Department of Electronics & Computer Science

Unique Course Number: ELC401 Course Name: Engineering Mathematics - IV

Unique CO Number	Course Outcome (CO) Statement
ELC4011	Analyse and synthesize core knowledge of complex analysis to integrate the complex functions by Cauchy's theorem, Cauchy's Integral Formula and Cauchy's Residue theorem by demonstrating the use of singularities, poles, power series and residues at poles
ELC4012	Apply the concept of Correlation and Regression to the Engineering problems
ELC4013	Distinguish between discrete and continuous random variable and choose appropriate probability distribution for statistical inference in data analysis and extend the investigation of the relationship between two random variables to quantify the extent or degree to which the variables are correlated
ELC4014	Demonstrate the ability to perform calculations involving Dot products, Norms, Cauchy-Schwartz's inequality and the Triangle inequality.
ELC4015	Apply transformation to reduce Quadratic Form
ELC4016	Apply fundamental concepts & Principles of functional to obtain the externals using Euler-Lagrange's equations under different cases of a function.

Course Number: ECC402 Course Name: Electronics Circuits

Unique CO Number	Course Outcome (CO) Statement
ECC4021	Evaluate the performance of amplifiers through frequency response.
ECC4022	Analyse differential amplifiers for various performance parameters
ECC4023	Express mathematically the performance parameters in terms of circuit parameters
ECC4024	Choose appropriate circuit for the given specifications/ applications
ECC4025	Describe various applications and circuits based on operational amplifiers.
ECC4026	Design an application with the use of integrated circuits.

Course Number: ECC403 Course Name: Control & Instrumentation

Unique CO Number	Course Outcome (CO) Statement
ECC4031	Derive the transfer functions for the given control systems..
ECC4032	Design and analyse the performance of control systems based on the time domain and frequency domain specifications.
ECC4033	Judge the stability of the given control systems using appropriate stability criteria.
ECC4034	Understand and explain the working principle of sensors and transducers.
ECC4035	Analyze various parameters of data acquisition systems.
ECC4036	Define and describe instrument communication standards.

Course Number: ECC404 Course Name: Microprocessors and Microcontrollers

Unique CO Number	Course Outcome (CO) Statement
ECC4041	To explain 16-bit Microprocessor architectures and fundamental concepts of Microcontrollers
ECC4042	To develop programming skills for Microprocessors and Microcontrollers
ECC4043	To interface various devices in Microprocessor and Microcontroller systems
ECC4044	To design and implement Microprocessor and Microcontroller based systems
ECC4045	To describe the significance of various peripherals interfaced with microprocessor.
ECC4046	To describe the significance of various peripherals interfaced with microprocessor.

Course Number: ECC405 Course Name: Discrete Structures and Automata Theory

Unique CO Number	Course Outcome (CO) Statement
ECC4051	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.
ECC4052	Reason Logically.
ECC4053	Perform operations with Sets, Relations, Functions, Graphs and their applications.
ECC4054	Design Deterministic Finite Automata (DFA) and Non-deterministic Finite Automata (NFA) and Pushdown Automata with understanding of power and limitations
ECC4055	Design Context Free Grammar and perform the operations like simplification and normal forms.
ECC4056	Apply Discrete Structures and Automata Theory concepts into solving real world computing problems in the domain of Formal Specification, Verification, Artificial Intelligence etc.

Lab Outcomes

Course Number:ELC401 Course Name: Electronic Circuits

Unique CO Number	Course Outcome (CO) Statement
ELC4011	Experimentally evaluate performance of amplifiers through frequency response.
ELC4012	Analyze differential amplifiers for various performance parameters
ELC4013	Implement practically various applications and circuits based on operational amplifiers.
ELC4014	Design RC oscillators using integrated circuits as per the given specifications
ELC4015	Analyze astable multivibrator using IC 555
ELC4016	Analyze 4 bit R2R DAC

Course Number: ELC402 Course Name: Control and Instrumentation Lab

Unique CO Number	Course Outcome (CO) Statement
ELC4021	Analyse a control system in time and frequency domain.
ELC4022	Sketch various plots in time and frequency domain and analyse the system using the plots.
ELC4023	Analyse the stability of control systems via controllers
ELC4024	Calculate and draw the characteristics of transducers
ELC4025	Measure the physical quantities of transducers
ELC4026	Demonstration of the instrumentation system

Course Number: ECC403 Course Name: Microprocessor and Microcontroller Lab

Unique CO Number	Course Outcome (CO) Statement
ELC4031	To define and study the arithmetic and logical instructions of 8086
ELC4032	To define and study the branching and movement operation instructions of 8086
ELC4033	To describe the set of string instructions for faster operation.
ELC4034	To utilize the instructions in interfacing peripherals with 8086
ELC4035	To define and study the arithmetic and logical instructions of 8051
ELC4036	To demonstrate interfacing of peripherals using 8051

Course Number: ECC404 Course Name: Skill Based Lab Python

Unique CO Number	Course Outcome (CO) Statement
ELC4041	Describe syntax and semantics in Python for fundamental programming
ELC4042	Illustrate different file handling operations
ELC4043	Interpret the concept of class, object and packages
ELC4044	Express proficiency in the handling Python libraries for data science
ELC4045	Design GUI Applications in Python
ELC4046	Develop machine learning applications using Python.

Course Number: ELM404 Course Name: Mini Project 1B

Unique CO Number	Course Outcome (CO) Statement
ECM4011	Identify problems based on research needs
ECM4012	Apply Knowledge and skill to solve societal problems in a group.
ECM4013	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ECM4014	Analyze the impact of solutions in societal and environmental context for sustainable development
ECM4015	Use standard norms of engineering practices
ECM4016	Excel in written and oral communication.

ELC4022	Analyze the performance of single stage and multistage amplifiers.
ELC4023	Analyze the performance parameters of feedback amplifiers
ELC4024	Explain the MOSFET based circuits of oscillators.
ELC4025	Perform DC and AC analysis of MOSFET differential amplifier
ELC4026	Evaluate the performance of various power amplifiers

Course Number: ELC 403 Course Name: Microprocessors and Applications

Unique CO Number	Course Outcome (CO) Statement
ELC4611	Recall behaviors of Microcontrollers
ELC4612	Describe the various RISC and CISC Microcontrollers
ELC4613	To apply appropriate instructions to develop software logic for appropriate microcontroller hardware
ELC4614	To classify different input output peripherals interfaced with microcontrollers as per their application
ELC4615	To select appropriate hardware software co-design techniques for microcontroller based embedded system
ELC4616	To create microcontroller based Application

Course Number: EXC 404 Course Name: Principles of Communication Engineering

Unique CO Number	Course Outcome (CO) Statement
ELC4541	Comprehend the need for various components in analog communication systems
ELC4542	Analyze various analog modulation methods, & study modulators, demodulators circuits for amplitude, frequency & phase modulated systems.

ELC4543	Analyze the characteristics and function of the radio receivers.
ELC4544	Identify the characteristics of pulse modulation techniques and study different Pulse modulators and Demodulators
ELC4545	Understand the importance of Digital modulation techniques and study them.
ELC4546	Identify the need of multiplexing techniques and recommend the suitable multiplxing system.

Course Number: ELC405 Course Name: Signals & Systems

Unique CO Number	Course Outcome (CO) Statement
ELC4411	Describe continuous and discrete time signals analytically and graphically.
ELC4412	Differentiate between continuous time and discrete time signals and systems
ELC4413	Apply frequency domain techniques for analysis of continuous time signals and systems
ELC4414	Apply frequency domain techniques for analysis of discrete time signals and systems
ELC4415	Analyze continuous and discrete time signals and systems in time domain.
ELC4416	Analyze continuous and discrete time signals and systems in frequency domain

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LO STATEMENTS

Course Number:ELL401 Course Name: Electronics Devices & Circuit-II Laboratory

Unique LO Number	Lab Outcome (LO) Statement
ELL4311	Study the characteristics of NMOS
ELL4312	Analyze the frequency response of multistage amplifiers
ELL4313	Analyze the frequency response of feedback amplifier.
ELL4314	Design circuits based on oscillator
ELL4315	Analyze the performance parameters of differential amplifier.
ELL4316	Calculate the efficiency .of different power amplifiers

Course Number: ELL402 Course Name: Microprocessor and Applications Lab

Unique LO Number	Lab Outcome (LO) Statement
ELL4611	Write assembly language programs and implement on Microcontroller
ELL4612	Write and implement assembly programs for 8051 using Keil.
ELL4613	Write and implement C language programs for 8051 using Keil.
ELL4614	Write assembly program to demonstrate on chip features of 8051
ELL4615	Write assembly program to interface peripheral IC's to 8051
ELL4616	Design 8051 based System

Course Number:ELC403 Course Name: Analog Communication Laboratory

Unique LO Number	Lab Outcome (LO) Statement
ELL 4031	Visualize different waveforms at different junctions for continuous and pulse modulation and demodulation methods
ELL 4032	Illustrate modulated and demodulated output waveforms at each continuous and pulse modulation and Demodulation Techniques
ELL 4033	Compare the difference between each modulation technique
ELL 4034	Calculate modulation Index for Amplitude modulation, Frequency and modulation Techniques
ELL 4035	Simulate the digital modulation circuit and draw its waveforms at different junctions
ELL 4036	Apply the knowledge of modulation to design receivers and analyze spectrums by solving problems

Course Number:ELC404 Course Name: Python Programming Laboratory

Unique LO Number	Lab Outcome (LO) Statement
ELL4041	Describe syntax and semantics in Python
ELL4042	Illustrate different file handling operations
ELL4043	Demonstrate object-oriented programming in Python
ELL4044	Design GUI Applications in Python
ELL4045	Express proficiency in the handling Python libraries for data science
ELL 4046	Develop machine learning applications using Python.

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Course Number:ELM401 Course Name: Mini Project -1(B) Laboratory

Unique LO Number	Lab Outcome (LO) Statement
ELM4511	Identify problems based on societal /research needs
ELM4512	Apply Knowledge and skill to solve societal problems in a group.
ELM4513	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ELM4514	Analyze the impact of solutions in societal and environmental context for sustainable development.
ELM4515	Use standard norms of engineering practices
ELM4516	Excel in written and oral communication.