Vidyavardhini's college of Engineering & Technology Vasai(w)
Department of Electronics & Telecommunication Engineering
Course Outcomes for R-2016 Syllabus

Program Outcomes (POs)

Engineering Graduates will be able to:

- **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9. Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

At the end of the program engineering graduate will be able to:

1. Apply the knowledge of Electronics and Communication to analyse, design and

implement application specific problems with modern tools.

2. Adapt emerging technologies with continuous learning in the field of Electronics and Telecommunication engineering with appropriate solutions to real life problems.

FEC101	C101	Applied Mathematics I
FEC101.1	C101.1	Students will be able to apply the concepts of Complex Numbers,hyperbolic functions and logarithmsto solve engineering problems.
FEC101.2	C101.2	Students will be able to solve and Analyze Partial Derivatives and apply it in related field of Engineering
FEC101.3	C101.3	Students will be able to apply principals of basic operations of matrices , rank and echelon form of matrices to solve linear simultaneous equations & Curve Fitting
FEC101.4	C101.4	Students will be able Apply Numerical Methods and Inculcate the habit of Mathematical thinking through Indeterminate forms, Taylor's Series Expansion and by using Scilab.
FEC102	C102	Applied Physics I
FEC102.1	C102.1	Students will be able to draw miller indices using concept of crystallography and Identify crystal structure using X-ray diffraction techniques viz. Laue method, rotating crystal method & powder method
FEC102.2	C102.2	Students will be able to determine the output of LED, photoconductor and photovoltaic cell applying concepts of semiconductor physics
FEC102.3	C102.3	Students will be able to classify dia,para and Ferromagnetic materials based on susceptibility value using qualitative treatment of Langvein and Weiss equation
FEC102.4	C102.4	Students will be able to design acoustic of hall/auditorium using reasons for acoustic defects and Select method for production of ultrasonic waves
FEC103	C103	Applied Chemistry I
FEC103.1	C103.1	Students will be able to analyze the quality of water and suggest methods of treatment.
FEC103.2	C103.2	Students will be able to illustrate the knowledge of polymers, fabrication methods, conducting polymers in industrial fields.
FEC103.3	C103.3	Students will be able to apply the knowledge of lubricants, their properties & mechanism to avoid frictional resistance and interpret phase transformations using thermodynamics
FEC103.4	C103.4	Students will be able to demonstrate knowledge of portland cement.
FEC104	C104	Engineering Mechanics
FEC104.1	C104.1	Illustrate the concept of resultant for different types of force systems and locate the centroid for plane composite lamina
FEC104.2	C104.2	Analyse the support reactions, trusses and real life application of friction by using conditions of equilibrium.
FEC104.3	C104.3	Analyse the motion of particles and rigid bodies by establishing the kinematic relation between displacemnt, velocity and acceleration.
FEC104.4	C104.4	Analyse body in motion using force and acceleration, work-energy, impulse-momentum principles
FEC105	C105	Basic Electrical & Electronics Engineering
FEC105.1	C105.1	understand fundamentals of DC circuits and apply knowledge for analyzing network theorems in DC circuits.
FEC105.2	C105.2	learn the fundamentals and analyze single phase AC circuits and three phase AC circuits

FEC105.3	C105.3	learn the basic operation and analyze the performance of single-phase transformer.
FEC105.4	C105.4	Illustrate concepts of semiconductor devices like rectifiers, filters and BJT.
FEC106	C106	Environmental Studies
FEC106.1	C106.1	Students will be able to classify essential resources and control measures for sustainable development.
FEC106.2	C106.2	Students will be able to illustrate sources and effects of environmental decay.
FEC106.3	C106.3	Students will be able to select renewable sources of energy and technology essential for sustainable development.
FEC106.4	C106.4	Students will be able to apply the regulations of Environmental Protection Act and other bodies for perpetuation of environment.
FEL101	C107	Basic Workshop practice-I
FEL101.1	C107.1	Students will be able to model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL101.2	C107.2	Students will be able to model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL101.3	C107.3	Students will be able to perform various basic House Wiring techniques while taking care of electrical safety.
FEL101.4	C107.4	Students will be able to perform various basic domestic plumbing operations such as pipe cutting, threading, fitting etc.
FEC201	C108	Applied Mathematics II
FEC201.1	C108.1	Students will be able to apply euler, runge kutta method to solve differential equations of second and fourth order and apply trapezoidal, simpson's 1/3rd, simpson's ⅜ th rule to solve definite integrals numericaly and by using scilab.
FEC201.2	C108.2	Students will be able to solve differential equations of first order, first degree and engineering problems representable in form of linear differential equations with constant coefficients, Cauchy's/Legendre's homogenous equations
FEC201.3	C108.3	Students will be able to apply Beta, Gamma functions and D.U.I.S.to evaluate definite integrals.
FEC201.4	C108.4	Students will be able to apply double /triple integration to find area, mass, volume and find length of the curve using scilab and rectification method.
FEC202	C109	Applied Physics II
FEC202.1	C109.1	Calculate thickness of thin wire or foil to wedge-shaped thin film, refractive index, wavelength of light /or radius of curvature to Newton's rings in interference application and calculate missing order, grating element wavelength of light using diffraction grating considering parameter viz resolving power of grating
FEC202.2	C109.2	Calculate critical angle, angle of acceptance, V number, number of modes of propagation, numerical aperture of step index fibre and compare characteristics of images received by photography and holography
FEC202.3	C109.3	Determine non-existence of electrons in the nucleus using uncertainty principle and calculate motion of free particle using time independent and time dependent Schrodinger wave equation.
FEC202.4	C109.4	Apply concept of electromagnetism in focussing system and CRO
FEC203	C110	Applied Chemistry II
FEC203.1	C110.1	Illustrate types of corrosion & suggest control measures in industries.
FEC203.2	C110.2	Analyze the quality of fuel & calculate the oxygen required for combustion of fuel.

FEC203.3	C110.3	Illustrate composition, properties of alloys & properties & application of composite material.
FEC203.4	C110.4	Illustrate the principles of green chemistry
FEC204	C111	Engineering Drawing
FEC204.1	C111.1	Apply the basic principles of projections in Projection of Lines, Planes and Engineering Curves
FEC204.2	C111.2	Apply the basic principles of projections in Projection of Solids & Section of solids
FEC204.3	C111.3	Visualize the given 3D object and draw Orthographic projections
FEC204.4	C111.4	Draw Isometric view from the given orthographic projections
FEC204.5	C111.5	Draw Orthographic and Isometric Projection using AutoCad
FEC205	C112	Structured Programming Approach
FEC205.1	C112.1	Students will be able to write an algorithm to support Structure Programming approach.
FEC205.2	C112.2	Students will be able to use variables, derived data types and control structures to write c program
FEC205.3	C112.3	Students will be able to use Strings and Functions to solve complex computational problem
FEC205.4	C112.4	Students will be able to use Pointers, Structure-Union and Files for solving complex computational problem
FEC206	C113	Communication Skills
FEC206.1	C113.1	Students develop the ability to understand the importance of communication fundamentals
FEC206.2	C113.2	Student apply techniques to improve oral communication & develop their own speaking style
FEC206.3	C113.3	Students acquire the letter writing skills and produce the letters in any given situation
FEC206.4	C113.4	Student learn all the important aspects of reading including skimming, scanning , note making and understand discourse coherence.
FEL201	C114	Basic Workshop practice-II
FEL201.1	C114.1	Model different prototypes in the carpentry trade such as Cross cut lap joint, Tee lap joint, Dovetel lap joint.
FEL201.2	C114.2	Model various basic prototypes in the trade of fitting such as Square, Hexagonal and V Male Female joint.
FEL201.3	C114.3	Read various basic Layout drawing; make positive and negative film, and perform PCB etching and drilling, Tinning and soldering operations.
FEL201.4	C114.4	Dismantle and Assemble a Personal Computer, perform Basic troubleshooting and maintenance, identify network components and perform Basic networking and crimping.
ETS301	C201	Applied Mathematics III
ETS301.1	C201.1	Apply Laplace transform, Inverse Laplace transform to different applications.
ETS301.2	C201.2	Apply the concept of Fourier Series for expansionof periodic functions.
ETS301.3	C201.3	Apply Principles of Vector differentiation and Integral calculus to the analysis of engineering problems.
ETS301.4	C201.4	Understand complex variables and functions and perform mapping using different techniques and Bessels functions

ETC302	C202	Analog Electronics I
ETC302.1	C202.1	Students will be able to understand and demonstrate VI characterstics of semiconductor devices and it's applications.
ETC302.2	C202.2	Students will be able to analyse various biasing techniques of BJT, FET.
ETC302.3	C202.3	Students will be able to examine ac analysis of BJT, JFET amplifier using low and mid frequency models.
ETC302.4	C202.4	Students will be able to explain the concept of feedback and distinguish types of oscillators.

ETC303	C203	Digital Electronics
ETC303.1	C203.1	Students will be able to explain number systems and their conversion, boolean function representation and its minimisation techniques as well as categorize different semiconductor memories.
ETC303.2	C203.2	Students will be able to design and develop various types of combinational logic circuits.
ETC303.3	C203.3	Students will be able to design and develop sequential logic circuits with real time applications.
ETC303.4	C203.4	Students will be able to explain different types of memories, concept of programmable devices and write VHDL code for combinational and sequential circuits .

ETC304	C204	Circuits and Transmission Lines
ETC304.1	C204.1	Analyse the steady state behavior of DC and AC circuits with dependent and independent source
ETC304.2	C204.2	Calculate the behavior of electric circuits and transmission lines in time and frequency domain
ETC304.3	C204.3	characterise electric circuits in terms of its impedance, admittance and two port parameters
ETC304.4	C204.4	Design RLC circuits and matching circuits for a required impedance or admittance function

ETC305	C205	Electronic Instruments and Measurements
ETC305.1	C205.1	Students will be able to apply the basic knowledge of working sensors & transducers used in electronic Measurement.
ETC305.2	C205.2	Students will be able to Differentiate operating modes of CRO/DSO
ETC305.3	C205.3	Students will be able to test & Measure of Resistance, capacitance, inductance values of bridges.
ETC305.4	C205.4	Students will be able to Use the concept of signal analyzer & acquisition system for application

ETL301	C207	Analog Electronics I Laboratory
ETL301.1	C207.1	Students willl be able to analyze V I characteristic of semiconductor devices and operation of circuits like clipper and clamper.
ETL301.2	C207.2	Students willl be able to analyze and compare parameters of various biasing techniques of BJT & FET .
ETL301.3	C207.3	Students will be able to sketch and analyze frequency response of multistage amplifier
ETL301.4	C207.4	Students will be able to design and analyze performance of oscillator circuit.

ETL302	C208	Digital Electronics Laboratory
ETL302.1	C208.1	Students will be able to analyse performance of various basic gates,universal gates and code converters.
ETL302.2	C208.2	Students will be able to design and analyze performance of various combinational circuits.
ETL302.3	C208.3	Students will be able to design and analyze performance of various sequential circuits.
ETL302.4	C208.4	Students will be able to write Verilog/ VHDL codes for Combinational and sequential circuits.
ETL303	C209	Circuits and Measurement Laboratory
ETL303.1	C209.1	Students will be able to Illustrate the basic knowledge of working sensors & transducers
ETL303.2	C209.2	Students will be able to Evaluate the values of Resistance, capacitance, inductance of bridges.
ETL303.3	C209.3	Students will be able to analyse the behavior of DC and AC circuits with source
ETL303.4	C209.4	Students will be able to analyse and calculate impedance, admittance and two port parameters in electric circuits
ETSL304	C210	Object Oriented Programming Methodology, Laboratory
ETSL304.1	C210.1	Students will be able toApply Object Oriented Programming principles
ETSL304.2	C210.2	Students will be able to Implement the concept of Class, Object & Method
ETSL304.3	C210.3	Students will be able to Implement program on inheritance, interface and packages
ETSL304.4	C210.4	Students will be able to Implement run time programming concepts using multi-threading & applets
ETS401	C211	Applied Mathematics IV
ETS401.1	C211.1	Apply matrix theory to solve the system of linear equations and eigen values and eigen vectors and their applications.
ETS401.2	C211.2	Evaluate contour Integration and expand theanalytic functions inside circle.
ETS401.3	C211.3	Apply Gram Schmidt Process to find orthonormal basis and Illustrate properties of vector space,subpace over real field.
ETS401.4	C211.4	Apply theory of calculus of variation to solve Isometric problems , functions independent of a variable and independent of both variables .
ETC402	C212	Analog Electronics II
ETC402.1	C212.1	To analyze & design multistage amplifier using BJT & FET in various configuration to determine frequency response &voltage gain.
ETC402.2	C212.2	To distinguish various power amplifiers and differential amplifiers.
ETC402.3	C212.3	To analyze and compare various integrated circuit biasing techniques.
ETC402.4	C212.4	To apply basics of Op-amp and Regulators.
ETC403	C213	Microprocessors and Peripherals
ETC403.1	C213.1	Examine the Architecture of microprocessor 8085, 8086.
ETC403.2	C213.2	Develop assembly language program of 8086 microprocessor for arithmetic, logical, string, timer/counter and Input Output operations.
ETC403.3	C213.3	Analyze peripheral devices, co-processor and its interfacing with 8086 microprocessors and design of microprocessor-based system.
ETC403.4	C213.4	Examine the concepts of advance Microprocessors.

ETC404	C214	Wave Theory and Propagation
ETC404.1	C214.1	To solve electric and magnetic fields for various charge and current distributions
ETC404.2	C214.2	To compute phenomenon of wave propagation through different medium
ETC404.3	C214.3	To solve electromagnetic problems using numerical techniques
ETC404.4	C214.4	To compare various mechanisms for wave propagation
ETC 405	C215	Signals and Systems
ETC 405.1	C215.1	Understand basics of signals and systems and categorize signals and systems based on input, output, and processing.
ETC 405.2	C215.2	Analyze CT/DT systems and evaluate response for CT/DT systems.
ETC 405.3	C215.3	Analyze CT systems in time domain and transformed domain using Laplace transform and Fourier Analysis.
ETC 405.4	C215.4	Analyze DT systems in time domain and transformed domain using Z transform and Fourier Analysis.
ETC406	C216	Control Systems
ETC406.1	C216.1	Students will be able to understand basic concepts of control system and apply this knowledge to derive the mathematical model of system.
ETC406.2	C216.2	Students will be able to compute and compare Transfer Function of a system with various techniques.
ETC406.3	C216.3	Students will be able to evaluate stability of systems in time and frequency domain.
ETC406.4	C216.4	Student will be able to apply the control theory to design the conventional controllers widely used in the industries.
ETL401	C217	Analog Electronics II Laboratory
ETL401.1	C217.1	Students will be able to analyze frequency response,overall gain and bandwidth of multistage amplifier.
ETL401.2	C217.2	Students will be able to analyze and reconstruct distortion in power amplifier .
ETL401.3	C217.3	Students will be able to design and analyze differential amplifier outputs in differential and common mode signals using simulations.
ETL401.4	C217.4	Students will be able to demonstrate applications of Op-amp and working of Regulators.
ETL402	C218	Microprocessors and Peripherals Lab
ETL402.1	C218.1	Students will be able to write assembly langauge program for arithmatic operations.
ETL402.2	C218.2	Students will be able to develop assembly langauge program for arrays .
ETL402.3	C218.3	Students will be able to write assembly language program based on string instrunctions.
ETL402.4	C218.4	Students will be able to assemble a program for interfacing 8255 PPI ,D/A converter with 8086 Microprocessor
ETL403	C219	Software Simulation Lab
ETL403.1	C219.1	Write programs to of signal processing and communication using MATLAB.
ETL403.2	C219.2	Write program to analyse the stabilty of control system using MATLAB.
ETL403.3	C219.3	Design, implement and test the performance of combinational circuits in SIMULINK.
ETL403.4	C219.4	Create and examine performance of electrical circuits using PSPICE.

ETC501	C301	Microcontrollers and Applications
ETC501.1	C301.1	Students will be able to demonstrate Architecture of 8051 microcontroller and examine its concepts.
ETC501.2	C301.2	Students will be able to develop assembly language program for 8051 microcontroller for aritmatic,logical, dealay,input,output,serial communication and interrupts..
ETC501.3	C301.3	Students will be able to examine concept of advance microcontroller ARM7 & develop its program.
ETC501.4	C301.4	Students will be able to interface various peripheral devices with 8051 microcontroller.
ETC502	C302	Analog Communication
ETC502.1	C302.1	Students will be able to understand the fundamentals of communication, significance of noise and apply this knowledge to evaluate the effects of noise in communication systems
ETC502.2	C302.2	Students will be able to explain the concepts of AM Modulation/ Demodulation and distinguish among all AM systems along with their applications .
ETC502.3	C302.3	Students will be able to analyse Angle modulation/demodulation techniques and illustrate the working principles of FM transmitter/ receiver.
ETC502.4	C302.4	Students will be able to understand the concept of analog Pulse modulation/ demodulation and compare multiplexing/ De-multiplexing techniques with their applications.
ETC503	C303	Random Signal Analysis
ETC503.1	C303.1	Students will be able to explain and apply concepts of Probability theory to solve relevant problems
ETC503.2	C303.2	Students will be able to differentiate random variables on the basis of CDF, PDF, PMF and also Joint, marginal and conditional CDF, PDF, PMF
ETC503.3	C303.3	students will be able to apply fundamentals of Random processes add analyze types of processes.
ETC503.4	C303.4	students will be able to apply basics of Markov Chains and relate it to real world applications.
ETC504	C304	RF Modeling and Antennas
ETC504.1	C304.1	Student will be able to analyse lumped and distributed element filter.
ETC504.2	C304.2	Student will be able to explain and apply fundamentals of electromagnetics.
ETC504.3	C304.3	Student will be able to analyse various wire and special types of antennas .
ETC504.4	C304.4	Student will be able to analyse antenna arrays.
ETC505	C305	Integrated Circuits
ETC505.1	C305.1	Student will be able to describe fundamentals of operational amplifier and analyse linear applications
ETC505.2	C305.2	Student will be able to describe and analyse non- linear applications of OP-AMP.
ETC505.3	C305.3	Student will be able to analyse and design different types of timers and voltage regulators.
ETC505.4	C305.4	Student will be able to to analyse and design different types of counters and shift registers.

ETS506	C306	Business Communication and Presentation Skills
ETS506.1	C306.1	Develop the interpersonal skills to progress professionally by building stronger relationships
ETS506.2	C306.2	Design a technical document using precise language, suitable vocabulary and apt style
ETS506.3	C306.3	Apply the techniques to participate in Group Discussions, Interviews and resume writing for self recruitment.
ETS506.4	C306.4	Display competence required for professional career growth

ETL501	C307	Microcontrollers and Applications Laboratory
ETL501.1	C307.1	Students will be able to write assembly langauge program for arithmatic operations.
ETL501.2	C307.2	Students will be able to develop assembly langauge program for arranging arrays .
ETL501.3	C307.3	Students will be able to assemble a program for interfacing of D/A converter, stepper motor with 8051 Microcontroller.
ETL501.4	C307.4	Students will be able to write a assembly languge program for ARM7 processor.

ETL502	C308	Communication Engineering Lab I
ETL502.1	C308.1	Students will be able to Analyse AM transmitter/ Receiver waveforms in time and frequency domain
ETL502.2	C308.2	Students will be able to Analyse FM transmitter/ Receiver waveforms in time and frequency domain and simulate FM
ETL502.3	C308.3	Students will be able to analyse and verify working of Pre-emphasis/ De-emphasis, Sample and Hold and PWM circuits
ETL502.4	C308.4	Students will be able to Demonstrate working principle of Time Division Multiplexing.

ETL503	C309	Communication Engineering Lab-III
ETL503.1	C309.1	Students will be able to construct and analyse various application circuits using OP-AMP.
ETL503.2	C309.2	Students will be able to construct and analyse various application circuits using special purpose Ics
ETL503.3	C309.3	Student will be able to design and analyse lumped and distributed element filters .
ETL503.4	C309.4	Students will be able to design and analyse the behaviour of different wire antennas using 4NEC2.

ETL504	C310	Mini Project I
ETL504.1	C310.1	Select the appropriate hardware project through proper survey.
ETL504.2	C310.2	Implement and trouble-shoot the circuit.
ETL504.3	C310.3	Design PCB layout using Eagle software and fabricate the same.
ETL504.4	C310.4	Write and present their work effectively with ethical values.

ETC601	C311	Digital Communication
ETC601.1	C311.1	Explain components of digital communication system, Information theory and source coding techniques and apply this knowledge to compute Entropy of sourec
ETC601.2	C311.2	Compare Bandpass modulation and demodulation schemes based on power spectra, bandwidth, spectral efficiency, bit rate and their applications
ETC601.3	C311.3	Evaluate types of error control codes for reliable transmission of digital signal
ETC601.4	C311.4	Analyse spreading techniques and determine bit error performance
ETC602	C312	Discrete Time Signal Processing
ETC602.1	C312.1	Students will be able to analyze frequency response of LTI system and determine output of frequency selective filters.
ETC602.2	C312.2	Students will be able to analyze behavior of discrete time system using DFT and its properties.
ETC602.3	C312.3	Students will be able to design Infinite Impulse Response / Finite Impulse Response to meet desired specifications.
ETC602.4	C312.4	Students will be able to design decimator, interpolator, analyze Finite Word Length effects and use signal processing algorithms for various applications.
ETC603	C313	Computer Communication and Telecom Networks
ETC603.1	C313.1	Describe and compare computer networking terminologies, reference models, physical layer services and systems.
ETC603.2	C313.2	Analyze data link layer protocols at logical link control and medium access control sublayers.
ETC603.3	C313.3	Classify the routing protocols and Design the network using IP addressing and subnetting schemes.
ETC603.4	C313.4	Describe and analyze transport layer protocols and its services.
ETC604	C314	Television Engineering
ETC604.1	C314.1	Students will be able to distinguish among transmission & reception of picture signal in Analog Television and analyze the working principle of camera tubes.
ETC604.2	C314.2	Students will be able to analyze the generation of colour signal in colour television .
ETC604.3	C314.3	Student will be able to analyze the fundamental concept of digital & advance television systems..
ETC604.4	C314.4	Students will be able to compare the working principle of LED, LCD, Plasma, High definition and Wide dimension systems and there standards
ETC606	C316	VLSI Design
ETC606.1	C316.1	Students will be able to demostrate MOS fabrication process, technology scaling and its issues.
ETC606.2	C316.2	Students will be able to realize combinational and sequential circuits using different design style, draw their layouts and compare their performance parameter.
ETC606.3	C316.3	Students will be able to distinguish memories depending upon its usage and operation.
ETC606.4	C316.4	Students will be able to demonstrate an understanding of working principles of clocking styles ,distribution,interconnect and power reduction.

ETL601	C317	Discrete Time Signal Processing Laboratory
ETL601.1	C317.1	Students will be able to analyze frequency response and pole zero plot of frequency selective filters in MATLAB
ETL601.2	C317.2	Students will be able to to determine response of digital filter by convolution, implemented using DFT, IDFT, Overlap save and overlap add methods in MATLAB
ETL601.3	C317.3	Students will be able to to design and verify the response of IIR and FIR filters using MATLAB.
ETL601.4	C317.4	Students will be able to Analyze concept of multirate signal processing by implementing decimator and interpolator in MATLAB
ETL602	C318	COMMUNICATION ENGG LAB III (Digital Communication Laboratory + CCN)
ETL602.1	C318.1	Implement and analyze digital modulation schemes in time and frequency domain.
ETL602.2	C318.2	Simulate and analyze source coding and channel coding techniques.
ETL602.3	C318.3	Perform configurations on routers and switches to design a network using simulator.
ETL602.4	C318.4	Demonstrate an understanding of the significance of protocols in computer networks using simulator.
ETL603	C319	COMMUNICATION ENGG. LABORATORY IV (VLSI DESIGN + TV LAB)
ETL603.1	C319.1	Students will be able to analyse and compare MOS scaling,Mos inverters and their VTC.
ETL603.2	C319.2	Students will be able to sketch and simulate layouts for different MOS circuits using MICROWIND.
ETL603.3	C319.3	Students will be able to analyze composite video signal of Monochrome & colour television
ETL603.4	C319.4	Students will be able to test the monochrome & colour television kits to find faults
ETL604	C320	Mini Project II
ETL604.1	C320.1	Select the appropriate software/simulation project through proper survey.
ETL604.2	C320.2	Design and implement project using appropriate method.
ETL604.3	C320.3	Carry out performance analysis of the implemented method using quantitative measures.
ETL604.4	C320.4	Write and present their work effectively with ethical values.
ETC701	C401	Image and Video Processing
ETC701.1	C401.1	Students will be able to understand and apply basics of monochrome and color image processing.
ETC701.2	C401.2	Students will be able to select among various spatial domain and frequency domain filtering techniques and apply them for image enhancement.
ETC701.3	C401.3	Students will be able to perform image segmentation, morphological operations and

		image restoration operations for the application in hand.
ETC701.4	C401.4	Students will be able to interpret and apply quantitative models for various fields of digital video processing.
ETC702	C402	Mobile Communication
ETC702.1	C402.1	Understand the design concepts of cellular system and apply to compute coverage and capacity of system
ETC702.2	C402.2	Classify the types of propagation model and design practical link budget to estimate path loss
ETC702.3	C402.3	Analyze the evolution of mobile technologies from 2G to 4G with their system architecture, specifications, advantages and challenges
ETC702.4	C402.4	Illustrate emerging technologies required for 4G mobile system
ETC703	C403	Optical Communication and Networks
ETC703.1	C403.1	Describe and analyze fundamental parameters and transmission characteristics of optical communication.
ETC703.2	C403.2	Compare principle of working and characteristics of sources, detectors and formulate a link power budget.
ETC703.3	C403.3	Describe and distinguish optical networks and system components.
ETC703.4	C403.4	Illustrate access networks,power penalty and network management functions .
ETC704	C404	Microwave and Radar Engineering
ETC704.1	C404.1	Students will be able to explain and analyse the working of waveguides and waveguide components.
ETC704.2	C404.2	Students will be able to analyse and design impedance matching and tunning networks.
ETC704.3	C404.3	Students will be able to describe the operation and analyse the microwave tubes and microwave semiconductor devices.
ETC704.4	C404.4	Students will be able to describe the working and analyse types of RADARS and microwave applications.
ETE 701	C405	Data Compression and Encryption
ETE 701.1	C405.1	Student will be able to apply Modular arithmetic for encryption and decryption algorithm.
ETE 701.2	C405.2	Student will be Able to Analyze symmetric & asymmetric key by number theory concept
ETE 701.3	C405.3	Students will be able to design algorithm For compression Of Text files
ETE 701.4	C405.4	Students will be able to differentiate between image & video compression techniques
ETE 703	C407	Neural Network and Fuzzy Logic
ETE 703.1	C407.1	Compare and contrast among types of neural networks based on architecture and training algorithm.
ETE 703.2	C407.2	Analyze Neural Network algorithms for applications in the field of pattern recognition and classification.
ETE 703.3	C407.3	Solve fuzzification and defuzzification methods to select the best one based on the application.

ETE 703.4	C407.4	Design Fuzzy Controller System for real time applications.
ETL701	C409	Image and Video Processing Laboratory
ETL701.1	C409.1	Modify spatial and gray scale resolution of the image using MATLAB.
ETL701.2	C409.2	Perform spatial and frequency domain filtering for image enhancement using MATLAB.
ETL701.3	C409.3	Use and apply image transform using MATLAB for application in hand.
ETL701.4	C409.4	Perform image restoration operations and morphological operations on images using MATLAB.
ETL702	C410	Advanced communication Engineering. Laboratory I
ETL702.1	C410.1	Examine the effect of cluster size on system capacity and quality of service (S/I) using MATLAB.
ETL702.2	C410.2	Analyse Trunk radio system by calculating blocking probability for Erlang B and Erlang C system using MATLAB
ETL702.3	C410.3	Construct orthogonal codes (PN sequence, convolutional code and Walsh code) of length n for 2G and 3G mobile system using MATLAB
ETL702.4	C410.4	Analyse the effect of small-scale fading parameters on the performance of radio channel
ETL703	C411	Advanced Engineering.Laboratory II
ETL703.1	C411.1	Analyze different parameters for propagation of light inside fiber and design a step index fiber with given specifications using simulator.
ETL703.2	C411.2	Examin performance of fiber optic link , optical sources and detectors.
ETL703.3	C411.3	Analyse and implement distributed and Lumped type of impedance matching network.
ETL703.4	C411.4	Analyse and implement waveguide and microwave components.
ETEL701	C412	Data Compression and Encryption
ETEL701.1	C412.1	Students will be able to Write algorithm for lossless compression technique in MATLAB
ETEL701.2	C412.2	Students will be able to implement Lossy compression techniques in MATLAB
ETEL701.3	C412.3	To develop arithmetic coding & find the tag value in MATLAB
ETEL701.4	C412.4	To implement the algorithm in MATLAB of encryption & decryption for given plain text
ETEL703	C414	Neural Network and Fuzzy Logic
ETEL703.1	C414.1	Develop the logic given in problem statement using algorithms in Neural Network and implement it in MATLAB using algorithms in Neural Network and implement it in MATLAB
ETEL703.2	C414.2	Analyze Neural Network algorithms for applications in the field of pattern recognition and classification.
ETEL703.3	C414.3	Solve fuzzification and defuzzification methods to select the best one based on the application.
ETEL703.4	C414.4	Design Fuzzy Controller System for real time applications.

ETP701	C416	PROJECT I
ETP701.1	C416.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and propose appropriate solution to solve the problem.
ETP701.2	C416.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ETP701.3	C416.3	Analyze and compare the results with the standard results.
ETP701.4	C416.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ETP701.5	C416.5	Write and present their work effectively with ethical values.
ETP701.6	C416.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
ETC801	C417	Wireless Networks
ETC801.1	C417.1	Explain and illustrate concepts and specifications of cellular systems
ETC801.2	C417.2	Design and evaluate link budgets for Wide area wireless networks.
ETC801.3	C417.3	Compare and contrast different emerging PAN technologies
ETC801.4	C417.4	Explain and illustrate WSN technology with its protocol stack
ETC802	C418	Satellite communication and Networks
ETC802.1	C418.1	Students will be able to compare and contrast between different terminologies and nomenclatures in relation to satellites and satellite communication
ETC802.2	C418.2	Students will be able to differentiate between various satellite subsystems and earth stations
ETC802.3	C418.3	Students will be able to analyse and design a link budget considering various losses
ETC802.4	C418.4	Students will be able to compare and appraise various protocols involved in satellite network and laser satellite communication
ETC803	C419	Internet and Voice Communication
ETC803.1	C419.1	Students will be able to explain the features and analyse the application layer protocols such as FTP, DNS, DHCP and SMTP.
ETC803.2	C419.2	Students will be able to explain the transport layer protocols and analyse the srvices such as flow control, error control and congestion control.
ETC803.3	C419.3	Students will be able to calculate addresses , apply subnet masks and design the subnetworks to fulfill networking requirements
ETC803.4	C419.4	Students will be able to analyze the issues in providing quality-of-service for multimedia and real time applications.
ETE 802	C421	Telecom Network Management
ETE 802.1	C421.1	Students will be able to explain fundamental Principles of TNM and discuss case histories of the same.
ETE 802.2	C421.2	students will be able to differentiate between network management models
ETE 802.3	C421.3	Students will be able to use network management fundamental Principles in TCP/IP based Internet Model using SNMP.

ETE 802.4	C421.4	Students will be able describe Broadband network management and TMN architecture with its Interfaces.
ETL801	C424	Wireless Networks Laboratory
ETL801.1	C424.1	Explain and Compare different Software tools available for Wireless Networks.
ETL801.2	C424.2	Students will be able to describe and demonstrate WCDMA and Bluetooth concepts in MATLAB(SIMULINK).
ETL801.3	C424.3	Design and develop ZIGBEE, CDMA network using NETSIM.
ETL801.4	C424.4	Explain and illustrate different applications of WSNs.
ETL802	C425	Satellite communication and Networks Laboratory
ETL802.1	C425.1	Students will be able to develop a communication link through transponder.
ETL802.2	C425.2	Students will be able to design and simulate link budget for satellite link.
ETL802.3	C425.3	Students will be able to analyse C/N ratio and FHSS in MATLAB
ETL802.4	C425.4	Students will be able to compute RSS of DTH.
ETL803	C426	Internet and Voice Communication Laboratory
ETL803.1	C426.1	Students will be able to configure DNS, DHCP client server system using cisco packet tracer.
ETL803.2	C426.2	Students will be able to analyse and Implement transport layer services such as congestion control, error control using NETSIM.
ETL803.3	C426.3	Students will be able to design local and wide area networks using both static and dynamic addressing techniques.
ETL803.4	C426.4	Students will be able to configure VOIP TELEPHONE using cisco packet tracer.
ETEL802	C428	Telecom Network Management
ETEL802.1	C428.1	Students will be Able to differentiate Commercial Monitoring & Open source tools
ETEL802.2	C428.2	Students will be Able to Design & simulate SNMP based management network RW & read only communicates using cisco packet tracer
ETEL802.3	C428.3	Students will be Able to demonstrate network Audit ,ASN commands & Network commands for WLAN
ETEL802.4	C428.4	Students will be Able to design & simulate Routimg configuration of layer 3 & VLAN network using cisco packet tracer
ETP801	C431	PROJECT II
ETP801.1	C431.1	Explore beyond the curriculum to identify problem of society, industrial or research needs; investigate the problem through in-depth literature survey and propose appropriate solution to solve the problem.
ETP801.2	C431.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ETP801.3	C431.3	Analyze and compare the results with the standard results.
ETP801.4	C431.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ETP801.5	C431.5	Write and present their work effectively with ethical values.
ETP801.6	C431.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.