



# MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

Pulladigunta, Vatticherukurr Mandal, Guntur, Andhra Pradesh-522017

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CO#	CO STATEMENT
<b>C101</b>	<b>ENGLISH -I</b>
<b>C101.1</b>	Listening and Reading language to gain knowledge in the areas of communication.
<b>C101.2</b>	Reproduce with accurate grammatical structures to form sentence and paragraph
<b>C101.3</b>	Selection of vocabulary apply to the situation
<b>C101.4</b>	Developing comprehension skills at reading strategies
<b>C101.5</b>	Improving spoken skills for discussion and demonstration
<b>C102</b>	<b>MATHEMATICS-I</b>
<b>C102.1</b>	Solve first order differential equations and applications of first order differential equations.
<b>C102.2</b>	Solve linear differential equations of higher order.
<b>C102.3</b>	Find the maximum and minimum values of functions of two variables.
<b>C102.4</b>	Determine Laplace transform and Inverse Laplace transform of various functions and use Laplace transform to determine general solution of Linear Ordinary Differential Equation.(Apply Laplace transforms to solve differential equations)
<b>C102.5</b>	Find the solution of First Order Linear and Non Linear Equations by Partial Differentiation.
<b>C103</b>	<b>MATHEMATICS-II (NUMERICAL METHODS AND COMPLEX VARIABLES)</b>
<b>C103.1</b>	Evaluate approximating the roots of algebraic and transcendental equations by iterative methods.
<b>C103.2</b>	Apply Newton's forward ,backward and Lagranges for equal and unequal intervals.
<b>C103.3</b>	methods and know the concepts of special functions
<b>C103.4</b>	Define and analyze limits and continuity of complex valued functions.Apply the concept of analyticity and results on harmonic and entire functions and basic concepts of complex integration.construct the complex valued functions using Milne-Thomson's method
<b>C103.5</b>	Represent the functions as Taylor and Laurent power series, classify singularities and poles. Find residue of complex functions.Evaluatve complex integrals and improper integrals using residue
<b>C104</b>	<b>APPLIED PHYSICS</b>
<b>C104.1</b>	Explain the need of coherent sources and the conditions for sustained interference.
<b>C104.2</b>	Understand the properties of light.
<b>C104.3</b>	Understand the significance of wave function.
<b>C104.4</b>	Explain the applications of Dielectric and magnetic materials.
<b>C104.5</b>	Identify applications of semiconductors and superconductors in electronic devices.
<b>C105</b>	<b>COMPUTER PROGRAMMING</b>
<b>C105.1</b>	Discuss The fundamentals of algorithms, flowcharts and C-Tokens
<b>C105.2</b>	Use Suitable control structures for developing code in C
<b>C105.3</b>	Implement C-programs using derived data types such as arrays, structures
<b>C105.4</b>	Develop C-programs using pointer and its related concepts
<b>C105.5</b>	Design Well structured modular programs using file handling functions
<b>C106</b>	<b>ENGINEERING DRAWING</b>

<b>C106.1</b>	To introduce the use and the application of drawing instruments and to make the students construct the polygons, curves and various types of scales. The student will be able to understand the need to enlarge or reduce the size of objects in representing them.
<b>C106.2</b>	To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other and also the line inclined to both the reference planes
<b>C106.3</b>	To make the students draw the projections of the plane inclined to both the planes.
<b>C106.4</b>	To make the students draw the projections of the various types of solids in different positions inclined to one of the reference planes.
<b>C106.5</b>	To represent the object in 3D view through isometric views. The student will be able to present and convert the isometric view to orthographic view and vice versa.
<b>C107</b>	<b>ENGLISH COMMUNICATION SKILLS LAB-I</b>
<b>C107.1</b>	Understand public speaking skills for professional level and social purpose
<b>C107.2</b>	To improve communication skills for academic purpose
<b>C107.3</b>	To know verbal language of English for competitive purpose
<b>C107.4</b>	To know pronunciation, stress pattern and intonation of language
<b>C107.5</b>	Understanding oral communication methods and its techniques
<b>C108</b>	<b>APPLIED/ENGINEERING PHYSICS LAB</b>
<b>C108.1</b>	Understand the quality of instruments on the procedure level.
<b>C108.2</b>	Determine the wave nature of light on the basis of lasers.
<b>C108.3</b>	Determine the spacer by using the films and parallel interference.
<b>C108.4</b>	Identify the types of the semiconductors using hall effect.
<b>C108.5</b>	Explain and design the circuit by using the p-n junction.
<b>C109</b>	<b>ENGINEERING WORK SHOP AND IT WORK SHOP</b>
<b>C109.1</b>	Devlop on manufacturing of components using workshop trades including fitting,carpentry
<b>C109.2</b>	Understand various basic electrical connections.
<b>C109.3</b>	Identify various hardware components of a system
<b>C109.4</b>	Assemble the computer
<b>C109.5</b>	Use various Microsoft tools.
<b>C110</b>	<b>ENGLISH -II</b>
<b>C110.1</b>	Gain knowledge in the area of technology and science
<b>C110.2</b>	Promotes life skills and social skills
<b>C110.3</b>	Makes to understand different cultural etiquettes
<b>C110.4</b>	Understand the need of inventions and discoveries by reading about different scientists
<b>C110.5</b>	Gain knowledge of environment and its sustainability
<b>C111</b>	<b>MATHEMATICS-III</b>
<b>C111.1</b>	Determine the rank of a matrix and solve the system of linear algebraic equations.
<b>C111.2</b>	Determine the Eigen values and Eigen vectors of a matrix and discuss the nature of quadratic forms.
<b>C111.3</b>	Apply Double and Triple integration technique to evaluate areas and volumes covered by region.
<b>C111.4</b>	Evaluate Beta and Gamma functions and integrals.
<b>C111.5</b>	Find the normal to the surface and evaluate divergence and curl of vector functions.
<b>C112</b>	<b>APPLIED CHEMISTRY</b>
<b>C112.1</b>	Describe the structure , properties and applications of polymers.

<b>C112.2</b>	Specify the Quality and composition of fuels
<b>C112.3</b>	Explain the mechanism of corrosion and apply few corrosion control methods
<b>C112.4</b>	Illustrate the importance of advanced materials in Engineering
<b>C112.5</b>	Simulate the non conventional energy sources to produce electric power
<b>C113</b>	<b>ELECTRICAL AND MECHANICAL TECHNOLOGY</b>
<b>C113.1</b>	Describe the working principle and operation characteristics of DC Machine and Transformers.
<b>C113.2</b>	Illustrate principle of operation and characteristics of Alternators and 3-phase Induction motor.
<b>C113.3</b>	Compare and analysis the construction and working of various measuring instruments.
<b>C113.4</b>	Learn various modes of heat transfer.
<b>C113.5</b>	Study of power transmission by drives, identify the parts of the lathe machine and basic knowledge on the manufacturing process.
<b>C114</b>	<b>ENVIRONMENTAL STUDIES</b>
<b>C114.1</b>	Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities
<b>C114.2</b>	The natural resources and their importance of the sustenance of the life and recognise the need to conserve the natural resourees
<b>C114.3</b>	Social issues both rural and urban environment and the possible means to combat the challenge
<b>C114.4</b>	The environmental legislation of india and the first global initiative toward sustainable development
<b>C114.5</b>	Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
<b>C115</b>	<b>DATA STRUCTURES</b>
<b>C115.1</b>	Define data structures like array, stack, queues and linked list.
<b>C115.2</b>	Explain insertion, deletion and traversing operations on data structures.
<b>C115.3</b>	Identify the asymptotic notations to find the complexity of an algorithm.
<b>C115.4</b>	Compare various searching and sorting techniques.
<b>C115.5</b>	Choose appropriate data structure while designing the algorithms.
<b>C116</b>	<b>APPLIED /ENGINEERING CHEMISTRY LAB</b>
<b>C116.1</b>	Estimate the unknown solutions by using volumetric titration method
<b>C116.2</b>	Analyse the quality of water
<b>C116.3</b>	Construct the Electro chemical cell
<b>C116.4</b>	Determine the Ph of liquid samples
<b>C116.5</b>	Measure the strength of acids by conduct metric and potentio metric titrations.
<b>C117</b>	<b>ENGLISH COMMUNICATION SKILLS LAB - II</b>
<b>C117.1</b>	Give knowledge in the area of communication skills of LSRW
<b>C117.2</b>	Comprehend English language used for debate, discussion and presentation
<b>C117.3</b>	Helps to express ideas in oral communication skills in the view of interviews
<b>C117.4</b>	Comprehend how to develop writing skills
<b>C117.5</b>	Helps to reproduce vocabulary to avoid errors in the sentence constructions
<b>C118</b>	<b>COMPUTER PROGRAMMING LAB</b>
<b>C118.1</b>	Make use of basic C programming language constructs and practice logical ability to solve problems in Linux environment.
<b>C118.2</b>	Solve problems by using control structures and modularity.

<b>C118.3</b>	Build programs using basic data structures include arrays, structures
<b>C118.4</b>	Apply pointers and dynamic memory allocation for dealing real world problems.
<b>C118.5</b>	Utilize files for developing C programs and understand the basic concepts of computer hardware and software.
<b>C201</b>	<b>Electronic Devices &amp; circuits</b>
<b>C201.1</b>	Interpret the concepts of Semiconductor physics to understand various electronic devices.
<b>C201.2</b>	Demonstrate the construction, working principle and V-I characteristics of various Non linear devices.
<b>C201.3</b>	Compare different types of rectifiers with and without filters with relevant expressions
<b>C201.4</b>	Understand different Biasing and Stabilization methods for BJT and FET.
<b>C201.5</b>	Analyze amplifier circuits using small signal low frequency transistor model
<b>C202</b>	<b>Switching Theory &amp; Logic Design</b>
<b>C202.1</b>	Illustrate the importance of various number systems and to perform different arithmetic operations on them.
<b>C202.2</b>	Apply Boolean algebra postulates-map and tabulation methods to minimize Boolean functions
<b>C202.3</b>	Illustrate various combinational and sequential circuits used in digital systems
<b>C202.4</b>	Design various PLDs such as ROMs, PALs, PLAs and PROMs
<b>C202.5</b>	Analyze different finite state machines using Meelay More machines
<b>C203</b>	<b>Signals &amp; Systems</b>
<b>C203.1</b>	Classify various types of signals and systems to illustrate their responses
<b>C203.2</b>	Apply transformation methods to solve signals and differential equations.
<b>C203.3</b>	Analyze the sampling theorem to calculate nyquist rate
<b>C203.4</b>	Analyze the linear systems in time and frequency domains
<b>C204</b>	<b>Network Analysis</b>
<b>C204.1</b>	Solve Network Problem Using Mesh and Nodal Analysis
<b>C204.2</b>	Solve Ac Circuits with series/parallel Combination
<b>C204.3</b>	Design resonant circuits for given Bandwidth
<b>C204.4</b>	Analyze Different Network Theorems and Two port Network parameters
<b>C204.5</b>	Compute the response of First order and second Order Network using Time Domain Analysis and laplace Transform Method
<b>C205</b>	<b>Random variables &amp; Stochastic Processes</b>
<b>C205.1</b>	Interpret the concepts of random variables and stochastic processes in real time applications
<b>C205.2</b>	Use the principle definitions, fundamental theorem and important relations in statistics
<b>C205.3</b>	Describe about significance of Joint Distribution function, Joint Density function and Characteristic function
<b>C205.4</b>	Explain the concept of stationary and widesense stationary process and their significane and evaluate its condition
<b>C205.5</b>	Explain the concept of power density spectrum and cross power density spectrum of a random process
<b>C205.6</b>	Analyze linear systems with theory of stochastic processes
<b>C206</b>	<b>MEFA</b>
<b>C206.1</b>	Describe managerial economics ,demand and production..
<b>C206.2</b>	Estimate the cost and profits of organization
<b>C206.3</b>	Examine the market structures and can able to set the prices.

C206.4	Identify the business organizations and business cycles
C206.5	Calculate the financial accounts of organizations
C206.6	Estimates the capital budgets and able to make descisions
<b>C207</b>	<b>EDC LAB</b>
C207.1	Identify and test the behavior of electronic components and study the operation of Function generator ,RPS and CRO etc.
C207.2	Analyze the V-I characteristics of different electronic devices such as diodes, transistors.
C207.3	Implement the Rectifier circuits using diodes and capacitor.
C207.4	Examine the amplification characteristics of a Transistor in CE, CC,CS configurations
<b>C208</b>	<b>N &amp; ET LAB</b>
C208.1	Apply network theorems to analyze the electrical network
C208.2	Analyze RLC circuits and understand resonance Frequency
C208.3	Determine parameters of a given two-port network
C208.4	Discuss the Magnetization characteristics of DC shunt Generator
C208.5	Observe the speed control of DC Motor
C208.6	Observe the performance of 3-phase induction motor
<b>C209</b>	<b>Electronic Circuit Analysis</b>
C209.1	Analyze amplifier circuits using small signal high frequency transistor models.
C209.2	Demonstrate multistage amplifiers and differential amplifier with its characteristics
C209.3	Analyze the effect of feedback on the performance of negative feedback amplifiers and oscillators
C209.4	Compare various power amplifiers in terms of Efficiency.
C209.5	Distinguish single, double and staggered tuned amplifiers in terms of bandwidth
<b>C210</b>	<b>Control Systems</b>
C210.1	Clarify various control systems and analyze the effects of feedback on physical systems
C210.1	Aanalyse the Transfer function and state models of physical systems and electrical systems
C210.1	Aanalyse Time response of First and Second order, Steady state and error constants for different standard test signals
C210.1	Examine the Time Response and Frequency response Stability using R-H criterion, Root Locus, Polar plots, Bode Plots and Nyquist Stability Criterion
C210.1	Design a Lag, Lead, Lead-Lag Compensators and PID controllers for given Specifications and Analyse and solve linear equations, controllability and observability
<b>C211</b>	<b>Electromagnetic Waves &amp; Transmission Lines</b>
C211.1	Explain basic mathematical concepts related to electromagnetic vector fields and apply basic laws to determine E & H fields
C211.2	Apply Maxwell's equations to solve problems in Electromagnetic field theory
C211.3	Analyze the propagation characteristics of EM waves in different media and types of polarization
C211.4	Evaluate reflection and refraction of EM waves propogated in normal & oblique incidences
C211.5	Demonstrate the transmission line equivalent circuit, characteristics with various lengths. Measurement of length, distance and design of stubs using Smith Charts
<b>C212</b>	<b>Analog Communications</b>
C212.1	Demonstrate the need for modulation and also the basic blocks and circuits present in a communication system, square law and switching modulator and demodulators

C212.2	Distinguish various analog modulation techniques like DSB, SSB and VSB with their generation, detection methods and also system performance in presence of Noise
C212.3	Analyze Frequency modulators and Demodulators with their spectrum, average power, band width, and also with AM
C212.4	Sketch the AM, FM radio transmitter and receiver circuits with the role of AGC /AFC
C212.5	Discriminate different types of pulse analog modulation Techniques such as PAM,PWM and PPM with their modulation and Demodulation methods
<b>C213</b>	<b>Pulse &amp; Digital Circuits</b>
C213.1	Define the concept of linear wave shaping circuits and analyze the response of linear wave shaping circuits for different signals.
C213.2	Understand the non-linear wave shaping circuits
C213.3	Demonstrate switching characteristics of diodes and transistors
C213.4	Design and analyze different multivibrators and time base generators
C213.5	Understand operation and verify the outputs of sampling gates and logic families
<b>C214</b>	<b>Management Science</b>
C214.1	Describe different concepts of management
C214.2	Apply Quality Control, Work-study principles in real life industry
C214.3	Explain HRM process and Marketing strategies
C214.4	Analyze different Project Management techniques
C214.5	Design and evaluate different strategic management concepts
C214.6	Describe Strategic Management through contemporary management practices
<b>C215</b>	<b>ECA LAB</b>
C215.1	Analyze the frequency response of single, multistage amplifiers and feedback amplifiers
C215.2	Design and simulate RC and LC Oscillators for the given specifications
C215.3	Compare the Efficiency of Class A and Class B Amplifiers and calculate the resonant frequency of Tuned amplifiers
C215.4	Design multistage amplifiers, feedback amplifiers, power amplifiers, tuned amplifiers using MULTISIM Simulation tool
<b>C216</b>	<b>AC LAB</b>
C216.1	Compare different amplitude modulated (DSB-FC, DSB-SC, SSB) signals and observe the operation of peak detector in demodulation process.
C216.2	Perform frequency modulation & demodulation and recognize need for pre-emphasis and de-emphasis
C216.3	Perform signal sampling and observe the PAM, PWM and PPM signals and their demodulation
C216.4	Identify the importance AGC circuits and PLL in communication systems
C216.5	Simulate various analog and pulse modulation & demodulation schemes using Simulink- MATLAB
<b>C301</b>	<b>Computer Architecture &amp; Organization</b>
C301.1	Illustrate basic architecture of modern computers and calculate its performance using performance equation
C301.2	Interpret machine instruction types and determine the effective address of operand using addressing modes
C301.3	Categorize various instructions to perform arithmetic, logical and branch operations;
C301.4	Illustrate various bus structures and interfacing technique for I/O organization
C301.5	Demonstrate memory management and executing process of various operations of modern computer



<b>C302</b>	<b>Linear IC Applications</b>
<b>C302.1</b>	Analyze the IC 741 operational amplifier. Compare performance metrics for different configurations
<b>C302.2</b>	Illustrate and design the linear, non-linear applications of Op-Amp and active filters
<b>C302.3</b>	Design and analyze the working of multivibrators using IC 555
<b>C302.4</b>	Illustrate the functional characteristics of VCO, PLL and its applications in communication.
<b>C302.5</b>	Demonstrate and Compare working principle of various data converters using Op-Amp
<b>C303</b>	<b>Digital IC Applications</b>
<b>C303.1</b>	Analyze the commercially available digital integrated circuit families.
<b>C303.2</b>	Apply the knowledge of hardware description language (VHDL) concept to model the any digital circuit.
<b>C303.3</b>	Illustrate combinational and sequential logic circuits using different ICs.
<b>C303.4</b>	Develop and synthesis the HDL code for combinational and sequential circuits.
<b>C303.5</b>	Test for the functionality of combinational and sequential circuits using EDA tools.
<b>C304</b>	<b>Digital Communications</b>
<b>C304.1</b>	Analyze the wave form Coding techniques of digital communication systems in PCM, DPCM, DM, ADM and also mention the effect of Noise, drawbacks
<b>C304.2</b>	Analyze ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK Modulation and demodulation techniques with coherent and non coherent matched and optimum filters
<b>C304.3</b>	Apply knowledge of average information, entropy, information rate and mutual information to evaluate channel capacity
<b>C304.4</b>	Analyze Shannon- Fano , Huffman source encoder with efficiency and also linear block codes
<b>C304.5</b>	Apply Time domain, transform domain, graphical approach to encode convolution codes and decode convolution codes using viterbi algorithm
<b>C305</b>	<b>Antenna and Wave Propagation</b>
<b>C305.1</b>	Define antenna parameters & Illustrate the concept of radiation by applying mathematical formulation
<b>C305.2</b>	Design & Analyze the performance characteristics of loop & array of antennas
<b>C305.3</b>	Calculate the gain and draw the radiation pattern of different antennas
<b>C305.4</b>	Analyze characteristics of different non resonant radiators and draw the waveforms.
<b>C305.5</b>	Illustrate the atmospheric effects on EM wave propagation
<b>C306</b>	<b>PDC LAB</b>
<b>C306.1</b>	Understand & analyze linear and non linear wave shaping
<b>C306.2</b>	Design & analyze transistor as a switch
<b>C306.3</b>	Verify logic gates, flip-flops & sampling gates
<b>C306.4</b>	Design & analyze various multivibrators
<b>C306.5</b>	Generate time base signals using bootstrap circuit
<b>C307</b>	<b>LICA LAB</b>
<b>C307.1</b>	Evaluate and design Performance of linear non-linear applications of Operational amplifier using IC741
<b>C307.2</b>	Design and analyze the performance of active filters
<b>C307.3</b>	Design and analyze the Performance of different Multi vibrators using IC 555
<b>C307.4</b>	Analyze the response of IC 566 & IC 565

<b>C307.5</b>	Test different voltage regulations (Ex: 5V, 9V & 12V)
<b>C308</b>	<b>DICA LAB</b>
<b>C308.1</b>	Demonstrate the use of xilinx ISE software and realize basic digital circuits using VHDL
<b>C308.2</b>	Analyze the functionality of Combinational circuits and Sequential Circuits using digital ICs
<b>C308.3</b>	Develop a program and synthesize a given application / problem statement using EDA tools.
<b>C308.4</b>	Design and model complex digital system independently or in a team
<b>C309</b>	<b>Microprocessors &amp; Microcontrollers</b>
<b>C309.1</b>	Apply the concepts of buses to discriminate the architectural view of Microprocessors and Microcontrollers
<b>C309.2</b>	Illustrate various addressing modes and instruction sets of Microprocessors and Microcontrollers to develop Assembly language programs
<b>C309.3</b>	Analyze different programmable interfacing modules to interface with microprocessors and controllers for real time applications.
<b>C309.4</b>	Analyze and Compare the features and functional concepts of advanced Microprocessors and Microcontrollers.
<b>C309.5</b>	Develop a report to generate a code for applications using microprocessors and microcontrollers to meet the societal requirements.
<b>C310</b>	<b>Microwave Engineering</b>
<b>C310.1</b>	Discuss different modes in waveguide structures
<b>C310.2</b>	Illustrate Rectangular and Circular Waveguides
<b>C310.3</b>	Illustrate Rectangular and Circular Resonators
<b>C310.4</b>	Calculate S-matrix for various waveguide components and Develop the splitting of the microwave energy in a desired direction
<b>C310.5</b>	Distinguish between Microwave tubes and Solid State Devices
<b>C310.6</b>	Calculate various microwave parameters
<b>C311</b>	<b>VLSI Design</b>
<b>C311.1</b>	Analyze the electrical properties of transistors and make use of fabrication to build CMOS circuits.
<b>C311.2</b>	Analyze the characteristics of CMOS circuits to examine electrical behavior of digital circuits.
<b>C311.3</b>	Construct the layout of any logic circuit by apply the concept of stick diagram and design rules.
<b>C311.4</b>	Distinguish between the concept of SRAM and EPROM programming technologies based FPGA architectures.
<b>C311.5</b>	Analyze the power dissipation using various approaches in low power circuit design by considering the EDA tools
<b>C312</b>	<b>Digital Signal Processing</b>
<b>C312.1</b>	Analyze the Discrete time systems to solve differential equations
<b>C312.2</b>	Use FFT algorithms to calculate the DFT
<b>C312.3</b>	Design a Digital filter (FIR&IIR) from the given specifications
<b>C312.4</b>	Analyze the Multirate Processing concepts in various applications
<b>C312.5</b>	Apply the signal processing concepts on DSP Processor
<b>C313</b>	<b>Bio Medical Engineering</b>
<b>313.1</b>	Demonstrate the principles of electronics used in designing various diagnostic equipment and analyze ECG, EEG and EMG recordings for disorder identification.
<b>313.2</b>	Understand principles of bio-electrodes and transducers.



313.3	Understand the activities and measurement of Cardiovascular and Respiratory system.
313.4	Choose a better technical support with exposure to the hospitals and health care industry.
313.5	Examine about different patient care and monitoring equipment and measurement and study of therapeutic and prosthetic devices.
<b>C314</b>	<b>MPMC LAB</b>
C314.1	Discriminate the fundamental of assembly level programming of microprocessors and microcontrollers.
C314.2	Develop and execute different assembly language programs by applying the 8086 microprocessor and 8051 microcontroller instruction sets.
C314.3	To interface different I/O devices to processor & controller, and will explore several techniques of interfacing
C314.4	Compare different implementations and Design simple microcontroller based system for real time applications.
<b>C315</b>	<b>VLSI LAB</b>
C315.1	Able to gain a knowledge of the designing the circuit, generating the symbol, layout of the circuits for real-time applications using the Mentor Graphics tool
C315.2	Analyze the characteristics of CMOS based Analog and digital circuits
C315.3	Construct the layouts for complex CMOS logic circuits by following the design rules
C315.4	Evaluate the performance of analog/digital circuits in terms of power, speed and area
<b>C316</b>	<b>DC LAB</b>
C316.1	Verify the pulse digital communication techniques using EDA tools
C316.2	Analysis of Frequency Shift Keying ,Phase Shift Keying, Differential Phase Shift Keying techniques and Companding technique
C316.3	Verification of Binary Cyclic Code – Encoder and Decoder
C316.4	Demonstrate the use of Matlab software and implement the basic applications
<b>C401</b>	<b>Radar Systems</b>
C401.1	Demonstrate the RADAR principle using basic block diagram and solve the radar range equation to predict range performance, receiver noise, SNR, probability of detection probability of false alarm, transmitter power.
C401.2	Analyze different types of radars: CW , FM-CW,MTI and pulse doppler radars with their principle
C401.3	Examine the various tracking mechanisms in amplitude comparison monopulse and phase comparison mono pulse tracking radars.
C401.4	Calculate the efficiency of Non-matched filters, matched filters with Non- white noise, noise figure and noise temperature
C401.5	Compare types of displays duplexers and phased array antennas ,radomes with their basic concepts, applications, advantages, limitations.
<b>C402</b>	<b>Digital Image Processing</b>
C402.1	Analyze image formation model and fundamental concepts involved in digital image processing to process gray and color image data.
C402.2	Analyze the images by applying various transformation techniques
C402.3	Apply the concepts of fundamental image enhancement algorithms in spatial and frequency domains and also restoration techniques to improve the quality of image.
C402.4	Illustrate various coding techniques for image compression and multi-resolution processing

C402.5	Analyze different reshaping operations on the image using morphological algorithms and detect Region of interest by applying segmentation techniques on gray and color images.
<b>C403</b>	<b>Computer Networks</b>
C403.1	Compare OSI and TCP/IP models effectively.
C403.2	Describe physical, datalink layers and compare different multiplexing techniques.
C403.3	Analyze Datalink layer services and protocol types efficiently.
C403.4	Illustrate MAC sublayer, multiple access protocol and analyze Ethernet and WLAN architectures.
C403.5	Analyzing Network layer design issues, routing using congestion control algorithms.
C403.6	Make use of Internet Transport protocol and describe operation of DNS and Electronic mail.
<b>C404</b>	<b>Optical Communications</b>
C404.1	Solve problems using Ray theory, electromagnetic mode theory, scattering mechanisms in optical fibers
C404.2	Apply electromagnetic mode theory for optical waveguides and also Analyze WDM in optical links
C404.3	Compare line coding techniques, digital-, analog- receivers used in optical communication systems and also calculate the amount of light lost and dispersion in an optical system
C404.4	Analyze optical fiber systems using different types of photo detectors and optical test equipment
C404.5	Analyze point-to-point links using link power-, rise time- budgets, and also Compare optical sources, and detectors used in optical communication systems
C404.6	Compare measurement of attenuation, dispersion using different methods and also Analyze eye pattern technique in a digital transmission system
<b>C405</b>	<b>Electronic Switching Systems</b>
C405.1	Evaluate the time and space parameters of a switched signal
C405.2	Establish the digital signal path in time and space, between two terminals
C405.3	Evaluate the inherent facilities within the system to test some of the SLIC, CODEC and digital switch functions
C405.4	Investigate the traffic capacity of the system
C405.5	Evaluate methods of collecting traffic data
C405.6	Evaluate the method of interconnecting two separate digital switches
<b>C406</b>	<b>Embedded Systems</b>
C406.1	Apply an appropriate software tools to provide an interface between peripherals and systems
C406.2	Identify a suitable firmware to meet real time computing constraints of and embedded systems
C406.3	Design the subsystems and integrate for a complete system so that we able to know an embedded system.
C406.4	Analyze the basic concepts of an embedded system so that we able to know an embedded system design approach to perform a specific function
C406.5	Prepare programming environment used to develop embedded system
<b>C407</b>	<b>MWE Lab</b>
C407.1	Study of Gunn Diode Characteristics using Gunn power supply.
C407.2	Measurement of attenuation, Impedance, Frequency, and radiation patterns of Horn, Parabolic antennas using X-band Microwave bench.
C407.3	Measurement of Scattering parameters of Circulator, Magic Tee using X-band microwave bench
C407.4	Analysis of Directional coupler and Reflex Klystron Characteristics
C407.5	Synthesis of micro-strip antennas using HFSS

<b>C407.6</b>	Characterization of LED and Laser diodes
<b>C408</b>	<b>DSP LAB</b>
<b>C408.1</b>	Write code to different operations on signals and verify them using MATLAB software.
<b>C408.2</b>	Design Digital filters (IIR & FIR) to detect frequency response using MATLAB software
<b>C408.3</b>	Simulate the programs and execute them on the DSP Starter Kit using Code Composer Studio Software tool
<b>C408.4</b>	Apply enhancement algorithms, restoration and transformation techniques to improve the quality of an image using MATLAB software
<b>C409</b>	<b>Cellular Mobile Communications</b>
<b>C409.1</b>	Analyze the cellular mobile system and concepts like frequency reuse, cellular structures and shapes.
<b>C409.2</b>	Apply the concept of interference and analyze different types of antennas its parameters and effects in cellular systems.
<b>C409.3</b>	Distinguish the frequency management, Channel assignment and signal coverage of a cell.
<b>C409.4</b>	Analyze the handoff strategies and vehicle locating methods in a cell.
<b>C409.5</b>	Detect various architectures and access schemes in cellular networks.
<b>C410</b>	<b>Electronic Measurement &amp; Instrumentation</b>
<b>C410.1</b>	Apply the acquired knowledge of measuring instrumentations to measure in a complex design
<b>C410.2</b>	Analyze the available oscilloscopes to measure of various signal
<b>C410.3</b>	Identify the appropriate transducers among available transducer to design project
<b>C410.4</b>	Analyze various bridge circuits for the measurement of physical quantities to minimize errors in measurements
<b>C410.5</b>	Inspect data acquisition systems and to apply for instrumentation in industrial
<b>411</b>	<b>Satellite Communications</b>
<b>411.1</b>	Apply Kepler's laws of planetary motion to analyze orbital mechanics and launching methods of satellites.
<b>411.2</b>	Categorize various types of Satellite subsystems and evaluate reliability and space qualification.
<b>411.3</b>	Deduce the expression for G/T ratio to assess the satellite link budget.
<b>411.4</b>	Apply the knowledge of various multiple access techniques for satellite communication design.
<b>411.5</b>	Analyze the principles of low earth orbits and geo-stationary satellite systems.
<b>C412</b>	<b>Wireless Sensor Networks</b>
<b>C412.1</b>	Illustrate wireless sensor networks and its architectures effectively
<b>C412.2</b>	Define different networking technologies, topologies and its applications
<b>C412.3</b>	Describe the MAC protocols for wireless sensor networks and its advantages
<b>C412.4</b>	Explain the concepts of routing protocols, issues and types efficiently
<b>C412.5</b>	Analyze the functionalities of transport layer and apply security protocols
<b>C412.6</b>	Analyzing security attacks in WSN applications, evaluate sensor network platform and tools
<b>C413</b>	<b>SEMINAR</b>
<b>C413.1</b>	Gain factual knowledge like fundamental principles and theories
<b>C413.2</b>	Develop critical thinking and specific skill about topics of current intellectual importance
<b>C413.3</b>	Present seminar and prepare report
<b>C414</b>	<b>PROJECT</b>

<b>C414.1</b>	Apply relevant engineering principles and theories to design, built, operate, simulate and analyze the development of an engineering product, system or concept
<b>C414.2</b>	Design and perform investigations/experiments to collect data and analyze result in order to make relevant decision on the performance of an engineering product, system or concept.
<b>C414.3</b>	Demonstrate the social, cultural and environmental responsibilities of an engineer
<b>C414.4</b>	Practice ethical and professional norms for the implementation of engineering projects.





























