



**SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION**

**ENGINEERING**

**COURSE OUTCOMES (R-2017)**

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	MA8352	<b>Linear Algebra and Partial Differential Equations</b>	MA8352.1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
			MA8352.2	Demonstrate accurate and efficient use of advanced algebraic techniques.
			MA8352.3	Demonstrate their mastery by solving non-trivial problems related to the concepts and by proving simple theorems about the statements proven by the text.
			MA8352.4	Able to solve various types of partial differential equations
			MA8352.5	Able to solve engineering problems using Fourier series.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8393	<b>Fundamentals of Data Structures In C</b>	EC8393.1	Explain the fundamental concept of C programming and operations performing in it.
			EC8393.2	Demonstrate the concept of data structures, storage structures and common operations on them
			EC8393.3	Distinguish the various linear and non linear data structures with their representation and perform different operations on them
			EC8393.4	Apply the various data operations using Tree and graph structures
			EC8393.5	Appropriately choose the sorting and searching algorithm for an application

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8351	<b>Electronic Circuits- I</b>	EC8351.1	Understand various biasing methods and stabilization techniques of different transistors
			EC8351.2	Analyze the performance of small signal single stage and multi stage BJT amplifiers
			EC8351.3	Analyze the performance of small signal single stage and multi stage FET amplifiers
			EC8351.4	Acquire knowledge of Frequency response characteristics of BJT and FET amplifiers
			EC8351.5	Apply the knowledge of electronic circuits to design power supply

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8352	<b>Signals and Systems</b>	EC8352.1	Classify the Signals and Systems according to its properties
			EC8352.2	Apply Laplace Transform, Fourier transform, Z-Transform and DTFT in signal analysis
			EC8352.3	Examine continuous time LTI systems using Fourier and Laplace transforms
			EC8352.4	Make use of Z transform and DTFT in discrete time signals
			EC8352.5	Interpret the LTI discrete time systems using Z transform and DTFT

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8391	<b>Control Systems Engineering</b>	EC8391.1	Identify various control system components and their representations
			EC8391.2	Analyze the various time domain parameters
			EC8391.3	Analyze the various frequency response plots and its system
			EC8391.4	Apply the concepts of various system stability criteria
			EC8391.5	Design various transfer functions of digital control system using state variable models.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8392	<b>Digital Electronics</b>	EC8392.1	Minimize Boolean expressions in different forms and implement them using logic gates
			EC8392.2	Design various combinational digital circuits using logic gates
			EC8392.3	Analysis of synchronous sequential circuits and its internal structures
			EC8392.4	Design asynchronous sequential circuits for a given specification
			EC8392.5	Discuss about the characteristics and structure of different memory systems

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8381	<b>Fundamentals of Data Structures in C Laboratory</b>	EC8381.1	Write basic and advanced programs in C
			EC8381.2	Implement functions and recursive functions in C
			EC8381.3	Implement data structures using C
			EC8381.4	Choose appropriate sorting algorithm for an application and implement it in a modularized way

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	EC8361	<b>Analog and Digital Circuits Laboratory</b>	EC8361.1	Demonstrate the frequency response of the various types of amplifiers and implementation of digital logic circuits
			EC8361.2	Analyze the limitations and performance in bandwidth of single stage and multi stage amplifiers
			EC8361.3	Design a lumped circuit in bread board and in simulation tool to determine the bandwidth of an amplifiers and digital logic circuits to verify the truth table.
			EC8361.4	Summarize a report from the output obtained for analog as well as digital circuits

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
3	HS8381	<b>Interpersonal Skills/Listening &amp; Speaking</b>	HS8381.1	Listen and Respond appropriately
			HS8381.2	Participate in group discussion
			HS8381.3	Make effective presentations
			HS8381.4	Participate confidently and appropriately in conversations both formal and informal

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	MA8451	<b>Probability and Random Processes</b>	MA8451.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of Standard distributions, which can describe real life phenomenon.
			MA8451.2	Understand the basic concepts of one and two dimensional random variables and applying engineering applications.
			MA8451.3	Apply the concept random processes in engineering disciplines
			MA8451.4	Understand and apply the concept of correlation and spectral densities
			MA8451.5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8452	<b>Electronic Circuits II</b>	EC8452.1	Analyze the different types of Feedback Amplifier Circuits
			EC8452.2	Design the different types of Oscillators for given specifications
			EC8452.3	Examine the performance of various tuned amplifiers
			EC8452.4	Design the different types of Wave Shaping and Multivibrators
			EC8452.5	Summarize the operation of Power Amplifiers and DC converters

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8491	<b>Communication Theory</b>	EC8491.1	Understand the fundamentals of Amplitude modulation schemes.
			EC8491.2	Summarize the concepts of Angle modulation schemes and compare AM and FM .
			EC8491.3	Apply the concepts of random process in the design of Communication systems.
			EC8491.4	Analyze the noise performance of AM and FM systems.
			EC8491.5	Gain knowledge in sampling ,quantization and pulse modulation schemes

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8451	<b>Electromagnetic Fields</b>	EC8451.1	Understanding of fundamental electromagnetic laws and concepts mathematically.
			EC8451.2	Estimation of electric field quantity based on concepts and laws
			EC8451.3	Estimation of magnetic field quantity based on concepts and laws
			EC8451.4	Explain the concept of time varying fields and write Maxwell's equations in all forms
			EC8451.5	Analyze propagation of plane wave in different media's and boundaries.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8453	<b>Linear Integrated Circuits</b>	EC8453.1	Illustrate the concept of linear integrated circuits
			EC8453.2	Design the linear and non linear applications of OP-AMP.
			EC8453.3	Design applications using analog multiplier and PLL
			EC8453.4	Design ADC and DAC using OP – AMPS
			EC8453.5	Generate waveforms using OP – AMP Circuits and Analyze special function ICs

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	GE8291	<b>Environmental Science and Engineering</b>	GE8291.1	Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
			GE8291.2	Environmental Pollution or problems cannot be solved by mere laws
			GE8291.3	Public awareness of environmental is at infant stage.
			GE8291.4	Ignorance and incomplete knowledge has lead to misconceptions
			GE8291.5	Development and improvement in std. of living has lead to serious environmental disasters.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8461	<b>Circuits Design and Simulation Laboratory</b>	EC8461.1	Understand the various types of amplifiers, oscillators and multivibrators
			EC8461.2	Demonstrate the knowledge in design schemes through implementation of oscillators and tuned amplifiers
			EC8461.3	Demonstrate the different types of wave shaping circuits and multivibrators

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
4	EC8462	<b>Linear Integrated Circuits Laboratory</b>	EC8462.1	Design amplifiers, oscillators, D-A converters using operational amplifiers
			EC8462.2	Design filters using op-amp and performs an experiment on frequency response.
			EC8462.3	Analyze the working of PLL and describe its application as a frequency multiplier.
			EC8462.4	Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8501	<b>Digital Communication</b>	EC8501.1	Apply the concepts of source coding techniques on the information signals.
			EC8501.2	Compare the various waveform coding schemes.
			EC8501.3	Understand the various baseband transmission schemes
			EC8501.4	Analyze characteristics of different digital modulation schemes and their noise performance.
			EC8501.5	Apply various error control coding schemes over information bits.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8553	<b>Discrete-Time Signal Processing</b>	EC8553.1	Apply DFT for the analysis of signals and systems
			EC8553.2	Understand and design IIR filters.
			EC8553.3	Understand and design FIR filters.
			EC8553.4	Characterize the effects of finite precision representation on digital filters
			EC8553.5	Understand the DSP architectures and its applications

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8552	<b>Computer Architecture and Organization</b>	EC8552.1	Describe data representation, instruction formats and the operation of a digital computer
			EC8552.2	Illustrate the fixed point and floating-point arithmetic for ALU operation
			EC8552.3	Discuss about implementation schemes of control unit and pipeline performance
			EC8552.4	Explain the concept of various memories, interfacing and organization of multiple processors
			EC8552.5	Discuss parallel processing technique and unconventional architectures

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8551	<b>Communication Networks</b>	EC8551.1	Summarize the components required to build different types of networks.
			EC8551.2	Outline the required functionality of Data link and Media access control.
			EC8551.3	Identify the solution for various functionalities at routing protocols.
			EC8551.4	Identify the flow of information from one node to another node in the Transport layer.
			EC8551.5	Explain the various functionality at application layer

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	OMD551	<b>Biomedical instrumentation</b>	OMD551.1	Learn the different bio potentials with propagation and various types of electrodes
			OMD551.2	Compute the different electrode placement for various physiological recording
			OMD551.3	Illustrate the different types of bio-amplifiers
			OMD551.4	Know techniques for non electrical physiological measurements
			OMD551.5	Understand the different biochemical measurements



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5	EC8073	<b>Medical Electronics</b>	EC8073.1	Know the human body electro- physiological parameters and recording of bio- potentials
			EC8073.2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc
			EC8073.3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators.
			EC8073.4	Understand physical medicine methods eg. ultrasonic, shortwave, microwave, Surgical diathermies , and bio-telemetry principles and methods
			EC8073.5	Know about recent trends in medical instrumentation

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8562	<b>Digital Signal Processing Laboratory</b>	EC8562.1	Carryout basic signal processing operations
			EC8562.2	Demonstrate their abilities towards MATLAB based implementation of various DSP systems
			EC8562.3	Analyze the architecture of a DSP Processor AND Design a DSP system for various applications of DSP
			EC8562.4	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8561	<b>Communication Systems Laboratory</b>	EC8561.1	Simulate & validate the various functional modules of a communication system
			EC8561.2	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes
			EC8561.3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
			EC8561.4	Simulate end-to-end communication Link

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
5	EC8563	<b>Communication Networks Laboratory</b>	EC8563.1	Students develop the ability to implementing various routing protocols and maintaining a secure data transfer. Identifying the procedure of doing the experiment.
			EC8563.2	Students develop the ability to examine various routing protocols
			EC8563.3	Students have the ability to design and simulate various types of topologies and understanding the differences between them
			EC8563.4	Students able to Illustrate the different aspects of networks, protocols and network design models.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	EC8691	<b>Microprocessors and Microcontrollers</b>	EC8691.1	Outline basics of 8086 and execute programs based on 8086 microprocessor
			EC8691.2	Discuss the 8086 memory interfacing circuits
			EC8691.3	Illustrate the 8086 based I/O Interfacings circuits
			EC8691.4	Describe the basics of 8051 and execute programs based on 8051 microcontroller
			EC8691.5	Construct a system based on 8051 microcontroller

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6	EC8095	<b>VLSI Design</b>	EC8095.1	Explain the various characteristics of CMOS transistor and sketch layout diagram for Boolean expressions
			EC8095.2	Construct digital combinational circuits based on various MOS technologies and explain various power strategies
			EC8095.3	Explain the various sequential logic circuits for digital operations
			EC8095.4	Illustrate various arithmetic building blocks and memory subsystems
			EC8095.5	Understand the various implementation strategies of the combinational and sequential logic circuits

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	EC8652	<b>Wireless Communication</b>	EC8652.1	Characterize a wireless channel and evolve the system design specifications
			EC8652.2	Design a cellular system based on resource availability and traffic demands
			EC8652.3	Identify the various signaling schemes for fading channels
			EC8652.4	Identify suitable multipath mitigation techniques for the wireless channel and system under consideration
			EC8652.5	Understand the concepts of multiple antenna techniques

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6	MG8591	<b>Principles of Management</b>	MG8591.1	Evolution of management, functions and roles of managers
			MG8591.2	Different types of planning process and tools used for planning
			MG8591.3	Different organization structures and functions of human resources manager
			MG8591.4	control techniques and the role of technology in management
			MG8591.5	Control techniques and the role of technology in management

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	EC8651	<b>Transmission Lines and RF Systems</b>	EC8651.1	Explain the characteristics of transmission lines and its losses
			EC8651.2	Write about the standing wave ratio and input impedance in high frequency transmission lines
			EC8651.3	Analyze impedance matching by stubs using smith charts
			EC8651.4	Analyze the characteristics of TE and TM waves
			EC8651.5	Design a RF transceiver system for wireless communication

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6	EC8004	<b>Wireless Networks</b>	EC8004.1	Explain the various protocols and standards of wireless LAN.
			EC8004.2	Describe the concept of Mobile IP packet delivery and routing in mobile ad-hoc network
			EC8004.3	Analyze the fundamentals of 3G services and its Protocol
			EC8004.4	Discuss about the different wireless WAN architectures.
			EC8004.5	Explain 4G technologies and its applications

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6	EC8681	<b>MICROPROCESSOR AND MICROCONTROLLER LABORATORY</b>	EC8681.1	Ability to Write ALP Programmes for fixed and Floating Point and Arithmetic operations
			EC8681.2	Ability to Interface different I/Os with processor
			EC8681.3	Ability to Generate waveforms using Microprocessors
			EC8681.4	Ability to Execute Programs in 8051

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	EC8661	<b>VLSI Design Laboratory</b>	EC8661.1	Write HDL code for basic as well as advanced digital integrated circuit
			EC8661.2	Import the logic modules into FPGA Boards
			EC8661.3	Synthesize Place and Route the digital IPs
			EC8661.4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	EC8611	<b>Technical Seminar</b>	EC8611.1	Establish motivation for any topic of interest and develop a thought process for technical presentation
			EC8611.2	Organize a detailed literature survey and build a document with respect to technical publications
			EC8611.3	Analysis and comprehension of proof-of-concept and related data
			EC8611.4	Effective presentation and improve soft skills
			EC8611.5	Make use of new and recent technology for creating technical reports

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
6	HS8581	<b>Professional Communication</b>	HS8581.1	Make effective presentations
			HS8581.2	Participate confidently in Group Discussions
			HS8581.3	Attend job interviews and be successful in them.
			HS8581.4	Develop adequate Soft skills required for the workplace

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
7	EC8701	<b>Antennas and Microwave Engineering</b>	EC8701.1	Apply the basic principles and evaluate antenna parameters and link power budgets
			EC8701.2	Design and Analyze the performance of Wire, Microstrip and frequency independent antennas
			EC8701.3	Analyze array antenna with its applications
			EC8701.4	Understand the operation of various microwave devices
			EC8701.5	Design a microwave system given the application specifications

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
7	EC8751	<b>Optical Communication</b>	EC8751.1	Realize basic elements in optical fibers, different modes and configurations
			EC8751.2	Analyze the transmission characteristics associated with dispersion and polarization techniques.
			EC8751.3	Design optical sources and detectors with their use in optical communication system
			EC8751.4	Construct fiber optic receiver systems, measurements and coupling techniques
			EC8751.5	Design optical communication systems and its networks.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
7	EC8791	<b>Embedded and Real Time Systems</b>	EC8791.1	Discuss the basic concepts of embedded system
			EC8791.2	Describe the architecture and peripherals of ARM processor
			EC8791.3	Discuss about the embedded program strategies and optimization
			EC8791.4	Explain the basic concepts of real time operating system design
			EC8791.5	Illustrate the model real-time applications using embedded-system concepts

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7	EC8702	<b>Ad hoc and Wireless Sensor Networks</b>	EC8702.1	Know the basics of Ad hoc networks and Wireless Sensor Networks
			EC8702.2	Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement
			EC8702.3	Apply the knowledge to identify appropriate physical and MAC layer protocols
			EC8702.4	Understand the transport layer and security issues possible in Ad hoc and sensor networks
			EC8702.5	Be familiar with the OS used in Wireless Sensor Networks and build basic modules

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7	OBT753	<b>Introduction to cell biology</b>	OBT753.1	Understand the basics concepts of cell structure
			OBT753.2	Understand the various types of cell organelles and its functions
			OBT753.3	Classify the types of cell divisions
			OBT753.4	Explain and compare the architectural hierarchy of DNA, RNA and Protein
			OBT753.5	Illustrate the role of enzymes in industries.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
7	EC8092	<b>Advanced Wireless communication</b>	EC8092.1	Understanding the importance of improving capacity of wireless channel using MIMO
			EC8092.2	Explain the characteristics of small scale and large scale fading measurements.
			EC8092.3	Identify the significance of channel impairment mitigation using space-time block codes.
			EC8092.4	Identify the channel impairment mitigation using Trellis codes
			EC8092.5	Outline the concept of advanced MIMO system like layered space time codes, MU-MIMO System and MIMO-OFDM systems

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7	EC8711	<b>Embedded Laboratory</b>	EC8711.1	Write programs in ARM for a specific Application
			EC8711.2	Interface memory, A/D and D/A convertors with ARM system
			EC8711.3	Analyze the performance of interrupt
			EC8711.4	Write program for interfacing keyboard, display, motor and sensor.

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7	EC8761	<b>Advanced Communication Laboratory</b>	EC8761.1	Analyze the performance of simple optical link by measurement of losses and analyzing the mode characteristics of fiber
			EC8761.2	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
			EC8761.3	Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
			EC8761.4	Understand the intricacies in Microwave System design

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8	EC8093	<b>Digital Image Processing</b>	EC8093.1	Explain the fundamentals of digital image processing techniques.
			EC8093.2	Explain the various image enhancement techniques in spatial and frequency domain.
			EC8093.3	Apply the various filtering methods for image restoration.
			EC8093.4	Operate on images using the various techniques for image segmentation.
			EC8093.5	Use various techniques for image compression and recognition.

SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
8	GE8076	<b>Professional Ethics in Engineering</b>	GE8076.1	To understand the core values that shapes the ethical behavior of an engineer and awareness of professional ethics, safety and global issues.
			GE8076.2	To apply the ethical principles and examine the perception of professional ethics, various moral issues and uses of ethical theories.
			GE8076.3	To analyze the various social issues, industrial standards, code of ethics, global issues and role of professional ethics in engineering field.
			GE8076.4	To validate the responsibilities of an engineer for safety and risk benefit analysis, professional rights and Responsibilities of an engineer.
			GE8076.5	To create awareness on a variety of global issues and devise ethical principles to resolve situations that arise in their professional and personal lives.

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8	EC8094	<b>Satellite Communication</b>	EC8094.1	Describe the satellite orbits and launch methodologies
			EC8094.2	Discuss the concept of space segment
			EC8094.3	Analyze the link design of satellites
			EC8094.4	Use different access techniques to communicate satellite systems
			EC8094.5	Understand the applications of satellite.



SEMSTER	SUBJECT CODE	SUBJECT NAME	CO NO	COURSE OUTCOMES
8	EC8811	<b>Project Work</b>	EC8811.1	Develop the ability to do the literature survey systematically to identify the research gap.
			EC8811.2	Develop the ability to demonstrate the problem formulated from the research gap identified through literature review.
			EC8811.3	Develop the ability to experiment / examine a specific problem by formulating proper methodologies.
			EC8811.4	Develop the ability to appraise and select the successful solution for the problem.
			EC8811.5	On completion of the project work, students will be in a position to take up challenging practical problems and find solution by formulating proper methodology.