National Institute of Electronics & Information Technology
Gorakhpur

Course Preamble

	Certified Internet of Things (IoT) Developer	
1	Course Descriptions	This course will describe the Internet of Things (IoT), the technology used to build various kind of devices, how they communicate, how they store data, and the kinds of distributed systems needed to support them.
2	Objective	The overall goal of this course is to enable you to build an IoT system. During this course, you'll learn the various kind of IoT systems that you'll encounter and build using representative technologies
2	Eligibility	O-level/ ITI/ Diploma/ A-level/B.E/B.Tech. /MCA/BCA (pursuing also)
3	Intake	Fifty (50)
4	Duration	4 Weeks (60 hours)
5	Timing	10:00 AM to 01:00 PM (3hours/Day)
6	Training Fee	3000.00 (for Online Mode) 4500.00 (for In-campus/offline Mode)
7	Topics to be covered.	• Introduction to IoT • Installation of Arduino • Interfacing of Arduino with sensor • Introduction to Nodemcu and its GPIO pin • Interfacing of Nodemcu with Thingspeak • Installation of Blynk and interfacing with various devices • Displaying data using Adafruit Io • Introduction to Raspberry Pi and its interfacing
7	Hardware and other requirement for the participants	• Candidate must have latest computer/laptop with preferably 4 GB RAM or higher and Graphics Card (2 GB) • Software: Arduino IDE • Internet connection with good speed (preferably 2Mbps or higher)
8	Training Outcomes	By the end of this course the candidates will get acquainted with: • the definition and usage of the term "Internet of Things" in different contexts • understand the key components that make up an IoT system • apply the knowledge and skills acquired during the course to build and test a complete, working IoT system involving prototyping, programming and data analysis • understand where the IoT concept fits within the broader ICT industry and possible future trends
9	Theory / Practical Class Delivery Mode	Online/Offline

10	**Hands on Lab session**	Using open-source software tool
11	**Contact Details**	Name of Course Coordinator: Shalinee Mishra Email: shalinee@nielit.gov.in Mobile Number:8317093875 Name of Course Co-coordinator: Sh. Ritesh Pratap Rao Email: riteshpratap@nielit.gov.in Mobile Number: 8317093893

	<Internet of Things>			
	Topics to be covered.			
	Theory		**Practical**	
	Content	Name of Instructor	Content	Name of Instructor
Day1	• What Is the Internet of Things (IoT)? • Brief History and evolution of IoT • IoT Architecture and Protocols • Various Platform of IoT • Overview of IoT components and IoT Communication Technologies • Trends in the Adoption of IoT • IoT is Powerful and Pervasive • Societal Benefits of IoT • Risks, Privacy, and Securit	SM		
Day2	• Introduction to Arduino and its Architecture • Arduino simulation environment	SM	• Installation of Arduino IDE	SM
Day3	• Basics of C: • Operators • Conditionals • Arrays • Functions	SM	• Hands on in IDE	SM
Day4	• Blinking LED • Condition based LED • LED pattern	SM	• Pattern generation	SM
Day5	• LED using switch • PWM • Buzzer	RPR	• Intensity control of LED • volume control of buzzer	RPR
Day6	• Interfacing with seven segment display	RPR	• Display values from 0 to 9 • Counter from 0 to 9 using loop	RPR

			• Counter using switch	
Day7	• LCD interfacing • Custom character display	SM	• To display character in LCD • Moving character in LCD • To display custom character in LCD	SM
Day8	• Introduction to sensors • Temperature sensor • Photoresistor Sensor • Flame detector Sensor • Ultrasonic Sensor	SM	• Photoresistor sensor • Sound Sensor • Flame sensor • RGB led • LM35 • Thermistor sensor • Displaying value of Ultrasonic sensor in LCD	SM
Day9	• Humidity sensor • PIR sensor • Gas Sensor	SM	• To display value of Humidity sensor in Monitor and in LCD • Interfacing of PIR, Buzzer and LED • Displaying value of Gas sensor in Monitor	SM
Day10	• Working with Radio frequency identification (RFID) device • Bluetooth module	SM	• AT commands and Controlling of LED using Bluetooth	SM
Day11	• Introduction to NodeMcu • Node GPIO • Web Server	SM	• Scanning Wifi Networks and connecting to Wifi • Controlling led through web Browse	SM
Day12	• Nodemcu through Thigspeak	SM	• Creating account on Thingspeak • Connect temperature and Humidity Sensor • Continuously monitor sensor reading through internet • Generate API and program Node MCU	SM

				Thing TalkBack – Control Home Appliance Using Internet from anywhere	
Day13	• Creating Twitter app on Thingspeak	SM		• TimeControl – Control Home Appliance at a particular time • How to create apps on ThingSpeak • Create a twitter API • Trigger an action of twitting through NodeMCU • Make Node MCU to tweet the sensor value	SM
Day14	• BLYNK APP • IFTTT – IF THIS THEN THAT • Adafruit IO	SM		• Installing Blynk Android App and creating account • Controlling Home Appliance using Blynk Android App • Creating account on IFTTT and Applets on IFTTT • Creating Adafruit Account • Using Adafruit to read sensors value and send data to Node MCU	SM
Day15	• Adafruit and IFTTT interfacing	SM		• Controlling Home Appliance Using Google Assistant	SM
Day16	• Introduction to Raspberry PI, • OS installation • GPIO Pin	RPR		• OS Installation	RPR
Day17	• Basics of python	RPR			RPR
Day18	• Blinking LED • Sensor Interfacing with Rpi	RPR		• Blinking LED • PIR and Humidity Sensor interfacing with Raspberry PI	RPR

Day19	• Interfacing of Raspberry Pi with Thingspeak	RPR	• Send data to Things Speak • Get data from things speak	RPR
Day20	• Project • Feedback and assessment			

ABBREVIATIONS:

SM: Smt. Shalinee Mishra (Scientist-C)
RPR: Sh. RItesh Pratap Rao (Scientist-B)