

SHREE L.R. TIWARI COLLEGE OF ENGINEERING

Kanakia Park, Mira Road(E), Thane-401107, Maharashtra.

Electronics Department

Second Year Academic Year:2020-21		ODD SEM
Course code	Course Name	Course Outcomes
ELC 301	Applied Mathematics-III	ELC301.1 Students will be able to demonstrate basic knowledge of laplace transform, fourier series, Bessel function, vector algebra and complex variable. ELC301.2 Students will be able to identify and model the problems in the field of electronics ELC301.3 students will be able to apply the application of mathematics in electronics and Telecommunication engineering.
ELC 302	Electronics Devices and circuits -I	ELC 302.1 Students will be able to explain working of semiconductor devices. ELC 302.2 Students will be able to analyze characteristics of semiconductor devices ELC 302.3 Students will be able to perform DC and AC analysis of Electronics circuits ELC 302.4 Students will be able to compare various biasing circuits as well as various configurations of BJT, JFET and MOSFETs. ELX 302.5 Students will be able to select best circuit for the given specifications/application. ELC 302.6 Students will be able to design electronics circuits for given specifications.
ELC 303	Digital Logic Circuits	ELC303.1 Students will be able to perform various logical and arithmetic operations various number systems as well as conversion of one representation to another. ELC303.2 Students will be able to apply Boolean algebra for the implementation and minimization of logic functions. ELC303.3 Students will be able to analyze, design and implement combinational logic circuits. ELC303.4 students will be able to differentiate between logic families TTL and CMOS. ELC303.5 Students will be able to analyze, design and implement sequential logic circuits.
ELC304	Electrical Network Analysis and Synthesis	ELC304.1 Students will be able to apply their understanding of network theorems in analyzing complex circuits. ELC304.2 Students will be able to evaluate the time and frequency response of electrical circuits and thereby understand the behaviour of electrical networks. ELC304.3 Students will be able to evaluate the inter-relationship among various circuit parameters and solve complex networks using these parameters. ELC304.4 Students will be able to synthesize electrical networks for a given network function and design simple filters.
ELC305	Electronic Instruments and Measurement	ELC305.1 Students will be able to describe the static & dynamic characteristics of an instrument, components of general instrumentation system & different types of errors in the measurement process ELC305.2 Students will be able to analyze various test & measuring instruments including AC and DC bridges to determine the unknown quantity under measurement. ELC305.3 Students will be able to use CRO to perform wide range of simple to complex measurement functions for voltage, phase and component testing. ELC305.4 Students will be able to select choice of transducer for practical & real-life applications based on their principle of operation, working, construction & characteristics.
ELL304	OOPM	ELL304.1 To apply fundamental programming constructs. ELL304.2 To illustrate concept of packages, classes, objects ELL304.3 To illustrate concept of string, array, vectors ELL304.4 To apply fundamental programming constructs.

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Course code	Course Name	Course Outcomes
ELC401	Applied Mathematics IV	ELC401.1 Students will be able to demonstrate basic knowledge of calculus of variation,vector spaces,matrix theory,random variables,probability.
		ELC401.2 Students will be able to identify and model the problems in the field of electronics
		ELC401.3 students will able to apply the application of mathematics in electronics and Telecommunication engineering.
ELC402	Electronics Devices and Circuits II	ELC402.1 Students will be able to Ability to understand amplifiers through frequency response
		ELC402.2 Students will be able to perform DC and AC analysis of single stage and multistage amplifiers, oscillators, etc.
		ELC402.3 Students will be able to derive expression for performance parameters in terms of circuit and device parameters.
		ELC402.4 Student will be able to select appropriate circuit for given specifications/applications
		ELC402.5 Students will be able to explain working and construction details of special, semiconductor devices
ELC403	Microprocesor and Applications	ELC403.1 To explain fundamental concepts of microcontrollers.
		ELC403.2To develop programming skills for microcontrollers using Assembly and C concepts
		ELC403.3 To interface various devices to the microcontroller
		ELC403.4To design and implement microcontroller- based systems
ELC404	Analog Communication	ELC404.1 Students will be able to describe the various elements of communication system.
		ELC404.2 Students will be able to analyze the performance of different analog modulation methods.
		ELC404.3 Students will be able to illustrate generation and detection of amplitude and frequency modulated systems
		ELC4.4.4 Apply the concept of Z transform and comprehend conversion from time domain to frequency domain for discrete time systems. 5
		ELC404.5 Students will be able to recognize the need for multiplexing techniques
ELC405	Signals and Systems	ELC405.1 Identify and differentiate between continuous and discrete time signals and systems.
		ELC405.2 Develop input output relationship for LTI systems.
		ELC405.3 Apply the concept of Laplace transform and understand conversion from time domain to frequency domain for continuous time systems
		ELC405.4 Students will be able to assess the characteristics of pulse modulation techniques.
		ELC405.5 Analyse continuous time signals using Fourier series and discrete time signals using fourier transform.
ELL404	Skill Lab : Python Programming	ELL404.1 Describe syntax and semantics in Python
		ELL404.2 Illustrate different file handling operations
		ELL404.3 Interpret object oriented programming in Python
		ELL404.4 Design GUI Applications in Python
		ELL404.5 Express proficiency in the handling Python libraries for data science
		ELL404.6 Develop machine learning applications using Python

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Course code	Course Name	Course Outcomes
EXC501	Micro-controllers and Applications	EXC501.1: Explain basic terminology and describe the components, parts and operation of a microcontroller based system. EXC501.2: Describe the microcontroller architecture and usages of the instruction set of the representative microcontrollers. EXC501.3: Explain and perform input/output and interrupt operations in a microcontroller system. EXC501.4: Interpret and write simple programs for microcontroller applications.
EXC502	Digital communication	EXC502.1 Demonstrate an understanding of fundamentals of integrated circuits EXC502.2 Analyse the various applications and circuits based on particular integrated circuits EXC502.3 Analyse the various applications and circuits based on particular integrated circuits EXC502.3 select and use appropriate particular integrated circuits to build a given application EXC502.4 Design an application with the use of integrated circuits
EXC503	Engineering Electromagnetics	EXC503.1 Ability to find nature of electric or magnetic fields produced due to different charge distributions EXC503.2 Ability to understand working of different equipment based on electromagnetic effects used in day to day life EXC503.3 Knowledge of behavior of EM waves and travelling of waves in free space as well as media EXC503.4 Ability to identify and solve problems related to the propagation of waves EXC503.5 Ability to understand the basics of wave propagation required for the study of antennas
EXC504	Design with Linear Integrated Circuits	EXC504.1 Demonstrate an understanding of fundamental integrated circuit. EXC504.2 Analyse the various applications and circuits based on particular integrated circuit. EXC504.3 Select and use an appropriate integrated circuit to build a given application. EXC504.4 Design an application with the use of integrated circuit.
EXC505	Business Communication & Ethics	EXS506.1 Communicate Effectively in both verbal and written form and demonstrate knowledge of professional and ethical responsibilities. EXS506.2 Participate and succeed in campus placements and competitive examinations like GATE, CET EXS506.3 Possess entrepreneurial approach and ability for life long learning. EXS506.4 Have education necessary for understanding for the impact of engineering solutions on society and demonstrate awareness.
ELXDLO5011	Database and Management System	ELXDLO 5011 .1 Understand the fundamentals of a database systems ELXDLO 5011 .2 Design and draw ER and EER diagram for the real life problem. ELXDLO 5011 .3 Convert conceptual model to relational model and formulate relational algebra queries. ELXDLO 5011 .4 Design and querying database using SQL. ELXDLO 5011 .5 Analyze and apply concepts of normalization to relational database design. ELXDLO 5011 .6 Understand the concept of transaction, concurrency and recovery

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EXC601	Embedded System and RTOS	EXC601.1 Identify and describe various characteristic features and applications of embedded systems.
		EXC601.2 Analyse and identify hardware for embedded systems implementation.
		EXC601.3 Analyse and identify various software issues involved in Embedded systems for real time requirements.
		EXC601.4 Analyse and explain the design life-cycle for embedded system implementation.
EXC602	Computer Communication Network	EXC602.1 Demonstrate understanding of networking concepts and required protocols.
		EXC602.2 Analyze the various layers and protocols of the layered architecture.
		EXC602.3 Evaluate different addressing schemes, connecting devices and routing protocols.
		EXC602.4 Appreciate the application layer protocols.
EXC603	VLSI Design	EXC603.1. Demonstrate a clear understanding of choice of technology, scaling, MOS models and system level design issues.
		EXC603.2. Design and analyze MOS based inverters.
		EXC603.3. Design MOS based circuits with different design styles.
		EXC603.4. Design semiconductor memories, adders and multipliers
EXC604	Signals and systems	ELX604.1 After successful completion of this course student will be able to Differentiate between continuous time and discrete time Signals and Systems
		ELX604.2 After successful completion of this course student will be able to Understand various transforms for time domain to frequency domain conversion
		ELX604.3 After successful completion of this course student will be able to Apply frequency domain techniques for analysis of LTI systems
		ELX604.4 After successful completion of this course student will be able to Apply frequency domain techniques for analysis of continuous and discrete signals
ELXDLO6023	Wireless Communication	ELX DLO6023.1 Understand the concepts of basic cellular system, frequency reuse, channel assignment
		ELX DLO6023.2 Understand the fundamentals radio propagation , Path loss and comprehend the effect of Fading .
		ELX DLO6023.3 . Acquire the Knowledge about multiple access technologies and different of different spread spectrum techniques
		ELX DLO6023.4 Acquire the Knowledge about overall GSM cellular concept and analyse its services and features
		ELX DLO6023 .5 Comprehend the features of CDMA technology
		ELX DLO6023.6 Analyse the evolution of cellular technology from 2G to 4G Cellular systems .
ELXDLO6024	Computer Organization and Architecture	ELX DLO6024.1 The learner will have the ability to Define the performance metrics of a Computer
		ELX DLO6024.2 "The learner will have the ability to Define the performance metrics of a Computer"
		ELX DLO6024.3 "The learner will have the ability to Explain the advantages and limitations of Parallelism in systems"
		ELX DLO6024.4 The learner will have the ability to Explain the various architectural enhancements in modern processors

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Final Year Academic Year:2019-20

Course code	Course Name	Course Outcomes
EXC 701	Instrumentation System Design	EXC 701.1 Demonstrate the needs of advancement in instrumentation systems.
		EXC 701.2 Select the proper components for pneumatic & hydraulic systems.
		EXC 701.3 Choose the transmitter / controller for given process application.
		EXC 701.4 Analyze the controller parameters for discrete or continuous type.
		EXC 701.5 Design the controller (electronic) for a given process or application.
EXC 702	Power Electronics	ELX702.1 Discuss trade-offs involved in power semiconductor devices.
		ELX702. 2 Designing of triggering ,commutation and protection circuits for SCRs.
		ELX702.3 Analyse different types of single phase rectifiers and DC-DC converter
		ELX702.4 Analyse different types of single phase rectifiers and DC-AC converter
		ELX702.5 Analyse different types of AC voltage controllers and Cycloconverters
EXC703	Digital signal processing	BEEXC703.1 Students will be able to Demonstrate an understanding of the discrete-time Fourier transform and the concept of digital frequency
		BEEXC703.2 Students will be able to Design FIR and IIR digital filters to meet arbitrary specifications and Develop algorithms for implementation
		BEEXC703.3 Students will be able to Understand the effect of hardware limitations on performance of digital filters
		BEEXC703.4 Students will be able to Use advanced signal processing techniques and digital signal processors in various applications
ELXDLO7031	Neural Network and Fuzzy Logic	BEELXDLO7031.1. Choose between different types of neural networks
		BEELXDLO7031.2. Design a neural network for a particular application
		BEELXDLO7031.3. Understand the applications of neural networks
		BEELXDLO7031.4. Appreciate the need for fuzzy logic and control
ILO7016	Cyber Security and Laws	ILO7016.1 After successful completion of the course student will be able to Understand the concept of cybercrime and its effect on outside world
		ILO7016.2 After successful completion of the course student will be able to Interpret and apply IT law in various legal issues
		ILO7016.3 After successful completion of the course student will be able to Distinguish different aspects of cyber law
		ILO7016.4 After successful completion of the course student will be able to Apply Information Security Standards compliance during software design and development

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Course code	Course Name	Course Outcomes
EXC801	Internet of Things	ELX801.1 The Objective of this course is to understand the design features of Internet of Things. ELX801.2 The Objective of this course is to understand importance of data handling in IoT Way. ELX801.3 The Objective of this course is to introduce multiple way of data communication and networking. ELX801.4 The Objective of this course is to understand the design issue of Iot.
EXC802	Analog and Mixed VLSI Design	ELX802.1 Discuss tradeoffs involved in analog VLSI Circuits. ELX802.2 Analyze building blocks of CMOS analog VLSI circuits. ELX802.3 Design building blocks of CMOS analog VLSI circuits ELX802.4 Carry out verifications of issues involved in analog and mixed signal circuits
ELXDLO8042	MEMS Technology	ELXDLO8042.1 Understand the underlying fundamentals principles of MEMS devices including physical operation and material properties ELXDLO8042.2 Design and simulate MEMS devices using standard simulation tools ELXDLO8042.3 Develop different concept of micro system sensors and actuator for real world applications ELXDLO8042.4 Understand the rudiments of Microfabrication techniques ELXDLO8042.5 Understand the underlying fundamentals principles of MEMS devices including physical operation and material properties
ELXDLO8044	Digital Image Processing	ELXDLO8044.1. Understand the fundamentals of Digital Image representation and simple pixel relations. ELXDLO8044.2. Explain spatial domain and frequency domain techniques for digital image enhancement. ELXDLO8044.3. Perform segmentation and morphological operations. ELXDLO8044.4. Apply compression and decompression techniques to different digital images.
ILO8026	Research Methodology	1. Prepare a preliminary research design for projects in their subject matter areas 2. Accurately collect, analyze and report data 3. Present complex data or situations clearly 4. Review and analyze research findings