



Dadi Institute of Engineering & Technology

An Autonomous Institute

Approved by AICTE & Permanently Affiliated to JNTUGV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.
NH-16, Anakapalle – 531002, Visakhapatnam, A.P.

A Two-week FDP on “Internet of things (IOT)”

Organized by
**Department of Electrical &
Electronics Engineering**

Course Instructor:
DATAPRO

Date: 23-09-2024 to 5-10-2024
Venue: Department of EEE



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About the Institute

Dadi Institute of Engineering & Technology is a top ranked Engineering and Management College affiliated to Jawaharlal Nehru Technological University, GV. The Institute is NAAC Accredited, ISO Certified and also associated with many professional bodies in the field of Engineering, Technology and Management. It strives to promote the highest standards among the students and enable them to build a New World. Dadi Institute of Engineering & Technology is distinctive among institutions of higher learning. Founded in 2006 by Sri Dadi Veerabhadra Rao, an academician and former Minister as the first multi cultural and co-educational college in Anakapalle which admits only academically promising students.

About EEE Department

The Department of EEE was established in the year 2006. It offers B.Tech. Program, with an initial intake of 120. It also offers MTech program in Power & Industrial drives with an intake of 36. The department has good infrastructural facilities and has full-fledged laboratories equipped with adequate hardware and software. The faculty members are actively involved in research and is publishing papers in reputed national and international journals/conferences.

About the course

IoT (Internet of Things) projects involve connecting everyday objects to the internet, enabling them to collect and share data. Common projects include home automation, smart agriculture, and environmental monitoring.



Course Instructor:

DATAPRO

Duration:

One week: (23-09-2024 to 5-10-2024)

Overview & Need for the Course:

- Automation and Efficiency
- Data Collection and Analysis
- Connectivity and Communication
- Enhanced Customer Experience
- Cost Reduction and Sustainability
- Innovation and New Opportunities
- Improved Decision-Making
- Remote Management and Monitoring
- Increased Security:
- Scalability

Course Objective

The objective of the “Internet of Things (IoT) Associate”, course is to provide students with comprehensive knowledge and practical skills in basic electronics and IoT platforms. Through hands-on identification and troubleshooting of electronic components, students will gain a solid foundation in basic electronics and the operation of measurement devices. The course will introduce microprocessors, microcontrollers, and the Internet of Things (IoT), focusing on the Arduino platform for embedded programming and sensor interfacing. Students will conceptualize and develop IoT-based use cases, such as smart street lighting, home automation, and digital locks. Additionally, they will explore wireless IoT architecture using Node MCU, TCP/IP modeling for IoT, and cloud-based IoT implementation, equipping them to create and monitor IoT devices using cloud platforms.

- **Understanding IoT Fundamentals:**

Students gain a solid understanding of the core concepts of IoT, including its components, architecture, and protocols.

- **Building IoT Systems:**

They learn how to design and build simple IoT systems using low-cost embedded platforms like Arduino or Raspberry Pi.

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- **Developing IoT Applications:**

Students develop practical skills in creating IoT applications, including designing web services to interact with IoT devices and deploying applications to the cloud.

- **Analyzing Real-World IoT Applications:**

The course explores various IoT applications in diverse fields, such as smart homes, industrial automation, and smart cities, to understand their benefits and challenges.

Course Outcome

By the end of the "Internet of Things (IoT) Associate" course, students will be proficient in identifying and troubleshooting basic electronic components, operating measurement devices, and understanding microprocessors and microcontrollers. They will develop skills in programming and interfacing with Arduino platforms, enabling them to design and implement practical IoT use cases such as smart street lighting, home automation, and digital locks. Additionally, students will explore wireless IoT architecture using Node MCU, TCP/IP modeling for IoT, and cloud-based IoT implementation, allowing them to create and monitor IoT devices using cloud platforms. These competencies will prepare students for advanced study or careers in electronics and IoT development, equipping them to contribute innovative solutions to the growing field of IoT.

Date	Session	Topics
23-09-2024	2.00pm to 5.00pm	Basics of electronics, introduction to IOT concepts and Technologies, Internet of things architecture And Implements
24-09-2024	2.00pm to 5.00pm	Arduino programming language concepts, Introduction to Arduino embedded Development Board and ATmega microcontroller Working with Arduino IDE 1.8.6 and programming Arduino MEGA Hardware. Interfacing Arduino with LED, Breadboard. Data representation concepts.
25-09-2024	2.00pm to 5.00pm	Serial communication – UART protocol, USB protocol, UART to USB conversion. Working with serial ports in Arduino. Introduction to sensors and concepts, Infrared proximity sensors principles Working and connecting with Arduino.

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26-09-2024	2.00pm to 5.00pm	IOT communication Wired and Wireless protocols Layers and protocols-TCP/IP Layer, OSI model IEEE standards –Bluetooth standards ,Bluetooth module-working of HC05 module ,Bluetooth, Standards ,specification, protocol stack, versions, controlling devices using Bluetooth module
27-09-2024	2.00pm to 5.00pm	Cloud computing-introduction ,services and importance in IOT. Introduction to think speak cloud and working with Think Speak API keys and channels. Data collection from sensors and automatic storage Think Speak cloud using node mcu.
28-09-2024	2.00pm to 5.00pm	ESP8266 Wi-Fi chip –working principle ,pin outs, connection with Arduino MEGA board ,AT commands Setting up TCP client using ESP8266. Data collections and sensors and automatic storage in think speak cloud using in ESP8266 and arduino MEGA
30-09-2024	2.00pm to 5.00pm	Send messages to IOT devices using Talk back. REST client control IOT devices remotely from REST Client in system and mobile. Python-introduction ,environment setup, basic building blocks–variables-operators IO functions – data types–control structures-Data structures–List ,tuple, set, dictionary, functions, modules
1-10-2024	2.00pm to 5.00pm	Python Common gate way interface–introduction ,enabling CGI server in windows implementing client-server architecture ,Raspberry Pi- introduction Raspberry pi as an IOT gateway ,connecting with raspberry pi through VNC .make Raspberrypi as server using python CGI.
3-10-2024	2.00pm to 5.00pm	integration of cloud with Raspberrypi as an IOT Gateway .Pubnub cloud –publishers and subscribers architecture .publishing data to Pubnub cloud using raspberry pi. realtime data storage in cloud using arduino , ESP8266 and arduino pi.
4-10-2024	2.00pm to 5.00pm	IOT protocol –message queuing telemetry transport protocol (MQTT)-Architecture ,machine to machine communication, Implementing MQTT Broker using Raspberry pi.
5-10-2024	2.00pm to 5.00pm	Project

Course Contents

Identification and troubleshooting of Basic Electronics components

- Identification of electronics components
- Understanding the Fundamentals of basic electronics
- Troubleshooting of electronics components
- Understanding the operation of measurement devices

Conceptualising IoT Platform – Arduino

- Introduction to microprocessor and micro controller
- Introduction to Internet of Things(IoT) – applications, protocols, use cases
- Introduction to Arduino
- Embedded C Language
- Interfacing of sensors and actuators with Arduino Boards

Conceptualising IoT based use cases

- Smart Street Light control
 - Home automation using Arduino
 - Password enabled Digital Lock using Arduino
- ### Fundamentals of wireless IoT using NodeMCU
- Fundamentals and architecture of wireless IoT
 - TCP/IP modelling for IoT
 - NodeMCU as an IoT Platform
 - Fundamentals of cloud Platforms
 - Implementation of cloud based IoT use cases

Real-World Examples:

• Smart Homes:

IoT enables features like automated lighting, temperature control, security systems, and smart appliances.

• Wearable Health Devices:

IoT-enabled wearables track health data, monitor vital signs, and facilitate remote patient monitoring.

• Smart Cities:

IoT applications in smart cities include smart parking, traffic management, waste management, and environmental monitoring.

• Industrial Applications:

Predictive maintenance, asset tracking, and remote monitoring in manufacturing and other industries are examples of IoT applications.

• Agriculture:

IoT-based irrigation systems, crop monitoring, and livestock management are examples of IoT in agriculture.

IoT in the World Around Us

Monitoring tank levels in industrial and agricultural applications.

Automating processes in industrial operations for safety, efficiency and cost savings.

Upgrading to Industry 4.0 technologies that combine edge computing, AI and real-time connectivity in applications like factory automation.

Value Added Training

Bringing employable skills to the Classrooms!

To help our students gain exposure to the latest in technological developments, to provide an opportunity to develop inter-disciplinary skills and to equip them with skills which shape a global citizen's profile. The main objective is improving the employability skills of arts & science students of PMIST

The Course has been Delivered by industry experts, they bring the knowhow of cutting edge technology to the college doorstep.

Students have the options to choose from a host of courses as per their inclination at a nominal fee. These include courses on Software Development IT Infrastructure Management Electronic Design Automation , Industrial Automation and Special Programs which includes Cloud Computing , Internet of Things , Machine Learning , Artificial Intelligence , Block Chain Ethical Hacking, Automotive Embedded system, Data science etc..

Our Key differentiators is our true customized training programs to empower graduating students to meet the global demand.

Course on IOT

Internet of Things (IoT) is the concept of connecting any device to the Internet and to other connected devices. IoT platform uses Devices and objects with built-in sensors which integrates data from the different devices and performs analytics to distribute the most valuable information with applications. When devices/objects can represent themselves digitally, they can be controlled from anywhere.

The course imparts a sound understanding of the basic electronics, microcontroller architectures, sensors, IoT architecture and communication protocols. This course makes you understand the scope of the IoT, architecture of its networks, devices, programming, data, security and the rapidly evolving field of cloud computing and its relation to IoT.

DEPARTMENT OF ELECTRICAL & ELCTRONICS ENGINEERING ASSESSMENT

Name of the FDP: Internet of things (IOT) (23-09-2024 to 5-10-2024)

Date of exam: 5-10-2024

Regd.No.:

Marks:

Name of the Faculty:

1. What is the full form of IoT?

- a) Internet of Technology
- b) Incorporate of Things
- c) Internet of Things
- d) Incorporate of Technology

2. What is IoT?

- a) network of physical objects embedded with sensors
- b) network of virtual objects
- c) network of objects in the ring structure
- d) network of sensors

3. Who coined the term “Internet of Things”?

- a) Kevin Aston
- b) John Wright
- c) Edward Jameson
- d) George Garton

4. When was the actual term “Internet of Things” coined?

- a) 1998
- b) 1999
- c) 2000
- d) 2002

5. Which of the following is not an IoT device?

- a) Table
- b) Laptop
- c) Arduino
- d) Tablet

6. Which of the following is false about IoT devices?

- a) IoT devices use the internet for collecting and sharing data
- b) IoT devices need microcontrollers
- c) IoT devices use wireless technology
- d) IoT devices are completely safe

7. Which of the following is not an IoT platform?

- a) Amazon Web Services
- b) Microsoft Azure
- c) Salesforce
- d) Flipkart

8. Which of the following is not an application of IoT?

- a) BMP280
- b) Smart home
- c) Smart city
- d) Self-driven cars

9. Which layer is used for wireless connection in IoT devices?

- a) Application layer
- b) Network layer
- c) Data link layer
- d) Transport layer

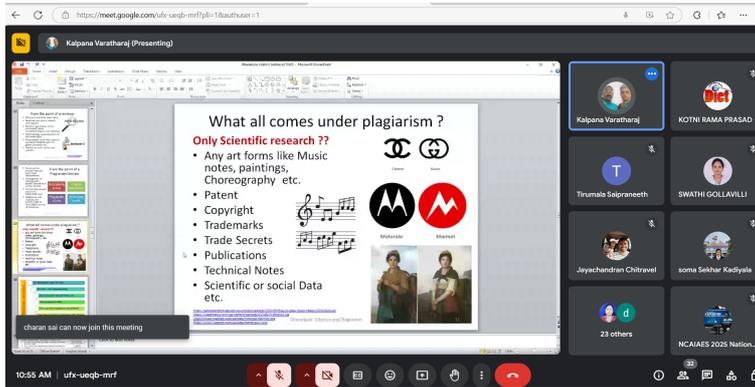
10. Which of the following is false about the IoT components?

- a) A light sensor (photoresistor) is an analog sensor
- b) A microphone is a digital sensor
- c) A push button is a digital sensor
- d) A keyboard is a digital sensor



Born Vs Made Digital

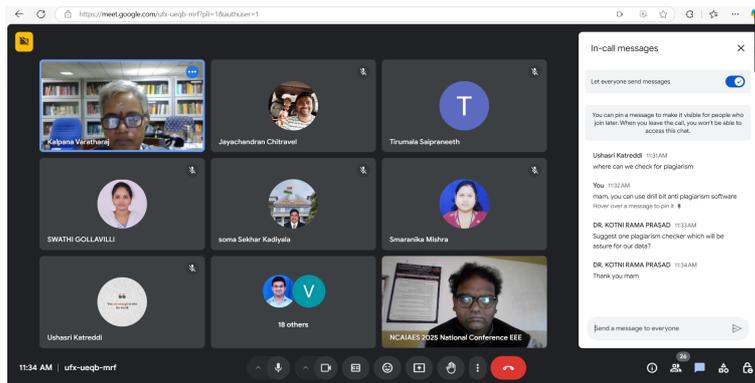
- Easy sharable
- Readable with digital devices
- Digital format to physical format
- First physical copy
- Convertible to digital format with different technologies
- Physical format to digital format



What all comes under plagiarism ?

Only Scientific research ??

- Any art forms like Music notes, paintings, Choreography etc.
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- Copyright
- Trademarks
- Trade Secrets
- Publications
- Technical Notes
- Scientific or social Data etc.



In-call messages

Let everyone send messages

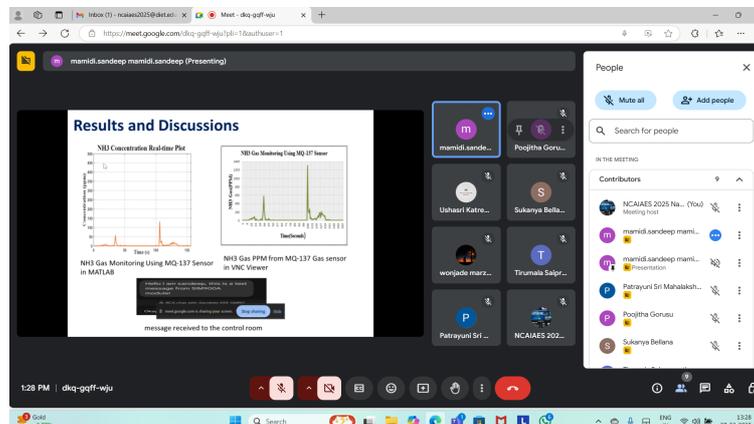
You can pin a message to make it visible for people who join later. When you leave the call, you won't be able to access this chat.

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DR. KOTNI RAMA PRASAD 11:34 AM
Thank you mam



Results and Discussions

NH3 Concentration Real-time Plot

NH3 Gas Monitoring Using MQ-137 Sensor in MATLAB

NH3 Gas PPM from MQ-137 Gas sensor in VNC Viewer

message received to the control room

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DEPARTMENT OF ELECTRICAL & ELCTRONICS ENGINEERING Value Added Course: Internet of things (IOT) (23-09-2024 to 5-10-2024) **TWO Week FDP**

Participants' Feedback

Academic Year: 2024-25 Name of the Participant:

Regd.No.:

Institute he/she belongs to: Dadi Institute of Engineering & Technology

This Questionnaire is intended to collect information relating to your satisfaction towards the add on course. The information provided by you will be kept confidential and will be used as feedback for quality improvement of the programmed conducted by the Institution in future.

1. The add on course was relevant for me
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
2. The content of the add on course was very comprehensive
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
3. The OVERALL content of the add on course was excellent
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
4. The trainers had very strong expertise in the area
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
5. The trainers had excellent communication skills
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
6. The trainers were very well prepared for the class
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
7. The class timings were very convenient
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
8. The class used in the session was very appropriate
A. Excellent B. Good C. Average D. Satisfactory E. Poor []
9. The registration process was extremely efficient and smooth
A. Excellent B. Good C. Average D. Satisfactory E. Poor []

Signature of the participant