**Workshop on "Arduino and FPGA Based Embedded System Design"**
**23 to 27 June 2025**

**Program Schedule:**

| Day and Date | Time | Module/Activity | Instructor/TA |
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| **Day 1**<br>Date: 23rd June 2025 | Lecture<br>(9:30 AM to 11:30 AM) | Introduction to Arduino and Embedded Systems<br>• Introduction to Embedded Systems<br>• Overview of Arduino Platform<br>• Arduino IDE and Basic Programming | Prof. Rutu Parekh/ Prof Yash Agrawal and TAs |
| | Lecture cum Lab<br>(11:30 AM–1:30 PM) | • Setting up Arduino IDE<br>Writing and uploading your first Arduino sketch (Blink LED) | |
| | Lecture<br>(2:30 PM -4:30 PM) | Arduino Hardware and Software Fundamentals<br>• Arduino Architecture and Microcontroller Basics<br>• Digital and Analog I/O<br>• Basic Electronic Components and Circuit Design<br>Project Planning and Management | |
| | Lecture cum Lab<br>(4:30 PM– 6:30 PM) | • Interfacing LEDs and Push Buttons<br>Digital and Analog Input and Output Programming | |
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| **Day 2**<br>Date: 24th June 2025 | Lecture<br>(9:30 AM to 11:30 AM) | Advanced Arduino Programming<br>• Serial Communication and Data Logging<br>• Working with Libraries and Timers<br>• Serial Communication with PC<br>• Data Logging to SD Card | Prof. Rutu Parekh/ Prof Yash Agrawal and TAs |
| | Lecture cum Lab<br>(11:30 AM–1:30 PM) | • Building a Simple Android App to Control LED via Bluetooth<br>Sending Sensor Data from Arduino to Android App | |
| | Lecture<br>(2:30 PM -4:30 PM) | Sensors and Actuators Interfacing<br>• Introduction to Sensors and Actuators<br>• Interfacing Temperature, Humidity, and Light Sensors<br>Motor Control with Arduino | |
| | Lecture cum Lab<br>(4:30 PM– 6:30 PM) | • Building a Basic Home Automation System<br>Environmental Monitoring System with Multiple Sensors | |

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| **Day 3**<br>Date: 25th June 2025 | Lecture<br>(9:30 AM to 11:30 AM) | Cloud Integration with Arduino<br>• Introduction to IoT and Cloud Platforms Sending Data from Arduino to Cloud (Blynk, ThingSpeak) | Prof. Rutu Parekh/ Prof Yash Agrawal and TAs |
| | Lecture cum Lab<br>(11:30 AM–1:30 PM) | • Setting up Blynk or ThingSpeak Account Sending Sensor Data to Cloud and Visualizing | |
| | Lecture<br>(2:30 PM -4:30 PM) | Introduction to Verilog HDL<br>• Basics and Structure<br>• Modeling Styles | |
| | Lecture cum Lab<br>(4:30 PM– 6:30 PM) | • Setting up ISE Environment<br>• Implementation of Modeling Styles in Verilog | |
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| **Day 4**<br>Date: 26th June 2025 | Lecture<br>(9:30 AM to 11:30 AM) | • Introduction to Operators in Verilog | Prof Yash Agrawal/ Prof. Rutu Parekh/ and TAs |
| | Lecture<br>(11:30 AM–1:30 PM) | • Combination and Sequential system designs<br>• Introduction to FPGA Embedded board | |
| | Lecture cum Lab<br>(2:30 PM -4:30 PM) | • Lab on System Design using Verilog HDL and FPGA | |
| | Lecture cum Lab<br>(4:30 PM– 6:30 PM) | | |
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| **Day 5**<br>Date: 27th June 2025 | Lecture<br>(9:30 AM to 11:30 AM) | • FSM Designs for Embedded Systems<br>• Advanced HDL modeling, processor fundamentals | Prof Yash Agrawal/ Prof. Rutu Parekh/ and TAs |
| | Lecture<br>(11:30 AM–1:30 PM) | • Discussion of High-end Applications - Image Processing, Audio Processing, Hardware Accelerators, Neural Network Designs<br>• Project Development | |
| | Lecture cum Lab<br>(2:30 PM -4:30 PM) | • Lab on Embedded Project Development using Verilog HDL and FPGA | |
| | Lecture cum Lab<br>(4:30 PM– 6:30 PM) | | |
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