



# PALLAVI ENGINEERING COLLEGE

(Formerly Nagole Institute of Technology & Science)  
Abdullapurmet(M), Near Hayathanagar

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### COURSE OUTCOMES

#### **I YEAR ECE SEMESTER-I (REGULATION –R18)**

#### **ACADEMIC YEAR: 2019-2020**

#### **Course Code & Name: MA101BS Mathematics-I**

Upon completion of the course, students will be able to:

Course Name	Course outcomes
C111 [1]	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
C111 [2]	Find the Eigen values and Eigen vectors
C111[3]	Reduce the quadratic form to canonical form using orthogonal transformations.
C111[4]	Analyse the nature of sequence and series.
C111[5]	Solve the applications on the mean value theorems.
C111[6]	Evaluate the improper integrals using Beta and Gamma functions
C111[7]	Find the extreme values of functions of two variables with/ without constraints.

#### **Course Code & Name: AP102BS: Applied Physics**

Upon completion of the course, Students will be able to:

Course Name	Course outcomes
C112 [1]	The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
C112 [2]	The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on. .

C112[3]	Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
C112[4]	The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

**Course Code & Name: CS103ES: Programming For Problem Solving**

Upon the completion of the course, students will be able to:

Course Name	Course outcomes
C113 [1]	To write algorithms and to draw flowcharts for solving problems
C113 [2]	To convert the algorithms/flowcharts to C programs.
C113 [3]	To code and test a given logic in C programming language.
C113 [4]	To decompose a problem into functions and to develop modular reusable code.
C113 [5]	To use arrays, pointers, strings and structures to write C programs.
C113 [6]	Searching and sorting problems.

**Course Code & Name: ME104ES: Engineering Graphics**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C114 [1]	Preparing working drawings to communicate the ideas and information.
C114 [2]	Read, understand and interpret engineering drawings.

**Course Code & Name: AP105BS: Applied Physics Lab**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C115 [1]	Analyze the characteristics of Semi conductor Devices
C115 [2]	Understand the properties of material help the students to prepare new materials for various engineering applications.

**Course Code & Name: CS106ES: Programming For Problem Solving Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C116 [1]	Formulate the algorithms for simple problems
C116 [2]	Translate given algorithms to a working and correct program
C116 [3]	Correct syntax errors as reported by the compilers
C116 [4]	Identify and correct logical errors encountered during execution
C116 [5]	Represent and manipulate data with arrays, strings and structures
C116 [6]	Use pointers of different types
C116 [7]	Create, read and write to and from simple text and binary files
C116 [8]	Create, read and write to and from simple text and binary files

**Course Code & Name: \*MC109ES: Environmental Science**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C117 [1]	Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

**I YEAR ECE SEMESTER-II (REGULATION –R18)****ACADEMIC YEAR: 2019-2020****Course Code & Name: MA201BS: Mathematics - II**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C121 [1]	Identify whether the given differential equation of first order is exact or not
C121 [2]	Solve higher differential equation and apply the concept of differential equation to real world problems
C121 [3]	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped

**Course Code & Name: CH102BS: Chemistry**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C122 [1]	The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
C122 [2]	The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
C122 [3]	The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
C122 [4]	The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.

**Course Code & Name: EE103ES: Basic Electrical Engineering**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C123 [1]	To analyze and solve electrical circuits using network laws and theorems.
C123 [2]	To understand and analyze basic Electric and Magnetic circuits
C123 [3]	To study the working principles of Electrical Machines
C123 [4]	To introduce components of Low Voltage Electrical Installations

**Course Code & Name: ME105ES: ME205ES: Engineering Workshop**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C124 [1]	Study and practice on machine tools and their operations
C124 [2]	Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
C124 [3]	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
C124[4]	Apply basic electrical engineering knowledge for house wiring practice.

**Course Code & Name: EN105HS: English**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
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C125 [1]	Use English Language effectively in spoken and written forms
C125 [2]	Comprehend the given texts and respond appropriately.
C125 [3]	Communicate confidently in various contexts and different cultures.
C125 [4]	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

**Course Code & Name: CH106BS: Engineering Chemistry Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C126 [1]	Determination of parameters like hardness and chloride content in water.
C126 [2]	Estimation of rate constant of a reaction from concentration – time relationships.
C126 [3]	Determination of physical properties like adsorption and viscosity.
C126 [4]	Calculation of R <sub>f</sub> values of some organic molecules by TLC technique

**Course Code & Name: EN107HS: English Language and Communication Skills Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C127 [1]	Better understanding of nuances of English language through audio-visual experience and group activities
C127[2]	Neutralization of accent for intelligibility
C127 [3]	Speaking skills with clarity and confidence which in turn enhances their employability skills

**Course Code & Name: EE108ES: Basic Electrical Engineering Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C128 [1]	Get an exposure to basic electrical laws.
C128 [2]	Understand the response of different types of electrical circuits to different excitations.
C128 [3]	Understand the measurement, calculation and relation between the basic electrical parameters

C128 [4]	Understand the basic characteristics of transformers and electrical machines
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## **II YEAR ECE SEMESTER-I (REGULATION –R18)**

**ACADEMIC YEAR: 2019-2020**

### **Course Code & Name: EC301PC: Electronic Devices and Circuits**

Upon completion of the course, students will be able to:

Course Name	Course outcomes
C211 [1]	Know the characteristics of various components.
C211 [2]	Understand the utilization of components.
C211 [3]	Understand the biasing techniques
C211 [4]	Design and analyze small signal amplifier circuits.

### **Course Code & Name: EC302PC: Network Analysis and Transmission Lines**

Upon completion of the course, Students will be able to:

Course Name	Course outcomes
C212 [1]	Gain the knowledge on basic RLC circuits behaviour.
C212 [2]	Analyze the Steady state and transient analysis of RLC Circuits.
C212 [3]	Know the characteristics of two port network parameters.
C212 [4]	Analyze the transmission line parameters and configurations.

### **Course Code & Name: EC303PC: Digital System Design**

Upon the completion of the course, students will be able to:

Course Name	Course outcomes
C213 [1]	Understand the numerical information in different forms and Boolean Algebra theorems
C213 [2]	Postulates of Boolean algebra and to minimize combinational functions
C213 [3]	Design and analyze combinational and sequential circuits

C213 [4]	Known about the logic families and realization of logic gates.
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**Course Code & Name: EC304PC: Signals and Systems**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C214 [1]	Differentiate various signal functions.
C214 [2]	Represent any arbitrary signal in time and frequency domain.
C214 [3]	Understand the characteristics of linear time invariant systems.
C214 [4]	Analyze the signals with different transform technique

**Course Code & Name: EC305ES: Probability Theory and Stochastic Processes**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C215 [1]	Understand the concepts of Random Process and its Characteristics.
C215 [2]	Understand the response of linear time Invariant system for a Random Processes.
C215 [3]	Determine the Spectral and temporal characteristics of Random Signals.
C215 [4]	Understand the concepts of Noise in Communication systems.

**Course Code & Name: EC306PC: Electronic Devices And Circuits Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C216 [1]	Design and analyze the characteristics of PN junction diode and its Applications
C216 [2]	Design and analyze the characteristics of amplifiers (CE, CB, CC)

**Course Code & Name: EC307PC: Digital System Design Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C217 [1]	Realization and design of Boolean Expression using Logic gates

C217 [2]	Analyze, design and implement digital logic circuits
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**Course Code & Name: EC308ES: Basic Simulation Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C218 [1]	Simulate the basic operations on matrices, and various types of signals
C218 [2]	Simulate and verify correlation and Weiner-Khinchine relation.

**Course Code & Name: \*MC309/\*MC409: Constitution of India**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C219 [1]	The Constitution of India is the supreme law of India
C219 [2]	Understand Social, political and economic perspectives of the Indian Society

**II YEAR ECE SEMESTER-II (REGULATION –R18)**

**ACADEMIC YEAR: 2019-2020**

**Course Code & Name: MA401BS: Laplace Transforms, Numerical Methods and Complex Variables**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C221 [1]	Use the Laplace transforms techniques for solving ODE's
C221 [2]	Find the root of a given equation.
C221 [3]	Estimate the value for the given data using interpolation
C221 [4]	Find the numerical solutions for a given ODE's
C221 [5]	Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
C221 [6]	Taylor's and Laurent's series expansions of complex Function

**Course Code & Name: EC402PC: Electromagnetic Fields And Waves**

Upon the completion of the course, Students will be able to:



Course Name	Course outcomes
C222 [1]	Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields.
C222 [2]	Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
C222 [3]	Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
C222 [4]	Analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.

**Course Code & Name: EC403PC: Analog and Digital Communications**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C223 [1]	Analyze and design of various continuous wave and angle modulation and demodulation techniques
C223 [2]	Understand the effect of noise present in continuous wave and angle modulation techniques.
C223 [3]	Attain the knowledge about AM , FM Transmitters and Receivers
C223 [4]	Analyze and design the various Pulse Modulation Techniques.
C223 [5]	Understand the concepts of Digital Modulation Techniques and Baseband transmission.

**Course Code & Name: EC404PC: Linear IC Applications**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C224 [1]	A thorough understanding of operational amplifiers with linear integrated circuits.
C224 [2]	Attain the knowledge of functional diagrams and applications of IC 555 and IC 565
C224 [3]	Acquire the knowledge about the Data converters.

**Course Code & Name: EC405PC: Electronic Circuit Analysis**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C225 [1]	Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.
C225 [2]	Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations
C225 [3]	Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.
C225 [4]	Design Multi vibrators and sweep circuits for various applications.

**Course Code & Name: EC406PC: Analog and Digital Communications Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C226 [1]	Analyze, design and implement modulation schemes
C226 [2]	Apply and demonstrate various coding schemes

**Course Code & Name: EC407PC: IC Applications Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C227 [1]	Design oscillators and amplifiers using operational amplifiers.
C227 [2]	Analyze the performance of multivibrators using IC'S

**Course Code & Name: EC408PC: Electronic Circuit Analysis Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C228 [1]	Analyze, design and implement analog circuits
C228 [2]	Analyze the performance of oscillators and multivibrators.

**III YEAR ECE SEMESTER-I (REGULATION –R16)**

**ACADEMIC YEAR: 2019-2020**

**Course Code & Name: EC501PC : Electromagnetic Theory And Transmission Lines**

Upon completion of the course, students will be able to:

Course Name	Course outcomes
C311 [1]	Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions, and use them for solving engineering problems.
C311 [2]	Analyze the Wave Equations for good conductors and good dielectrics, and evaluate the UPW Characteristics for several practical media of interest.
C311 [3]	Establish the proof and estimate the polarization features, reflection and transmission coefficients for UPW propagation, distinguish between Brewster and Critical Angles, and acquire knowledge of their applications.
C311 [4]	Determine the Transmission Line parameters for different lines, characterize the distortions and estimate the characteristics for different lines.
C311 [5]	Analyze the RF Line features and configure them as SC, OC Lines, QWTs and HWTs, and design the same for effective impedance transformation.
C311 [6]	Study the Smith Chart profile and stub matching features, and gain ability to practically use the same for solving practical problems.

**Course Code & Name: EC502PC: Linear And Digital IC Applications**

Upon completion of the course, Students will be able to:

Course Name	Course outcomes
C312 [1]	A thorough understanding of operational amplifiers with linear integrated circuits.
C312 [2]	Understanding of the different families of digital integrated circuits and their characteristics.
C312[3]	Also students will be able to design circuits using operational amplifiers for various applications.

**Course Code & Name: EC503PC Digital Communications**

Upon the completion of the course, students will be able to:

Course Name	Course outcomes
C313 [1]	Understand basic components of digital communication systems.
C313 [2]	Design optimum receivers for digital modulation techniques.
C313 [3]	Analyze the error performance of digital modulation techniques.

C313 [4]	Understand the redundancy present in digital communication by using various source coding techniques .
C313 [5]	Know about different error detecting and error correcting codes like block codes, cyclic codes and convolution codes.

**Course Code & Name: SM504MS Fundamentals Of Management**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C314 [1]	To understand the Management Concepts in their Profession.
C314 [2]	The students can learn various Management Functions like planning, organizing, staffing, leading, Motivation and control.
C314 [3]	The students can explore the Management Practices in their domain area.

**Course Code & Name: MC500HS Professional Ethics (Open Elective I)**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C315 [1]	The students will understand the importance of Values and Ethics in their personal lives and professional careers.
C315 [2]	The students will learn the rights and responsibilities as an employee, team member and a global citizen

**Course Code & Name: EC505PC Linear IC Applications Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C316 [1]	Design oscillators and amplifiers using operational amplifiers.
C316 [2]	Analyze the performance of oscillators and multivibrators using SPICE

**Course Code & Name: EC506PC Digital IC Applications Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C317 [1]	Analyze, design and implement combinational circuits

C317 [2]	Analyze, design and implement sequential circuits and its applications
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**Course Code & Name: EC507PC Digital Communications Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C318 [1]	Simulate different Digital modulation schemes
C318 [2]	Apply and demonstrate various coding schemes

**III YEAR ECE SEMESTER-II (REGULATION –R16)**

**ACADEMIC YEAR: 2019-2020**

**Course Code & Name: CE623OE Intellectual Property Rights Open elective II**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C321 [1]	To understand the Intellectual Property for international organizations, agencies & treaties.
C321 [2]	Understand the importance of Trade Marks & Trade Secret
C321 [3]	Learn the New development of Intellectual property.

**Course Code & Name: EC612PE Digital Image Processing (PE-I)**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C322 [1]	Exploration of the limitations of the computational methods on digital images.
C322 [2]	Expected to implement the spatial and frequency domain image transforms on enhancement and restoration of images.
C322 [3]	Elaborate understanding on image enhancement techniques.
C322 [4]	Expected to define the need for compression and evaluate the basic compression

**Course Code & Name: EC601PC Antennas and Wave Propagation**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C323 [1]	Explain the mechanism of radiation, distinguish between different antenna characteristic parameters, establish their mathematical relations, estimate them for different practical cases.
C323 [2]	Distinguish between short dipoles, half-wave dipoles, quarter-wave monopoles and small loops, configure their current distributions, derive their far fields and radiation characteristics and sketch their patterns.
C323 [3]	Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of folded dipole, Yagi-Uda Antenna, Helical Antennas, Horn Antennas, and to acquire the knowledge of their analysis, design and development.
C323 [4]	Analyze a micro strip rectangular patch antenna and a parabolic reflector antenna, identify the requirements and relevant feed structure, carry out the design and establish their patterns.
C323 [5]	Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements in the laboratory.
C323 [6]	Carry out the Linear Array Analysis, estimate the array factor and Characteristics and sketch the pattern for 2-element array, N-element BSA,EFA, modified EFA, Binomial Arrays.
C323 [7]	Classify the different wave propagation mechanisms, identify their frequency ranges, determine the characteristic features of ground wave, ionosphere wave, space wave, duct and troposphere propagations, and estimate the parameters involved.

**Course Code & Name: EC602PC Microprocessors and Microcontrollers**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C324 [1]	Understands the internal architecture and organization of 8086, 8051 and ARM processors/controllers.
C324 [2]	Understands the interfacing techniques to 8086 and 8051 and can develop assembly language programming to design microprocessor/ micro controller based systems

**Course Code & Name: EC603PC Digital Signal Processing**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C325 [1]	Perform time, frequency, and Z -transform analysis on signals and systems.

C325 [2]	Understand the inter-relationship between DFT and various transforms.
C325 [3]	Understand the significance of various filter structures and effects of round off errors.
C325 [4]	Design a digital filter for a given specification.
C325 [5]	Understand the fast computation of DFT and appreciate the FFT processing.
C325 [6]	Understand the tradeoffs between normal and multi rate DSP techniques and finite length word effects.

**Course Code & Name: EC604PC Digital Signal Processing Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C326 [1]	Simulate the Signal Processing Concepts
C326 [2]	Implementation of systems using Multirate signal processing

**Course Code & Name: EC605PC Microprocessors and Microcontrollers Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C327 [1]	Develop 8086 programming codes for basic operations
C327 [2]	Interface peripherals and demonstrate the 8051 based applications

**Course Code & Name: EN606HS Advanced English Communication Skills (Aecs) Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C328 [1]	Acquire vocabulary and use it contextually
C328 [2]	Listen and speak effectively
C328 [3]	Develop proficiency in academic reading and writing
C328 [4]	Increase possibilities of job prospects

C328 [5]	Communicate confidently in formal and informal contexts
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#### **IV YEAR ECE SEMESTER-I (REGULATION –R16)**

**ACADEMIC YEAR: 2019-2020**

**Course Code & Name: EC701PC Microwave Engineering**

Upon completion of the course, students will be able to:

Course Name	Course outcomes
C411 [1]	To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems.
C411 [2]	To distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications.
C411 [3]	To distinguish between the methods of power generation at microwave frequencies, derive the performance characteristics of 2-Cavity and Reflex Klystrons, Magnetrons, TWTs and estimate their efficiency levels, and solve related numerical problems.
C411 [4]	To realize the need for solid state microwave sources, understand the concepts of TEDs, RWH Theory and explain the salient features of Gunn Diodes and ATT Devices.
C411 [5]	To realize the need for solid state microwave sources, understand the concepts of TEDs, RWH Theory and explain the salient features of Gunn Diodes and ATT Devices.
C411 [6]	To establish the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design.
C411 [7]	To set up a microwave bench, establish the measurement procedure and conduct the experiments in microwave lab for measurement of various microwave parameters.

**Course Code & Name: EC723PE Coding Theory And Techniques**

Upon completion of the course, Students will be able to:

Course Name	Course outcomes
C412 [1]	To acquire the knowledge in measurement of information and errors.
C412 [2]	Understand the importance of various codes for communication systems.
C412 [3]	To design encoder and decoder of various codes.



C412 [4]	To know the applicability of source and channel codes.
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**Course Code & Name: EC733PE Radar Systems**

Upon the completion of the course, students will be able to:

Course Name	Course outcomes
C413 [1]	To explore the concepts of radar and its frequency bands.
C413 [2]	To understand Doppler effect and get acquainted with the working principles of CW radar, FM-CW radar.
C413 [3]	To impart the knowledge of functioning of MTI and Tracking Radars.
C413 [4]	To explain the designing of a Matched Filter in radar receivers.

**Course Code & Name: EC743PE Electronic Measurements And Instrumentation**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C414 [1]	It provides an understanding of various measuring systems functioning and metrics for performance analysis.
C414 [2]	Provides understanding of principle of operation, working of different electronic instruments viz. signal generators, signal analyzers, recorders and measuring equipment.
C414 [3]	Provides understanding of use of various measuring techniques for measurement of different physical parameters using different classes of transducers.

**Course Code & Name: EC702PC VLSI Design**

Upon Completion of the course, the students will be able to:

Course Name	Course outcomes
C415 [1]	Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors.
C415 [2]	Choose an appropriate inverter depending on specifications required for a circuit
C415 [3]	Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
C415 [4]	Design different types of logic gates using CMOS inverter and analyze their transfer characteristics

C415 [5]	Provide design concepts required to design building blocks of data path using gates.
C415 [6]	Design simple memories using MOS transistors and can understand design of large memories.
C415 [7]	Design simple logic circuit using PLA, PAL, FPGA and CPLD.
C415 [8]	Design simple logic circuit using PLA, PAL, FPGA and CPLD.
C415 [9]	Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system

**Course Code & Name: EC703PC VLSI and E-CAD Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C416 [1]	Understand the working principle of sources, detector of optical fiber.
C416 [2]	Analyze the performance of characteristics and measurements using simple optical communication link.

**Course Code & Name: EC704PC Microwave Engineering Lab**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C417 [1]	Understand the working principle and behavior of microwave components.
C417 [2]	Measure and analyze the characteristics of Microwave test Bench at X band.

**Course Code & Name: EC705PC Industry Oriented Mini Project**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C418 [1]	Apply the relevant knowledge and skills, which are acquired to a given problem.
C418 [2]	Document and present the work with requirements on structure, format, and language usage.

**Course Code & Name: EC706PC SEMINAR**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
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C419 [1]	Use English Language effectively in any Technical seminar form.
C419 [2]	Make use of the technical and engineering knowledge continuously which meets the expected outcome.

#### **IV YEAR ECE SEMESTER-II (REGULATION –R16)**

**ACADEMIC YEAR: 2019-2020**

#### **Course Code & Name: CS833OE PHP PROGRAMMING (Open Elective – III)**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C421 [1]	Be able to develop a form containing several fields and be able to process the data provided on the form by a user in a PHP-based script.
C421 [2]	Understand basic PHP syntax for variable use and standard language constructs, such as conditionals and loops.
C421 [3]	Understand the syntax and use of PHP object-oriented classes
C421 [4]	Understand the syntax and functions available to deal with file processing for files on the server as well as processing web URLs.
C421 [5]	Understand the paradigm for dealing with form-based data, both from the syntax of HTML forms, and how they are accessed inside a PHP-based script.

#### **Course Code & Name: EC853PE Optical Communications**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C422 [1]	To realize the significance of optical fibre communications.
C422 [2]	To understand the construction and characteristics of optical fibre cable.
C422 [3]	To develop the knowledge of optical signal sources and power launching.
C422 [4]	To identify and understand the operation of various optical detectors.
C422 [5]	To understand the design of optical systems and WDM.

#### **Course Code & Name: EC862PE Analog CMOS IC Design**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C423 [1]	To understand most important building blocks of all CMOS analog Ics.
C423 [2]	To study the basic principle of operation, the circuit choices and the tradeoffs involved in the MOS transistor level design common to all analog CMOS ICs.
C423 [3]	To understand specific design issues related to single and multistage voltage, current and differential amplifiers, their output and impedance issues, bandwidth, feedback and stability.
C423 [4]	To understand the design of differential amplifiers, current amplifiers and OP AMPs.

**Course Code & Name: EC801PC MAJOR PROJECT**

Upon the completion of the course, Students will be able to:

Course Name	Course outcomes
C424 [1]	Apply the relevant knowledge and skills, which are acquired to a given problem
C424 [2]	Independently analyze and discuss inquiries/problems and solve larger problems
C424 [3]	Evaluate, and critically assess others scientific results as survey
C424 [4]	Document and present the work with requirements on structure, format, and language usage.
C424 [5]	Make use of the technical and engineering knowledge continuously which meets the expected outcome.