
SYLLABUS FOR BOARD OF STUDIES ADOPTION — generated from the live catalogue record

IoT with Raspberry Pi and Arduino

S-08A · 5 days (configurable 1–5 days) · Informatics · IoT · Years: 3rd, PG

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OVERVIEW

Sensors, actuators, microcontroller programming and a working connected device with a cloud dashboard.

IoT connects the physical and digital worlds across agriculture, manufacturing and cities; a working connected device with a cloud dashboard is a standout final-year project.

HOURS AND CREDIT POSITION

Contact hours: 40 Guided project: 20 Self-study: 0 Notional total: 60

Credit claim: 2

60 notional hours ÷ 30 hours per credit (NSQF track, UGC Micro-credentials Guidelines §5.3.3) = 2 credits.

COURSE OUTCOMES

CO1. Describe the architecture of an IoT system from sensor to cloud (K2)

CO2. Program a microcontroller to read sensors and drive actuators (K3)

CO3. Control hardware from a Raspberry Pi using Python (K3)

CO4. Transmit device telemetry using MQTT (K3)

CO5. Build a connected device with a live cloud dashboard (K3)

COURSE CONTENT — MODULES

Hours shown are the recommended format; module time scales proportionally when the engagement runs 1–5 days.

Module 1 — IoT foundations (5h recommended)

Theory: Architecture, sensors, actuators, the edge-to-cloud path

Lab: Map an IoT architecture

Output: Architecture diagram

Module 2 — Microcontrollers (5h recommended)

Theory: Arduino programming, digital and analog input/output

Lab: Program an Arduino to read and act

Output: Arduino sketch

Module 3 — Single-board computers (5h recommended)

Theory: Raspberry Pi, GPIO, Python control

Lab: Control hardware from a Raspberry Pi

Output: Pi control script

Module 4 — Sensors and actuators (5h recommended)

Theory: Reading sensors, driving actuators, calibration

Lab: Wire and calibrate sensors and actuators

Output: Working sensor rig

Module 5 — Connectivity (5h recommended)

Theory: Wi-Fi, MQTT, publish and subscribe

Lab: Publish telemetry over MQTT

Output: MQTT telemetry stream

Module 6 — Cloud integration (5h recommended)

Theory: Sending telemetry to a cloud service

Lab: Send device data to the cloud

Output: Cloud-connected device

Module 7 — Dashboards (5h recommended)

Theory: Visualising device data

Lab: Build a live dashboard

Output: Device dashboard

Module 8 — Device capstone (5h recommended)

Theory: A connected device with a live cloud dashboard

Lab: Assemble the capstone device

Output: Connected device + dashboard

ASSESSMENT SCHEME (100 MARKS)

Continuous lab exercises — 40 marks
Capstone project & demonstration — 40 marks
Quiz & viva voce — 20 marks

CO-PO MAPPING

CO1 !' PO1 (strength 2)

IoT architecture is foundational knowledge.

CO2 !' PO3 (strength 2)

Microcontroller programming is solution development.

CO3 !' PO3 (strength 2)

Controlling hardware is solution development.

CO4 !' PO5 (strength 2)

MQTT is a modern tool of the field.

CO5 !' PO3 (strength 2)

The connected device is a developed solution.

EVERY PARTICIPANT RECEIVES

- Certificate of completion
- Course material
- LMS access
- Interview question bank
- Mock interview & viva practice
- Optional nasscom NSQF assessment (priced per candidate on your quotation)

FEE

13,200 per student, incl. GST

Excludes the optional nasscom assessment where offered. Final pricing on your college's quotation.

DESIGNED BY

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