SCIENT INSTITUTE OF TECHNOLOGY

Ibrahimpatnam, R.R. District – 501506
(Affiliated to JNTUH, Hyderabad & Approved by AICTE, New Delhi)

Department Of Electronics & CommunicationEngineering

Academic year: 2017 -18

YEAR: I **Semester:I** **Regulation: R16**

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Solve the first and higher order differential equations by various methods choosing the right method in different engineering problems	L2
CO2	Write the matrix representation of a set of linear equations and to analyze solutions of system of equations	L2
CO3	Find the Eigen values and Eigen vectors which come across under linear transformations	L2
CO4	Find the extreme values of functions of two variables with/ without constraints	L2
CO5	Formation of the partial differential equations and solving the first order equations and standard type equations	L5

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Course Name: Engineering Chemistry **Course Code: CH102BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Generalize knowledge of atomic, molecular and electronic changes, band theory related to conductivity	L3
CO2	Predict knowledge about importance of water and understanding its treatments methods	L4
CO3	Explain the principles and concepts of electrochemistry, Corrosion.	L2
CO4	State the Skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L1
CO5	Determine the configurational and conformational analysis of molecules and reaction mechanisms.	L4

Course Name: Engineering Physics-I **Course Code: PH103BS**

At the end of this course each student should be able to:

S.No	Course outcomes	Blooms Taxonomy Level
CO1	Identify the importance of light phenomena in thin films and resolution.	L2
CO2	Detect the principle and working of various laser systems.	L4
CO3	Examine the principle and working of various optical fibers and light propagation through optical fibers	L4
CO4	Distinguish various crystal systems and understand atomic packing factor	L4
CO5	Relate the various defects in crystals	L3

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Course Name: Professional Communication in English **Course Code: EN104HS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Improve Techni ques for Effective Reading and writing and to be aware of Logical,Lexical and Grammatical Devices	L1
CO2	Comprehend the Technical vocabulary , Principles and Practice and to respond appropriately	L2
CO3	Analysis the Good Comprehension Skills & Techniques	L4
CO4	Demonstrate Steps in Effective Precis Writing	L3
CO5	Enhance the proficiency in the acquisition of language skill to Communicate confidently in formal and informal contexts.	L1 ,L4

Course Name: Engineering Mechanics **Course Code: ME105ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Relate the basic force system. Determine the equilibrium of a particle in space using principle of laws of mechanics.	L3
CO2	Apply the principles of particle kinematics; compute the equilibrium of rigid bodies in two dimensions and in the three dimensions.	L3
CO3	Detect the concept of particle dynamics; calculate the principle moment of inertia of plane areas And Mass Moment of inertiaof composite sections. Find the location of centroid and calculate moment of inertia of a givensection.	L4
CO4	Evaluate the general equations of equilibrium. Understand the kinetics and kinematics of a body undergoing rectilinear,curvilinear, rotatory motion and rigid body motion	L4
CO5	Estimate the methods of minimization of potential energy solve the problems of simple system with sliding friction and calculate linear and angular acceleration of moving body in general plane motion. Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.	L3

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Course Name: Basic Electrical &Electronics Engineering **Course Code: EE106ES**

At the end of this course each student should be able to:

S.No	Course outcomes	Bloom's Taxonomy Level
CO1	Analyse the concept of electrical circuits and its components	L4
CO2	Illustrate and solve problems of electrical circuits using network laws and theorems	L2
CO3	Describe the concepts of diodes and transistors	L2
CO4	Demonstrate the knowledge of various configurations, characteristics and applications	L3
CO5	Identify and characterize diodes and various types of transistors	L2

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

At the end of this course each student should be able to:

S.No	Course outcomes	Bloom's Taxonomy Level
CO1	Understanding the nuances of English speech sounds, word accent, intonation and rhythm	L1,L3
CO2	Identify the strategies in communication through audio- visual experience and group activities	L2,L4
CO3	Improve the fluency in spoken English and Neutralize their mother tongue influence	L1,L2,L3
CO4	Enhance Listening skills by listening and Practicing to eminent personalities' Presentations/Speeches	L1,L2,L3,L5
CO5	Use the language appropriately & with clarity and confidence which in turn enhances their employability skills for public speaking and Interviews	L1,L3

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Course Name: Engineering Workshop **Course Code: ME108ES**

At the end of this course each student should be able to:

S.No	Course outcomes	Bloom's Taxonomy Level
CO1	Analyze machine tools and their operations	L4
CO2	Recognize manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding	L4
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.	L2
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3

YEAR: I **Semester: II** **Regulation: R16**

Course Name: Engineering Physics-II **Course Code: PH201BS**

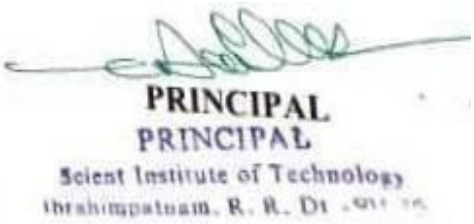
At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Recognize the importance of behavior of a particle quantum mechanically	L4
CO2	Determine the concentration estimation of charge carriers in semi conductors	L4
CO3	Describe various magnetic dielectric properties and apply them in engineering applications.	L2,L3
CO4	Describe magnetic properties of the materials and know the basic principles of Superconductors.	L2
CO5	Identify the basic principles and applications of nano materials	L2

Course Name: Mathematics -II **Course Code: MA202BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Use Laplace transform techniques for solving DE's	L2
CO2	Evaluate integrals using Beta and Gamma functions	L4
CO3	Evaluate multiple integrals and can apply these concepts to find areas, volumes, moment of inertia etc of regions on a plane or in space	L4
CO4	Find Gradient, Divergence, Curl and their physical and geometrical interpretation, Laplacian operator, Vector identities	L2
CO5	Evaluate the line, surface and volume integrals and converting them from one to another	L2



Course Name: Mathematics -III **Course Code: MA203BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Differentiate among random variables involved in the probability models which are useful for all branches of engineering	L4
CO2	Calculate mean, proportions and variances of sampling distributions and to make important decisions s for few samples which are taken from a large data	L4
CO3	Solve the tests of ANOVA for classified data	L3
CO4	Find the root of a given algebraic and transcendental equations andsolution of a system of equations	L 2
CO5	Fit a curve for a givendata and ,find the numerical solutions for a given first order initial value problem	L2

Course Name: Computer Programming in C **Course Code: CS204ES**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Demonstrate the basic knowledge of computer hardware and software.	L3
CO2	State algorithms for solving problems.	L1
CO3	Draw flowcharts for solving problems.	L5
CO4	Code a given logic in C programming language.	L5
CO5	Use knowledge in using C language for solving problems.	L3

Course Name: Engineering Graphics **Course Code: ME205ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Discuss about section and orthographic views of engineering components	L3
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Outline the section views of solids and development of surfaces	L2
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Engineering Chemistry Lab **Course Code: *CH206BS***

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determination of parameters like hardness and chloride content in water.	L4
CO2	Estimation of rate constant of a reaction from concentration – time relationships	L3
CO3	Determination of physical properties like adsorption and viscosity.	L4
CO4	Calculation of Rf values of some organic molecules by TLC technique.	L4
CO5	Prepare the drug molecules and check the purity of organic molecule.	L5

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Course Name: Engineering Physics Lab **Course Code:PH207BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Develop various Experimental skills which is very essential for an Engineering student	L5
CO2	Use the various tools like Screw gauge, Vernier Calipers, Physical Balance, Spectrometer and Microscope	L3
CO3	Determine the concept of error and its analysis. Develop experimental skills to design new experiments in Engineering	L4
CO4	compare the theory and correlate with experiment	L5

Course Name: Computer Programming in C Lab **Course Code: CS208ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Design and test programs to solve mathematical and scientific problems.	L5
CO2	List the structured programs using control structures.	L1
CO3	List the Structured programs using functions.	L1
CO4	Develop the structured programs using sorting methods.	L5
CO5	Produce Programs in C using structured programming approach tosolve the problems.	L5

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Department Of Electronics and Communication Engineering

Academic year: 2017 -2018

Course outcomes

Year: II **Semester: I** **Regulation: R16**

Course name: Mathematics – IV **Course Code: MA301BS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Solve Cauchy's and Legendre's differential equations.	L4
CO2	Produce points, singular points and regular singular points for the Given ODE.	L5
CO3	Determine the solution of ordinary differential equations in series form,Fresenius method to obtain a series solution for the given linear ODE.	L4
CO4	Identify Bessel equation and Legendre equation and solve them under Special conditions with the help of series solutions method.	L2
CO5	Analyze the complex functions with reference to their analyticity, Integration using Cauchy's integral theorem.	L4

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Analog Electronics **Course Code: EC302ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Revise Electronic Circuit Analysis Theory in order to equip them withthe necessary tools for the analysis of various Electronic Circuits.	L5
CO2	Validate various electronic circuits and their analysis.	L5
CO3	Classify various amplifiers.	L4
CO4	Analyze transformer and direct coupled amplifiers and their frequency Response considerations.	L4
CO5	Estimate BJT & MOS amplifiers at low and high frequencies.	L3

YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Electrical Technology **Course Code: EC303ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the DC transient analysis of RL, RC and RLC circuits.	L1
CO2	Discuss the basic fundamentals to construct and operate DC generators, DC Motors, transformers.	L2
CO3	Apply the basic fundamentals to construct and operate DC generators, DCMotors, transformers.	L3
CO4	Argue the principles to form simple electric apparatus and machinery that are of use in practical situations.	L5
CO5	Solve problems and projects and to plan a process for solution, taking Advantage of diverse technical knowledge and skills.	L4

YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Signals and Stochastic Process Course Code: EC304ES

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Estimate the principles of vector spaces, including how to relate the concepts of basis, dimension, inner product, and norm to signals.	L3
CO2	Classify and classify signals (e.g. periodic, even) and systems (e.g. causal, linear) and an understanding of the difference between discrete and continuous time signals and systems, understand the principles of impulse Functions, step function and signum function.	L4
CO3	Analyze the implications of linearity, time-invariance, causality, memory, and BIBO stability.	L4
CO4	Determine the response of linear systems to any input signal by convolution in the time domain, and by transformation to the frequency domain, filter characteristics of a system and its bandwidth, the concepts of auto correlation and cross correlation and psd.	L4
CO5	Plan the definitions and basic properties (e.g. time-shift, modulation, Parseval's Theorem) of Fourier series, Fourier transforms, Laplace transforms, Z transforms, and an ability to compute the transforms and inverse transforms of basic examples using methods such as partial fraction expansions,ROC of Z Transform/ Laplace Transform.	L5

YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Network Analysis **Course Code: EC305ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Produce the gains concept and acquire the knowledge on Basic network elements.	L5
CO2	Propose and analyze the RLC circuits' behavior in detail.	L5
CO3	Analyze and understand the performance of periodic waveforms. Understand and learns the concept of the gain, and knowledge in the characteristics of two port network parameters (Z, Y, ABCD, h & g).	L4
CO4	Explain the filter design concepts in real world applications	L2
CO5	Express the concept of attenuator, image transfer constant, and Impedance matching network.	L2

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Electronic Devices and Circuits Lab **Course Code: EC306ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Identify and utilize various electronic components and devices with their specifications to Implement and verify the outputs of hardware circuits.	L2
CO2	Relate and Analyze the characteristics of PN junction diode , Zenerdiode and Silicon Controlled Rectifier.	L3
CO3	Develop the rectifier circuits with and without filter and voltage regulator.	L5
CO4	Analyze the characteristics and calculate the parameters of transistors likeBJT, FET, and UJT.	L4
CO5	Design the various Amplifiers like Common Emitter, Common Base,Common Source and Implement them using hardware and also observe theirfrequency responses.	L5

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Basic Simulation Lab **Course Code: EC307E**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Produce and perform operations on various types of signals (unitimpulse, unit step, square, saw tooth, sinusoidal, ramp and sinc etc.).	L5
CO2	Apply convolution and correlation between signals.	L3
CO3	Analyze time and frequency response for a given LTI system.	L4
CO4	Judge the sampling theorem and stability of a system.	L5
CO5	Relate signal characteristics in frequency domain by Fourier transform method.	L3

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Basic Electrical Engineering Lab **Course Code**: **EC308ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply KVL and KCL in real time applications.	L3
CO2	Analyze Serial and Parallel Resonance.	L4
CO3	Determine time response of first order systems.	L4
CO4	Modify two port network parameters.	L5
CO5	Develop various network theorems.	L5

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Environmental Science and Technology **Course Code: MC300ES**
At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express Knowledge regarding environment and its components.	L2
CO2	Identify various ecosystems, their biodiversity and Scientific methodsto protect them.	L2
CO3	Estimate different types of pollution and their control measures.	L3
CO4	Classify effective methods of waste management.	L4
CO5	Analyze global environmental problems and come out with best possible solutions, Illustrate green environmental issues.	L4

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Switching Theory and Logic Design **Course Code: EC401ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Construct number systems, binary addition and subtraction, 2's complement representation and operations with this representation and understand the different binary codes.	L5
CO2	Explain switching algebra theorems and apply them for logic functions.	L2
CO3	Identify the importance of SOP and POS canonical forms in the minimization of combinational circuits or other optimization of Boolean formulasin general using Karnaugh map or tabulation method and study of digital logic gates and their properties.	L2
CO4	Design of basic building blocks of combinational circuits and extend to build more larger complex circuits.	L5
CO5	Analyze the of basic building blocks of sequential circuits and design Procedures of Sequential logic circuits, Evaluate larger sequential circuits usingFSM such as Melay and Moore.	L4

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Pulse and Digital Circuits **Course Code: EC402ES**

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Argue the linear wave shaping circuits like high pass circuits forvarious input signals.	L5
CO2	Choose the linear wave shaping circuits like low pass RC circuits forvarious input signals.	L5
CO3	Identify the application of attenuators.	**L2**
CO4	Estimate the non-linear wave shaping circuits like clippers diodes andtransistors.	L3
CO5	State the non-linear wave shaping circuits like clampers usingdiodes, Analyze the clamping circuit theorem..	L1

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Control Systems **Course Code: EE404ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define and analyze the operation of open loop and closed loop systems.	L1
CO2	Analyze transfer functions for electro-dynamic plants and machines, with Electrical, electro-mechanical, electro-pneumatic, and electro-hydraulic elementsfrom plant site collected data.	L4
CO3	Modify and analyze the stability of a system in s – domain.	**L5**
CO4	Calculate the control systems in the frequency domain and solve theproblems related to compensation techniques.	L4
CO5	Conclude the problems relating to stability of control systems and Formulate state model to electrical and electro mechanical plants and evaluate plantresponse to particular inputs.	L4

YEAR: II **Semester: II SEM** **Regulation: R18**

Course name: Analog Communications **Course Code: EC405ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Contrast the baseband signal and system.	L4
CO2	Identify various element processes and parameters in telecommunicationsystems and describe their functions, effects and inter relationship.	L2
CO3	Design procedure of AM transmission and reception, Analyze, Measure and Evaluate the performance of a Telecommunication system against givencriteria.	L5
CO4	Detect basic knowledge of FM transmission and reception	**L4**
CO5	Evaluate various types of DSB &SSB transmission and reception, Understand various types of VSB transmission and reception.	L4

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Business Economics and Financial Analysis **Course Code: SM405MS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe the economic activities performed by the businessmen in thebusiness for profit earning.	L2
CO2	Examine the significance of demand, its analysis, measurement ofdemand and its forecasting.	L4
CO3	Predict the production function through the Cobb Douglas Production Function.	L4
CO4	Design and implement different structures of market covering how price isdetermined under different market structures.	L5
CO5	Analyze different forms of business organizations existing in the modern Business, Describe the allocation of capital which plays a vital role in a businessorganization.	L4

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Analog Communications Lab **Course Code: EC406ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Question the baseband signal and system.	L4
CO2	Identify various element processes and parameters in telecommunicationsystems and describe their functions, effects and inter relationship.	L2
CO3	Design procedure of AM transmission and reception.	L5
CO4	Analyze, Measure and Evaluate the performance of a Telecommunicationsystem against given criteria.	L4
CO5	Solve basic knowledge of FM transmission and reception, Understand various types of DSB &SSB transmission and reception.	L4

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Pulse and Digital Circuits Lab **Course Code: EC407ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Select the linear wave shaping circuits like high pass circuits for various input signals.	L4
CO2	Validate the linear wave shaping circuits like low pass RC circuits for various input signals.	L5
CO3	Analyze the application of attenuators.	L4
CO4	Discuss the non-linear wave shaping circuits like clippers diodes and transistors.	L2
CO5	Estimate the non-linear wave shaping circuits like clampers usingdiodes, Analyze the clamping circuit theorem.	L3

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Analog Electronics Lab **Course Code: EC408ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Detect various transistor amplifier circuits and their freq. responses at low, mid and high frequencies.	L4
CO2	Determine amplifier circuits using BJTs.	L4
CO3	Analyze the concepts of both positive and negative feedback in electroniccircuits.	L4
CO4	Design, construct & analyze oscillator circuits to generate signals in variousfrequency ranges.	L5
CO5	Evaluate different types of power amplifiers for practical applications of desiredspecifications, Acquire experience in building and troubleshooting simple electronic analog circuits	L4

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Gender Sensitization Lab **Course Code: MC400HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Relate a better understanding of important issues related to gender in contemporary India.	L3
CO2	Use sensitized to basic dimensions of the biological, Sociological, psychological and legal aspects of gender. This will be achievedthrough discussion of materials derived from research, facts, everyday life, literature, and film.	L3
CO3	Value attains a finer grasp of how gender discrimination works in our society and how to counter it.	L3
CO4	Decide acquire insight into the gendered division of labor and itsrelation to politics and economics.	L5
CO5	Judge Men and women students and professionals will be better equipped to work and live together as equals, Students will develop a sense of appreciation ofwomen in all walks of life	L5

YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Control Systems Engineering **Course Code: A50217**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Justify how to improve the system performance by selecting a suitablecontroller and/or compensator for a specific application
CO2	Apply various time domain and frequency domain techniques to assess the system performance
CO3	Review various control strategies to different applications
CO4	Revise system Controllability and Observability using state space Representation and applications of state space representation to varioussystems.
CO5	Choose control design techniques and state space analysis of continuoussystems

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YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Computer Organization and Operating Systems

Course Code: A50516

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Analyze the concepts of computer organization for several engineeringapplications
CO2	Use the fundamentals of computer organization as a tool in digital systems.
CO3	Identify, formulate, and solve hardware and software computer engineeringproblems.
CO4	Consider IO, memory, Stack organization and parallel processing of acomputer
CO5	Develop Pipeline And Vector Processing

YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Antennas and Wave Propagation **Course Code: A50418**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Explains the mechanism of radiation and distinguish between the antenna parameters
CO2	Formulate Ability to understand about the various antennas like folded, yagi-uda and antenna arrays
CO3	Estimate to understand about the microwave antennas horn ,parabolic, helicalantennas
CO4	Interrupt to understand antenna measurements and micro strip antennas
CO5	Identify to understand wave propagation and types of modes of propagation andatmosphere layers.

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YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Electronic Measurements and Instrumentation Course Code: A50422

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	analyze the performance characteristics of each instrument and Illustrate basic meters such as voltmeters and ammeters.
CO2	explain about different types of signal analyzers and signal generators
CO3	Illustrate the basic features of oscilloscope and different types ofoscilloscopes.
CO4	apply the complete knowledge of various electronics instruments/transducers to measure the physical quantities in the field of science, engineering and technology
CO5	Describe measure various physical parameters by appropriately selecting the transducers.

YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Analog Communications **Course Code: A50408**
At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Apply and relate the analog modulation techniques to real time applications like Radio Broadcasting, telecommunications, TV's etc.
CO2	Compare different modulation Techniques.
CO3	Design transmitters and receivers for Analog Communication.
CO4	Design various communication systems by including noise analysis
CO5	Review of sampling for Band pass and Band limited signals

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YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Linear and Digital IC Applications **Course Code: A50425**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Discuss A thorough understanding of operational amplifiers with linear integrated circuits.
CO2	Evaluate of the different families of digital integrated circuits and their Characteristics.
CO3	Predict students will be able to design circuits using operational amplifiers for variousapplications

YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: Analog Communications Lab. **Course Code: A50482**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Question all the experiments using any simulation software
CO2	Design transmitter and receiver in analog communication system
CO3	Deduce various experiments using Teena software and ASL Kit
CO4	Design and Analyze various problems when implemented on DSP
CO5	Develop Sinusoidal wave forms

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YEAR: III **Semester: I SEM** **Regulation: R15**

Course name: IC Applications and HDL Simulation Lab. **Course Code: A50488**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Formulate applications of Op-amp
CO2	design VCO, PLL circuits by using op-amp
CO3	Modify the operation of LDO regulator TPS7250IC
CO4	Plan the operation of TPS40200IC 15A04508
CO5	Prepare Programming can be done using any complier

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YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Managerial Economics and Financial Analysis Course Code: A60010
At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Produce the market dynamics namely, demand and supply, demand Forecasting, elasticity of demand and supply, pricing methods and pricingin different market structures.
CO2	Argue Gain an insight into how production function is carried out to achieveleast cost combination of inputs and cost analysis
CO3	Develop an understanding of Analyze how capital budgeting decisions arecarried out
CO4	Choose the framework for both manual and computerized accountingprocess
CO5	Decide how to analyze and interpret the financial statements through Ratio analysis.

YEAR: III **Semester: II SEM** **Regulation: R13**

Course name: Human Values And Professional Ethics **Course Code: A60018**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Judge the professional competence for augmenting universalhuman order.
CO2	Identify the scope and characteristics of people friendly andeco-friendly production systems.
CO3	Justify and develop appropriate technologies and management patterns for above production systems.
CO4	Express the level of individual: as socially and ecologically responsibleengineers, technologists and managers
CO5	List the level of society: as mutually enriching institutions andorganizations

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YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Disaster Management **Course Code: A60117**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Define Disaster, man-made Hazards and Vulnerabilities
CO2	State Disaster management mechanism.
CO3	Describe Capacity building concepts and planning of disaster managements
CO4	Analyze the disaster effects.
CO5	Illustrate planning for disaster management.

YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Digital Communications **Course Code: A60420**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Express basic components of Digital Communication Systems.
CO2	Design optimum receiver for Digital Modulation Techniques.
CO3	Analyze the error performance of Digital Modulation Techniques.
CO4	Explain the redundancy present in Digital Communication by using various Source coding techniques.
CO5	Analyze about different error detecting and error correction codes like block codes,cyclic codes and convolution codes.

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YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: VLSI Design **Course Code: A60432**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Calculate qualitative knowledge about the process of integrated Circuit using MOS transistors. Chose an appropriate inverter depending onspecifications required for a circuit
CO2	compare the layout of any logic circuit which helps to understand and Estimate parasitic of any logic circuit.
CO3	Design different types of logic gates using CMOS inverter andanalyze their transfer characteristics. Provide design concepts required to Design building blocks of data path using gates.
CO4	Conclude simple memories using MOS transistors and canunderstand design of large memories.
CO5	Relate simple logic circuit using PLA, PAL, FPGA and CPLD. Understand different types of faults that can occur in a system and learn theconcept of testing and adding extra hardware to improve testability of system.

YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Microprocessors and Microcontrollers **Course Code: A60430**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Use the basic concepts of microprocessor, internalarchitecture& organization of 8086
CO2	Classify the basic different of microprocessor and microcontroller ,8051 architecture and real time control of 8051
CO3	design the various interfacing techniques of 8086 and 8051 and& develop assembly language programming
CO4	Develop the internal architecture & organization of ARM processor
CO5	analyze the CORETEX processor architecture & OMAPprocessor architecture &advanced pipeline technology

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YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Digital Signal Processing **Course Code: A60421**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Formulate perform time, frequency and Z-Transforms on signals systems
CO2	Modify the inter-relationship between DFT and varioustransforms.
CO3	design a digital filter for given specification
CO4	Judge the fast computation of DFT and appreciate the FFTprocessing
CO5	Choose the tradeoffs between normal and multirate DSPtechniques and finite length effects

YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Microprocessors and Microcontrollers Lab **Course Code: A60494**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Design and implement programs on 8085 microprocessor
CO2	Consider and implement programs on 8086 microprocessor.
CO3	Discuss interfacing circuits with 8085
CO4	Apply and implement 8051 microcontroller based systems
CO5	Compare the concepts related to I/O and memory interfacing

YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Digital Signal Processing Lab. **Course Code: A60493**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Calculate the handling of discrete/digital signals using MATLAB
CO2	Deduce the basic operations of Signal processing
CO3	Analyze the spectral parameter of window functions
CO4	Design IIR, and FIR filters for band pass, band stop, low pass and highpass filters.
CO5	Develop the signal processing algorithm using MATLAB.

YEAR: III **Semester: II SEM** **Regulation: R15**

Course name: Advance English Communication Skills Lab **Course Code: EN606HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Modify vocabulary and use it contextually
CO2	Explain and speak effectively
CO3	Develop proficiency in academic reading and writing
CO4	Discuss possibilities of job prospects
CO5	Estimate confidently in formal and informal contexts

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YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Management Science **Course Code: A70014**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Plan an organizational structure for a given context in the organization.
CO2	Determine carry out production operations through Work study.
CO3	Examine the markets, customers and competition better andprice the given products appropriately.
CO4	Predict quality for a given product or service.
CO5	Decide and control the HR function better.

YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Microwave Engineering **Course Code: A70442**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Justify the significance of microwaves and microwavetransmission lines.
CO2	Analyze the characteristics of microwave tubes and compare them.
CO3	List and explain the various microwave solid state devices.
CO4	Validate microwave bench for measuring microwave parameters.

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YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Computer Networks **Course Code: A70515**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Explain and explore the basics of Computer.
CO2	Identify Networks and Various Protocols.
CO3	Illustrate the World Wide Web concepts.
CO4	Outline a network and flow of information.
CO5	Apply easily the concepts of network security, Mobile and ad hocnetworks.

YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Cellular and Mobile Communications **Course Code: A70434**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Estimate due to multipath fading channel.
CO2	Relate the fundamental techniques to overcome the differentfading effects.
CO3	Use Co-channel and Non-Co- channel interferences.
CO4	Value with cell coverage for signal and traffic, diversity techniquesand mobile antennas.
CO5	Analyze of frequency management, Channel assignment andtypes of handoff.

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YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Digital Image processing Course Code: A70436

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Categorize the inter-relationship between DFT and various transforms.
CO2	Detect the significance of various filter structures and effects of Round off errors.
CO3	Design a digital filter for a given specification.
CO4	Evaluate the fast computation of DFT and appreciate the FFTProcessing.
CO5	Predict the tradeoffs between normal and multi rate DSPTechniques and finite length word effects.

YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Embedded Systems Design **Course Code: A70440**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Recognize the selection procedure of processors in the embeddeddomain.
CO2	Illustrate different types of memories and core of the embedded system.
CO3	Construct the design procedure for embedded firmware.
CO4	Choose the role of real time operating systems in embedded systems.
CO5	Consider the correlation between the task synchronization latency issues.

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YEAR: IV **Semester: I SEM** **Regulation: R13**

Course name: Advanced Communication Skills Lab **Course Code: A70086**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Decide Accomplishment of sound vocabulary and its proper usecontextually.
CO2	Relate Flair in Writing and felicity in written expression.
CO3	Use Enhanced job prospects.
CO4	Define Effective Speaking Abilities.

YEAR: IV **Semester: I SEM** **Regulation: R1**
Course name: Microwave Engineering and Digital Communications Lab
Course Code: A70499
At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Illustrate the characteristics of various microwave generators.
CO2	Compare Scattering parameters of various microwave components usingmicrowave bench.
CO3	Classify PCM Generation and Detection.
CO4	Evaluate Time Division Multiplexing of 2 Band Limited Signals.
CO5	Prepare DPSK: Generation and Detection, QPSK: Generation andDetection.

YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Satellite Communications **Course Code: A80452**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Produce the historical background, basic concepts and frequencyallocations for satellite communication.
CO2	Propose orbital mechanics, launch vehicles and Launchers.
CO3	Describe the design of satellite links for specified C/N with system design examples.
CO4	Discuss satellite sub systems like Telemetry, tracking, command andmonitoring power systems etc.
CO5	Explain the various multiple access systems for satellite communication systems and satellite packet communications

YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Telecommunication Switching Systems and Networks

Course Code: A80431

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Identify the main concepts of telecommunication network design.
CO2	Analyze and evaluate fundamental telecommunication traffic models.
CO3	Illustrate basic modern signaling system.
CO4	Solve traditional interconnection switching system design problems.
CO5	Outline the concept of packet switching.

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YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Wireless Communications and NetworksCourse Code: A80454

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	State the principles of wireless communications.
CO2	Deduce cellular system design concepts.
CO3	Design fundamentals of wireless networking.
CO4	Develop various multiple access schemes used in wireless Communication.
CO5	Formulate wireless wide area networks and their performance Analysis.

YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Industry Oriented Mini Project **Course Code: A80087**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Design identifies basic requirements for an application and proposes a effective solution.
CO2	Prepare knowledge through practical assignments and learn the various design methods for solving problem.
CO3	Produce skills to build design techniques for various problem analyses.
CO4	Propose the fundamental concepts and techniques used in mini projects.
CO5	Calculate project enables the student to understand the business process.

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YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Seminar **Course Code: A80089**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Classify and master public speaking during technical presentations.
CO2	Compare an opportunity; where in individuals can meet others with the same Interests/problems/concerns and also to envisage emerging technologies.
CO3	Conclude a sense of renewed hope and inspiration, as sometimes businessconcerns are lessened by sharing experiences with others.
CO4	Evaluate a great morale booster for students for career making advancement.
CO5	Examine speaker and it will motivate students in facing technical and HRinterview rounds.

YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Major Project Work **Course Code: A80088**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Analyze a problem, identify and define the computing requirementsappropriate to its solutions.
CO2	Discuss effectively on teams to accomplish a common goal.
CO3	Use current techniques, skill and tools necessary for computing practices.
CO4	Design and development principles in the construction of software systemsof varying complexity.
CO5	Express an eye opener to bridge gap between Academia and real time industryissues on technological front.

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YEAR: IV **Semester: II SEM** **Regulation: R13**

Course name: Comprehensive Viva **Course Code: A80090**

At the end of this course, each student should be able to

S.NO	COURSE OUTCOMES
CO1	Develop communicate orally about analyzing a problem.
CO2	Argue express the effectively to accomplish a common goal.
CO3	Choose recapitulate fundamentals from across all semesters of B-Tech. coursework [4 years of learning].
CO4	Consider handle difficult scenario during Viva Voice in the event of plenty ofsubjects under question.

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Department Of Electronics & Communication Engineering

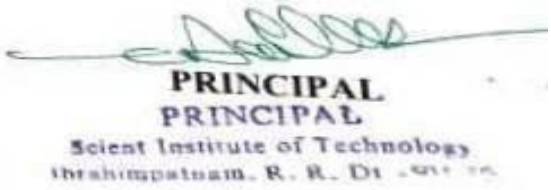
Academic Year 2018-19

YEAR: I **Semester: I SEM** **Regulation: R18**

Course Name: MATHEMATICS-I **Course Code: MA101BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2



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

At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

Course Name: Programming for Problem Solving **Course Code: CS103ES**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings , structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs usingfunctions which are used to decompose a problem into different modules , developing programs using recursions and a concept of dynamic memoryallocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

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

At the end of this course each student should be able to:

S.NO	Course Outcomes	Blooms Taxonomy Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Applied physics Lab **Course Code: AP105BS**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day – to – day life	L4

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Course Name: Programming for Problem Solving Lab **Course Code: CS106ES**

At the end of this course each student should be able to:

S.NO.	Course Outcomes	Blooms Taxonomy Level
CO1	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5

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

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources	L4
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues inorder to create awareness about the international conventions for mitigating global environmental problems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcomethe current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

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YEAR : I **Semester:II** **Regulation:R18**

Course Name: Mathematics -II **Course Code: MA201BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L2
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	Apply the knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space	L3, L4
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

Course Name: Engineering Chemistry **Course Code: CH202BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

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Course Name: Basic Electrical Engineering **Course Code: EE203ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Analyse and Solve electrical circuits using network laws and theorems	L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5

Course Name: English **Course Code: EN204HS**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension,writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3

Course Name: Engineering Chemistry Lab **Course Code: CH206BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determination of parameters like hardness and chloride content in water	L4
CO2	Estimation of rate constant of a reaction from concentration – time relationships – time relationships	L3
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rf values of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

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S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

Course Name: Basic Electrical Engineering Lab **Course Code: EE208ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Express the basic electrical laws.	L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4

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Department Of Electronics and Communication Engineering

Academic year 2018-19

Course outcomes

YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Mathematics-IV **Course Code: MA301BS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze the complex functions with reference to their analyticity integration usingCauchy's integral theorem	**L4**
CO2	Define the Taylor's and Laurent's series expansion of complex functions	**L1**
CO3	Identify any periodic function in term of sines and cosines	**L2**
CO4	Express a non-periodic function as integral representation	**L2**
CO5	Calculate one dimensional wave and heat equation	**L4**

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course name: Analog Electronics **Course Code: EC302ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply Electronic Circuit Analysis Theory in order to equip them with thenecessary tools for the analysis of various Electronic Circuits.	**L3**
CO2	Classify various electronic circuits and their analysis.	**L4**
CO3	Define various amplifiers.	**L4**
CO4	Discuss transformer and direct coupled amplifiers and their frequency responseconsiderations.	**L2**
CO5	Analyze BJT & MOS amplifiers at low and high frequencies.	**L4**

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Electrical Technology **Course Code: EC303ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Modify the DC transient analysis of RL, RC and RLC circuits.	**L5**
CO2	Apply the basic fundamentals to construct and operate DC generators, DCMotors, transformers.	**L3**
CO3	Develop the basic skills needed to perform and design experimental projects.	**L5**
CO4	Detect the principles to form simple electric apparatus and machinery that are ofuse in practical situations.	**L4**
CO5	Formulate problems and projects and to plan a process for solution, takingadvantage of diverse technical knowledge and skills.	**L5**

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Signals and Stochastic Process **Course Code: EC304ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the principles of vector spaces, including how to relate the conceptsof basis, dimension, inner product, and norm to signals.	**L1**
CO2	State and classify signals (e.g. periodic, even) and systems (e.g. causal, linear) and an understanding of the difference between discrete and continuous time signals and systems, understand the principles of impulse functions, step function andsignum function and signum function.	**L1**
CO3	Analyze the implications of linearity, time-invariance, causality, memory, andBIBO stability.	**L4**
CO4	Determine the response of linear systems to any input signal by convolution in the time domain, and by transformation to the frequency domain, filter characteristics ofa system and its bandwidth, the concepts of auto correlation and cross correlation and psd.	**L4**
CO5	Interpret the definitions and basic properties (e.g. time-shift, modulation,Parseval's Theorem) of Fourier series, Fourier transforms, Laplace transforms, Z transforms, and an ability to compute the transforms and inverse transforms of basicexamples using methods such as partial fraction expansions, ROC of Z Transform/ Laplace Transform.	**L5**

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Network Analysis **Course Code: EC305ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express the gains concept and acquire the knowledge on Basic networkelements.	**L2**
CO2	Explain the RLC circuits' behavior in detail.	**L2**
CO3	Analyze and understand the performance of periodic waveforms.	**L4**
CO4	Modify the concept of the gain, and knowledge in the characteristics of two port network parameters (Z, Y, ABCD, h & g).	**L5**
CO5	Outline the filter design concepts in real world applications.	**L2**

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Electronic Devices and Circuits Lab **Course Code: EC 306ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Identify and utilize various electronic components and devices with theirspecifications to Implement and verify the outputs of hardware circuits.	**L2**
CO2	Construct and Analyze the characteristics of PN junction diode, Zener diode andSilicon Controlled Rectifier.	**L4**
CO3	Evaluate the rectifier circuits with and without filter and voltage regulator.	**L4**
CO4	Analyze the characteristics and calculate the parameters of transistors like BJT,FET, and UJT.	**L4**
CO5	Design the various Amplifiers like Common Emitter, Common Base, Common Source and Implement them using hardware and also observe their frequency responses.	**L5**

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Basic Simulation Lab **Course Code: EC307ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Categories and perform operations on various types of signals (unit impulse, unitstep, square, saw tooth, sinusoidal, ramp and sinc etc.).	**L4**
CO2	Produce convolution and correlation between signals.	**L5**
CO3	Analyze time and frequency response for a given LTI system.	**L4**
CO4	List the sampling theorem and stability of a system.	**L1**
CO5	Explain signal characteristics in frequency domain by Fourier transform method.	**L2**

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YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Basic Electrical engineering Lab **Course Code: EC308ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply KVL and KCL in real time applications.	**L3**
CO2	Analyze Serial and Parallel Resonance.	**L4**
CO3	Argue To determine time response of first order systems.	**L5**
CO4	Explain two port network parameters.	**L2**
CO5	Detect various network theorems. Environmental Science and TechnologyCourse Outcome Statement.	**L4**

YEAR: II **Semester: I SEM** **Regulation: R16**

Course Name: Environmental science and Technology **Course Code: MCC300ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Validate Knowledge regarding environment and its components.	**L5**
CO2	Describe various ecosystems, their biodiversity and Scientific methods toprotect them.	**L2**
CO3	Categorize different types of pollution and their control measures.	**L4**
CO4	Classify effective methods of waste management.	**L4**
CO5	Analyze global environmental problems and come out with best possiblesolutions Illustrate green environmental issues.	**L4**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Switching Theory and Logic Design **Course Code: EC401ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State number systems, binary addition and subtraction, 2's complement representation and operations with this representation and understand the different binarycodes.	**L1**
CO2	Explain switching algebra theorems and apply them for logic functions.	**L2**
CO3	Identify the importance of SOP and POS canonical forms in the minimization ofcombinational circuits or other optimization of Boolean formulas in general using Karnaugh map or tabulation method and study of digital logic gates and their properties.	**L2**
CO4	Design of basic building blocks of combinational circuits and extend to buildlarger complex circuits.	**L5**
CO5	Analyze the of basic building blocks of sequential circuits and design proceduresof Sequential logic circuits.	**L4**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: pulse and Digital Circuits **Course Code: EC402ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Judge the linear wave shaping circuits like high pass circuits for various Input signals.	**L5**
CO2	Justify the linear wave shaping circuits like low pass RC circuits for variousinput signals.	**L5**
CO3	Analyze the application of attenuator.	**L4**
CO4	Detect the non-linear wave shaping circuits like clippers diodes and Transistors.	**L4**
CO5	Relate the non-linear wave shaping circuits like clampers using diodes.	**L3**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Control Systems **Course Code: EC404ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Examine the operation of open loop and closed loop systems.	**L4**
CO2	Analyze transfer functions for electro-dynamic plants and machines, with electrical, electro-mechanical, electro-pneumatic, and electro-hydraulic elements fromplant site collected data.	**L4**
CO3	Prepare and analyze the stability of a system in s – domain.	**L5**
CO4	Modify the control systems in the frequency domain and solve the problemsrelated to compensation techniques.	**L5**
CO5	State the problems relating to stability of control systems and formulatestate model to electrical and electro mechanical plants and evaluate plant response to particular inputs.	**L1**

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Analog Communications **Course Code: EC405ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	List the baseband signal and system.	**L1**
CO2	Identify various element processes and parameters in telecommunicationsystems and describe their functions, effects and inter relationship	**L2**
CO3	Design procedure of AM transmission and reception, Analyze, Measure andEvaluate the performance of a Telecommunication system against given criteria.	**L5**
CO4	Describe basic knowledge of FM transmission and reception	**L2**
CO5	Apply various types of DSB &SSB transmission and reception.	**L3**

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Business Economics and Financial Analysis Course Code:EC405ES

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe the economic activities performed by the businessmen in the businessfor profit earning.	**L2**
CO2	Plan the significance of demand, its analysis, measurement of demand andits forecasting.	**L5**
CO3	Prepare the production function through the Cobb Douglas Production Function.	**L5**
CO4	Design and implement different structures of market covering how price isdetermined under different market structures.	**L5**
CO5	Analyze different forms of business organizations existing in the modernbusiness.	**L4**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Analog Communications Lab **Course Code: EC406ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the baseband signal and system.	**L2**
CO2	Identify various element processes and parameters in telecommunication systemsand describe their functions, effects and inter relationship.	**L2**
CO3	Design procedure of AM transmission and reception.	**L5**
CO4	Analyze, Measure and Evaluate the performance of a Telecommunication systemagainst given criteria.	**L4**
CO5	Revise basic knowledge of FM transmission and receptionUnderstand various types of DSB &SSB transmission and reception.	**L5**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Pulse And Digital Circuits Lab **Course Code: EC407ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Justify the linear wave shaping circuits like high pass circuits for variousinput signals.	**L5**
CO2	Predict the linear wave shaping circuits like low pass RC circuits for variousinput signals.	**L4**
CO3	Analyze the application of attenuators.	**L4**
CO4	Use the non-linear wave shaping circuits like clippers diodes and transistors.	**L3**
CO5	Value the non-linear wave shaping circuits like clampers using diodes.	**L3**

YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Analog Electronics Lab **Course Code: EC408ES**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze various transistor amplifier circuits and their freq. responses at low, midand high frequencies.	**L4**
CO2	Design amplifier circuits using BJTs.	**L5**
CO3	Detect the concepts of both positive and negative feedback in electroniccircuits.	**L4**
CO4	Predict, construct & analyze oscillator circuits to generate signals in variousfrequency ranges.	**L4**
CO5	Revise different types of power amplifiers for practical applications of desiredspecifications.	**L5**

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YEAR: II **Semester: II SEM** **Regulation: R16**

Course name: Gender Sensitization Lab **Course Code: MC400HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Estimate will have developed a better understanding of important issues relatedto gender in contemporary India.	**L3**
CO2	Define Will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion ofmaterials derived from research, facts, everyday life, literature, and film.	**L2**
CO3	List Will attain a finer grasp of how gender discrimination works in oursociety and how to counter it.	**L1**
CO4	Apply Will acquire insight into the gendered division of labor and its relationto politics and economics.	**L3**
CO5	Relate Men and women students and professionals will be better equipped to work andlive together as equals.	**L3**

YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Electromagnetic Theory and Transmission Lines **Course Code: EC501PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze and design the electrical machines based on the concept of electrostatics.	**L4**
CO2	Design modified equations for boundaries and medias.	**L5**
CO3	Develop the long time charge storage devices.	**L5**
CO4	Plan the energy storage design of high magnetic field coils used in transformers,motors and generators.	**L5**
CO5	Illustrate and development of Maxwell's equation for dielectric and conductingmedia.	**L2**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Linear and Digital IC Applications **Course Code: EC502PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe the operation of linear integrated circuits and its applications.	**L2**
CO2	Discuss and Analyze the operation of Active filters.	**L2**
CO3	Explain the operation of IC 555 Timer and its applications.	**L2**
CO4	Select the knowledge of IC 565 and its applications.	**L4**
CO5	Propose of the different families of digital integrated circuits and there.Characteristics.	**L5**

YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Digital Communications **Course Code: EC503PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Argue basic components of Digital Communication Systems.	**L5**
CO2	Design optimum receiver for Digital Modulation Techniques.	**L5**
CO3	Analyze the error performance of Digital Modulation Techniques.	**L4**
CO4	Compare the redundancy present in Digital Communication by using varioussource coding techniques.	**L4**
CO5	Classify about different error detecting and error correction codes like block codes,cyclic codes and convolution codes.	**L4**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Fundamentals Of Management **Course Code: SM504MS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the nature and scope, functions and roles in the management andevolutions in management.	**L1**
CO2	Discuss framework for planning and management objectives for business development and decision making and problem solving in the business process.	**L2**
CO3	Detect principles of organization and its structure and empowerment oforganization culture and human resource management tasks.	**L4**
CO4	Predict leadership management skills and crisis management and handling team.	**L4**
CO5	Identify types and strategies for control process in the business process andestablishing control systems and finding various methods.	**L2**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Linear IC Applications Lab **Course Code: EC505PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the basic components of digital communication systems along with theconcepts of PCM and DM.	**L2**
CO2	Discuss various digital modulation techniques.	**L2**
CO3	Analyze error performance of digital modulation techniques.	**L4**
CO4	Illustrate different encoding methods.	**L2**
CO5	Demonstrate the concepts of error detecting, error correcting codes and spreadspectrum techniques.	**L3**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: DIGITAL IC APPLICATIONS LAB **Course Code: EC506PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Evaluate the architecture, functioning and specifications of standard digital ICs of74xx series.	**L4**
CO2	Design and verify various combinational logic circuits using digital ICs.	**L5**
CO3	Judge and verify various Sequential logic circuits using digital ICs.	**L5**
CO4	Analyze the transform Characteristics of 74H, LS, HS series IC's.	**L4**
CO5	Relate the Clock pulse of 450KHz using NAND /NOR gates.	**L3**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course name: Digital Communications Lab **Course Code: EC507PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze how a continuous signal is converted to digital signal.	**L4**
CO2	Detect various digital modulation schemes.	**L4**
CO3	Evaluate the characteristics of PAM, PWM.	**L4**
CO4	Modify the multiplexing Techniques of TDM, OFDM.	**L5**

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YEAR: III **Semester: I SEM** **Regulation: R16**

Course Name: Professional Ethics **Course Code: MC500HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Determine the importance of Values and Ethics in their personal lives.	**L4**
CO2	Examine the importance of Values and Ethics in their professional careers.	**L4**
CO3	Relate the rights and responsibilities as an employee, team member and a globalcitizen.	**L3**
CO4	explain development process of ethics	**L2**
CO5	Define historical periods of the term moral.	**L1**

YEAR: III **Semester: II SEM** **Regulation: R16**

Course Name: Professional Elective-I **Course Code: MC500HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define to utilize the professional competence for augmenting universal human order,	**L1**
CO2	identify the scope and characteristics of people friendly and eco-friendlyproduction systems,	**L2**
CO3	Estimate and develop appropriate technologies and management patterns forabove production systems.	**L3**
CO4	Apply At the level of individual: as socially and ecologically responsible engineers,technologists and managers	**L3**
CO5	Classify the level of society: as mutually enriching institutions and organizations	**L4**

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YEAR: III **Semester: II SEM** **Regulation: R16**

Course Name: Computer organization and operating system (Open Elective-II)

Course Code: EC611PE

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Choose Basic structure of a digital computer.	**L5**
CO2	Consider Arithmetic operations of binary number system.	**L5**
CO3	Explain The organization of the Control unit, Arithmetic and Logical unit, Memory unitand The I/O unit.	**L2**
CO4	Apply Operating system functions, types, system calls.	**L3**
CO5	State Memory management techniques and dead lock avoidance operating systems'file System implementation and its interface.	**L1**

YEAR: III **Semester: II SEM** **Regulation: R16**

Course name: Antennas and Wave propagation **Course Code: EC601PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the mechanism of radiation and distinguish between the antennaparameters.	**L2**
CO2	Outline about the various antennas like folded, yagi-uda and antenna arrays.	**L2**
CO3	Develop about the microwave antennas horn, parabolic, helical antennas.	**L5**
CO4	Design antenna measurements and micro strip antennas.	**L5**
CO5	Evaluate antennas for given specifications.	**L4**

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YEAR: III **Semester: II SEM** **Regulation: R16**

Course name: Microprocessors & Microcontrollers **Course Code: EC602PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Modify the basic concepts of microprocessor, internal architecture& organization of 8086.	**L5**
CO2	Discuss the basic different of microprocessor and microcontroller, 8051architecture and real time control of 8051.	**L2**
CO3	Design the various interfacing techniques of 8086 and 8051 and & developassembly language programming.	**L5**
CO4	Explain the internal architecture & organization of ARM processor.	**L2**
CO5	Analyze the CORETEX processor architecture & OMAP processorArchitecture &advanced pipeline technology.	**L4**

YEAR: III **Semester: II SEM** **Regulation: R16**

Course name: Digital Signal Processing **Course Code: EC603PC**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Prepare perform analyze perform time,frequency,and Z-Transforms on signals Systems.	**L5**
CO2	Predict the inter-relationship between DFT and various transforms.	**L4**
CO3	Design a digital filter for given specification.	**L5**
CO4	Estimate the fast computation of DFT and appreciate the FFT processing.	**L3**
CO5	Discuss the tradeoffs between normal and multirate DSP techniquesand finite length effects.	**L2**

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YEAR: III **Semester: II SEM** **Regulation: R16**

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

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Modify how digital to analog (D/A) and analog to digital (A/D) convertersoperate on a signal and be able to model these operations mathematically.	**L5**
CO2	Plan Perform time, frequency and Z-transform analysis on signals and LTI systemsand study the properties like stability, causality, time-invariance and etc.	**L5**
CO3	Select the inter-relationship between DFT and various transforms.	**L4**
CO4	Estimate the significance of various filter structures and effects of round offerrors.	**L3**
CO5	Design of infinite impulse response filters for a given specification.	**L5**

YEAR: III **Semester: II SEM** **Regulation: R16**

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

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Identify the internal organization and different modes of operation of popular8086 microprocessors.	**L2**
CO2	State the importance of addressing modes and the instruction set of the processor / controller which is used for programming the processor and controller.	**L1**
CO3	Apply design tools for microprocessor system design, test and evaluation.	**L3**
CO4	Analyze I/O operation with 8086 and software interaction and integration.	**L4**
CO5	Design the memory organization and interrupts of processors/ microcontrollers helps in various system designing aspects. Design and conductexperiments related to microprocessor/microcontroller based system design.	**L5**

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YEAR: III **Semester: II SEM** **Regulation: R16**

Course Name: Advanced English Communication Skills Lab **Course Code: EN606HS**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Construct vocabulary and use it contextually.	**L5**
CO2	Choose to Listen and speak effectively.	**L5**
CO3	Develop proficiency in academic reading and writing.	**L5**
CO4	Outline Increase possibilities of job prospects.	**L2**
CO5	State Communicate confidently in formal and informal contexts.	**L1**

YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Management Science **Course Code: A70014**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Plan an organizational structure for a given context in the organization.
CO2	Contrast Carry out production operations through work study.
CO3	Analyze the markets, customers and competition better and price the givenproducts appropriately.
CO4	Judge quality for a given product or service.
CO5	Prepare and control the HR function better.

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YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Microwave Engineering **Course Code: A70442**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Justify the significance of microwaves and microwave transmission lines.
CO2	Analyze the characteristics of microwave tubes and compare them.
CO3	List and explain the various microwave solid state devices.
CO4	Solve a microwave bench for measuring microwave parameters.
CO5	Describe the microwave bench set-up with different blocks and their features.

YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Computer Networks **Course Code: A70515**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Revise and explore the basics of computer.
CO2	Validate networks and various protocols.
CO3	Identify the world wide web concepts.
CO4	Express a network and flow of information.
CO5	List easily the concepts of network security, mobile and ad hoc networks.

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YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Cellular and Mobile Communications **Course Code: A70434**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Define Due To Multipath Fading Channel.
CO2	Describe The Fundamental Techniques To Overcome The Different FadingEffects.
CO3	Apply Co-channel and Non-Co-Channel interferences.
CO4	Analyze Familiar With Cell Coverage For Signal And Traffic, Diversity Techniques AndMobile Antennas.
CO5	Construct Of Frequency Management, Channel Assignment And Types OfHandoff.

YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Digital Image processing **Course Code: A70436**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Deduce the inter-relationship between DFT and various transforms.
CO2	Design the significance of various filter structures and effects ofRound off errors.
CO3	Identify a digital filter for a given specification.
CO4	Detect the fast computation of DFT and appreciate the FFT Processing.
CO5	Predict the tradeoffs between normal and multi rate DSPTechniques and finite length word effects.

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YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Embedded Systems Design **Course Code: A70440**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Revise the selection procedure of processors in the embedded domain.
CO2	Illustrate different types of memories and core of the embedded system.
CO3	Validate the design procedure for embedded firmware.
CO4	Choose the role of real time operating systems in embedded systems.
CO5	Evaluate the correlation between the task synchronization latency issue.

YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Advanced Communication skills Lab **Course Code: A70086**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Explain Accomplishment of sound vocabulary and its proper use contextually.
CO2	Detect Flair in Writing and felicity in written expression.
CO3	Define Enhanced job prospects.
CO4	Decide Effective Speaking Abilities.

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YEAR: IV **Semester: I SEM** **Regulation: R15**

Course name: Microwave Engineering and Digital communications
Lab Course Code:A70499

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Illustrate the characteristics of various microwave generators.
CO2	Determine Measure Scattering parameters of various microwave components using microwave bench.
CO3	Revise PCM Generation and Detection.
CO4	Estimate Time Division Multiplexing of 2 Band Limited Signals.
CO5	Apply DPSK Generation and Detection, QPSK Generation andDetection.

YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Satellite Communications **Course Code: A80452**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Describe the historical background, basic concepts and frequencyallocations for satellite communication.
CO2	Demonstrate orbital mechanics, launch vehicles and Launchers.
CO3	Estimate the design of satellite links for specified C/N with systemdesign examples.
CO4	Validate satellite sub systems like Telemetry, tracking, command andmonitoring power systems etc.
CO5	Explain the various multiple access systems for satellite communicationsystems and satellite packet communications.

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YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Telecommunication Switching Systems and Networks
Course Code:A80431

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	State the main concepts of telecommunication network design.
CO2	Analyze and evaluate fundamental telecommunication traffic models.
CO3	Justify basic modern signaling system.
CO4	Solve traditional interconnection switching system design problems.
CO5	Explain the concept of packet switching.

YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Wireless Communications and Networks **Course Code: A80454**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Judge the principles of wireless communications.
CO2	State cellular system design concepts.
CO3	Modify fundamentals of wireless networking.
CO4	Analyze various multiple access schemes used in wireless Communication.
CO5	Estimate wireless wide area networks and their performance Analysis.

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YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Industry Oriented Mini Project **Course Code: A80087**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Design identifies basic requirements for an application and proposes a effective solution.
CO2	Demonstrate Build knowledge through practical assignments and learn the various design methods forsolving problem.
CO3	Explain skills to build design techniques for various problem analyses.
CO4	Justify the fundamental concepts and techniques used in mini projects.
CO5	Identify Make up project enables the student to understand the business process.

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YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Seminar **Course Code: A80089**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Express and master public speaking during technical presentations.
CO2	Apply Get an opportunity; where in individuals can meet others with the same Interests/problems/concerns and also to envisage emerging technologies.
CO3	Use Have a sense of renewed hope and inspiration, as sometimes business concerns arelessened by sharing experiences with others.
CO4	State Have a great morale booster for students for career making advancement.
CO5	Define Become speaker and it will motivate students in facing technical and HR interviewrounds.

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YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Major Project **Course Code: A80088**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	Analyze a problem, identify and define the computing requirements appropriate toits solutions.
CO2	Discuss Function effectively on teams to accomplish a common goal.
CO3	Explain current techniques, skill and tools necessary for computing practices.
CO4	Design and development principles in the construction of software systems ofvarying complexity.
CO5	Describe e y e opener to bridge gap between Academia and real time industry. issues on technological front.

YEAR: IV **Semester: II SEM** **Regulation: R15**

Course name: Comprehensive Viva **Course Code: A80090**

At the end of this course, each student should be able to:

S.NO	COURSE OUTCOMES
CO1	State Communicate orally about analyzing a problem.
CO2	State the effectively to accomplish a common goal.
CO3	Illustrate Recapitulate fundamentals from across all semesters of B-Tech course work [4years of learning].
CO4	Outline Handle difficult scenario during Viva Voce in the event of plenty of subjectsunder question.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic year 2019-2020

Course outcomes

YEAR : I **Semester:I** **Regulation:R18**

Course Name: MATHEMATICS-I **Course Code: MA101BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

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

At the end of this course each student should be able to:

S.NO	Course Outcomes	Blooms Taxonomy Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

Course Name: Programming for Problem Solving **Course Code: CS103ES**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings , structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs using functions which are used to decompose a problem into different modules , developing programs using recursions and a concept of dynamic memoryallocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

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

At the end of this course each student should be able to:

S.NO	COURSE OUTCOMES	Blooms Taxonomy Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Applied physics Lab **Course Code: AP105BS**

At the end of this course each student should be able to:

S.NO.	COURSE OUTCOMES	Blooms Taxonomy Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day – to – day life	L4

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

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources	L4
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment andquantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmentalproblems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcomethe current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

Course Name: Programming for Problem Solving Lab **Course Code: CS106ES**

At the end of this course each student should be able to:

S.NO.	COURSE OUTCOMES	Blooms Taxonomy Level
CO1	Formulate the algorithms for simple problems, and translate givenalgorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify andcorrect logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5

YEAR : I **Semester: II** **Regulation:R18**

Course Name: Mathematics -II **Course Code: MA201BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L2
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	the knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space	L4
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

Course Name: Engineering Chemistry **Course Code: CH202BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

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Course Name: Basic Electrical Engineering **Course Code: EE203ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Analyse and Solve electrical circuits using network laws and theorems	L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5

Course Name: English **Course Code: EN204HS**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension,writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6

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

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3

Course Name: Engineering Chemistry Lab **Course Code: CH206BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determination of parameters like hardness and chloride content in water	L4
CO2	Estimation of rate constant of a reaction from concentration – time relationships – time relationships	L3
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rfvalues of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

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Course Name: English Language Communication Skills Lab **Course Code: EN207HS**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

Course Name: Basic Electrical Engineering Lab **Course Code: EE208ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Express the basic electrical laws.	L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4

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Department Of Electronics and Communication Engineering

Academic year 2019-2020

Course outcomes

YEAR: II **Semester: I** **Regulation: R18**

Course name: Electronic Devices and Circuits **Course Code: EC301PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Choose the characteristics of various components.	L5
CO2	Classify the utilization of components.	L4
CO3	Create the biasing techniques.	L1
CO4	Analyze the design of small signal Amplifier.	L4
CO5	Design and analyze small signal Amplifier circuits.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Network Analysis and Transmission Lines **Course Code: EC302PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the knowledge on basic RLC circuits' behavior.	L1
CO2	To Analyze the Steady state and transient analysis of RLC circuits.	L4
CO3	Explain the characteristics of two port network parameters.	L2
CO4	Design the transmission line parameters and configurations.	L5
CO5	Compare about singles stub matching, double stub matching and smith chart.	L4

YEAR: II **Semester: I** **Regulation: R18**

Course name: Digital System Design **Course Code: EC303PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Estimate the numerical information in different forms and Boolean Algebra theorems	L3
CO2	Compare Postulates of Boolean algebra and to minimize Boolean functions and ability to design and analyze combinational circuits.	L4
CO3	Design sequential circuits.	L5
CO4	Analyze sequential machines.	L4
CO5	Define about the logic families, realization of logic gates and IC interfacing.	L1

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Signals and Systems **Course Code: EC304PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express differentiate various signal functions	L2
CO2	list any arbitrary signal in time and frequency domain	L1
CO3	State the characteristics of linear time invariant systems	L1
CO4	Analyze the signals with different transform techniques	L4
CO5	Illustrate correlation between the signals and verify the sampling theorem	L2

YEAR: II **Semester: I** **Regulation: R18**

Course name: Probability Theory and Stochastic Processes **Course Code: EC305ES**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	apply the basic concepts of Random Process and its Characteristics	L3
CO2	analyze the response of linear time Invariant system for a Random Processes	L4
CO3	Determine the temporal characteristics of Random Signals	L4
CO4	produce the Spectral characteristics of Random Signals	L5
CO5	modify the concepts of various Noise in Communication systems	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Electronic Devices and Circuits Lab **Course Code: EC 306PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Illustrate and utilize various electronic components and devices with their specifications to Implement and verify the outputs of hardware circuits.	L2
CO2	Construct and Analyze the characteristics of PN junction diode, Zener diode and Silicon Controlled Rectifier.	L4
CO3	Justify the rectifier circuits with and without filter and voltage regulator.	L2
CO4	Classify the characteristics and calculate the parameters of transistors like BJT, FET, and UJT.	L4
CO5	Design the various Amplifiers like Common Emitter, Common Base, Common Source and Implement them using hardware and also observe their frequency responses.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Digital Systems Design Lab **Course Code: EC307PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Relate and implementation of Boolean functions using digital logic IC's.	L2
CO2	List Implementation of different combinational logic circuits using IC's.	L1
CO3	Define& Realize and implementation of Asynchronous and Synchronous counters using Flip-Flop IC's	L1
CO4	Design a finite state machine of a Sequence Detector.	L5

YEAR: II **Semester: I** **Regulation: R18**

Course Name: Basic Simulation Lab **Course Code: EC308PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe and perform operations on various types of signals (unit impulse, unit step, square, saw tooth, sinusoidal, ramp and sinc etc.).	L2
CO2	To discuss convolution and correlation between signals.	L2
CO3	Analyze time and frequency response for a given LTI system.	L4
CO4	Classify the sampling theorem and stability of a system.	L2
CO5	Define signal characteristics in frequency domain by Fourier transform method.	L1

YEAR: II **Semester: I** **Regulation: R18**

Course Name: Constitution of India **Course Code: MC309**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the concept of Indian Constitution	L1
CO2	List the Fundamental Rights and Fundamental Duties	L1
CO3	Analyze the Directive Principles of State policy	L4
CO4	Design the distribution of powers between of Union and states	L5
CO5	To describe know the Emergency Provision of Indian Constitution	L2

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YEAR: III **Semester: I** **Regulation: R16**

Course Name: Electromagnetic Theory and Transmission Lines Course Code: EC501PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply learn the Basic Laws, like coulombs law, gauss law	L3
CO2	Relate learn laws of biotsavarts law ,amperes law	L3
CO3	Analyze the Wave Equations for good conductors and good dielectrics	L4
CO4	Illustrate the Transmission Line parameters for different lines. Analyze the RF Line features and configure them as SC, OC Lines	L2
CO5	Ability to design single stub matching ,double stub matching and smith chart	L5

YEAR: III **Semester: I** **Regulation: R16**

Course Name: Linear and Digital IC Applications Course Code: EC502PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design state of operational amplifiers with linear integrated circuits	L5
CO2	Formulate of the different families of digital integrated circuits and their characteristics.	L2
CO3	Analyze circuits using operational amplifiers for various applications	L4
CO4	LIST Digital Integrated Circuits and analysis	L1
CO5	To describe of different Sequential Logic IC's and Memories	L2

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To list basic components of Digital Communication Systems.	L1
CO2	Design optimum receiver for Digital Modulation Techniques.	L5
CO3	Analyze the error performance of Digital Modulation Techniques.	L4
CO4	Create the redundancy present in Digital Communication by using various source coding techniques.	L1
CO5	Classify about different error detecting and error correction codes like block codes, cyclic codes and convolution codes.	L4

Course Name: Data Base Management System **Course Code: CS512OE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to design knowledge on database system applications and database design	L5
CO2	create knowledge on relational model, views and relational algebra	L1
CO3	Identify knowledge on SQL queries ,schema refinement	L2
CO4	Explain concepts on transaction management	L2
CO5	Analyze knowledge on file organization and indexing	L4

Course Name: FUNDAMENTALS OF MANAGEMENT Course Code: SM504MS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to explain the nature and scope, functions and roles in the management and evolutions in management.	L2
CO2	Express framework for planning and management objectives for business development and decision making and problem solving in the business process.	L2
CO3	List principles of organization and its structure and empowerment of organization culture and human resource management tasks.	L1
CO4	Describe the leadership management skills and crisis management and handling team.	L1
CO5	Identify types and strategies for control process in the business process and establishing control systems and finding various methods.	L2

Course Name: Professional Ethics Course Code: MC500HS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the importance of Values and Ethics in their personal lives.	L2
CO2	State the importance of Values and Ethics in their professional careers.	L1
CO3	Design the rights and responsibilities as an employee, team member and a global citizen.	L5

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the basic components of digital communication systems along with the concepts of PCM and DM.	L2
CO2	Discuss various digital modulation techniques	L2
CO3	Analyze error performance of digital modulation techniques	L4
CO4	Illustrate different encoding methods	L2
CO5	Demonstrate the concepts of error detecting, error correcting codes and spread spectrum techniques	L3

Course Name: DIGITAL IC APPLICATIONS LAB **Course Code: EC506PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explore the architecture, functioning and specifications of standard digital ICs of 74xx series	L3
CO2	Design and verify various combinational logic circuits using digital ICs.	L5
CO3	State and verify various Sequential logic circuits using digital ICs.	L1
CO4	Analyze the transform Characteristics of 74H, LS, HS series IC's.	L4
CO5	Construct the Clock pulse of 450KHz using NAND /NOR gates.	L4

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Course Name: Digital Communications Lab **Course Code: EC507PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze how a continuous signal is converted to digital signal	L4
CO2	Demonstrate various digital modulation schemes	L3
CO3	Evaluate the characteristics of PAM, PWM	L2
CO4	Explain the multiplexing Techniques of TDM, OFDM	L2

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YEAR: IV **Semester: I** **Regulation: R16**

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems	L4
CO2	distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications	L4
CO3	differentiate 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	L4
CO4	discuss the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design	L2
CO5	construct a microwave bench, establish the measurement procedure and conduct the experiments in microwave lab for measurement of various microwave parameters	L4

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Course Name: Computer Networks **Course Code: EC721PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to explain various types of computer networks layers.	L2
CO2	Attain state in data link layer &IEEE standards.	L4
CO3	Describe knowledge in data link layer & rating protocols.	L2
CO4	Discuss knowledge in data link layer & rating protocols.	L2
CO5	Compare mechanisms & various attacks incurred in networks.	L4

Course Name: Embedded System Design **Course Code: EC734PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to apply the selection procedure of processors in the embedded domain	L3
CO2	illustrate different types of memories and core of the embedded system	L2
CO3	simplify the design procedure for embedded firmware	L5
CO4	discuss the role of real time operating systems in embedded systems	L2
CO5	evaluate the correlation between the task synchronization latency issue	L2

Course name: VLSI Design **Course Code: EC702PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Outline qualitative knowledge about the process of integrated circuit using MOS transistors. Chose an appropriate inverter depending on specifications required for a circuit	L2
CO2	Explain the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit.	L2
CO3	Interrupt different types of logic gates using CMOS inverter and analyze their transfer characteristics. Provide design concepts required to design building blocks of data path using gates.	L3
CO4	Select simple memories using MOS transistors and can understand design of large memories.	L4
CO5	Solve simple logic circuit using PLA, PAL, FPGA and CPLD. 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.	L4

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Course Name: Electronic Measurements and Instrumentation Course Code: EC743PE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze the performance characteristics of each instrument and illustrate basic meters such as voltmeters and ammeters.	L4
CO2	explain about different types of signal analyzers and signal generators	L2
CO3	Revise the basic features of oscilloscope and different types of oscilloscopes.	L5
CO4	Apply the complete knowledge of various electronics instruments/transducers to measure the physical quantities in the field of science, engineering and technology	L3
CO5	List various physical parameters by appropriately selecting the transducers.	L1

Course Name: Industry Oriented Mini Project (IOMP) Course Code: EC705PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design identifies basic requirements for an application and proposes a effective solution.	L5
CO2	State Build knowledge through practical assignments and learn the various design methods for solving problem	L1
CO3	Develop skill to build design techniques for various problem analyses.	L5
CO4	Use the fundamental concepts and techniques used in mini project.	L3
CO5	Value project enables the student to understand the business process	L3

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Course Name: Seminar **Course Code: EC706PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Discuss for basic concepts of science and technology.	L2
CO2	Recognise the understanding perceptive of techniques applicable to their domain.	L4
CO3	Compare the solutions upon their own knowledge.	L4
CO4	Conclude their Presentation and Communication skills.	L4
CO5	Choose up them to pursue their placements and higher studies.	L5

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Argue VHDL programs for C41combinational and sequential logics.	L5
CO2	Relate simulation, synthesis and implementation of various digital logics	L3
CO3	Design and analyze NMOS and CMOS logic circuits	L5
CO4	Predict layouts for logic circuits and perform physical verification	L4
CO5	Express VHDL C41Ddes and implement various logic circuits on FPGA boards.	L2

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Illustrate the characteristics of various microwave generators	L2
CO2	Calculate Scattering parameters of various microwave components using microwave bench	L1
CO3	Determine electrical parameters of various microwave components using microwave bench	L4
CO4	Demonstrate the radiation pattern of the antennas.	L4

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Department Of Electronics and Communication Engineering

Academic year 2019-2020

Course outcomes

YEAR: II **Semester: II** **Regulation: R18**

Course name: Laplace Transforms, Numerical Methods & Complex Variables
Course Code: MA401BS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to solve the Laplace transforms techniques for solving ODE'S	L4
CO2	estimate the value for the given data using interpolation and find the root of a given equation	L3
CO3	interact the numerical solutions for a given ODE'S	L3
CO4	analyze the complex function with reference their analyticity	L4
CO5	relate the integration using Cauchy's integral and residue theorems	L3

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Course name: Electromagnetic Fields and Waves **Course Code: EC402PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply the knowledge of Basic Laws, Concept and proofs related to Electrostatic Field and Magneto static Fields.	L3
CO2	Purpose between the static and time -varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.	L5
CO3	classify The Basic law's and its different Applications	L2
CO4	Able to Analyze The Wave Equations for good conductions, good dielectrics and evaluate the UPW characteristics for several practical media of interest.	L4
CO5	examine completely the Rectangular waveguides, their mode characteristics and design Waveguides for solving Practical problems	L4

Course name: Analog and Digital Communications **Course Code: EC403PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze and design of various continuous wave and angle modulation and demodulation techniques	L4
CO2	Choose the effect of noise present in continuous wave and angle modulation techniques.	L5
CO3	Consider the knowledge about AM,FM Transmitters and Receivers	L5
CO4	Justify and design the various Pulse Modulation Techniques.	L5
CO5	Revise the concepts of Digital Modulation Techniques and Baseband transmission.	L5

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Course name: Linear IC Applications **Course Code: EC404PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to estimate operational amplifiers with linear integrated circuits	L3
CO2	Design and analyze various applications of op-amp.	L5
CO3	Relate and analyze filters, oscillators and waveform generators using op-amp.	L3
CO4	attain the knowledge of functional diagrams and applications of IC 555 and IC 565	L2
CO5	Express the knowledge about the Data converters.	L2

Course name: Electronic Circuit Analysis **Course Code: EC405PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to outline the basic concepts of Design the multistage amplifiers and understand the concepts of High Frequency Analysis of transistors Transistors	L2
CO2	analyze the Concepts of negative feedback to improve the stability of amplifiers	L4
CO3	design the positive feedback to generate sustained oscillations	L5
CO4	discuss, the Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications	L2
CO5	Estimate and design the various types of Multivibrators and sweep circuits for various applications.	L3

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YEAR: III **Semester: II** **Regulation: R16**

Course name: JAVA Programming **Course Code: CS621OE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to discuss the basics of java and object oriented programming concepts	L2
CO2	attain knowledge on inheritance, polymorphism, interfaces ,inner classes and packages	L1
CO3	compare the skills to apply object oriented programming in problem solving .acquiring the knowledge on multithreading &to handle run time errors using exception handling	L4
CO4	Differentiate the concepts on advanced JAVA like collections, files database connections.	L4
CO5	determine knowledge on GUI programming in JAVA	L4

Course name: Digital Image Processing **Course Code: EC612PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Evaluate Exploration of the limitations of the computational methods on digital images	L4
CO2	Examine Expected to implement the spatial and frequency domain image transforms on enhancement and restoration of images	L4
CO3	Predict derive on image enhancement techniques	L4
CO4	Elaborate analyze on image Restoration techniques	L4
CO5	Expected to define the need for compression and evaluate the basic compression algorithms.	L5

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Course name: Antennas and Wave propagation **Course Code: EC601PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Explain the mechanism of radiation and distinguish between the antenna parameters	L2
CO2	judge about the various antennas like folded, yagi-uda and antenna arrays	L1
CO3	Ability to discuss about the microwave antennas horn ,parabolic, helical antennas	L2
CO4	list antenna measurements and micro strip antennas	L1
CO5	State wave propagation and types of modes of propagation and atmosphere layers.	L1

Course name: Microprocessors & Microcontrollers **Course Code: EC602PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to derive the basic concepts of microprocessor, internal architecture& organization of 8086	L5
CO2	choose the basic different of microprocessor and microcontroller ,8051 architecture and real time control of 8051	L5
CO3	design the various interfacing techniques of 8086 and 8051 and & develop assembly language programming	L5
CO4	select the internal architecture & organization of ARM processor	L4
CO5	analyze the CORETEX processor architecture & OMAP processor architecture &advanced pipeline technology	L4

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Course name: Digital Signal Processing **Course Code: EC603PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to perform analyze perform time,frequency,and Z-Transforms on signals systems	L4
CO2	Derive the inter-relationship between DFT and various transforms.	L1
CO3	design a digital filter for given specification	L5
CO4	justify the fast computation of DFT and appreciate the FFT processing	L5
CO5	list the tradeoffs between normal and multirate DSP techniques and finite length effects	L1

Course name: Advance English Communication Skills Lab **Course Code:** EE606PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To improve students' fluency in spoken English	L4
CO2	enable them to listen to English spoken at normal conversational speed	L1
CO3	help students develop their vocabulary	L5
CO4	read and comprehend texts in different contexts	L5
CO5	communicate their ideas relevantly and coherently in writing	L1

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YEAR: IV **Semester: II** **Regulation: R16**

Course name: Optical Communications Course Code: EC853PE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to describe and analyze the constructional parameters of optical fibers.	L2
CO2	Estimate the losses due to attenuation, absorption, scattering and bending.	L4
CO3	Analyze the fiber slicing and optical sources.	L4
CO4	Compare various optical detectors and choose suitable one for different applications.	L4
CO5	List the optical system design.	L1

Course name: Global Positioning System Course Code: EC863PE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to compare the basic concepts of GPS and GLONASS overview	L4
CO2	Analyze signal channels.	L4
CO3	Relate GPS Receivers &Data errors.	L3
CO4	Illustrate Differential GPS.	L2
CO5	Deduce different GPS Applications.	L5

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Course name: Disaster Management **Course Code: CE511OE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to explain Disaster, man-made Hazards and Vulnerabilities	L2
CO2	discuss Disaster management mechanism	L2
CO3	describe Capacity building concepts and planning of disaster managements	L2
CO4	Analyze the disaster effects	L4
CO5	illustrate planning for disaster management	L2

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

YEAR: I **Semester: I SEM** **Regulation: R18**

Course Name: MATHEMATICS-I **Course Code: MA101BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

Course Name: Programming for Problem Solving **Course Code: CS103ES**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings , structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs usingfunctions which are used to decompose a problem into different modules , developing programs using recursions and a concept of dynamic memoryallocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

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

At the end of this course each student should be able to:

S.NO	Course Outcomes	Blooms Taxonomy Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Applied physics Lab **Course Code: AP105BS**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day – to – day life	L4

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Course Name: Programming for Problem Solving Lab **Course Code: CS106ES**

At the end of this course each student should be able to:

S.NO.	Course Outcomes	Blooms Taxonomy Level
CO1	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5

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

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources	L4
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues inorder to create awareness about the international conventions for mitigating global environmental problems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcomethe current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

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YEAR : I **Semester: II** **Regulation:R18**

Course Name: Mathematics -II **Course Code: MA201BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L2
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	Apply the knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space	L3,L4
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

Course Name: Engineering Chemistry **Course Code: CH202BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

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Course Name: Basic Electrical Engineering **Course Code: EE203ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Analyse and Solve electrical circuits using network laws and theorems	L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5

Course Name: English **Course Code: EN204HS**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension,writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3

Course Name: Engineering Chemistry Lab **Course Code: CH206BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determination of parameters like hardness and chloride content in water	L4
CO2	Estimation of rate constant of a reaction from concentration – time relationships – time relationships	L3
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rf values of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

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Course Name: English Language Communication Skills Lab **Course Code: EN207HS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

Course Name: Basic Electrical Engineering Lab **Course Code: EE208ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Express the basic electrical laws.	L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: II **Semester: I** **Regulation: R18**

Course name: Electronic Devices and Circuits **Course Code: EC301PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Choose the characteristics of various components.	L5
CO2	Classify the utilization of components.	L4
CO3	Create the biasing techniques.	L1
CO4	Analyze the design of small signal Amplifier.	L4
CO5	Design and analyze small signal Amplifier circuits.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Network Analysis and Transmission Lines **Course Code: EC302PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the knowledge on basic RLC circuits' behavior.	L1
CO2	To Analyze the Steady state and transient analysis of RLC circuits.	L4
CO3	Explain the characteristics of two port network parameters.	L2
CO4	Design the transmission line parameters and configurations.	L5
CO5	Compare about singles stub matching, double stub matching and smith chart.	L4

YEAR: II **Semester: I** **Regulation: R18**

Course name: Digital System Design **Course Code: EC303PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Estimate the numerical information in different forms and Boolean Algebra theorems	L3
CO2	Compare Postulates of Boolean algebra and to minimize Boolean functions and ability to design and analyze combinational circuits.	L4
CO3	Design sequential circuits.	L5
CO4	Analyze sequential machines.	L4
CO5	Define about the logic families, realization of logic gates and IC interfacing.	L1

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Signals and Systems **Course Code: EC304PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express differentiate various signal functions	L2
CO2	list any arbitrary signal in time and frequency domain	L1
CO3	State the characteristics of linear time invariant systems	L1
CO4	Analyze the signals with different transform techniques	L4
CO5	Illustrate correlation between the signals and verify the sampling theorem	L2

YEAR: II **Semester: I** **Regulation: R18**

Course name: Probability Theory and Stochastic Processes **Course Code: EC305ES**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply the basic concepts of Random Process and its Characteristics	L3
CO2	analyze the response of linear time Invariant system for a Random Processes	L4
CO3	Determine the temporal characteristics of Random Signals	L4
CO4	produce the Spectral characteristics of Random Signals	L5
CO5	modify the concepts of various Noise in Communication systems	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Electronic Devices and Circuits Lab **Course Code: EC 306PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Illustrate and utilize various electronic components and devices with their specifications to Implement and verify the outputs of hardware circuits.	L2
CO2	Construct and Analyze the characteristics of PN junction diode, Zener diode and Silicon Controlled Rectifier.	L4
CO3	Justify the rectifier circuits with and without filter and voltage regulator.	L2
CO4	Classify the characteristics and calculate the parameters of transistors like BJT, FET, and UJT.	L4
CO5	Design the various Amplifiers like Common Emitter, Common Base, Common Source and Implement them using hardware and also observe their frequency responses.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Digital Systems Design Lab **Course Code: EC307PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Relate and implementation of Boolean functions using digital logic IC's.	L2
CO2	List Implementation of different combinational logic circuits using IC's.	L1
CO3	Define& Realize and implementation of Asynchronous and Synchronous counters using Flip-Flop IC's	L1
CO4	Design a finite state machine of a Sequence Detector.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Basic Simulation Lab **Course Code: EC308PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe and perform operations on various types of signals (unit impulse, unit step, square, saw tooth, sinusoidal, ramp and sinc etc.).	L2
CO2	To discuss convolution and correlation between signals.	L2
CO3	Analyze time and frequency response for a given LTI system.	L4
CO4	Classify the sampling theorem and stability of a system.	L2
CO5	Define signal characteristics in frequency domain by Fourier transform method.	L1

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Constitution of India **Course Code: MC309**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the concept of Indian Constitution	L1
CO2	List the Fundamental Rights and Fundamental Duties	L1
CO3	Analyze the Directive Principles of State policy	L4
CO4	Design the distribution of powers between of Union and states	L5
CO5	To describe know the Emergency Provision of Indian Constitution	L2

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: II **Semester: II** **Regulation: R18**

Course name: Laplace Transforms, Numerical Methods & Complex Variables
Course Code: MA401BS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to solve the Laplace transforms techniques for solving ODE'S	L4
CO2	estimate the value for the given data using interpolation and find the root of a given equation	L3
CO3	interact the numerical solutions for a given ODE'S	L3
CO4	analyze the complex function with reference their analyticity	L4
CO5	relate the integration using Cauchy's integral and residue theorems	L3

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Course name: Electromagnetic Fields and Waves **Course Code: EC402PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply the knowledge of Basic Laws, Concept and proofs related to Electrostatic Field and Magneto static Fields.	L3
CO2	Purpose between the static and time -varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.	L5
CO3	classify The Basic law's and its different Applications	L2
CO4	Able to Analyze The Wave Equations for good conductions, good dielectrics and evaluate the UPW characteristics for several practical media of interest.	L4
CO5	examine completely the Rectangular waveguides, their mode characteristics and design Waveguides for solving Practical problems	L4

Course name: Analog and Digital Communications **Course Code: EC403PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze and design of various continuous wave and angle modulation and demodulation techniques	L4
CO2	Choose the effect of noise present in continuous wave and angle modulation techniques.	L5
CO3	Consider the knowledge about AM,FM Transmitters and Receivers	L5
CO4	Justify and design the various Pulse Modulation Techniques.	L5
CO5	Revise the concepts of Digital Modulation Techniques and Baseband transmission.	L5

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Course name: Linear IC Applications **Course Code: EC404PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to estimate operational amplifiers with linear integrated circuits	L3
CO2	Design and analyze various applications of op-amp.	L5
CO3	Relate and analyze filters, oscillators and waveform generators using op-amp.	L3
CO4	attain the knowledge of functional diagrams and applications of IC 555 and IC 565	L2
CO5	Express the knowledge about the Data converters.	L2

Course name: Electronic Circuit Analysis **Course Code: EC405PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to outline the basic concepts of Design the multistage amplifiers and understand the concepts of High Frequency Analysis of transistors Transistors	L2
CO2	analyze the Concepts of negative feedback to improve the stability of amplifiers	L4
CO3	design the positive feedback to generate sustained oscillations	L5
CO4	discuss, the Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications	L2
CO5	Estimate and design the various types of Multivibrators and sweep circuits for various applications.	L3

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: III **Semester: I** **Regulation: R18**

Course name: Microprocessors and Microcontrollers **Course Code: EC501PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understands the internal architecture, organization and assembly language programming of 8086 processors	L2
CO2	Understands the internal architecture, organization and assembly language programming of 8051/controllers.	L2
CO3	Understands the interfacing techniques to 8086 and 8051 based systems.	L2
CO4	Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.	L2

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YEAR: III **Semester: I** **Regulation: R18**

Course name: Data communications and Networks **Course Code:** EC502PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Know the Categories and functions of various Data communication Networks.	L1
CO2	Design and analyze various error detection techniques	L5
CO3	Demonstrate the mechanism of routing the data in network layer	L2
CO4	Know the significance of various Flow control and Congestion control Mechanisms.	L1
CO5	Know the Functioning of various Application layer Protocols.	L1

YEAR: III **Semester: I** **Regulation: R18**

Course name: Control systems **Course Code: EC503PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understand the modeling of linear-time-invariant systems using transfer function and state space representations	L2
CO2	Understand the concept of stability and its assessment for linear-time invariant systems.	L2
CO3	Design simple feedback controllers	L5
CO4		
CO5		

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YEAR: III **Semester: I** **Regulation: R18**

Course name: Business economics and financial analysis Course Code: SM504MS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe the economic activities performed by the businessmen in the business for profit earning.	L2
CO2	Examine the significance of demand, its analysis, measurementof demand and its forecasting.	L4
CO3	Predict the production function through the Cobb Douglas Production Function.	L4
CO4	Design and implement different structures of market covering how price is determined under different market structures.	L6
CO5	Analyze different forms of business organizations existing in the modern Business, Describe the allocation of capital which plays a vital role in a business organization.	L4

YEAR: III **Semester: I** **Regulation: R18**

Course name: Electronic measurements and instrumentation **Course Code: EC513PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Measure electrical parameters with different meters and understand the basic definition of measuring parameters.	L5
CO2	Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.	L3
CO3	Operate an Oscilloscope to measure various signals	L2
CO4	Measure various physical parameters by appropriately selecting the transducers.	L5
CO5	Describe measure various physical parameters by appropriately selecting thetransducers.	L4

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YEAR: III **Semester: I** **Regulation: R18**

Course Name: Microprocessors and microcontrollers lab **Course Code: EC505PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design and implement programs on 8085 microprocessor	L6
CO2	Consider and implement programs on 8086 microprocessor.	L4
CO3	Discuss interfacing circuits with 8085	L6
CO4	Apply and implement 8051 microcontroller based systems	L3
CO5	Compare the concepts related to I/O and memory interfacing	L2

YEAR: III **Semester: I** **Regulation: R18**

Course Name: Data communications and networks lab **Course Code: EC506PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Know the Categories and functions of various Data communication Networks.	L1
CO2	Design and analyze various error detection techniques	L5
CO3	Demonstrate the mechanism of routing the data in network layer	L3
CO4	Know the significance of various Flow control and Congestion control Mechanisms.	L1
C05	Know the Functioning of various Application layer Protocols.	L1

YEAR: III **Semester: I** **Regulation: R18**

Course Name: ADVANCED COMMUNICATION SKILLS LAB **Course Code: EN508HS**

At end of this course, each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy Levels
CO1	Build sound vocabulary and its proper use contextually	L3
CO2	Use of functional English effectively in formal and informal contexts	L4
CO3	Develop effective speaking skills and Maximize job prospects	L3
CO4	Plan and make different forms of presentation using various techniques	L3
CO5	Understand an effective speaking skills and Maximize job prospects.	L2,L3

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YEAR: II **Semester: I** **Regulation: R18**

Course Name:

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the concept of Indian Constitution	L1
CO2	List the Fundamental Rights and Fundamental Duties	L1
CO3	Analyze the Directive Principles of State policy	L4
CO4	Design the distribution of powers between of Union and states	L5
CO5	To describe know the Emergency Provision of Indian Constitution	L2

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: III **Semester: II** **Regulation: R18**

Course name: ANTENNAS AND PROPAGATION **Course Code: EC601PC**

Course Code: EC601PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays.	L2
CO2	Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements in the laboratory.	L2
CO3	Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved.	L2
CO4	Analyze the characteristics and design relations of UHF, VHF and Microwave Antennas	L4
CO5	Understand the concepts and set-up requirements for microwave measurements, and familiarize with the procedure to enable antenna measurements.	L2

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Course name: Digital Signal Processing **Course Code: EC601PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understand the LTI system characteristics and Multi rate signal processing	L2
CO2	Understand the inter-relationship between DFT and various transforms.	L2
CO3	Design a digital filter for a given specification.	L6
CO4	Understand the significance of various filter structures and effects of round off errors.	L2
CO5	Choose the tradeoffs between normal and multi rate DSP techniques and finite length effects	L1

Course name: VLSI DESIGN **Course Code: EC603PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.	L4
CO2	Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit	L2
CO3	Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD.	L6
CO4	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.	L2
CO5	Select simple memories using MOS transistors and can understand design of large memories	L1

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Course name: EMBEDDED SYSTEM DESIGN **Course Code: EC613PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To understand the selection procedure of Processors in the embedded domain.	L2
CO2	Design Procedure for Embedded Firmware	L5
CO3	To visualize the role of Real time Operating Systems in Embedded Systems	L2
CO4	To evaluate the Correlation between task synchronization and latency issues	L5
CO5	Able to evaluate the correlation between the task synchronization latency issue	L5

Course Name: Non-conventional energy sources **Course Code: MT96010E**

At the end of this course each student should be able to:

CO1	Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells.	L2
CO2	Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation	L1
CO3	Explore the concepts involved in wind energy conversion system by studying its components, types and performance.	L2
CO4	Illustrate ocean energy and explain the operational methods of their utilization.	L2
CO5	Acquire the knowledge on Geothermal energy on cryptography and security models.	L4

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Course name: DIGITAL SIGNAL PROCESSING LAB **Course Code: EC604PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the handling of discrete/digital signals using MATLAB	L1
CO2	Detect the basic operations of Signal processing	L1
CO3	Analyze the spectral parameter of window functions	L4
CO4	Design IIR, and FIR filters for band pass, band stop, low pass and high pass filters.	L5
CO5	Construct the signal processing algorithm using MATLAB.	L3

Course name: e - CAD LAB **Course Code: EC605PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design entry and simulation of combinational &sequential circuits and functional verification	L5
CO2	Synthesis, p&r and post p&r simulation for combinational and sequential circuits.	L4
CO3	Implementation of the combinational &sequential circuits on FPGA hardware	L5
CO4	Write verilog and VHDL code for different circuits and understanding design styles.	L2,L5

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Course name: SCRIPTING LANGUAGES LAB **Course Code: EC606PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to understand the differences between Scripting languages and programming languages	L2
CO2	Able to gain some fluency programming in Ruby, Perl, TCL	L2
CO3	To Understand the concepts of scripting languages for developing web-based projects	L2
CO4	To understand the applications the of Ruby, TCL, Perl scripting languages	L2

Course name: ENVIRONMENTAL SCIENCE **Course Code: *MC609**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express Knowledge regarding environment and its components.	L2
CO2	Identify various ecosystems, their biodiversity and Scientific methods to protect them.	L2
CO3	Estimate different types of pollution and their control measures.	L3
CO4	Classify effective methods of waste management.	L4
CO5	Analyze global environmental problems and come out with best possiblesolutions, Illustrate green environmental issues.	L4

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: IV **Semester: I** **Regulation: R16**

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems	L4
CO2	Distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications	L4
CO3	Differentiate 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	L4
CO4	Discuss the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design	L2
CO5	Construct a microwave bench, establish the measurement procedure and conduct the experiments in microwave lab for measurement of various microwave parameters	L4

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Course Name: Computer Networks **Course Code: EC721PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to explain various types of computer networks layers.	L2
CO2	Attain state in data link layer &IEEE standards.	L4
CO3	Describe knowledge in data link layer & rating protocols.	L2
CO4	Discuss knowledge in data link layer & rating protocols.	L2
CO5	Compare mechanisms & various attacks incurred in networks.	L4

Course Name: Embedded System Design **Course Code: EC734PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to apply the selection procedure of processors in the embedded domain	L3
CO2	illustrate different types of memories and core of the embedded system	L2
CO3	simplify the design procedure for embedded firmware	L5
CO4	discuss the role of real time operating systems in embedded systems	L2
CO5	evaluate the correlation between the task synchronization latency issue	L2

Course name: VLSI Design **Course Code: EC702PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Outline qualitative knowledge about the process of integrated circuit using MOS transistors. Chose an appropriate inverter depending on specifications required for a circuit	L2
CO2	Explain the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit.	L2
CO3	Interrupt different types of logic gates using CMOS inverter and analyze their transfer characteristics. Provide design concepts required to design building blocks of data path using gates.	L3
CO4	Select simple memories using MOS transistors and can understand design of large memories.	L4
CO5	Solve simple logic circuit using PLA, PAL, FPGA and CPLD. 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.	L4

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Course Name: Electronic Measurements and Instrumentation Course Code: EC743PE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze the performance characteristics of each instrument and illustrate basic meters such as voltmeters and ammeters.	L4
CO2	explain about different types of signal analyzers and signal generators	L2
CO3	Revise the basic features of oscilloscope and different types of oscilloscopes.	L5
CO4	Apply the complete knowledge of various electronics instruments/transducers to measure the physical quantities in the field of science, engineering and technology	L3
CO5	List various physical parameters by appropriately selecting the transducers.	L1

Course Name: Industry Oriented Mini Project (IOMP) Course Code: EC705PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design identifies basic requirements for an application and proposes a effective solution.	L5
CO2	State Build knowledge through practical assignments and learn the various design methods for solving problem	L1
CO3	Develop skill to build design techniques for various problem analyses.	L5
CO4	Use the fundamental concepts and techniques used in mini project.	L3
CO5	Value project enables the student to understand the business process	L3

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Course Name: Seminar **Course Code: EC706PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Discuss for basic concepts of science and technology.	L2
CO2	Recognized the understanding perceptive of techniquesapplicable to their domain.	L4
CO3	Compare the solutions upon their own knowledge.	L4
CO4	Conclude their Presentation and Communication skills.	L4
CO5	Choose up them to pursue their placements and higher studies.	L5

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Argue VHDL programs for C41combinational and sequential logics.	L5
CO2	Relate simulation, synthesis and implementation of various digital logics	L3
CO3	Design and analyze NMOS and CMOS logic circuits	L5
CO4	Predict layouts for logic circuits and perform physical verification	L4
CO5	Express VHDL C41Ddes and implement various logic circuits on FPGA boards.	L2

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

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Illustrate the characteristics of various microwave generators	L2
CO2	Calculate Scattering parameters of various microwave components using microwave bench	L1
CO3	Determine electrical parameters of various microwave components using microwave bench	L4
CO4	Demonstrate the radiation pattern of the antennas.	L4

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Department Of Electronics and Communication Engineering

Academic year 2020-2021

Course outcomes

YEAR: IV **Semester: II** **Regulation: R16**

Course name: Optical Communications **Course Code: EC853PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to describe and analyze the constructional parameters of optical fibers.	L2
CO2	Estimate the losses due to attenuation, absorption, scattering and bending.	L4
CO3	Analyze the fiber slicing and optical sources.	L4
CO4	Compare various optical detectors and choose suitable one for different applications.	L4
CO5	List the optical system design.	L1

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Course name: Global Positioning System Course Code: EC863PE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to compare the basic concepts of GPS and GLONASS overview	L4
CO2	Analyze signal channels.	L4
CO3	Relate GPS Receivers &Data errors.	L3
CO4	Illustrate Differential GPS.	L2
CO5	Deduce different GPS Applications.	L5

Course name: Disaster Management Course Code: CE511OE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to explain Disaster, man-made Hazards and Vulnerabilities	L2
CO2	discuss Disaster management mechanism	L2
CO3	describe Capacity building concepts and planning of disaster managements	L2
CO4	Analyze the disaster effects	L4
CO5	illustrate planning for disaster management	L2

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Department Of Electronics and Communication Engineering

Academic year 2021-2022

YEAR: I **Semester: I SEM** **Regulation: R18**

Course Name: MATHEMATICS-I **Course Code: MA101BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Blooms Taxonomy Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

Course Name: Programming for Problem Solving **Course Code: CS103ES**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings , structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs usingfunctions which are used to decompose a problem into different modules , developing programs using recursions and a concept of dynamic memoryallocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

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

At the end of this course each student should be able to:

S.NO	Course Outcomes	Blooms Taxonomy Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Applied physics Lab **Course Code: AP105BS**

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day – to – day life	L4

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Course Name: Programming for Problem Solving Lab **Course Code: CS106ES**

At the end of this course each student should be able to:

S.NO.	Course Outcomes	Blooms Taxonomy Level
CO1	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5

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

At the end of this course each student should be able to:

S.No.	Course Outcomes	Blooms Taxonomy Level
CO1	Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources	L4
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmental problems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcomethe current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

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YEAR : I **Semester: II** **Regulation:R18**

Course Name: Mathematics -II **Course Code: MA201BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L2
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	Apply the knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space	L3 L4
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

Course Name: Engineering Chemistry **Course Code: CH202BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

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Course Name: Basic Electrical Engineering **Course Code: EE203ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Analyze and Solve electrical circuits using network laws and theorems	L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5

Course Name: English **Course Code: EN204HS**

At the end of this course each student should be able to:

S.no	Course Outcomes	Bloom's Taxonomy Level
CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6

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

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3

Course Name: Engineering Chemistry Lab **Course Code: CH206BS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Determination of parameters like hardness and chloride content in water	L4
CO2	Estimation of rate constant of a reaction from concentration – time relationships – time relationships	L3
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rf values of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

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Course Name: English Language Communication Skills Lab **Course Code: EN207HS**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

Course Name: Basic Electrical Engineering Lab **Course Code: EE208ES**

At the end of this course each student should be able to:

S.No	Course Outcomes	Bloom's Taxonomy Level
CO1	Express the basic electrical laws.	L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4

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Course outcomes

YEAR: II **Semester: I** **Regulation: R18**

Course name: Electronic Devices and Circuits **Course Code: EC301PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Choose the characteristics of various components.	L5
CO2	Classify the utilization of components.	L4
CO3	Create the biasing techniques.	L1
CO4	Analyze the design of small signal Amplifier.	L4
CO5	Design and analyze small signal Amplifier circuits.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Network Analysis and Transmission Lines **Course Code: EC302PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Define the knowledge on basic RLC circuits' behavior.	L1
CO2	To Analyze the Steady state and transient analysis of RLC circuits.	L4
CO3	Explain the characteristics of two port network parameters.	L2
CO4	Design the transmission line parameters and configurations.	L5
CO5	Compare about singles stub matching, double stub matching and smith chart.	L4

YEAR: II **Semester: I** **Regulation: R18**

Course name: Digital System Design **Course Code: EC303PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Estimate the numerical information in different forms and Boolean Algebra theorems	L3
CO2	Compare Postulates of Boolean algebra and to minimize Boolean functions and ability to design and analyze combinational circuits.	L4
CO3	Design sequential circuits.	L5
CO4	Analyze sequential machines.	L4
CO5	Define about the logic families, realization of logic gates and IC interfacing.	L1

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YEAR: II **Semester: I** **Regulation: R18**

Course name: Signals and Systems **Course Code: EC304PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express differentiate various signal functions	L2
CO2	list any arbitrary signal in time and frequency domain	L1
CO3	State the characteristics of linear time invariant systems	L1
CO4	Analyze the signals with different transform techniques	L4
CO5	Illustrate correlation between the signals and verify the sampling theorem	L2

YEAR: II **Semester: I** **Regulation: R18**

Course name: Probability Theory and Stochastic Processes **Course Code: EC305ES**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	apply the basic concepts of Random Process and its Characteristics	L3
CO2	analyze the response of linear time Invariant system for a Random Processes	L4
CO3	Determine the temporal characteristics of Random Signals	L4
CO4	produce the Spectral characteristics of Random Signals	L5
CO5	modify the concepts of various Noise in Communication systems	L5

YEAR: II **Semester: I** **Regulation: R18**

Course Name: Electronic Devices and Circuits Lab **Course Code: EC 306PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Illustrate and utilize various electronic components and devices with their specifications to Implement and verify the outputs of hardware circuits.	L2
CO2	Construct and Analyze the characteristics of PN junction diode, Zener diode and Silicon Controlled Rectifier.	L4
CO3	Justify the rectifier circuits with and without filter and voltage regulator.	L2
CO4	Classify the characteristics and calculate the parameters of transistors like BJT, FET, and UJT.	L4
CO5	Design the various Amplifiers like Common Emitter, Common Base, Common Source and Implement them using hardware and also observe their frequency responses.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Digital Systems Design Lab **Course Code: EC307PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Relate and implementation of Boolean functions using digital logic IC's.	L2
CO2	List Implementation of different combinational logic circuits using IC's.	L1
CO3	Define& Realize and implementation of Asynchronous and Synchronous counters using Flip-Flop IC's	L1
CO4	Design a finite state machine of a Sequence Detector.	L5

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Basic Simulation Lab **Course Code: EC308PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe and perform operations on various types of signals (unit impulse, unit step, square, saw tooth, sinusoidal, ramp and sinc etc.).	L2
CO2	To discuss convolution and correlation between signals.	L2
CO3	Analyze time and frequency response for a given LTI system.	L4
CO4	Classify the sampling theorem and stability of a system.	L2
CO5	Define signal characteristics in frequency domain by Fourier transform method.	L1

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YEAR: II **Semester: I** **Regulation: R18**

Course Name: Constitution of India **Course Code: MC309**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the concept of Indian Constitution	L1
CO2	List the Fundamental Rights and Fundamental Duties	L1
CO3	Analyze the Directive Principles of State policy	L4
CO4	Design the distribution of powers between of Union and states	L5
CO5	To describe know the Emergency Provision of Indian Constitution	L2

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Course outcomes

YEAR: II **Semester: II** **Regulation: R18**

Course name: Laplace Transforms, Numerical Methods & Complex Variables
Course Code: MA401BS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to solve the Laplace transforms techniques for solving ODE'S	L4
CO2	estimate the value for the given data using interpolation and find the root of a given equation	L3
CO3	interact the numerical solutions for a given ODE'S	L3
CO4	analyze the complex function with reference their analyticity	L4
CO5	relate the integration using Cauchy's integral and residue theorems	L3

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Course name: Electromagnetic Fields and Waves **Course Code: EC402PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Apply the knowledge of Basic Laws, Concept and proofs related to Electrostatic Field and Magneto static Fields.	L3
CO2	Purpose between the static and time -varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.	L5
CO3	classify The Basic law's and its different Applications	L2
CO4	Able to Analyze The Wave Equations for good conductions, good dielectrics and evaluate the UPW characteristics for several practical media of interest.	L4
CO5	examine completely the Rectangular waveguides, their mode characteristics and design Waveguides for solving Practical problems	L4

Course name: Analog and Digital Communications **Course Code: EC403PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze and design of various continuous wave and angle modulation and demodulation techniques	L4
CO2	Choose the effect of noise present in continuous wave and angle modulation techniques.	L5
CO3	Consider the knowledge about AM,FM Transmitters and Receivers	L5
CO4	Justify and design the various Pulse Modulation Techniques.	L5
CO5	Revise the concepts of Digital Modulation Techniques and Baseband transmission.	L5

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Course name: Linear IC Applications **Course Code: EC404PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Able to estimate operational amplifiers with linear integrated circuits	L3
CO2	Design and analyze various applications of op-amp.	L5
CO3	Relate and analyze filters, oscillators and waveform generators using op-amp.	L3
CO4	attain the knowledge of functional diagrams and applications of IC 555 and IC 565	L2
CO5	Express the knowledge about the Data converters.	L2

Course name: Electronic Circuit Analysis **Course Code: EC405PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to outline the basic concepts of Design the multistage amplifiers and understand the concepts of High Frequency Analysis of transistors Transistors	L2
CO2	analyze the Concepts of negative feedback to improve the stability of amplifiers	L4
CO3	design the positive feedback to generate sustained oscillations	L5
CO4	discuss, the Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications	L2
CO5	Estimate and design the various types of Multivibrators and sweep circuits for various applications.	L3

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Course outcomes

YEAR: III **Semester: I** **Regulation: R18**

Course name: Microprocessors and Microcontrollers **Course Code: EC501PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understands the internal architecture, organization and assembly language programming of 8086 processors	L2
CO2	Understands the internal architecture, organization and assembly language programming of 8051/controllers.	L2
CO3	Understands the interfacing techniques to 8086 and 8051 based systems.	L1, L2
CO4	Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.	L1

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YEAR: III **Semester: I** **Regulation: R18**

Course name: Data communications and Networks **Course Code:** EC502PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Know the Categories and functions of various Data communication Networks.	L1
CO2	Design and analyze various error detection techniques	L5
CO3	Demonstrate the mechanism of routing the data in network layer	L3
CO4	Know the significance of various Flow control and Congestion control Mechanisms.	L1
CO5	Know the Functioning of various Application layer Protocols.	L1

YEAR: III **Semester: I** **Regulation: R18**

Course name: Control systems **Course Code: EC503PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understand the modeling of linear-time-invariant systems using transfer function and statespace representations	L1
CO2	Understand the concept of stability and its assessment for linear-time invariant systems.	L1
CO3	Design simple feedback controllers	L5
CO4	Assess the stability of the control system	L2

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YEAR: III **Semester: I** **Regulation: R18**

Course name: Business economics and financial analysis Cours Code: SM504MS

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Describe the economic activities performed by the businessmen in the business for profit earning.	L2
CO2	Examine the significance of demand, its analysis, measurementof demand and its forecasting.	L4
CO3	Predict the production function through the Cobb Douglas Production Function.	L4
CO4	Design and implement different structures of market covering how price is determined under different market structures.	L5
CO5	Analyze different forms of business organizations existing in the modern Business, Describe the allocation of capital which plays a vital role in a business organization.	L4

YEAR: III **Semester: I** **Regulation: R18**

Course name: Electronic measurements and instrumentation **Course Code: EC513PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Measure electrical parameters with different meters and understand the basic definition of measuring parameters.	L1
CO2	Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.	L1
CO3	Operate an Oscilloscope to measure various signals	L2
CO4	Measure various physical parameters by appropriately selecting the transducers.	L1
CO5	Describe measure various physical parameters by appropriately selecting thetransducers.	L2

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YEAR: III **Semester: I** **Regulation: R18**

Course Name: Microprocessors and microcontrollers lab **Course Code: EC505PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design and implement programs on 8085 microprocessor	L5
CO2	Consider and implement programs on 8086 microprocessor.	L5
CO3	Discuss interfacing circuits with 8085	L4
CO4	Apply and implement 8051 microcontroller based systems	L3
CO5	Compare the concepts related to I/O and memory interfacing	L4

YEAR: III **Semester: I** **Regulation: R18**

Course Name: Data communications and networks lab **Course Code: EC506PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understand fundamental underlying principles of computer networking	L2
CO2	Understand details and functionality of layered network architecture.	L2
CO3	Apply mathematical foundations to solve computational problems in computer networking	L3
CO4	Analyze performance of various communication protocols.	L4
CO5	Compare routing algorithms	L4

YEAR: III **Semester: I** **Regulation: R18**

Course Name: ADVANCED COMMUNICATION SKILLS LAB **Course Code: EN508HS**

At end of this course, each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy Levels
CO1	Build sound vocabulary and its proper use contextually	L3
CO2	Use of functional English effectively in formal and informal contexts	L4
CO3	Develop effective speaking skills and Maximize job prospects	L5
CO4	Plan and make different forms of presentation using various techniques	L2
CO5	Understand an effective speaking skills and Maximize job prospects.	L2,L3

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YEAR: II **Semester: I** **Regulation: R18**

Course Name:

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the concept of Indian Constitution	L1
CO2	List the Fundamental Rights and Fundamental Duties	L1
CO3	Analyze the Directive Principles of State policy	L4
CO4	Design the distribution of powers between of Union and states	L5
CO5	To describe know the Emergency Provision of Indian Constitution	L2

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Course outcomes

YEAR: III **Semester: II** **Regulation: R18**

Course name: ANTENNAS AND PROPAGATION **Course Code: EC601PC**

Course Code: EC601PC

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays.	L2
CO2	Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements in the laboratory.	L2
CO3	Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved.	L2
CO4	analyze the characteristics and design relations of UHF, VHF and Microwave Antennas	L4
CO5	Understand the concepts and set-up requirements for microwave measurements, and familiarize with the procedure to enable antenna measurements.	L2

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Course name: Digital Signal Processing **Course Code: EC601PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Understand the LTI system characteristics and Multi rate signal processing	L2
CO2	Understand the inter-relationship between DFT and various transforms.	L2
CO3	Design a digital filter for a given specification.	L5
CO4	Understand the significance of various filter structures and effects of round off errors.	L2
CO5	Choose the tradeoffs between normal and multi rate DSP techniques and finite length effects	L3

Course name: VLSI DESIGN **Course Code: EC603PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.	L2
CO2	Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit	L2
CO3	Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD.	L5
CO4	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.	L2
CO5	Select simple memories using MOS transistors and can understand design of large memories	L5

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Course name: EMBEDDED SYSTEM DESIGN **Course Code: EC613PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To understand the selection procedure of Processors in the embedded domain.	L2
CO2	Design Procedure for Embedded Firmware	L5
CO3	To visualize the role of Real time Operating Systems in Embedded Systems	L2
CO4	To evaluate the Correlation between task synchronization and latency issues	L5
CO5	Able to evaluate the correlation between the task synchronization latency issue	L5

Course Name: Non-conventional energy sources **Course Code: MT96010E**

At the end of this course each student should be able to:

CO1	Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells.	L2
CO2	Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation	L1
CO3	Explore the concepts involved in wind energy conversion system by studying its components, types and performance.	L2
CO4	Illustrate ocean energy and explain the operational methods of their utilization.	L2
CO5	Acquire the knowledge on Geothermal energy on cryptography and security models.	L4

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Course name: DIGITAL SIGNAL PROCESSING LAB **Course Code: EC604PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	State the handling of discrete/digital signals using MATLAB	L1
CO2	Detect the basic operations of Signal processing	L1
CO3	Analyze the spectral parameter of window functions	L4
CO4	Design IIR, and FIR filters for band pass, band stop, low pass and high pass filters.	L5
CO5	Construct the signal processing algorithm using MATLAB.	L3

Course name: e - CAD LAB **Course Code: EC605PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design entry and simulation of combinational &sequential circuits and functional verification	L5
CO2	Synthesis, p&r and post p&r simulation for combinational and sequential circuits.	L4
CO3	Implementation of the combinational &sequential circuits on FPGA hardware	L5
CO4	Write verilog and VHDL code for different circuits and understanding design styles.	L2,L5

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Course name: SCRIPTING LANGUAGES LAB **Course Code: EC606PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Ability to understand the differences between Scripting languages and programming languages	L2
CO2	Able to gain some fluency programming in Ruby, Perl, TCL	L2
CO3	To Understand the concepts of scripting languages for developing web-based projects	L2
CO4	To understand the applications the of Ruby, TCL, Perl scripting languages	L2

Course name: ENVIRONMENTAL SCIENCE **Course Code: *MC609**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Express Knowledge regarding environment and its components.	L2
CO2	Identify various ecosystems, their biodiversity and Scientific methodstoprotect them.	L2
CO3	Estimate different types of pollution and their control measures.	L3
CO4	Classify effective methods of waste management.	L4
CO5	Analyze global environmental problems and come out with best possiblesolutions, Illustrate green environmental issues.	L4

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Course outcomes

YEAR: IV **Semester: I** **Regulation: R18**

Course name: Microwave and Optical Communications **Course Code: EC601PC**

~~Course Code: EC701PC~~

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Known power generation at microwave frequencies and derive the performance characteristics.	L1
CO2	Realize the need for solid state microwave sources and understand the principles of solid state devices.	L2
CO3	Distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications.	L4
CO4	Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.	L2
CO5	Understand the mechanism of light propagation through Optical Fibers.	L2

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Course name: Scripting Languages **Course Code: EC712PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Known about basics of Linux and Linux Networking	L1
CO2	Use Linux environment and write programs for automation	L3
CO3	Understand the concepts of Scripting languages	L2
CO4	Create and run scripts using PERL/TCl/Python.	L6
CO5	Usage of scripting languages in IC design flow	L3

Course name: Database Management Systems **Course Code: EC722PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Gain knowledge of fundamentals of DBMS, database design and normal forms	L2
CO2	Master the basics of SQL for retrieval and management of data.	L2
CO3	Be acquainted with the basics of transaction processing and concurrency control.	L1
CO4	Familiarity with database storage structures and access techniques	L3
CO5	understand the basic concepts and the applications of database systems	L2

Course name: Intellectual Property Rights

Course Code: MT700OE

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Classify the types of intellectual property, importance of intellectual property rights.	L1
CO2	Identify the Purpose and function of trademark, selecting, and evaluating trade mark and its registration processes.	L2
CO3	Discuss the fundamental of copy right law and law of patents.	L6
CO4	Determine the Trade secrete law, determination of trade secrete status, unfair competition.	L5
CO5	Identify the new development of intellectual property and international overview on intellectual property, and development in trade secrets law.	L2

Course Name: Professional Practice, Law & Ethics **Course Code: SM702MS**

At the end of this course each student should be able to:

CO1	The students will understand the importance of professional practice.	L2
CO2	The students will learn the rights and responsibilities as an employee, team member and a global citizen	L2
CO3	The students will develop some ideas of the legal and practical aspects of their profession..	L2
CO4	The students will understand the Law and Ethics in their personal lives and professional careers	L2

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Course name: Microwave and Optical Communications Lab **Course Code: EC703PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Verify characteristics of Reflex Klystron.	L3
CO2	Analyze various parameters of Waveguide Components.	L4
CO3	Estimate the power measurements of RF Components such as directional Couplers.	L3
CO4	Demonstrate characteristics of various optical sources.	L2
CO5	Measure data Rate, Numerical Aperture and Losses in Optical Link.	L5

Course name: Industrial Oriented Mini Project **Course Code: EC704PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze the challenges in the practical problems.	L4
CO2	Evaluate the solutions by formulating proper methodology	L5
CO3	Analyze various skills and perform well in teams.	L4
CO4	Apply the well in team Works.	L3
CO5	Evaluate the communication skillin facing reviews and contribute societal development.	L5

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Course name: Seminar **Course Code: EC705PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To study research papers for understanding of a new field, in the absence of a textbook, to summarize and review them.	L2
CO2	To identify promising new directions of various cutting edge technologies	L2
CO3	To impart skills in preparing detailed report describing the project and results	L3
CO4	To effectively communicate by making an oral presentation before an evaluation committee	L3
CO5		

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Course outcomes

YEAR: IV **Semester: II** **Regulation: R18**

Course name: Wireless sensor networks **Course Code: ECE013PC601PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Analyze and compare various architectures of Wireless Sensor Networks	L3
CO2	Understand Design issues and challenges in wireless sensor networks.	L2
CO3	Analyze and compare various data gathering and data dissemination methods.	L3
CO4	Design, Simulate and Compare the performance of various routing and MAC protocol	L5
CO5	Study about design principals, node architectures, hardware and software required for implementation of wireless sensor networks.	L1

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Course name: System on Chip Architecture **Course Code: EC821PE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Expected to understand SOC Architectural features	L5
CO2	To acquire the knowledge on processor selection criteria and limitations	L2
CO3	To acquires the knowledge of memory architectures on SOC.	L2
CO4	To understands the interconnection strategies and their customization on SOC.	L2

Course name: Total Quality Management **Course Code: MT802OE**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	To realize the importance of significance of quality	L2
CO2	Manage quality improvement teams	L2
CO3	Identify requirements of quality improvement programs	L3
CO4	Aware about quality for various manufacturing process	L4
CO5	To update on the various quality followed in current days.	L2

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Course name: Project Stage - II **Course Code: EC801PC**

At end of this course, each student should be able to:

S.NO	COURSE OUTCOMES	Bloom's Taxonomy Levels
CO1	Design identifies basic requirements for an applicationand proposes a effective solution.	L5
CO2	State Build knowledge through practical assignments and learn the various design methods for solving problem	L1
CO3	Develop skill to build design techniques for various problem analyses.	L5
CO4	Use the fundamental concepts and techniques used inmini project.	L3
CO5	Value project enables the student to understand thebusiness process	L3

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