# ACADEMIC LESSON PLAN OF WINTER 2026

| Discipline: Computer Engineering and IOT | Semester:3rd | Name of the Teaching Faculty:Manalisa Giri |
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| Subject: Introduction to Sensor Technology | No. of days/per week class allotted:3p/ w eek | Semester from:01/07/2026 TO 05/11/2026<br>No. of weeks:15 weeks |
| Week | Class/week | Theory Topics |
| 1st | 1st | INTRODUCTION TO EMBEDDED SYSTEMS<br>Definition of Embedded System<br>Embedded Systems Vs General Computing Systems |
| | 2nd | History of Embedded Systems |
| | 3rd | Classification |
| 2nd | 1st | Major Application Areas |
| | 2nd | Purpose of Embedded Systems |
| | 3rd | Characteristics and Quality Attributes of Embedded Systems |
| 3rd | 1st | TYPICAL EMBEDDED SYSTEM<br>• Core of the Embedded System: General Purpose and Domain Specific Processors<br>• ASICs<br>• PLDs<br>• Commercial Off-The-Shelf Components (COTS) |
| | 2nd | Memory:<br>• ROM,<br>• RAM<br>• Memory according to the type of Interface |
| | 3rd | Memory Shadowing |
| 4th | 1st | Memory selection for Embedded Systems |
| | 2nd | Sensors and Actuators |
| | 3rd | Communication Interface: On board and External Communication Interfaces |
| 5th | 1st | RTOS BASED EMBEDDED SYSTEM DESIGN<br>• Operating System Basics<br>• Types of Operating Systems |
| | 2nd | Tasks, Process and Threads<br>Multiprocessing and Multitasking |
| | 3rd | Task Scheduling |
| 6th | 1st | SENSORS / TRANSDUCERS<br>• Principles<br>• Classification<br>• Parameters |
| | 2nd | Characteristics<br>Environmental Parameters (EP) |
| | 3rd | Characterization Mechanical and Electromechanical Sensors:<br>• Introduction Resistive Potentiometer<br>• Strain Gauge |

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| 7th | 1st | Resistance Strain Gauge<br>Semiconductor Strain Gauges |
| | 2nd | Inductive Sensors: Sensitivity and Linearity of the<br>Sensor Types Capacitive Sensors: Electrostatic<br>Transducer Force/Stress Sensors Using Quartz<br>Resonators |
| | 3rd | Ultrasonic Sensors<br>Thermal Sensors: Introduction |
| 8th | 1st | Gas Thermometric Sensors<br>Thermal Expansion Type Thermometric Sensors<br>Acoustic Temperature Sensor |
| | 2nd | Junction Semiconductor Types<br>Thermal Radiation Sensors |
| | 3rd | Quartz Crystal Thermoelectric<br>Sensors NQR Thermometry<br>Spectroscopic Thermometry |
| 9th | 1st | Noise Thermometry<br>Heat Flux Sensors |
| | 2nd | Magnetic sensors Introduction - Sensors and the Principles Behind<br>Magneto resistive Sensors<br>Anisotropic Magneto resistive Sensing |
| | 3rd | Semiconductor Magneto<br>resistors Hall Effect and<br>Sensors |
| 10th | 1st | Inductance and EddyCurrent Sensors<br>Angular/Rotary Movement Transducers<br>Synchros |
| | 2nd | Synchro-resolvers<br>EddyCurrent Sensors |
| | 3rd | Electromagnetic Flowmeter<br>Switching Magnetic Sensors<br>SQUID Sensors |
| 11th | 1st | V RADIATION SENSORS AND SMART SENSORS<br>Introduction<br>Basic Characteristics<br>Types of Photo sensors/Photo detectors |
| | 2nd | X-ray and Nuclear Radiation<br>Sensors Fiber Optic Sensors |
| | 3rd | Electro analytical Sensors:<br>Introduction The Electrochemical Cell |
| 12th | 1st | The Cell Potential<br>Standard Hydrogen Electrode (SHE) |
| | 2nd | Liquid Junction and Other<br>Potentials Polarization |
| | 3rd | Concentration Polarization<br>Reference Electrodes |
| 13th | 1st | Sensor Electrodes<br>Electro ceramics in Gas Media. Introduction |
| | 2nd | Primary Sensors<br>Excitation |
| | 3rd | Amplification<br>Filters |
| 14th | 1st | Converters<br>Compensation |
| | 2nd | Information Coding/Processing<br>Data Communication |
| | 3rd | Standards for Smart Sensor<br>Interface The Automation |

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| | | Sensors |
| 15th | 1st | Applications: Introduction<br>On-board Automobile Sensors (Automotive Sensors) |
| | 2nd | Home Appliance Sensors<br>Aerospace Sensors |
| | 3rd | Sensors for Manufacturing<br>Sensors for environmental Monitoring |

Manalisa Giri

Signature of Teaching Faculty

COURSE OUTCOME

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| **CO1:** | Explain the fundamentals of embedded systems, including their architecture, characteristics, classifications, and applications, along with the role of processors, memory, sensors, and communication interfaces. |
| **CO2:** | Apply RTOS concepts such as task scheduling, multitasking, multiprocessing, processes, and threads in the design and implementation of embedded systems. |
| **CO3:** | Analyze the principles, characteristics, and working of various sensors and transducers, including mechanical, thermal, magnetic, ultrasonic, and electromechanical sensors. |
| **CO4:** | Evaluate smart sensors, radiation sensors, and embedded sensor-based systems for real-world applications in automotive, aerospace, manufacturing, home appliances, and environmental monitoring. |

# ACADEMIC LESSON PLAN OF WINTER 2026

| Discipline: Computer Engineering and IOT | Semester:5th | Name of the Teaching Faculty:Manalisa Giri |
|---|---|---|
| Subject: IOT Communication Technology | No. of days/per week class allotted:3p/week | Semester from:01/07/2026 TO 05/11/2026<br>No. of weeks:15 weeks |
| Week | Class/week | Theory Topics |
| 1st | 1st | 1. Introduction to IoT Communication<br>1.1 Overview of IoT Communication |
| | 2nd | 1.2 IoT Communication Requirements & Challenges |
| | 3rd | 1.3 Types of IoT Networks: PAN, LAN, WAN |
| 2nd | 1st | 1.4 IoT Communication Models & Protocols |
| | 2nd | 1.5 OSI Model and TCP/IP in IoT |
| | 3rd | 1.5 OSI Model and TCP/IP in IoT (Contd.) |
| 3rd | 1st | 2. Wireless Communication Technologies for IoT<br>2.1 Wi-Fi and Bluetooth in IoT |
| | 2nd | 2.1 Wi-Fi and Bluetooth in IoT (Contd.) |
| | 3rd | 2.2 ZigBee, Z-Wave, and LoRaWAN |
| 4th | 1st | 2.2 ZigBee, Z-Wave, and LoRaWAN (Contd.) |
| | 2nd | 2.3 5G and Cellular IoT (NB-IoT, LTE-M) |
| | 3rd | 2.4 RF Communication and Near Field Communication (NFC) |
| 5th | 1st | 2.5 Comparative Analysis of Wireless IoT Technologies |
| | 2nd | 2.5 Comparative Analysis of Wireless IoT Technologies (Contd.) |
| | 3rd | 3. IoT Networking Protocols<br>3.1 MQTT (Message Queuing Telemetry Transport) |
| 6th | 1st | 3.1 MQTT (Message Queuing Telemetry Transport) (Contd.) |
| | 2nd | 3.2 CoAP (Constrained Application Protocol) |
| | 3rd | 3.3 HTTP and WebSockets for IoT |
| 7th | 1st | 3.4 AMQP (Advanced Message Queuing Protocol) |
| | 2nd | 3.5 Implementing MQTT and CoAP in IoT Applications |
| | 3rd | 3.5 Implementing MQTT and CoAP in IoT Applications (Contd.) |
| 8th | 1st | 4. IoT Edge and Cloud Connectivity<br>4.1 Edge Computing vs. Cloud Computing in IoT |
| | 2nd | 4.2 IoT Gateways and Their Role in Communication |
| | 3rd | 4.3 IoT Data Transmission to Cloud Platforms |
| 9th | 1st | 4.3 IoT Data Transmission to Cloud Platforms (Contd.) |

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| | 2nd | 4.4 Cloud-Based IoT Services |
| | 3rd | 4.5 Real-time Data Streaming and Processing |
| 10th | 1st | 4.5 Real-time Data Streaming and Processing (Contd.) |
| | 2nd | 5. IoT Security and Privacy<br>5.1 Security Challenges in IoT Communication |
| | 3rd | 5.2 Secure IoT Communication Protocols (DTLS, TLS, IPSec) |
| 11th | 1st | 5.2 Secure IoT Communication Protocols (DTLS, TLS, IPSec) (Contd.) |
| | 2nd | 5.3 Data Encryption in IoT Networks |
| | 3rd | 5.4 Authentication Mechanisms for IoT Devices |
| 12th | 1st | 5.4 Authentication Mechanisms for IoT Devices (Contd.) |
| | 2nd | 6. IoT Communication in Industrial Applications<br>6.1 Smart Cities and Smart Homes |
| | 3rd | 6.2 Industrial IoT (IIoT) and Smart Manufacturing |
| 13th | 1st | 6.2 Industrial IoT (IIoT) and Smart Manufacturing (Contd.) |
| | 2nd | 6.3 IoT in Healthcare and Smart Agriculture |
| | 3rd | 6.4 Vehicle-to-Everything (V2X) Communication |
| 14th | 1st | 6.4 Vehicle-to-Everything (V2X) Communication (Contd.) |
| | 2nd | 6.5 IoT Communication in Supply Chain and Logistics |
| | 3rd | 6.5 IoT Communication in Supply Chain and Logistics (Contd.) |
| 15th | 1st | 6.5 IoT Communication in Supply Chain and Logistics (Contd.) |
| | 2nd | 6.5 IoT Communication in Supply Chain and Logistics (Contd.) |
| | 3rd | 6.5 IoT Communication in Supply Chain and Logistics (Contd.) |

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Signature of Teaching Faculty

## COURSE OUTCOME

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| **CO1:** | Explain the fundamentals of IoT communication, network architectures (PAN, LAN, WAN), communication models, and the OSI/TCP-IP models used in IoT. |
| **CO2:** | Analyze and compare various wireless communication technologies and IoT networking protocols, including Wi-Fi, Bluetooth, ZigBee, LoRaWAN, MQTT, CoAP, HTTP, and AMQP. |
| **CO3:** | Apply edge and cloud computing concepts to design IoT communication systems, including gateways, cloud connectivity, and real-time data transmission. |
| **CO4:** | Evaluate IoT security mechanisms and communication solutions for industrial applications such as smart cities, healthcare, agriculture, IIoT, V2X, and supply chain management. |

# ACADEMIC LESSON PLAN OF WINTER 2026

| Discipline: IT | Semester :3rd | Name of the Teaching faculty: Manalisa Giri |
|---|---|---|
| Subject : CGM | No.of Days/per week class allotted : 03 | Semester from date : with effect from 1/07/2026 to 5/11/2026<br>No. of weeks : 15 |
| Week | Class Day | Topics : Theory |
| 1st | 1st | Introduction to Computer Graphics: Introduction |
| | 2nd | Image Processing |
| | 3rd | Picture analysis |
| 2nd | 1st | Conceptual frame work for interactive graphics |
| | 2nd | Classification of computer graphics |
| | 3rd | Hardware: Various display devices |
| 3rd | 1st | Video controller, |
| | 2nd | Random-scan display processor |
| | 3rd | Image scanners |
| 4th | 1st | Interaction hardware |
| | 2nd | Raster Graphics Techniques: Interaction handling |
| | 3rd | Raster graphics features, |
| 5th | 1st | Line drawing algorithms |
| | 2nd | Circle drawing algorithms |
| | 3rd | Scan conversion |
| 6th | 1st | Polygon filling |
| | 2nd | Pattern filling, Halftoning |
| | 3rd | Clipping techniques |
| 7th | 1st | Geometric Transformation and Viewing: 2D |
| | 2nd | Geometric Transformation and Viewing: 3D |
| | 3rd | Representation and composition, 3Dviewing |
| 8th | 1st | User Interfacing: Interaction handling models |
| | 2nd | Window management Input handling |
| | 3rd | Window management output handling |
| 9th | 1st | Tool kits |
| | 2nd | Curves & Surfaces and Solid Modelling: Polygon meshes |
| | 3rd | Parametric cubic curves |
| 10th | 1st | Quadric surfaces |
| | 2nd | Bezier and B-spline curves |
| | 3rd | Representing solids: sweep representation |
| 11th | 1st | boundary representation |
| | 2nd | Spatial partitioning |
| | 3rd | Visibility: Hidden line and Hidden surfaces |

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| 12th | 1st | Floating horizon algorithm Robert's algorithm |
| | 2nd | Z-buffer List priority algorithms |
| | 3rd | Z-buffer List priority algorithms with numerical |
| 13th | 1st | Rendering: Illumination models |
| | 2nd | Types of Illumination model |
| | 3rd | Shadows Shading Transparency |
| 14th | 1st | Definition of Animation |
| | 2nd | Conversion& Computer Aided animation |
| | 3rd | Conversion& Computer Aided animation |
| 15th | 1st | Rules & Technology |
| | 2nd | Revision |
| | 3rd | Question and Answer discussion |

Signature of the faculty

## COURSE OUTCOME

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| **CO1:** | Understand the fundamentals of computer graphics, graphics hardware, display devices, image processing concepts, and interaction techniques. |
| **CO2:** | Apply raster graphics algorithms, clipping methods, and 2D/3D geometric transformations to create and manipulate graphical objects. |
| **CO3:** | Analyze user interface concepts, curves, surfaces, solid modeling techniques, and visibility algorithms for graphical system design. |
| **CO4:** | Design and evaluate realistic computer graphics applications using rendering techniques, illumination models, shading, transparency, and computer animation principles. |

# ACADEMIC LESSON PLAN OF WINTER 2026

| Discipline: IT, | Semester: 3rd | Name of the Teaching faculty: Manalisa Giri |
|---|---|---|
| Subject : Multimedia Lab | No.of Days/per week class allotted : 02 | Semester from date: with effect from 1/07/2026 to 5/11/2026<br>No. of weeks : 15 |
| Week | Class Day | Practical Topics: |
| 1st | 1st | Adobe Photoshop: Scanning image, Creating new images |
| | 2nd | Changing foreground, Changing Background, Creating and using paths |
| 2nd | 1st | Editing and retouching Duplicating images, Layers-linking with layers, Grouping an image |
| | 2nd | Rubber stamp and pattern stamp tool, Painting-paint brush tool, Airbrush tool, Pencil tool, Eraser tool, |
| 3rd | 1st | Gradient tools Photo shop filters |
| | 2nd | Quiz test in Photoshop |
| 4th | 1st | Sound Forge: Sound recording and editing through sound forgeXP |
| | 2nd | The main screen, the data window, opening an existing file-playing a sound file |
| 5th | 1st | Playing a section of a file, copying data to a new file, saving a file |
| | 2nd | Simple editing, Advanced editing, editing sound formats, |
| 6th | 1st | Applying sound processing functions Recording sound using sound forge. |
| | 2nd | Adobe Premiere: Creating desktop video with Adobe Premiere |
| 7th | 1st | Creating on Adobe Premiere movie, Starting a new project importing clips, |
| | 2nd | Assembling the clipping construction window |
| 8th | 1st | Previewing the movie |
| | 2nd | Changing duration of a cell, creating a transition, adding other clips and transitions, |
| 9th | 1st | Applying filters to a clip, Changing the time unit in the construction window |
| | 2nd | Using preview command to preview the transition and filter effects |
| 10th | 1st | Adding sound to movie, Connecting, and capturing source video through Broadway cord |
| | 2nd | Editing and compressing the video |

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| 11th | 1st | Quiz Test |
| | 2nd | Author ware: Introduction-system requirements, installing, general features |
| 12th | 1st | Knowledge objects-introduction to knowledge objects, choosing a knowledge object |
| | 2nd | Adding a knowledge object file, author ware knowledge objects, authoring basics - icon based authoring what each icon does the tool bar |
| 13th | 1st | Working with icons on the flow line, authoring-step by step |
| | 2nd | Distribution requirements, packaging an AW piece, packaging and AW piece for the web, Creating interactions - components of an interaction |
| 14th | 1st | How an interaction works, tracing the flow through an interaction, setting up an interaction step by step, Directing the flow - Decision structure, framework |
| | 2nd | Navigation structures -step by step, Transitions, Positioning and motion - using transition for special effects |
| 15th | 1st | Positioning objects using the motion icon, making objects move step by step |
| | 2nd | REVISION |

Signature of the faculty

## COURSE OUTCOME

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| **CO1:** | Apply Adobe Photoshop tools and techniques to create, edit, retouch, and enhance digital images using layers, paths, painting tools, and filters. |
| **CO2:** | Record, edit, and process digital audio using Sound Forge by applying sound editing techniques and audio processing functions. |
| **CO3:** | Create and edit digital videos using Adobe Premiere by importing media, assembling clips, adding transitions, filters, audio, and exporting compressed video projects. |
| **CO4:** | Design and develop interactive multimedia applications using Authorware by creating icon-based projects, implementing navigation structures, incorporating user interactions, animations, and packaging applications for deployment. |