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Certificate Course in Internet of Things(IOT)

Preamble:

The digital space has witnessed major transformations in the last couple of years and as per industry experts would continue to evolve itself. The latest entrant to the digital space is the Internet of Things (IoT). IoT can also be defined as interplay for software, telecom and electronic hardware industry and promises to offer tremendous opportunities for many industries. The number of Internet-connected devices (12.5 billion) surpassed the number of human beings (7 billion) on the planet in 2011, and by 2020, Internet-connected devices are expected to number between 26 billion and 50 billion globally. Therefore to leverage India's strength as a leader in the global service industry, through suitable promotion and supportive mechanisms the draft IoT policy has been formulated to create IoT eco-system in the country. The Indian Government's plan of developing 100 smart cities in the country, for which Rs. 7,060 crores has been allocated in the current budget could lead to a massive and quick expansion of IoT in the country. Also, the launch of the Digital India Program of the Government, which aims at 'Transforming India into Digital empowered society and knowledge economy' will provide the required impetus for development of the IoT industry in the country. The various initiatives proposed to be taken under the Smart City concept and the Digital India Program to setup Digital Infrastructure in the country would help boost the IoT industry. IoT will be critical in making these cities smarter.

Objective:

The Course is aimed at molding candidates to skill about the use of IoT in daily life devices and make some new innovative devices using available sensors and embedded systems.

Expected Job Roles

- Electronics Engineer
- Firmware developer
- Industrial Data Scientists
- IoT Architect
- Industrial Engineer

Duration:

- 90 hrs. /6 Weeks
- 3hrs. Daily

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Course Outline:

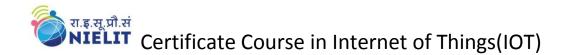| Sl. No	Module Title	Duration (Hours)		
		Theory	Lab	Total
1	The Internet of Things: Brain Storming Basics	6	9	15
2	The IOT Microcontroller Platform	6	9	15
3	The Basics of Sensors and Actuators	7	8	15
4	Interfacing Arduino with Internet	7	8	15
5	Arduino Communication with Andriod Phone & Cloud	7	8	15
6	Iot Project	7	8	15
	Total Duration	40	50	90

Prerequisites:

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Eligibility:

BE / B.Tech, MCA, MSc / BSc (IT / Computer Science /Electronics) or equivalent of any of these.

Online Theory / Practical Class Delivery Mode:

(Using any one of the following tools)

- NIELIT Web Conferencing tool using Jitsi.
- Cisco WebEx.
- Microsoft Team.
- Google Meet

E-contents, Presentations, Assignments, programs etc can be shared using E-mail/whatsApp/Google classroom

Training Fees:

Rs. 1000/-

Payment towards Course fee paid through:

Name : **NIELIT Lucknow**
Bank name : **Punjab National bank**
Account Number : **3926002105001894**
IFSC Code : **PUNB0392600**

*Once Fees paid will not be refunded in any case

Registration Process:

After fee payment a link of registration form will be provided to the students for Online Registration.

Examination:

1. The Student shall be completing the per day module after having self-assessment through daily quiz (05 MCQ), which shall be in line with the content covered per day.
2. There shall be an online test for assessment at the end of the course

Certificate:
NIELIT Lucknow will provide training certificate to all the participants after successfully completion of training program.
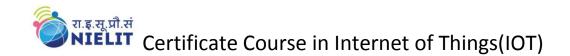
Detailed Syllabus and Learning Outcome:

S. No	Chapter Name	Course Outline	Duration (Hours)		Learning Outcome
			Theory	**Lab**	
1	**Module1 - The Internet of Things: Brain Storming Basics**	1.1 Basic concepts. 1.2 Communication Technologies	6	9	After completion of this module, the candidate will be able to : • Understand about the working of different types of IoT devices. • Understand about the different types of wired and wireless communication.
2	**Module 2 - The IOT Microcontroller**	2.1 Microcontroller Fundamental	6	9	After learning this module the participant will be able to • Understand about the

	Platform	2.2 Arduino Software 2.3 Programming interface			microcontrollers. • Learn about how the Arduino IDE work and how sketch uploaded on microcontroller using IDE
3.	**Module3 - The Basics of Sensors and Actuators**	3.1 Sensor Fundamentals 3.2 A/D Conversion 3.3 Other components 3.4 Actuators 3.5 Digital Sensors 3.6 Serial communication 3.7 I2C Technology	7	8	After completion of this module the participants will be able to • What is sensors? • What is actuators? • How sensors work? • What is the difference b/w Analog and digital sensors. • Communication from microcontroller using serial communication.
4.	**Module4 - Interfacing Arduino with Internet**	4.1 Internet Basics 4.2 Arduino-Ethernet Interface 4.3 Arduino using the WiFi 4.4 Data transmission & Reception.	7	8	After attending this module the participants will be able to • Learn about the basics of internet and networking concepts. • Connecting IoT devices to internet using Wifi (NodeMCU) • Sending the data of Ardunio over cloud. • Accessing of different types of cloud service.
5	**Module5 - Arduino Communication with Android Phone & Cloud**	5.1 Arduino interface 5.2 Android OS and Communication 5.3 Cloud computing 5.4 Project-1	7	8	After attending this module the participants will be able to • Controlling android devices using android smartphone. • Accessing real time data of sensors globally.

					• Controlling devices using google assistant.
6.	**Module-6 Project**	6.1 Project based on following verticals • Smart parking • Intelligent Transport System • Smart urban lighting	5	8	After completion of the project students will • Able to create a devices which will help to solve any real life problem.
Total Hours = 90			**40**	**50**	

Recommended hardware/software tools:

1. PC with capable of Arduino IDE.
2. Various type of Microcontrollers (Ardiuino UNO, NodeMCU)
3. Sensors (fire sensor, Ultrasonic, RFID, PIR Motion , Temperature and many more)
4. Other Electronic component like HC-05, LCD (16X2) monitor, HexKeypad, DC Motor

Course Name	Certificate Course in Internet of Things(IOT)	**Vertical**	IOT
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