power circles of synchronous motor. (BTL3)
			2402T.4	Analyze the various methods of starting in both induction and synchronous machines. (BTL3)

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

Year& Sem	Course Code	Course Name	CO's	
II-II	20A02403T	ELECTROMAGNETIC FIELD THEORY	2403T.1	Understand the concept of electrostatics (BTL2)
			2403T.2	Understand the concepts of Conductors and Dielectrics (BTL2)
			2403T.3	Understand the fundamental laws related to Magneto Statics (BTL2)
			2403T.4	Understand the concepts of Magnetic Potential (BTL2)
			2403T.5	Understand the concepts of Time varying Fields (BTL2)
<b>CO's</b>				
II-II	20A04404P	ANALOG ELECTRONIC CIRCUITS LAB	4404P.1	Analyze various amplifier circuits. [BTL3]
			4404P.2	Design multistage amplifiers[BTL4]
			4404P.3	Design OPAMP based analog circuits. [BTL4]
			4404P.4	Understand working of logic gates. [BTL2]
			4404P.5	Design and implement Combinational and Sequential logic circuits.[BTL4]

Year& Sem	Course Code	Course Name	CO's	
II-II	20A02401P	POWER ELECTRONICS LAB	2401P.1	Understand and analyze various characteristics of power electronic devices with gate firing circuits and forced commutation techniques. (BTL4)
			2401P.2	Analyze the operation of single-phase half & fully-controlled converters and inverters with different types of loads. BT(L4)
			2401P.3	Analyze the operation of DC-DC converters, single-phase AC Voltage controllers, cyclo converters with different loads (BTL3)



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

Year & Sem	Course Code	Course Name	CO's	
II-II	20A02402P	AC MACHINES LAB	2402P.1	Analyze and apply load test, no-load and blocked-rotor tests for construction of circle diagram and equivalent circuit determination in a single phase induction motor. (L4) (L4)
			2402P.2	Predetermine regulation of a three-phase alternator by synchronous impedance & m.m.f methods (L3)
			2402P.3	Predetermine the regulation of Alternator by Zero Power Factor method Xd and Xq determination of salient pole synchronous machine. (L3).
			2402P.4	Evaluate and analyze V and inverted V curves of 3 phase synchronous motor (L4).

Year & Sem	Course Code	Course Name	CO's	
II-II	20A02404	CIRCUITS SIMULATION AND ANALYSIS USING PSPICELAB	2404.1	Simulation of various circuits using PSPICE software. (BTL6)
			2404.2	Simulation of single-phase half & fully-controlled converters, and inverters (BTL6).
			2404.3	Simulation of single-phase AC Voltage controllers with different loads. (BTL6).
<b>CO's</b>				
II-II	20A99401	DESIGN THINKING FOR INNOVATION	9401.1	Understanding the concepts related to design thinking (BTL2)
			9401.2	Explain the fundamentals of Design Thinking and innovation(BTL2)
			9401.3	Apply the design thinking techniques for solving problems in various sectors(BTL3)
			9401.4	Analyze to work in a multidisciplinary environment(BTL4)
			9401.5	Evaluate the value of creativity & formulate specific problem statements of real time issues(BTL5)

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