Electronics and Computer Science Department

Semester/ Subject Wise COS

Course Code & Name	ECC 301 Engineering Maths III
CO Number	**CO Statement**
EEC 301.1	Understand the concept of Laplace transform and its application to solve the real integrals in engineering problems.
EEC 301.2	Understand the concept of inverse Laplace transform of various functions and its applications in engineering problems.
EEC 301.3	Expand the periodic function by using Fourier series for real life problems and complex engineering problems.
EEC 301.4	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
EEC 301.5	Use matrix algebra to solve the engineering problems.
EEC 301.6	Apply the concepts of vector calculus in real life problems.
Course Code & Name	ECC 302 Electronic Devices
EEC 302.1	Explain the working of semiconductor devices.
EEC 302.2	Interpret the characteristics of semiconductor devices.
EEC 302.3	Analyse Electronics circuits using BJT and FET (DC & AC analysis.
EEC 302.4	Compare various biasing circuits & configurations of BJT and MOSFETs.
EEC 302.5	Select best circuit for the given specifications/application.
EEC 302.6	Describe the working of advanced nanoelectronic devices.
Course Code & Name	ECC 303 Digital Electronics
EEC 303.1	Perform code conversion and able to apply Boolean algebra for the implementation and minimisation of logic functions.
EEC 303.2	Analyse, design and implement Combinational logic circuits.
EEC 303.3	Analyse, design and implement Sequential logic circuits.
EEC 303.4	Design and implement various counter using flip flops and MSI chips.
EEC 303.5	Understand TTL & CMOS logic families, PLDs, CPLD and FPGA.
EEC 303.6	Understand basics of Verilog Hardware Description Language and its programming with combinational and sequential logic circuits.
Course Code & Name	ECC 304 Data Structures and Algorithms
ECC 304.1	Implement various linear data structures.
ECC 304.2	Implement various non linear data structures.
ECC 304.3	Select appropriate sorting and searching techniques for a given problem and use it.
ECC 304.4	Develop solutions for real world problems by selecting appropriate data structure and alogorithms.
ECC 304.5	Analyse the complexity of the given algorithms.
Course Code & Name	ECC 305 Database Management Systems
ECC 305.1	Recognize the need of database management system
ECC 305.2	Design ER and EER diagram for real life applications
ECC 305.3	Construct relational model and write relational algebra queries
ECC 305.4	Formulate SQL queries
ECC 305.5	Apply the concept of normalization to relational database design
ECC 305.6	Describe the concepts of transaction, concurrency and recovery.
Course Code & Name	ECL 301 Electronic Devices Lab -
ECL 301.1	Explain the working of semiconductor devices
ECL 301.2	Interpret the characteristics of semiconductor devices.
ECL 301.3	Analyse electronics circuits using BJT and FET (DC & AC analysis)
ECL 301.4	Simulate basic circuits using electronic devices through software simulation
Course Code & Name	ECL 302 Digital Electronics Lab
ECL 302.1	Perform code conversion and able to apply Boolean algebra for the implementation and minimisation of logic functions.
ECL 302.2	Analyse, design and implement Combinational logic circuits.
ECL 302.3	Analyse, design and implement Sequential logic circuits.
ECL 302.4	Design and implement various counter using flip flops and MSI chips.
ECL 302.5	Understand TTL & CMOS logic families, PLDs, CPLD and FPGA.
ECL 302.6	Understand basics of Verilog Hardware Description Language and its programming with combinational and sequential logic circuits.
Course Code & Name	ECL 303 Data Structures and Algorithms La
ECL 303.1	Students will be able to implement linear data structures & will be able to handle operations like insertion, deletion, searching and traversing on them.
ECL 303.2	Students will be able to implement nonlinear data structures & will be able to handle operations like insertion, deletion, searching and traversing on them
ECL 303.3	Students will be able to choose appropriate data structure and apply it in various problem domains.
ECL 303.4	Students will be able to select appropriate searching techniques for given problems.
Course Code & Name	ECL 304 Database Management Systems lab
ECL 304.1	Design ER /EER diagram and convert to relational model for the realworld application
ECL 304.2	Apply DDL, DML, DCL and TCL commands.
ECL 304.3	Write simple and complex queries.
ECL 304.4	Use PL/SQL Constructs.
ECL 304.5	Demonstrate the concept of concurrent transactions execution and frontend-backend connectivity

Course Code & Name	ECL 305 Skill-based Lab OOPM (C++ and Java)
ECL 305.1	Use C++ in programming.
ECL 305.2	Use different control structures.
ECL 305.3	Understand fundamental features of an object-oriented language: object classes and interfaces, exceptions and libraries of object collections.
ECL 305.4	Understand Java Programming.
ECL 305.5	To develop a program that efficiently implements the features and packaging concept of java in laboratory.
ECL 305.6	To implement Exception Handling and Applets using Java.
Course Code & Name	ECM 301 Mini Project- 1A
ECM 301.1	Identify problems based on societal /research needs.
ECM 301.2	Apply Knowledge and skill to solve societal problems in a group.
ECM 301.3	Develop interpersonal skills to work as member of a group or leader
ECM 301.4	Draw the proper inferences from available results through theoretical/ experimental/simulations
ECM 301.5	Analyse the impact of solutions in societal and environmental context for sustainable development
ECM 301.6	Use standard norms of engineering practices
ECM 301.7	Excel in written and oral communication
ECM 301.8	Demonstrate capabilities of self-learning in a group, which leads to life-long learning.
ECM 301.9	Demonstrate project management principles during project work.
Course Code & Name	ECC 401 Engineering Maths IV
ECC 401.1	Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals
ECC 401.2	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning and AI.
ECC 401.3	Apply the concepts of probability and expectation for getting the spread of the data and distribution of probabilities
ECC 401.4	Apply the concept of vector spaces and orthogonalization process in Engineering Problems
ECC 401.5	Use the concept of Quadratic forms and Singular value decomposition which are very useful tools in various Engineering applications.
ECC 401.6	Find the extremals of the functional using the concept of Calculus of variation.
Course Code & Name	ECC 402 Electronic Circuits
ECC 402.1	Evaluate the performance of amplifiers through frequency response.
ECC 402.2	Analyse differential amplifiers for various performance parameters
ECC 402.3	Express mathematically the performance parameters in terms of circuit parameters
ECC 402.4	Choose appropriate circuit for the given specifications/ applications
ECC 402.5	Describe various applications and circuits based on operational amplifiers.
ECC 402.6	. Design an application with the use of integrated circuits.
Course Code & Name	ECC 403 Controls and Instrumen tation
ECC 403.1	Derive the transfer functions for the given control systems
ECC 403.2	Analyse the performance of control systems based on the time domain and frequency domain specifications
ECC 403.3	Judge the stability of the given control systems using appropriate stability criteria.
ECC 403.4	Understand and explain the working principle of sensors and transducers.
ECC 403.5	Explain various parameters of data acquisition systems.
ECC 403.6	Describe instrument communication standards.
Course Code & Name	ECC 404 Microprocessors and Microcontrollers
ECC 404.1	Explain 16-bit Microprocessor architectures and fundamental concepts of Microcontrollers
ECC 404.2	To develop programming skills for Microprocessors and Microcontrollers
ECC 404.3	To interface various devices in Microprocessor and Microcontroller systems
ECC 404.4	To design and implement Microprocessor and Microcontroller based systems.
Course Code & Name	ECC 405 Discrete Structures and Automata Theory
ECC 405.1	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving
ECC 405.2	Reason Logically
ECC 405.3	Perform operations with Sets, Relations, Functions, Graphs and their applications.
ECC 405.4	Design Deterministic Finite Automata (DFA) and Non-deterministic Finite Automata (NFA) and Pushdown Automata with understanding of power and limitations
ECC 405.5	Design Context Free Grammar and perform the operations like simplification and normal forms.
ECC 405.6	Apply Discrete Structures and Automata Theory concepts into solving real world computing problems in the domain of Formal Specification, Verification, Artificial Intelligence etc
Course Code & Name	ECL 401 Electronic Circuits Lab
ECL401.1	Experimentally evaluate performance of amplifiers through frequency response.
ECL401.2	Analyze differential amplifiers for various performance parameters
ECL401.3	Implement practically various applications and circuits based on operational amplifiers.
ECL401.4	Design an application with the use of integrated circuits as per the given specifications
Course Code & Name	ECL 402 Controls and Instrumentation Laboratory
ECL 402.1	Simulate the performance of control systems
ECL 402.2	Analyse the stability of control systems via simulations
ECL 402.3	Develop the applications of Instrumentation systems
Course Code & Name	ECL 403 Microprocessors and Microcontrollers Lab
ECL 403.1	To develop programming skills for Microprocessors and Microcontrollers
ECL 403.2	To interface various devices in Microprocessor and Microcontroller systems

Course Code & Name	ECL404 Skill-Based Lab: Python Programming
ECL 404.1	Describe syntax and semantics in Python
ECL 404.2	Illustrate different file handling operations
ECL 404.3	Interpret object-oriented programming in Python
ECL 404.4	Design GUI Applications in Python
ECL 404.5	Express proficiency in the handling Python libraries for data science
ECL 404.6	Develop machine learning applications using Python
Course Code & Name	ECM 401 Mini Project-1B
ECM 401.1	Identify problems based on societal /research needs
ECM 401.2	Apply Knowledge and skill to solve societal problems in a group
ECM 401.3	Develop interpersonal skills to work as member of a group or leader
ECM 401.4	Draw the proper inferences from available results through theoretical/ experimental/simulations
ECM 401.5	Analyse the impact of solutions in societal and environmental context for sustainable development.
ECM 401.6	Use standard norms of engineering practices
ECM 401.7	Excel in written and oral communication
ECM 401.8	Demonstrate capabilities of self-learning in a group, which leads to life long learning.
ECM 401.9	Demonstrate project management principles during project work.
Course Code & Name	ECC 501 Communication Engineering
ECC 501.1	Analyse various analog modulation methods
ECC 501.2	Explain various pulse modulation techniques.
ECC 501.3	Evaluate the impact of Inter Symbol Interference in Baseband transmission and methods to mitigate its effect
ECC 501.4	Compare various Digital modulation methods based on spectral efficiency, Euclidean distance etc
ECC 501.5	Analyse the characteristics of radio receivers
Course Code & Name	ECC 502 Computer Organization and Architecture
ECC 502.1	To introduce the learner to the design aspects which can lead to maximized performance of a Computer
ECC 502.2	To introduce basic concepts and functions of operating systems
ECC 502.3	To understand the concepts of process synchronization and deadlock.
ECC 502.4	To understand various Memory, I/O and File management techniques
ECC 502.5	To introduce the learner to various concepts related to Parallel Processing
ECC 502.6	To highlight the various architectural enhancements in modern processors.
Course Code & Name	ECC 503 Software Engineering
ECC 503.1	Apply software engineering concept and choose process models for a software project development.
ECC 503.2	Analyse and specify software requirement specification (SRS) for software system
ECC 503.3	Convert requirement model into the design model and demonstrate the use of software and userinterface design principles.
ECC 503.4	Generate the project schedule and estimate the cost of software system.
ECC 503.5	Identify risks and prepare RMMM plan for quality software system
ECC 503.6	Apply testing strategies and tactics for software system.
Course Code & Name	ECC504 Web Technologies
ECC 504.1	Design static web pages using HTML5.
ECC 504.2	Design the layout of web pages using CSS3
ECC 504.3	Apply the concepts of client-side validation and scripts to static web pages using JavaScript and JQuery.
ECC 504.4	Build responsive web pages using front-end framework Bootstrap
ECC 504.5	Build dynamic web pages using server -side scripting.
ECC 504.6	Develop a web application using appropriate web development framework
Course Code & Name	ECCDO501 Software Testing & Quality Assurance
ECCDO501.1	. Investigate the reason for bugs and analyse the principles in software testing to prevent and remove bugs.
ECCDO501.2	Understand various software testing methods and strategies.
ECCDO501.3	Design test planning
ECCDO501.4	Manage the test process
ECCDO501.5	Apply the software testing techniques in the commercial environment
ECCDO501.6	Use practical knowledge of a variety of ways to test software and quality attributes
Course Code & Name	ECC DO501 Information Theory and Coding
ECC DO501.1	Comprehend the significance of this quantitative measure of information in the communication systems.
ECC DO501.2	Explain entropy, joint entropy, relative entropy, conditional entropy, and channel capacity of a system.
ECC DO501.3	Obtain knowledge in designing various source codes and channel codes.
ECC DO501.4	Differentiate between lossy and lossless compression techniques.
ECC DO501.5	Analyze an efficient data compression scheme for a given information source.
ECC DO501.6	Apply the concepts of multimedia communication.
Course Code & Name	ECL 501 Communication Engineering Lab
ECL 501.1	Perform hardware implementation of various analog and digital modulation methods
ECL 501.2	Illustrate generation and detection of various pulse modulation techniques.
ECL 501.3	Apply techniques to insert Inter Symbol Interference and methods to mitigate its effect.
ECL 501.4	Simulate various analog and digital modulation methods.
ECL 501.5	Demonstrate multiplexing and de-multiplexing of signals using multiplexing techniques.
ECL 501.6	Illustrate the effect of sampling frequency on the reconstructed signal

Course Code & Name	ECL502 Software Engineering and Web Technologies Lab
ECL 502.1	Identify requirements and apply process model to selected case study.
ECL 502.2	Analyse and design models for the selected case study using UML modelling
ECL 502.3	Use various Software Engineering and Project Management Tools
ECL 502.4	Design static web pages using HTML5, CSS3, Bootstrap
ECL 502.5	Apply the concepts of Client-side validation and scripts to static web pages using JavaScript and JQuery
ECL 502.6	Build dynamic web pages using Server-Side Scripting.
Course Code & Name	ECL 503 Software Testing & Quality Assurance Lab
ECL 503.1	Understand the system thoroughly (for requirement, designing and implementation).
ECL 503.2	Recognize failures in the system.
ECL 503.3	Investigate the reason for bugs.
ECL 503.4	. Design test plan and test cases
ECL 503.5	Execute the test cases manually and using automated tools
ECL 503.6	Manage the testing process.
Course Code & Name	ECL 503 Information Theory and Coding -
ECL 503.1	Understand the basics of information theory, source coding techniques and calculate Entropy of source
ECL 503.2	Implement Shannon-Hartley equation to find the upper limit on the Channel Capacity
ECL 503.3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system.
ECL 503.4	Apply the knowledge of digital electronics and describe the error control codes like block code, cyclic code and convolutional codes.
ECL 503.5	Implement audio and video compression techniques
Course Code & Name	ECM501 Mini project - 2A
ECM 501.1	Identify problems based on societal /research needs
ECM 501.2	Apply knowledge and skill to solve societal problems in a group
ECM 501.3	Develop interpersonal skills to work as member of a group or leader
ECM 501.4	Draw the proper inferences from available results through theoretical/experimental/simulations.
ECM 501.5	Analyze the impact of solutions in societal and environmental context for sustainable development
ECM 501.6	Use standard norms of engineering practices
ECM 501.7	Excel in written and oral communication
ECM 501.8	Demonstrate capabilities of self-learning in a group, which leads to life-long learning
ECM 501.9	Demonstrate project management principles during project work.
Course Code & Name	ECC 601 Embedded Systems and RTOS
ECC 601.1	Identify and describe various characteristic features and applications of Embedded systems.
ECC 601.2	Analyse and select hardware for Embedded system implementation.
ECC 601.3	Evaluate various communication protocols for Embedded system implementation.
ECC 601.4	Compare GPOS and RTOS and investigate the concepts of RTOS.
ECC 601.5	Evaluate and use various tools for testing and debugging embedded systems
ECC 601.6	Design a system for different requirements based on life-cycle for the embedded system, keeping oneself aware of ethics and environmental issues
Course Code & Name	ECC602 Artificial Intelligence
ECC602.1	Identify the characteristics of the environment and differentiate between various agent architectures.
ECC602.2	Apply the most suitable search strategy to design problem solving agents
ECC602.3	Represent a natural language description of statements in logic and apply the inference rules to design Knowledge Based agents
ECC602.4	Apply a probabilistic model for reasoning under uncertainty.
ECC602.5	Comprehend various learning techniques
ECC602.6	Describe the various building blocks of an expert system for a given real world problem.
Course Code & Name	ECC 603 Computer Networks
ECC 603.1	Enumerate the layers of OSI model and TCP/IP model and describe their functions.
ECC 603.2	Identify the characteristics of network devices and media used to design networks.
ECC 603.3	Demonstrate the knowledge of networking protocols at various layers of TCP/IP model.
ECC 603.4	Classify the routing protocols and analyse how to assign the IP addresses for a given network
ECC 603.5	Design and configure the networks using IP addressing and sub-netting / super-netting schemes
ECC 603.6	Explain the functions of Application layer and Presentation layers, their paradigms and Protocols.
Course Code & Name	ECC604 Data Warehousing and Mining
ECC 604.1	Understand Data Warehousing fundamentals and Dimensionality modelling principles
ECC 604.2	Understand the use of ETL techniques and apply OLAP operations.
ECC 604.3	Perceive the importance of data pre-processing and basics of data mining techniques
ECC 604.4	Relate to the concepts of market basket analysis in real world applications
ECC 604.5	Apply classification algorithms in real world dataset for classification and prediction.
ECC 604.6	Visualize the concept of clustering and its applications.
Course Code & Name	ECCDO 601 Machine Learning
ECCDO 601.1	Comprehend basics of Machine Learning
ECCDO 601.2	Build Mathematical foundation for machine learning
ECCDO 601.3	Understand various Machine learning models
ECCDO 601.4	Select suitable Machine learning models for a given problem
ECCDO 601.5	Build Neural Network based models
ECCDO 601.6	Apply Dimensionality Reduction techniques

Course Code & Name	ECL 601 Embedded Systems Lab
ECL 601.1	Interface various sensors and actuators to embedded cores
ECL 601.2	Write code using RTOS for multi-tasking Embedded systems
ECL 601.3	
Course Code & Name	ECL 602 Artificial Intelligence and Computer Networks Lab
ECL 602.1	Identify suitable Agent Architecture for a given real world AI problem
ECL 602.2	Implement simple programs using Prolog.
ECL 602.3	Implement various search techniques for a Problem-Solving Agent
ECL 602.4	Represent natural language description as statements in Logic and apply inference rules to it
ECL 602.5	Construct a Bayesian Belief Network for a given problem and draw probabilistic inferences from it.
ECL 602.6	Design and implement various network applications such as data transmission between client and server, file transfer etc. using Socket Programming
ECL 602.7	Determine how to assign the IP addresses and configure a network on different operating environments.
ECL 602.8	Configure the networks using IP addressing and subnetting / supernetting schemes using various OS commands
Course Code & Name	ECL 601 Embedded Systems Lab
ECL 601.1	Interface various sensors and actuators to embedded cores.
ECL 601.2	Write code using RTOS for multi-tasking Embedded systems
ECL 601.3	Design applications using different embedded cores
Course Code & Name	ECL 602 Artificial Intelligence and Computer Networks Lab
ECL 602.1	Identify suitable Agent Architecture for a given real world AI problem
ECL 602.2	Implement simple programs using Prolog.
ECL 602.3	Implement various search techniques for a Problem-Solving Agent.
ECL 602.4	Represent natural language description as statements in Logic and apply inference rules to it.
ECL 602.5	Construct a Bayesian Belief Network for a given problem and draw probabilistic inferences from it.
ECL 602.6	Design and implement various network applications such as data transmission between client and server, file transfer etc. using Socket Programming
ECL 602.7	Determine how to assign the IP addresses and configure a network on different operating environments.
ECL 602.8	Configure the networks using IP addressing and subnetting / supernetting schemes using various OS commands
Course Code & Name	ECL603 Data Warehousing and Mining Lab
ECL 603.1	Design data warehouse using dimensional modelling
ECL 603.2	Perform different OLAP operations
ECL 603.3	Differentiate among different data mining techniques and decide the applicability for each
ECL 603.4	Demonstrate classifications, prediction, etc. on datasets using open source tools
ECL 603.5	Perform Market basket analysis in real world data using data mining tools
ECL 603.6	Appreciate and visualize clustering techniques
Course Code & Name	ECL604 Skill base Lab: Linux Server Administration Lab
ECL 604.1	Understand the concept of Open-source technology and basics of Linux operating system
ECL 604.2	Learn various Linux Command Line administration tasks and perform file, user, group and process management tasks
ECL 604.3	Learn various Linux Command Line utilities to perform storage and network management tasks
ECL 604.4	Learn Linux Server administration tasks and configure servers for front and backend services.
ECL 604.5	Analyse a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem
ECL 604.6	Apply security measures to protect the operating environment and explain virtualization and their role in elastic computing.
Course Code & Name	ECM 601 Mini project – 2B
ECM 601.1	Identify problems based on societal /research needs.
ECM 601.2	Apply knowledge and skill to solve societal problems in a group
ECM 601.3	Develop interpersonal skills to work as member of a group or leader
ECM 601.4	Draw the proper inferences from available results through theoretical/experimental/simulations
ECM 601.5	Analyze the impact of solutions in societal and environmental context for sustainable development
ECM 601.6	Use standard norms of engineering practices.
ECM 601.7	Excel in written and oral communication
ECM 601.8	Demonstrate capabilities of self-learning in a group, which leads to life-long learning
ECM 601.9	Demonstrate project management principles during project work.
Course Code & Name	ECC 701 VLSI Design
ECC 701.1	To understand VLSI Design flow and technology trends.
ECC 701.2	To realise MOS based circuits using different design styles.
ECC 701.3	To study semiconductor memories using MOS logic.
ECC 701.4	To study adder, multiplier and shifter circuits for realizing data path design.
ECC 701.5	Understand the Backend flow of the IC Fabrication
Course Code & Name	ECC 702 Internet of Things
ECC 702.1	Understand concepts, functional blocks and communication methodology relevant to IoT.
ECC 702.2	Identify various components of IoT
ECC 702.3	Compare various communication protocols for IoT
ECC 702.4	Understand various methods for data handling in IoT-based systems
ECC 702.5	Design basic applications based on IoT using specific components
ECC 702.6	Introduce various security issues in IoT

Course Code & Name	not decided yet
Course Code & Name	ECL701 VLSI Design Lab
ECL 701.1	Demonstrate transfer, dynamic characteristics of various digital circuits.
ECL 701.2	Understand the circuit design using various simulation tools 3
ECL 701.3	Demonstrate layouts for various circuits and doing simulations
ECL 701.4	Understand the variation in the behaviour after extraction.
Course Code & Name	ECL 702 Internet of Things
ECL 702.1	Interface various sensors to any IoT device and push data onto cloud.
ECL 702.2	Remotely control various devices using Blynk App and Node-red environment.
ECL 702.3	Implement IoT protocols to control devices remotely
ECL 702.4	Implement services like Google Assistance, Adafruit I/O, IFTTT, Firebase etc in IoT.
ECL 702.5	Configure AWS Cloud and its Application in IoT
Course Code & Name	ISP701 Major Project – I
ISP 701.1	Identify problems based on societal /research needs.
ISP 701.2	Apply Knowledge and skill to solve societal problems in a group
ISP 701.3	Develop interpersonal skills to work as member of a group or leader.
ISP 701.4	Draw the proper inferences from available results through theoretical/ experimental/simulations
ISP 701.5	Analyze the impact of solutions in societal and environmental context for sustainable development
ISP 701.6	Use standard norms of engineering practices
ISP 701.7	Excel in written and oral communication.
ISP 701.8	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
ISP 701.9	Demonstrate project management principles during project work.
Course Code & Name	ECC 801 Robotics
ECC 801.1	Describe the basics of Robotics
ECC 801.2	Describe and derive kinematics and dynamics of stationary and mobile robots
ECC 801.3	Apply trajectory planning algorithms
ECC 801.4	Describe concepts of robot motion planning algorithms
ECC 801.5	Apply image processing in robotic vision
ECC 801.6	Identify suitable Robot language based on applications
Course Code & Name	ECC DO801 MEMS Technology
ECC DO801.1	Understand the different MEMS devices, working principles, materials and their properties.
ECC DO801.2	Design and simulate MEMS devices using standard simulation tools.
ECC DO801.3	Develop different concepts of MEMS sensors and actuators for real-world applications.
ECC DO801.4	Understand the rudiments of Micro-fabrication techniques.
Course Code & Name	not decided yet
Course Code & Name	ECL 801 Robotics lab
ECL 801.1	Use the acquired knowledge in solving direct and inverse kinematics problems
ECL 801.2	Select and Implement suitable task and trajectory planning algorithms.
ECL 801.3	Develop suitable programming tools for Robotic applications
ECL 801.4	Construct Robots/Robotic arms for automation applications
Course Code & Name	ECL 802 MEMS Technology
ECL 802.1	Determine various parameters for MEMS devices.
ECL 802.2	Plot characteristics of MEMS devices.
ECL 802.3	Select particular device for specific application.
ECL 802.4	Observe effect of device parameters variation on its performance.
Course Code & Name	ISP801 Major Project – II
ISP 801.1	Identify problems based on societal /research needs
ISP 801.2	Apply Knowledge and skill to solve societal problems in a group
ISP 801.3	Develop interpersonal skills to work as member of a group or leader
ISP 801.4	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ISP 801.5	Analyze the impact of solutions in societal and environmental context for sustainable development.
ISP 801.6	Use standard norms of engineering practices
ISP 801.7	Excel in written and oral communication.
ISP 801.8	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning
ISP 801.9	Demonstrate project management principles during project work