

ADVANCED ARDUINO, IoT & DRONE TECHNOLOGY INTERNSHIP (2025)

Duration: 6 Weeks

Target Audience: Engineering Students (CSE/ECE/EEE/AI/IoT)

Level: Advanced & Industry-Oriented

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WEEK 1: ADVANCED EMBEDDED & ELECTRONICS

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- Embedded System Architecture
- ARM vs AVR Controllers
- Power Management in Embedded Systems
- Advanced Sensors (IMU, Hall Effect, Gas Sensors)
- Hands-on: Sensor calibration & power optimization

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WEEK 2: ADVANCED ARDUINO & ESP32

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- ESP32 Architecture & Dual Core Processing
- RTOS Basics (FreeRTOS)
- Interrupts & Timers
- Low Power & Deep Sleep
- Hands-on: Multi-tasking using FreeRTOS

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WEEK 3: MODERN IoT & CLOUD

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- IoT Architecture 2025
- MQTT, CoAP, HTTPS
- AWS IoT Core
- Google Firebase
- Edge Computing
- Hands-on: Real-time cloud dashboard

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WEEK 4: AI + IoT (AIoT)

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- TinyML
- Edge AI
- ESP32 + TensorFlow Lite
- Computer Vision intro
- Hands-on: AI-based sensor prediction

Prepared by:
Prashant B Devani
System Manager,
Dept of CSE, PDACEK

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WEEK 5: INDUSTRY 4.0 & SECURITY

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- Industrial IoT
- Digital Twins
- OTA Updates
- IoT Security (TLS, JWT)
- Hands-on: Secure IoT Device

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WEEK 6: DRONE TECHNOLOGY (ADVANCED)

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- Flight Controllers
- PX4 & Ardupilot
- GPS Navigation
- Autonomous Drone Concepts
- Hands-on: Arduino-based drone simulation

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FINAL PROJECTS

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- Smart City using AIoT
- Autonomous Surveillance Drone
- Predictive Maintenance System
- Smart Energy Management

Learning Outcomes:

- Industry-ready Embedded & IoT skills
- Cloud & AI integration
- Drone & Autonomous Systems knowledge