Department of Electronics Engineering

Course Number: EXL801   Course Name: Internet of things

Unique CO Number	Course Outcome (CO) Statement
EXC8641	Describe the concept of Internet of Things
EXC8642	Classify different web connectivity protocols in IoT
EXC8643	Demonstrate data handling IoT
EXC8644	Identify sensor technology and sensor data communication for IoT
EXC8645	Categorise, interpret analyse data & different cloud service module
EXC8646	To design application based on IoT

Course Number: ELX 802   Course Name: Analog and Mixed Signal VLSI

Unique CO Number	Course Outcome (CO) Statement
EXC 8721	Recognize tradeoffs involved in analog VLSI Circuits
EXC 8722	Analyze basic building blocks of CMOS analog VLSI circuits
EXC 8723	Evaluate MOSFET based single stage and differential amplifiers and operational amplifiers
EXC 8724	Design building blocks of CMOS VLSI circuits
EXC 8725	Evaluate analog and mixed signal circuits based on mixed signal issues
EXC 8726	Carry out verifications of issues involved in analog and mixed signal circuits

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Affiliated to University of Mumbai, Approved by D.T.E. & A.I.C.T.E.| Awarded 'A' Grade by D.T.E., M.S. | Electronics Engineering Program Accreditated by N.B.A., New Delhi for 2 years w.e.f. 6th Aug.,2014 | Computer Engineering Program Re-Accreditated by N.B.A.,New Delhi for 3 yeas w.e.f. 1st July 2019 | Information Technology Program Accredited by N.B.A.,New Delhi for 3 years w.e.f. 1st July 2019

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Course Number:ELX DLO8041   Course Name: ADVANCED POWER ELECTRONICS

Unique CO Number	Course Outcome (CO) Statement
EXC8221	Describe the modern methods of analysis and control of power electronics systems
EXC8222	Explain the control and applications of motors.
EXC8223	Demonstrate the use of power electronics converters and drives.
EXC8224	Model the of power electronics converters and drives
EXC8225	Analyze the of power electronics converters and drives
EXC8226	Evaluate the performance of power electronics converters and drives

Course Number: ELXDLO8042   Course Name: MEMS Technology

Unique CO Number	Course Outcome (CO) Statement
EXC8741	Recall the fundamental principles of MEMS Devices including physical operation and material properties.
EXC8742	Compare the fabrication methods of MEMS.
EXC8743	Illustrate different concepts of microsystem sensors and actuators for real world applications.
EXC8744	Analyze the rudiments of Microfabrication technique.
EXC8745	Validate MEMS Devices using standard simulate tools.
EXC8746	Summarize the real world applications of MEMS.

Course Number: ELXDLO8044   Course Name: Digital Image Processing

Unique CO	Course Outcome (CO) Statement

Department of Electronics Engineering

Number	
EXC8421	Recall the basic concepts of image processing system and various image processing techniques in spatial and frequency domain
EXC8422	Demonstrate the methods of image representation and image manipulation to develop various image processing techniques.
EXC8423	Make use of different transforms in spatial and frequency domain and apply in various applications in image enhancement and image compression.
EXC8424	Analyze various image processing algorithms for image enhancement, compression ,segmentation and morphological operations.
EXC8425	Explain the methodologies for image segmentation ,morphological operation, compression and enhancement.
EXC8426	Develop the knowledge primarily obtained by studying examples and cases in the field of image compression Biomedical applications,Remote sensing,Factory automation etc

Unique Course Number: IL08027   Course Name: IPR and Patenting

Unique CO Number	Course Outcome (CO) Statement
EX8821	Recognize the importance of Intellectual Property assets.
EX8822	Associate with individuals and organizations in IPR capacity building.
EX8823	Explore for development, promotion, protection, compliance, and enforcement of Intellectual Property and Patenting
EX8824	Acquire the knowledge of patent search and patent filing procedure and applications.
EX8825	Compare Indian scenario of IPR with other country`s scenario.
EX8826	Figure out enforcement and emerging issues in IPR.

Course Number:ILO8029   Course Name: Environmental Management

Unique CO	Course Outcome (CO) Statement

Number	
ELX8841	Remember the Environmental related definition issues.
ELX8842	Understand the concept of environmental management, Government planning Responsibility
ELX8843	Understand the Global environmental concept
EXC8844	Understand ecosystem & interdependence
EXC8845	Analyze & understand ISO certification procedure
EXC8846	Apply your environment related legislations knowledge individually in your own organization.

Course Number: ELXL801   Course Name: Internet of Things Laboratory

Unique LO Number	Course Outcome (CO) Statement
EXL8641	Identify and Describe functionalities of Node MCU and Raspberry Pi
EXL8642	Demonstrate data handling and storage implementation.
EXL8643	Analyze MQTT protocol implementation
EXL8644	Analyze wireless protocol implementation
EXL8645	Develop IoT based security application
EXL8646	Design IoT based system

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Program Accredited by N.B.A.,New Delhi for 3 years w.e.f. 1ˢᵗ July 2019

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Course Number: ELXL 802   Course Name: Analog and Mixed Signal VLSI Lab

Unique CO Number	Course Outcome (CO) Statement
EXL 8721	Evaluate single stage amplifiers based on MOSFETs
EXL 8722	Design MOSFET based analog building blocks
EXL 8723	Design MOSFET based differential amplifier circuits
EXL 8724	Evaluate operational amplifiers based on MOSFETs
EXL 8725	Evaluate Mixed signal circuits with respect to their issues
EXL 8726	Analyze various analog, mixed signal, layout issues in circuits

Course Number:ELX LDLO8041   Lab Name: Advanced Power Electronics Laboratory

Unique CO Number	Course Outcome (CO) Statement
EXL8221	Demonstrate the speed control of AC Drives
EXL8222	Demonstrate the speed control of DC Drives
EXL8223	Simulate 3 phase DC-AC inverter
EXL8224	Simulate the effect of source inductance on 3 phase AC-DC converter
EXL8225	Build and simulate the DC –DC converter
EXL8226	Demonstrate the 3 phase AC-DC converter

Course Number: ELXLDLO8042   Course Name: MEMS Technology Lab

Unique CO Number	Course Outcome (CO) Statement
EXL8741	Enumerate and implement MEMS Devices.
EXL8742	Characterize the Geometry of MEMS and find performance characterstics such as resonant frequency,deflection per voltage or temperature.
EXL8743	Ascertain the harvested electrical power from mechanical vibrations using piezoelectric cantilever beam.
EXL8744	Explore and simulate of accelerometer.
EXL8745	Determine the tip deflection of the cantilever in sweep analysis.
EXL8746	Outline Case study of MEMS basic Devices.

Course Number: ELXLDLO8044   Course Name: Digital Image Processing Laboratory

Unique CO Number	Course Outcome (CO) Statement
EXL8421	To understand the fundamentals of image processing system
EXL8422	To experiment with enhancement techniques in spatial domain
EXL8423	To experiment with enhancement techniques in frequency domain
EXL8424	To examine image segmentation using discontinuities
EXL8425	To compare morphological operations in binary images
EXL8426	To apply image compression algorithm to compress and decompress digital images

Department of Electronics Engineering

Course Number: ELXL803   Course Name: Project-II

Unique CO Number	Course Outcome (CO) Statement
ELX8811	Outline the procedure for debugging hardware for implementation of project.
ELX8812	Choose the procedure for debugging software used in project.
ELX8813	Analyze the implemented project.
ELX8814	Compose the detailed project report.
ELX8815	Develop skills to work in a team.
ELX8816	Conclude future scope of the project