



MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

Pulladigunta, Vatticherukurr Mandal, Guntur, Andhra Pradesh-522017

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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

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

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

C118.3	Build programs using basic data structures include arrays, structures
C118.4	Apply pointers and dynamic memory allocation for dealing real world problems.
C118.5	Utilize files for developing C programs and understand the basic concepts of computer hardware and software.
C201	Electronic Devices & circuits
C201.1	Interpret the concepts of Semiconductor physics to understand various electronic devices.
C201.2	Demonstrate the construction, working principle and V-I characteristics of various Non linear devices.
C201.3	Compare different types of rectifiers with and without filters with relevant expressions
C201.4	Understand different Biasing and Stabilization methods for BJT and FET.
C201.5	Analyze amplifier circuits using small signal low frequency transistor model
C202	Switching Theory & Logic Design
C202.1	Illustrate the importance of various number systems and to perform different arithmetic operations on them.
C202.2	Apply Boolean algebra postulates-map and tabulation methods to minimize Boolean functions
C202.3	Illustrate various combinational and sequential circuits used in digital systems
C202.4	Design various PLDs such as ROMs, PALs, PLAs and PROMs
C202.5	Analyze different finite state machines using Meelay More machines
C203	Signals & Systems
C203.1	Classify various types of signals and systems to illustrate their responses
C203.2	Apply transformation methods to solve signals and differential equations.
C203.3	Analyze the sampling theorem to calculate nyquist rate
C203.4	Analyze the linear systems in time and frequency domains
C204	Network Analysis
C204.1	Solve Network Problem Using Mesh and Nodal Analysis
C204.2	Solve Ac Circuits with series/parallel Combination
C204.3	Design resonant circuits for given Bandwidth
C204.4	Analyze Different Network Theorems and Two port Network parameters
C204.5	Compute the response of First order and second Order Network using Time Domain Analysis and laplace Transform Method
C205	Random variables & Stochastic Processes
C205.1	Interpret the concepts of random variables and stochastic processes in real time applications
C205.2	Use the principle definitions, fundamental theorem and important relations in statistics
C205.3	Describe about significance of Joint Distribution function, Joint Density function and Characteristic function
C205.4	Explain the concept of stationary and widesense stationary process and their significane and evaluate its condition
C205.5	Explain the concept of power density spectrum and cross power density spectrum of a random process
C205.6	Analyze linear systems with theory of stochastic processes
C206	MEFA
C206.1	Describe managerial economics ,demand and production..
C206.2	Estimate the cost and profits of organization
C206.3	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
C207	EDC LAB
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
C208	N & ET LAB
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
C209	Electronic Circuit Analysis
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
C210	Control Systems
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
C211	Electromagnetic Waves & Transmission Lines
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 propagated 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
C212	Analog Communications
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
C213	Pulse & Digital Circuits
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
C214	Management Science
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
C215	ECA LAB
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
C216	AC LAB
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
C301	Computer Architecture & Organization
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

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

C307.5	Test different voltage regulations (Ex: 5V, 9V & 12V)
C308	DICA LAB
C308.1	Demonstrate the use of xilinx ISE software and realize basic digital circuits using VHDL
C308.2	Analyze the functionality of Combinational circuits and Sequential Circuits using digital ICs
C308.3	Develop a program and synthesize a given application / problem statement using EDA tools.
C308.4	Design and model complex digital system independently or in a team
C309	Microprocessors & Microcontrollers
C309.1	Apply the concepts of buses to discriminate the architectural view of Microprocessors and Microcontrollers
C309.2	Illustrate various addressing modes and instruction sets of Microprocessors and Microcontrollers to develop Assembly language programs
C309.3	Analyze different programmable interfacing modules to interface with microprocessors and controllers for real time applications.
C309.4	Analyze and Compare the features and functional concepts of advanced Microprocessors and Microcontrollers.
C309.5	Develop a report to generate a code for applications using microprocessors and microcontrollers to meet the societal requirements.
C310	Microwave Engineering
C310.1	Discuss different modes in waveguide structures
C310.2	Illustrate Rectangular and Circular Waveguides
C310.3	Illustrate Rectangular and Circular Resonators
C310.4	Calculate S-matrix for various waveguide components and Develop the splitting of the microwave energy in a desired direction
C310.5	Distinguish between Microwave tubes and Solid State Devices
C310.6	Calculate various microwave parameters
C311	VLSI Design
C311.1	Analyze the electrical properties of transistors and make use of fabrication to build CMOS circuits.
C311.2	Analyze the characteristics of CMOS circuits to examine electrical behavior of digital circuits.
C311.3	Construct the layout of any logic circuit by apply the concept of stick diagram and design rules.
C311.4	Distinguish between the concept of SRAM and EPROM programming technologies based FPGA architectures.
C311.5	Analyze the power dissipation using various approaches in low power circuit design by considering the EDA tools
C312	Digital Signal Processing
C312.1	Analyze the Discrete time systems to solve differential equations
C312.2	Use FFT algorithms to calculate the DFT
C312.3	Design a Digital filter (FIR&IIR) from the given specifications
C312.4	Analyze the Multirate Processing concepts in various applications
C312.5	Apply the signal processing concepts on DSP Processor
C313	Bio Medical Engineering
313.1	Demonstrate the principles of electronics used in designing various diagnostic equipment and analyze ECG, EEG and EMG recordings for disorder identification.
313.2	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.
C314	MPMC LAB
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.
C315	VLSI LAB
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
C316	DC LAB
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
C401	Radar Systems
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.
C402	Digital Image Processing
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.
C403	Computer Networks
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.
C404	Optical Communications
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
C405	Electronic Switching Systems
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
C406	Embedded Systems
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
C407	MWE Lab
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

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

C414.1	Apply relevant engineering principles and theories to design, built, operate, simulate and analyze the development of an engineering product, system or concept
C414.2	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.
C414.3	Demonstrate the social, cultural and environmental responsibilities of an engineer
C414.4	Practice ethical and professional norms for the implementation of engineering projects.

