

**Advanced Internet of Things (IoT) Hardware, Design Prototyping and Innovation Development
with real-time examples and Practicals
Interdisciplinary Program.
Powered by Virtual Innovation Lab
(In conformance with UN SDG)**

Eligibility: EEE, CSE, ME, CE BTech (I-IV) Years. Instructor Led Training.

Objective: The world is embarking on the 4th Industrial revolution. We need solutions and platforms for teachers and students to improve teaching, learning and research competence and develop 21st century skills like problem solving, innovation, collaboration, leadership and practical skills.

Course Outline: Advanced Internet of Things (IoT) Hardware, Design and Prototyping Innovation Development interdisciplinary program Enables Multiple Guided and Open Innovations. Innovative technology bringing advanced level hands-on engineering challenges for colleges/universities. Conceptualization to Finalization stage including Abstract, Block diagram, Circuit building and Simulation through Proteus, Coding, Simulation of a working prototype.

Outcome: 1.Help students with project based learning, innovation and prototyping from basic to advanced level in Embedded Systems, Communications, Sensors and Advanced IOT and build working virtual/hardware prototypes.
2. Ideation, Design Thinking, Computational Thinking, Physical Computing, Minimum Viable Product including Circuit Design, Circuit Building, Simulation and Coding.

S.No.	List of Practicals
A	Auto Irrigation through programmed microcontroller/Arduino & ZVS triggered opto isolator feeding SCR/TRIAC/Relay using communication link GSM network and IoT over the cloud.
1	Automatic Irrigation System on Sensing Soil Moisture Content without microcontroller with SCR
2	Automatic Irrigation System on Sensing Soil Moisture Content without microcontroller with TRIAC
3	Automatic Irrigation System on Sensing Soil Moisture Content without microcontroller with Relay
4	Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with SCR
5	Arduino based Automatic Irrigation System on Sensing Soil Moisture Content with SCR
6	Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with TRIAC
7	Arduino based Automatic Irrigation System on Sensing Soil Moisture Content with TRIAC
8	Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with Relay
9	Arduino based Automatic Irrigation System on Sensing Soil Moisture Content with Relay
10	Solar based Automatic Irrigation System on Sensing Soil Moisture Content without microcontroller with Relay
11	Solar based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with Relay
12	Arduino and Solar based Automatic Irrigation System on Sensing Soil Moisture Content with Relay
13	GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051

	Controller with SCR
14	Arduino and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with SCR
15	GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with TRIAC
16	Arduino and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with TRIAC
17	GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with Relay
18	Arduino and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with Relay
19	IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with SCR
20	Arduino, IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with SCR
21	IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with TRIAC
22	Arduino,IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with TRIAC
23	IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content using 8051 Controller with Relay
24	Arduino, IOT and GSM based Automatic Irrigation System on Sensing Soil Moisture Content with Relay
B	PIR & Doppler sensors for movement sensing with or Without programmed Controllers/Arduino using communication link IoT over the cloud.
1	PIR Sensor without microcontroller
2	PIR Sensor using 8051 Controller
3	Arduino based PIR Sensor
4	IOT based PIR Sensor using 8051 Controller
5	Arduino and IOT based PIR Sensor
6	Doppler Sensor without microcontroller
7	Doppler Sensor using 8051 Controller
8	Arduino based Doppler Sensor
9	IOT based Doppler Sensor using 8051 Controller
10	Arduino and IOT based Doppler Sensor
C	Vibration Sensor for Vibrating alert for deaf/Earthquake Alert with LED indication with or Without programmed Controllers/Arduino using communication link IoT over the cloud.
1	Vibration Sensor without microcontroller
2	Vibration Sensor using 8051 Controller
3	Arduino based Vibration Sensor

4	IOT based Vibration Sensor using 8051 Controller
5	Arduino and IOT based Vibration Sensor
6	Vibration Alert System for the Deaf without microcontroller
7	Vibration Alert System for the Deaf using 8051 Controller
8	Arduino based Vibration Alert System for the Deaf
9	Earthquake Alert without microcontroller
10	Earthquake Alert using 8051 Controller
11	Arduino based Earthquake Alert