Department of Electronics & Telecommunication Engineering
Revise Syllabus 2019-20
Program Outcomes
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 analyse 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 modelling 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

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

PSO1. Apply the knowledge of Electronics and Communication to analyse, design and implement application-specific problems with modern tools.

PSO2: Adapt emerging technologies with continuous learning in the field of Electronics and Telecommunication engineering with appropriate solutions to real life problems.

Course Outcomes

At the end of the semester, the student will able to

ECC301	Engineering Mathematics III
ECC301.1	Apply the concept of Laplace transform and its application to solve the real integrals in engineering problems.
ECC301.2	Apply the concept of inverse Laplace transform on various functions and its applications in engineering problems.
ECC301.3	Apply the concept of Fourier series to expand periodic function.
ECC301.4	Apply complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
ECC301.5	Apply matrix theory to solve the system of linear equations, eigen values, eigen vectors and their applications.
ECC301.6	Apply principles of vector differentiation and integration to engineering problem.
ECC302	Electronic Devices & Circuits

ECC302.1	Explain working principle of semiconductor devices and its characteristics.
ECC302.2	Examine biasing techniques of BJT, JFET and MOSFET.
ECC302.3	Determine small signal performance parameters for BJT (CE) amplifier and EMOSFET (CS) amplifier
ECC302.4	Illustrate frequency response of BJT and MOSFET amplifier.
ECC302.5	Compare the power amplifier based on efficiency and power consumption.
ECC302.6	Explain the working principal of differential amplifier.
ECC303	**Digital System Design**
ECC303.1	Explain Number systems and logical operations.
ECC303.2	Explain working of logic gates and logic families.
ECC303.3	Apply the concepts of logic operations to design and implement combinational circuits.
ECC303.4	Apply the concepts of logic operations to design and implement sequential circuits.
ECC303.5	Classify types of memories and Programmable Logic Devices (PLDs).
ECC303.6	Apply concepts of VHDL / Verilog to describe digital circuits.
ECC304	**Network Theory**
ECC304.1	Apply the knowledge of KVL and KCL in analysing Circuits by using network theorems
ECC304.2	Apply the time and frequency method of analysis.
ECC304.3	Evaluate circuit using graph theory
ECC304.4	Find the various parameters of two port network.
ECC304.5	Explains network functions for one port and two port and analyse their behaviour in terms of poles and zeros.
ECC304.6	Synthesize the network using passive elements.
ECC305	**Electronic Instrumentation & Control Systems**
ECC305.1	Explain the working principle of testing and measuring instruments.
ECC305.2	Explain working principle of sensors and transducers with their applications
ECC305.3	Examine various techniques to compute Transfer Function of a system
ECC305.4	Analyse transient and steady state response of first and second order control systems for different standard test signals

ECC305.5	Analyse stability of a system in time domain
ECC305.6	Analyse stability of a system in frequency domain
ECL301	**Electronic Devices & Circuits Lab**
ECL301.1	Demonstrate the use of electronic devices (CRO, Function Generator, Power supply and Multimeter).
ECL301.2	Sketch and observe characteristics of semiconductor devices.
ECL301.3	Analyse Zener voltage regulator characteristics.
ECL301.4	Demonstrate frequency response of an amplifier.
ECL301.5	Plot and demonstrate the performance of power amplifier.
ECL301.6	Analyse performance of differential amplifier.
ECL302	**Digital System Design Lab**
ECL302.1	Implement basic gates using universal gates.
ECL302.2	Examine Boolean functions using logic gates.
ECL302.3	Design and Implement Combinational circuits.
ECL302.4	Demonstrate working of flip flops and their interconversions.
ECL302.5	Design and Implement Sequential circuits.
ECL302.6	Simulate digital circuits using VHDL / Verilog.
ECL303	**Electronic Instrumentation & Control Systems Lab**
ECL303.1	Demonstrate the performance characteristics of transducers
ECL303.2	Demonstrate the working principle of bridge circuit
ECL303.3	Examine the response of the Type 0, 1, and 2 systems
ECL303.4	Analyse transient and steady state response of a given system
ECL303.5	Analyse the stability of a given system in time domain.
ECL303.6	Analyse the stability of a given system in frequency domain
ECL304	**Skill Lab: C++ and Java Programming**
ECL304.1	Describe basic principle of C++.
ECL304.2	Apply the concepts of control structures for effective programming in C++.
ECL304.3	Develop programming applications using object oriented language in C++.
ECL304.4	Describe basic principle of JAVA.
ECL304.5	Implement different programming applications using JAVA Packaging.
ECL304.6	Use exceptional handling to develop program in JAVA.

ECM301	Mini Project 1A
ECM301.1	Identify problems based on societal, research and industry needs.
ECM301.2	Investigate the problem thoroughly and propose an appropriate solution to solve the problem.
ECM301.3	Build PCB layout and fabricate the same.
ECM301.4	Implement and troubleshoot the circuit.
ECM301.5	Develop interpersonal skills to work as a member of a group or leader.
ECM301.6	Write and present their work effectively with ethical values.
ECC401	**Engineering Mathematics IV**
ECC401.1	Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
ECC401.2	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning and AI.
ECC401.3	Apply the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
ECC401.4	Apply the concept of vector spaces and orthogonalization process in Engineering Problems.
ECC401.5	Use the concept of Quadratic forms and Singular value decomposition which are very useful tools in various Engineering applications.
ECC401.6	Find the extremals of the functional using the concept of Calculus of variation.
ECC402	**Microcontrollers**
ECC402.1	Explain the elements of microprocessor-based system.
ECC402.2	Explain memory of microprocessor-based system
ECC402.3	Examine the detailed architecture of 8051 microcontroller.
ECC402.4	Write assembly language program for 8051 microcontrollers.
ECC402.5	Examine the detailed architecture of advance microcontroller ARM7.
ECC402.6	Illustrate microcontroller-based applications.
ECC403	**Linear Integrated Circuits**
ECC403.1	Explain the working of OPAMP and it's applications.
ECC403.2	Apply the fundamentals of OPAMP in linear IC application.

ECC403.3	Apply the fundamentals of OPAMP in Nonlinear IC application.
ECC403.4	Explain the working of IC 555 and its applications.
ECC403.5	Apply the fundamentals of regulator to design it with given specification.
ECC403.6	Explain the working of special purpose linear IC's.
ECC404	**Signals & Systems**
ECC404.1	Classify and Analyse different types of signals and systems.
ECC404.2	Analyse continuous time LTI signals and systems in transform domain
ECC404.3	Analyse discrete time LTI signals and systems in transform domain
ECC404.4	Represent signals using Fourier Series and Analyse the systems using the Fourier Transform.
ECC404.5	Classify and realize basic structures of DT systems
ECC404.6	Demonstrate the concepts learnt in Signals and systems Course using the modern engineering tools.
ECC405	**Principles of Communication Engineering**
ECC405.1	Explain basic components and types of noise in communication system
ECC405.2	Analyse the concepts of Amplitude Modulation and Demodulation techniques
ECC405.3	Analyse the concepts of Angle Modulation and Demodulation techniques.
ECC405.4	Illustrate the performance of AM and FM receivers
ECC405.5	Describe analog and digital pulse modulation and demodulation techniques
ECC405.6	Explain the principles of multiplexing and demultiplexing techniques.
ECL401	**Microcontrollers Lab**
ECL401.1	Explain different development tools required to develop microcontroller-based systems
ECL401.2	Write a program for arithmetic and logical operations.
ECL401.3	Write a program using code conversion and data transfer operation.
ECL401.4	Write an assembly language program for arrays.
ECL401.5	Write assembly language programs for general purpose I/O, Timers & Interrupts.
ECL401.6	Write a program to interface input output device with 8051 microcontrollers.

ECL402	**Linear Integrated Circuits Lab**
ECL402.1	Explain the working of OPAMP and it's application.
ECL402.2	Examine the performance of linear applications using OPAMP.
ECL402.3	Examine the performance of nonlinear applications using OPAMP.
ECL402.4	Implement Astable and Monostable multivibrators using IC 555 with given specifications.
ECL402.5	Demonstrate Regulation characteristics of voltage regulator.
ECL402.6	Simulate any application of linear ICs using Simulation Software.
ECL403	**Principles of Communication Engineering Lab**
ECL403.1	Demonstrate AM transmission systems in time and frequency domain using hardware and software (MATLAB)
ECL403.2	Demonstrate FM transmission systems in time and frequency domain using hardware and software (MATLAB)
ECL403.3	Demonstrate AM and FM radio receivers and observe waveforms in time and frequency domain
ECL403.4	Implement Pulse analog modulation and demodulation circuit using 555 IC and observe waveforms.
ECL403.5	Verify the Sampling theorem in (MATLAB) and observe the effect by changing sampling frequency
ECL403.6	Demonstrate the working principle of Time Division Multiplexing/ Demultiplexing.
ECL404	**Skill Lab :Python**
ECL404.1	Explain the syntax and semantics in Python
ECL404.2	Illustrate functions and file handling operations.
ECL404.3	Examine the concept of object oriented programming in Python
ECL404.4	Examine the concept of GUI and image processing in Python
ECL404.5	Use Python libraries for various applications
ECL404.6	Implement machine learning applications using Python
ECM401	**Mini Project 1B**
ECM401.1	Identify problems based on societal, research and industry needs.
ECM401.2	Investigate the problem thoroughly and propose appropriate solution to solve the problem.

ECM401.3	Apply the knowledge of interfacing devices to Arduino/ Raspberry pi.
ECM401.4	Implement and troubleshoot proposed method using Arduino/ Raspberry pi.
	Develop interpersonal skills to work as member of a group or leader.
ECM401.6	Write and present their work effectively with ethical values.
ECC501	**Digital Communication**
ECC501 .1	Apply the concepts of information theory in source coding.
ECC501 .2	Compare different error control systems and apply various error detection codes.
ECC501 .3	Analyse different error correction codes
ECC501 .4	Compare various baseband transmission methods for digital signals
ECC501 .5	Evaluate the performance of optimum baseband detection in the presence of white noise
ECC501 .6	Compare the performances of different digital modulation techniques.
ECC502	**Discrete Time Signal Processing**
ECC503	Analyse discrete time system using DFT and FFT.
ECC502 .2	Design digital IIR filters for given specifications.
ECC502 .3	Design digital FIR filters for given specifications.
ECC502 .4	Analyse different realization structures of Digital IIR and FIR filters.
ECC502 .5	Analyse the impact of finite word length on the performance of digital filters.
ECC502 .6	Apply signal processing concepts and algorithms in biomedical and audio signal processing applications.
ECC503	**Digital VLSI**
ECC503.1	Illustrate MOS operation and fabrication process.
ECC503.2	Examine performance parameters of CMOS inverter.
ECC503.3	Realize combinational and sequential circuits using different design style and compare their performance parameter.
ECC503.4	Explain operation of semiconductor memories.
ECC503.5	Examine data path elements and system level design issues.
ECC503.6	Illustrate RTL Design Process with its Case Studies.
ECC504	**Random Signal Analysis**

ECC504.1	Apply theory of probability and solve relevant problems.
ECC504.2	Differentiate continuous and discrete random variables and their distributions.
ECC504.3	Apply the concepts of expectations and functions of one-dimensional random variables to solve relevant problems.
ECC504.4	Apply the concepts of expectations and functions of multi-dimensional Random variables to solve relevant problems.
ECC504.5	Apply fundamentals of Random process in identifying it's type.
ECC504.6	Explain linear regression algorithms for predictive applications.
ECCDLO5013	**IT Infra and Security**
ECCDLO5013.1	Explain fundamentals of IT Infrastructure and its Management.
ECCDLO5013.2	Explain the concept of Access Control Policies and Models, Authentication and Access Control Services.
ECCDLO5013.3	Examine software vulnerabilities and attacks.
ECCDLO5013.4	Analyse the protection mechanisms for operating systems and database security.
ECCDLO5013.5	Explore the security aspects of wireless network infrastructure and protocols.
ECCDLO5013.6	Investigate the different attacks on Web Applications and Web services.
ECCDLO5014	**Data Structures and Algorithm**
ECCDLO5014.1	Explain the fundamentals of data structures and asymptotic analysis of functions
ECCDLO5014.2	Apply various operations on stack and queue data structures and its applications
ECCDLO5014.3	Apply addition and deletion operations on the Linked list data structures.
ECCDLO5014.4	Apply insertion, deletion, and searching operations on trees and graphs.
ECCDLO5014.5	Select suitable searching & sorting technique for a database application.
ECCDLO5014.6	Select suitable hash function and collision resolution technique for a database application.
ECCDLO5015	**Sensor Technology**
ECCDLO5015.1	Explain the transduction principle of various sensors.
ECCDLO5015.2	Select sensors suitable for required application

ECCDLO5015.3	Illustrate working of various MEMS sensors and actuators for particular application
ECCDLO5015.4	Analyse wireless sensing techniques for various application
ECCDLO5015.5	Explain data acquisition and signal conditioning methods
ECCDLO5015.6	Create an application using various sensor technologies
ECL501	**Digital Communication Lab**
ECL501.1	Students will be able to Compare various source coding schemes
ECL501.2	Students will be able to Design and implement different error correction codes
ECL501.3	students will be able to design and simulate cyclic encoder and decoder
ECL501.4	Students will be able to Compare various line coding techniques
ECL501.5	Students will be able to implement and Analyse various digital modulation techniques
ECL502	**Discrete Time Signal Processing Lab**
ECL502.1	Apply different operations on discrete signals using MATLAB
ECL502.2	Determine output response of digital filter using different convolution methods in MATLAB.
ECL502.3	Able design Butterworth IIR digital filter for given specifications using MATLAB.
ECL502.4	Analyse the response of FIR filters using MATLAB.
ECL502.5	Able analyse realisation methods of IIR filters using MATLAB Simulink tool.
ECL502.6	Analyse frequency response and pole zero plot of frequency selective filters using MATLAB
ECL503	**Digital VLSI Lab**
ECL503.1	Observe Characteristics of MOSFET for various performance parameters.
ECL503.2	Observe transfer characteristics of CMOS inverter.
ECL503.3	Implement combinational circuits using LT spice.
ECL503.4	Sketch layout for combinational circuits using different design style.
ECL503.5	Sketch layout for memory.
ECL503.6	Sketch data path component.

ECL504	Business Communication and Ethics Lab/Professional Communication & Ethics - II
ECL504.1	Write technical paper solicited and unsolicited proposals effectively.
ECL504.2	Write a cover letter and prepare a resume, statement of purpose, participate in GD and apply for personal interviews.
ECL504.3	Explain the roles and responsibilities of the members of the meeting, prepare meeting documentation and also participate as a member in a meeting.
ECL504.4	Deliver technical business presentations individually and contribute as a team member for building content and visuals in GD
ECL504.5	Demonstrate skills like leadership, motivation, negotiation etc during their projects.
ECL504.6	Explain Intellectual property rights and demonstrate ethical conduct while analysing technical paper.
ECM501	**Mini Project 2A Embedded System Project**
ECM501.1	Explain embedded systems and various Microcontrollers .
ECM501.2	Identify problems based on societal, research and industry needs.
ECM501.3	Investigate the problem thoroughly and propose an appropriate solution to solve the problem.
ECM501.4	Implement and troubleshoot proposed method using Microcontroller
ECM501.5	Develop interpersonal skills to work as member of a group or leader.
ECM501.6	Write and present their work effectively with ethical values.
ECC601	**Electromagnetics and Antenna**
ECC601.1	Explain electromagnetics field including static and dynamic in terms of Maxwells equations.
ECC601.2	Apply Maxwell's equation to solve electromagnetic phenomenon. .
ECC601.3	Explain fundamentals of Antennas, EM wave radiation and linear wire antenna elements.
ECC601.4	Design different types of Antenna arrays.
ECC601.5	Explain working of special types of Antennas and their properties.
ECC601.6	Describe concept of radio wave propagation

ECC602	Computer Communication Networks
ECC602.1	Explain network topologies, hardware devices, addressing schemes, and protocol stacks.
ECC602.2	Compare various transmission media and broadband technologies
ECC602.3	Analyse the flow control, error control, and the medium access control technique
ECC602.4	Design computer network using IP addressing and subnetting schemes
ECC602.5	Analyse connection-oriented and connectionless services
ECC602.6	Describe application layer protocols.
ECC603	Image Processing and Machine Vision
ECC603.1	Apply basic fundamentals of image processing for various applications
ECC603.2	Analyse image enhancement using spatial and frequency domain techniques.
ECC603.3	Analyse images using morphology and restoration techniques.
ECC603.4	Apply image segmentation algorithms based on principle of discontinuity and similarity
ECC603.5	Explain concept of machine vision and descriptors
ECC603.6	Describe machine vision algorithms for image classification.
ECC604	Artificial Neural Network and Fuzzy Logic
ECC604.1	Apply the basic concepts of neural networks in applications.
ECC604.2	Analyse the supervised learning algorithms.
ECC604.3	Analyse Unsupervised Learning algorithms for Mean Square Error and Sum Squared Error, Gradient Descent
ECC604.4	Explain basic concept of the Machine Learning and its algorithms.
ECC604.5	Explain the architecture of CNN and its application in image classification.
ECC604.6	Analyse the application of neural networks and fuzzy logic to real world problems.
ECCDLO6014	Database Management System
ECCDLO6014.1	Describe the fundamentals of database systems, different data models and design issues in database.
ECCDLO6014.2	Design ER diagram and developing relational schema.
ECCDLO6014.3	Differentiate between Relational Algebra & Calculus for computational capabilities and apply concepts of normalization to relational database design.

ECCDLO6014.4	Implement views, triggers and querying the database using SQL to retrieve the data from database.
ECCDLO6014.5	Describe transaction management, concurrency control, database security and privacy.
ECCDLO6015	**IoT and Industry 4.0**
ECCDLO6015.1	Explain the fundamentals of internet of things and machine to machine communication
ECCDLO6015.2	Illustrate the principles of protocols used for web and internet connectivity
ECCDLO6015.3	Select tools for data management and analytics in IoT.
ECCDLO6015.4	Discuss fundamentals of Industry 4.0 and Industrial IoT.
ECCDLO6015.5	Classify the case studies for specific application in IoT.
ECCDLO6015.6	Analyse advanced concepts and application of industry 4.0.
ECL601	**Electromagnetics and Antenna Lab**
ECL601.1	Demonstrate the gain measurement and polar plot plotting of an antenna.
ECL601.2	Design and analyse the radiation patterns of antennas using simulation tool 4NEC2.
ECL601.3	Design and analyse the performance of antenna arrays for given specifications using MATLAB.
ECL601.4	Demonstrate the radiation pattern plot and calculate beam width, front/back ratio, and gain of antennas using antenna trainer system.
ECL601.5	Design and analyse the performance of Microstrip antenna using Simulation tool HFSS.
ECL601.6	Demonstrate Reciprocity theorem verification for antenna.
ECL602	**Computer Communication Networks Lab**
ECL602.1	Demonstrate knowledge of small or medium-sized computer network that meets a customer 's specific needs.
ECL602.2	Perform configurations on routers and Ethernet switches.
ECL602.3	Compare routing algorithms and protocols.
ECL602.4	Simulate computer networks for services and Analyse the simulation results.
ECL602.5	Troubleshoot connectivity problems in a host occurring at multiple layers of the OSI model.
ECL602.6	Analyse connectionless and connection-oriented services and protocols

ECL603	**Image Processing and Machine Vision Lab**
ECL603.1	Analyse gray scale resolution using point processing algorithms in python.
ECL603.2	Implement histogram equalisation for image enhancement using Python
ECL603.3	Analyse spatial domain and frequency domain filtering for image enhancement using python.
ECL603.4	Apply morphological operations for various image processing applications using python.
ECL603.5	Apply basic concepts of Neural Networks for image processing using python.
ECL603.6	Apply image processing base algorithms for real time applications.
ECL604	**Skill Lab: Linux and Networking and Server Configuration**
ECL604.1	Demonstrate Installation of Linux using Debian, Ubuntu, and Kali Linux platforms and execute standard Linux commands.
ECL604.2	Write Process management, scheduling, and Inter-process communication in Linux.
ECL604.3	Write shell script programs for common administrative tasks and managing user accounts.
ECL604.4	Write shell script programs for conditional and looping statements in bash.
ECL604.5	Create DHCP server, DNS server, and NFS file server.
ECL604.6	Create and Deploy Mail server, Telnet server, FTP server, and Web server.
ECM601	**Mini Project 2B- FPGA based Projects**
ECM601.1	Explain various FPGA families and method of FPGA synthesis and implementation.
ECM601.2	Identify problems based on societal, research and industry needs.
ECM601.3	Investigate the problem thoroughly and propose an appropriate solution to solve the problem.
ECM601.4	Simulate and synthesize circuits in Verilog HDL.
ECM601.5	Develop interpersonal skills to work as a member of a group or leader
ECM601.6	Write and present their work effectively with ethical values.
ECC701	**Microwave Engineering**

ECC701.1	Analyse transmission line parameters and design distributed Impedance matching networks
ECC701.2	Explain the working of the rectangular waveguide and Analyse its different modes.
ECC701.3	Explain the coupling mechanisms in waveguides and analyse the waveguide multiport junctions.
ECC701.4	Explain the working principle and analyse the microwave linear and cross-field tubes.
ECC701.5	Explain the operation of microwave solid state devices and avalanche transit time devices.
ECC701.6	Explain the different microwave measurement techniques.
ECC702	**Mobile Communication System**
ECC702.1	Explain the cellular fundamentals and estimate the coverage and capacity of cellular systems
ECC702.2	Classify different types of propagation models and analyse the link budget.
ECC702.3	Compare and contrast GSM, GPRS, HSCSD, EDGE and IS-95 Technologies
ECC702.4	Apply the concepts of 3G technologies for UMTS and CDMA 2000
ECC702.5	Describe the features and working principle of 3GPP LTE
ECC702.6	Discuss the emerging technologies for upcoming mobile communication systems
ECCDLO 7012	**Deep Learning**
ECCDLO 7012.1	Explain the fundamentals of Deep Learning
ECCDLO 7012.2	Apply knowledge of deep learning in TensorFlow
ECCDLO 7012.3	Illustrate Regularization and Optimization techniques of deep learning models
ECCDLO 7012.4	Examine architectures of Convolution Neural Network based on its evaluation parameters.
ECCDLO 7012.5	Examine Architecture of Recurrent Neural Network and its application.
ECCDLO 7012.6	Illustrate the types of Autoencoders and its real-life applications
ECCDLO 7013	**Cloud Computing and Security**
ECCDLO 7013.1	Illustrate the fundamentals of cloud computing.
ECCDLO 7013.2	Interpret the significance of virtualization in the context of cloud computing
ECCDLO 7013.3	Examine cloud computing services working on AWS, Azure and Google cloud platforms

ECCDLO 7013.4	Determine design aspects of cloud computing for various services.
ECCDLO 7013.5	Secure the cloud environment by applying security fundamentals
ECCDLO 7013.6	Use cloud computing to realize health care, manufacturing, education and streaming applications.
ECCDLO 7023	**Internet Communication Engineering**
ECCDLO 7023.1	Explain internet standards and architecture model
ECCDLO 7023.2	Describe application layer protocols in the internet
ECCDLO 7023.3	Examine the internet security aspects of protocols at various layers of TCP/IP protocol suite.
ECCDLO 7023.4	Examine relevant protocols and compression algorithms for various multimedia standards
ECCDLO 7023.5	Compare integrated & differentiated services for quality of service.
ECCDLO 7023.6	Discuss new networking trends in industry and automation.
ECL701	**Microwave Engineering Laboratory**
ECL701.1	Analyse S-parameters and design distributed types of impedance matching network.
ECL701.2	Design the transmission lines using simulation software.
ECL701.3	Design rectangular waveguide using simulation software.
ECL701.4	Demonstrate the characteristics of waveguide junctions.
ECL701.5	Analyse characteristics of different modes of Reflex Klystron.
ECL701.6	Determine the VSWR, Frequency, and wavelength of the signal.
ECL702	**Mobile Communication System Laboratory**
ECL702.1	Demonstrate the effect of cellular system design parameters on system capacity and quality of service.
ECL702.2	Implement orthogonal codes of length n for 2G and G mobile system and verify properties.
ECL702.3	Analyse the effect of load on call blocking probability in GSM and CDMA systems
ECL702.4	Examine the effect of small-scale fading parameters on the performance of radio channel characteristics.
ECL702.5	Analyse link budget for various propagation path-loss models.
ECL702.6	Analyse the effect of multipath diversity on Bit Error Rate.

ECP701	Major Project-I
ECP701.1	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.
ECP701.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ECP701.3	Analyse and compare the results with the standard results.
ECP701.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ECP701.5	Write and present their work effectively with ethical values.
ECP701.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
ECC801	Optical Communication and Networks
ECC801.1	Explain the significance of fiber optic communication, it's elements.
ECC801.2	Analyse transmission characteristics of optical fiber Communication
ECC801.3	Examine working principles and characteristics of optical sources and detectors
ECC801.4	Distinguish network system components and multiplexing schemes SDH, PDH, and WDM for different real-time applications
ECC801.5	Illustrate the concept of optical packet-switching and access networks.
ECC801.6	Describe the transmission system model, network management functions, and next-generation optical networks
ECCDLO 8013	Wireless Networks
ECCDLO 8013.1	Explain fundamental architecture, design issues and standards of wireless networks.
ECCDLO 8013.2	Compare different types of Personal Area Network (PAN) technologies such as ZigBee, Bluetooth, UWB, NFC and 6LoWPAN.
ECCDLO 8013.3	Analyse different LAN topologies, technologies and ad hoc networks.
ECCDLO 8013.4	Compare various types of network protocols, ad hoc vehicle networks and Wireless MANs.
ECCDLO 8013.5	Evaluate the planning and design of performance of GSM and CDMA system in Wireless WANs.

ECCDLO 8013.6	Explain the basic network architecture of Wireless sensor networks for an IoT applications.
ECL801	**Optical Communication and Networks Laboratory**
ECL801.1	Observe different parameters for the propagation of light inside optical Fiber.
ECL801.2	Examine Fiber optic link to find propagation losses.
ECL801.3	Observe the performance characteristics of optical source and detector.
ECL801.4	Examine optical link to find bandwidth.
ECL801.5	Estimate link power and rise time budget in optical network
ECL801.6	Implement an optical network using the simulator
ECP801	**Major Project-II**
ECP801.1	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.
ECP801.2	Implement the methodology with modern tools and provide sustainable solution with effective utilization of the resources available.
ECP801.3	Analyse and compare the results with the standard results.
ECP801.4	Work as an individual and contribute as a team member with effective management skills to achieve a common objective.
ECP801.5	Write and present their work effectively with ethical values.
ECP801.6	Engage themselves in area of their interest applying the knowledge gained and explore new technical trends.
ECCDLOC8023	**Network Management in Telecommunication**
ECCDLOC8023.1	Explain the concepts of network management architectures, and protocols in telecommunications (NMT).
ECCDLOC8023.2	Differentiate between network management models.
ECCDLOC8023.3	Apply network management fundamental principles in TCP/IP based Internet Model using SNMP.
ECCDLOC8023.4	Explain the TMN framework.
ECCDLOC8023.5	Explain the TMN management architecture and its services.
ECCDLOC8023.6	Describe Broadband networks, its services, and ATM Technology.

ECCDLO 8014	**Web Design**
ECCDLO 8014.1	Design web pages using HTML5 and CSS3.
ECCDLO8014.2	Apply the concepts of client-side validation and scripts to static web pages using JavaScript and its framework.
ECCDLO8014.3	Build responsive web pages using front-end framework Bootstrap.
ECCDLO8014.4	Develop a web application using appropriate web development framework.
ECCDLO8014.5	Understand working of web services