



EDUCATION LANES

A Mahindra Group Initiative



CERTIFICATION COURSE IN
INTERNET OF THINGS

**Tech
Mahindra**

ABOUT IIIT-D

Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi) was created as a State University by an act of Delhi Government (The IIIT Delhi Act, 2007) empowering it to do research and development, and grant degrees. In a relatively short time, it has earned an excellent reputation in India and abroad for being a center of quality education and research in IT and interdisciplinary areas. The institute began with its first batch of 60 B.Tech students in 2008. This first batch graduated in 2012 - the first Convocation took place in November, 2012. By that time, the institute has attracted nearly 30 faculty members, and its academic program consisted of B.Tech., M.Tech. and Ph.D. programs in CSE and ECE.





COURSE OBJECTIVE

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. A thing in the internet of things can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an IP address and is able to transfer data over a network.

Increasingly, organizations in a variety of industries are using IoT to operate more efficiently, and its framework, Decision Framework, Configure STM32 Nucleoboard, Understand Sensors, Actuators & get started with an IoT system. Understand various IoT Networking Protocols which are mainly used to develop communication solutions and implement them on hardware. It Perform Data Analytics on the collected sensor data, use prediction algorithms to get useful insights and IoT challenges, business solutions, research scope and current development, Alexa Voice Bot on STM32 Nucleo board.

PEDAGOGY

- Hands-on projects and labs under the guidance of a mentor.
- Work on industry standard hardware and software platforms to build IoT applications.
- Online Live Classes supplemented by Assignments etc and group work.
- Additional Support through Tutorial sessions that will be planned on need basis to deepen the practical aspects of Applications and Big Data.

Assignment and Projects for practical application of theory concepts.

ASSESSMENTS

- There are continuous evaluations built in throughout the duration of the course. These maybe in the form of a quiz, assignment, project, case studies or other objective/subjective assessments. The evaluations are designed ensure continuous student engagement with the course and encourage learning. There will be a final assessment of the entire course (all modules) at the end of the program. While the results/feedback on such assignments will be provided, no consolidated mark or grade sheets shall be distributed to the Participants at the end of the course. Students who successfully clear the same along with the requisite attendance criteria will be awarded a Certificate from IIIT-DELHI as appropriate.
- A minimum of 70% attendance to the LIVE lectures is a prerequisite for the successful completion of this program.

WHO SHOULD ATTEND



This IoT Certification Training is for all the professionals who are passionate about work with IoT devices and want to go ahead and make their career as an IoT Developer. It is best suited for individuals who are:

- Software Developers who are venturing into IoT space
- Solution Architects
- Technical Architects & Students who seek IoT knowledge
- Business Executives and Managers who want to understand the essentials of IoT
- Professionals who want to get hands-on experience of IoT technologies to convert their ideas to products

ELIGIBILITY

Bachelor's /Master's degree in Computer/ Science/Engineering/Math/Statistics/ Economics/Science with a minimum of 50% marks in graduation.

COURSE MODULES

1. IoT Management

4.5h

- IoT Strategy; Capturing and Creating Value
- Technology Selection, Security & Privacy Issues
- Creating and Presenting Business Case

2. IoT Things (Hardware)

24h

- Architecture of ARM
- Lab 1: Introduction to Tool Environment and Hello World Lab
- Architecture of ARM
- Architecture of ARM
- Lab 2: Interfacing ARM with Leds and Pushbuttons/switches
- Architecture of ARM
- Lab 3: Interfacing ARM with UART along with Leds and Pushbuttons
- Lab 4: Interfacing Sensors with ARM and polling
- Lab 5: Interfacing Sensor with ARM and ARM with Android APP via BLE

- Lab 6: ARM: Interrupts and Timers
- Lab 7: ARM: DMA
- Lab 8: Singal processing on ARM
- Lab 9: BLE Mesh
- Lab 10: BLE Mesh
- Lab 11: BLE Mesh
- Hardware round-up

3. Internet of IoT (Networking)

15h

- Communication Criteria
- Planning Essentials - QoS Metrics, Range, Battery Life, and width, RAT Selection
- IoT Access Technology - Part 1 of 4
- IoT Access Technology - Part 2 of 4
- IoT Access Technology - Part 3 of 4
- Mathematical Basis of Network Planning - Probability Theory,
- Performance Guarantees
- IoT Access Technology - Part 4 of 4
- Capacity Oriented Planning; Coverage Oriented planning;
- Network Dimensioning
- IoT Case Studies
- Internet of IoT round-up

4. Applications and Big Data

31.5h

- Introduction to Cloud and Applications
- Map Reduce and Its extensions
- Map Reduce and Its extensions Lab
- LSH
- LSH Lab

- Link Analysis
- Link Analysis Lab
- Clustering of Large Datasets
- Clustering of Large Datasets lab
- Frequent Itemsets
- Frequent itemsets lab
- Structured Data and Semantic Web
- Introduction to RDF and OWL
- Semantic Web and RDF/ OWL Lab
- Mining of Health Data - Part 1
- Mining of Health Data - Part 2
- Docker Based container for Healthcare - Part 1
- Docker Based container for Healthcare - Part 2
- Applications and Big-Data round-up

5. Security in IoT

12h

- System Design - Basics and Vulnerability
- Intro to Networking - from security exploit perspectives
- Side channel attacks and counter measures
- Common exploits and attack methods for IoT Devices
- Hardware Trojan Detection & Trusted IC Design
- Tools for performing exploits & Attack Prevention Methods
- Good practices in secure IoT Design
- Security round-up

Total Program Hours

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87 Hours

COURSE DETAILS

- Course Duration : 7 Months
Campus Visit : 1 Day at the end of course
During Campus Visit : Felicitation of successful participants and tour of campus followed by high-tea.
- Course Schedule : Sat 10:00 AM - 1:00 PM
(Optional tutorials may be conducted on Tuesdays 7:00 PM - 9:00 PM as informed by the instructor(s) during the program)

PROGRAM COORDINATOR



Dr. Anuj Grover
(Program coordinator)
Assistant Professor (ECE)
PhD (2015), IIT-Delhi

Dr. Anuj Grover has obtained PhD from IIT Delhi in 2015, MS (Electronic Circuits and Systems) from UCSD in 2003, and B Tech (EE) from IIT Delhi in 2000. Prior to joining IIIT-Delhi, he had been working as Principal Engineer - Member of Technical Staff at STMicroelectronics, Greater NOIDA. He has been associated with IIIT-Delhi as a Guest Faculty since January 2018. In more than 18 years of experience in the semiconductor industry as a Memory Designer, he has worked on a wide range of technologies like Bulk CMOS, BCD, Imaging, UTBB-FDSOI CMOS, e-NVM across a range of feature sizes from 22nm to 0.35um.

He has strong interest in Systematic Innovation and is trained on applying Theory of Inventive Problem Solving (TRIZ). He has been awarded TRIZ Level-3 Certification from MIT and MATRIZ. He has also been certified by World Intellectual Property Organization (WIPO) on application of TRIZ for patents.

FACULTY

1. Sanjiva Shankar Dubey

Professor at IIIT Delhi, BIMTECH,
IIM Lucknow , IIM Indore .



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https://s3-eu-west-1.amazonaws.com/landingi-editor-uploads/EVUTAKdj/Sanjiva_S_Dubey_.pdf

2. G.P.S Raghava

PhD, Institute of Microbial
Technology, Chandigarh.



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<https://www.iiitd.ac.in/raghava>

3. Dr.Arun Balaji Buduru

PhD (2016), Arizona State University, USA



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<https://www.iiitd.ac.in/arunb>

4. Dr.Sujay Deb

PhD (2012), Washington State University



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<https://www.iiitd.ac.in/sdeb>

5. Dr.Gourab Ghatak

PhD, Wireless Communications,
CEA-LETI and Telecom ParisTech,
France



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6. Dr.Sumit J Darak

PhD (2013), Nanyang Technological
University (NTU), Singapore



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7. Dr.Vikram Goyal

PhD (2009), Computer Science and
Engineering, IIT Delhi



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8. Dr.V. Raghava Mutharaju

PhD (2016), Wright State University,
Dayton, OH, USA



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9. Dr.Vivek Bohara

PhD(2011), Electrical and Electronic
Engineering, Nanyang Technological
University, Singapore



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<https://www.iiitd.ac.in/vivek>



PROGRAMME FEES

INR 1,30,000/- + GST

	Registration Fees	Admission Fees	1st Installment	2nd Installment
Dates	On the day of registration	Jul'19	Oct'19	Jan'20
Amount	Registration Fees	INR 50,000 +GST	INR 30,000 +GST	INR 40,000 +GST

Discounted Fee for Lump sum Payment INR 1,20,000/- + GST



EDUCATION LANES

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Education Lanes is Tech Mahindra's Growth Factories division's initiative that offers certificate Programmes from premier institutes on a virtual platform. Education Lanes offers a comprehensive direct-to-device education suite with real-time interactive and participative virtual classroom sessions.

FOR ADMISSIONS

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Terms & Condition Apply. Any request for refund of registration fees on account of valid reason prior to the closure of registrations or 10 working days before the date of course commencement whichever is earlier, the amount paid shall be refunded with a deduction of Rs.5,000 + applicable taxes. For more info visit www.educationlanes.com

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