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swathi.gbr@gmail.com

Courses » Introduction to Internet of Things

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Register for Certification exam

Course outline

How to access the portal

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

DOWNLOAD VIDEOS

Assignment Solution

Text Translation

PRINCIPAL
G.Narayanamma Institute of
Technology & Science (for women)
(AUTONOMOUS)
Shaikpet, Hyderabad - 500 104

Introduction to Internet of Things

Prof Sudip Misra

34089 students have enrolled already!!

ABOUT THE COURSE

Internet of Things (IoT) is presently a hot technology worldwide. Government, academia, and industry are involved in different aspects of research, implementation, and business with IoT. IoT cuts across different application domain verticals ranging from civilian to defence sectors. These domains include agriculture, space, healthcare, manufacturing, construction, water, and mining, which are presently transitioning their legacy infrastructure to support IoT. Today it is possible to envision pervasive connectivity, storage, and computation, which, in turn, gives rise to building different IoT solutions. IoT-based applications such as innovative shopping system, infrastructure management in both urban and rural areas, remote health monitoring and emergency notification systems, and transportation systems, are gradually relying on IoT based systems. Therefore, it is very important to learn the fundamentals of this emerging technology.

INTENDED AUDIENCE

- CSE
- IT
- ECE
- EE
- Instrumentation Engg
- Industrial Engineering

PRE-REQUISITES

- Basic programming knowledge

INDUSTRY SUPPORT – LIST OF COMPANIES/INDUSTRY THAT WILL RECOGNIZE/VALUE THIS ONLINE COURSE

Nil

COURSE INSTRUCTOR

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Dr. Sudip Misra is a Professor in the Department of Computer Science and Engineering at the Indian Institute of Technology Kharagpur. Prior to this he was associated with Cornell University (USA), Yale University (USA), Nortel Networks (Canada) and the Government of Ontario (Canada). He received his Ph.D. degree in Computer Science from Carleton University, in Ottawa, Canada. He has several years of experience working in the academia, government, and the private sectors in research, teaching, consulting, project management, architecture, software design and product engineering roles.

His current research interests includes Wireless Ad Hoc and Sensor Networks, Internet of Things (IoT), Computer Networks, Learning Systems, and algorithm design for emerging communication networks. Dr. Misra is the author of over 260 scholarly research papers, including 140+ reputed journal papers. He has won seven research paper awards in different conferences. Recently, he and his students won Samsung Innovation Award and the IEEE ComSoc Student Competition. He was also awarded the IEEE ComSoc Asia Pacific Outstanding Young Researcher Award at IEEE GLOBECOM 2012, Anaheim, California, USA. He was also the recipient of several academic awards and fellowships such as the Young Scientist Award (National Academy of Sciences, India), Young Systems Scientist Award (Systems Society of India), Young Engineers Award (Institution of Engineers, India), (Canadian) Governor General's Academic Gold Medal at Carleton University, the University Outstanding Graduate Student Award in the Doctoral level at Carleton University and the National Academy of Sciences, India - Swarna Jayanti Puraskar (Golden Jubilee Award).

Dr. Misra was also awarded the Canadian Government's prestigious NSERC Post Doctoral Fellowship and the Humboldt Research Fellowship in Germany. Dr. Misra has been serving the editorial boards of distinguished journals such as the International Journal of Communication Systems (Wiley) and the IET Wireless Sensor Systems (UK). In the past, he served as the Associate Editor/Editorial Board Member of the Telecommunication Systems Journal (Springer), Security and Communication Networks Journal (Wiley), and the EURASIP Journal of Wireless Communications and Networking, IET Communications Journal, and the Computers and Electrical Engineering Journal (Elsevier).

Dr. Misra has published 9 books in the areas of wireless ad hoc networks, wireless sensor networks, wireless mesh networks, communication networks and distributed systems, network reliability and fault tolerance, and information and coding theory, published by reputed publishers such as Cambridge University Press, Springer, Wiley, and World Scientific.

COURSE LAYOUT

Week 1: Introduction to IoT: Part I, Part II, Sensing, Actuation, Basics of Networking: Part-I

Week 2: Basics of Networking: Part-II, Part III, Part IV, Communication Protocols: Part I, Part II

Week 3: Communication Protocols: Part III, Part IV, Part V, Sensor Networks: Part I, Part II

Week 4: Sensor Networks: Part III, Part IV, Part V, Part VI, Machine-to-Machine Communications

Week 5: Interoperability in IoT, Introduction to Arduino Programming: Part I, Part II, Integration of Sensors and Actuators with Arduino: Part I, Part II

Week 6: Introduction to Python programming: Part I, Part II, Introduction to Raspberry Pi: Part I, Part II,
Implementation of IoT with Raspberry Pi: Part I

Week 7: Implementation of IoT with Raspberry Pi: Part II, Part III, Introduction to SDN: Part I, Part II, SDN for IoT:
Part I

Week 8: SDN for IoT: Part II, Data Handling and Analytics: Part I, Part II, Cloud Computing: Part I, Part II

Week 9: Cloud Computing: Part III, Part IV, Part V, Sensor-Cloud: Part I, Part II

Week 10: Fog Computing: Part I, Part II, Smart Cities and Smart Homes: Part I, Part II, Part III

Week 11: Connected Vehicles: Part I, Part II, Smart Grid: Part 1, Part II, Industrial IoT: Part I

Week 12: Industrial IoT: Part I, Case Study: Agriculture, Healthcare, Activity Monitoring: Part I, Part II

SUGGESTED READING

1. "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
2. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti (Universities Press)
3. Research papers

CERTIFICATION EXAM :

- The exam is optional for a fee.
- Date of Exam: **April 27th 2019 (Saturday).**
- Time of Exam: Morning session 9am to 2 noon; Afternoon session: 2pm to 5pm
- Registration url: Announcements will be made when the registration form is open for registrations.
- The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published.

CERTIFICATION:

- Final score will be calculated as : 25% assignment score + 75% final exam score
- 25% assignment score is calculated as 25% of average of Best 8 out of 12 assignments

- E-Certificate will be given to those who register and write the exam and score greater than or equal to 40% final score. Certificate will have your name, photograph and the score in the final exam with the breakup.It will have the logos of NPTEL and IIT Kharagpur. It will be e-verifiable at nptel.ac.in/noc.

APPRECIATIONS AND COMMENTS BY THE PREVIOUS BATCH STUDENTS:

Respected Sir,
Thank you for a great course. It motivate me to learn more about arduino programming and raspberry pi. helps me to improve my robotics skills and many other projects skills.
SAYAN SAHA

Dear Admin,
I got my score...and cleared the exam...want to thank you all...and professor saab...for the wonderful course...thanks to you all. And want to request the team to come up with more advance level courses on same domain.
Thanks & Regards.
Manish Anand

Dear Mr.Sudeep Misra Sir and Mr.Anandarup mukherjee Sir,
I am very much impressed with the content. It is nice to undergo with this course. I learnt a lot from your content.
Thank you.
with regards,
Bhuvaneswari A

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38.5

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Roll No:NPTEL19CS31S31452959

To K SWATHI
G. NARAYANAMMA INSTITUTE OF TECHNOLOGY
AND SCIENCE (FOR WOMEN)
HYDERABAD

742

No. of weeks of NPTEL Courses	Equivalence of NPTEL course with regular FDP
4	$\frac{1}{2}$ FDP of one week
8	Full FDP of one week
12	$1\frac{1}{2}$ FDP

Duration of NPTEL course: 12 Weeks

NPTEL-AICTE
Faculty Development Programme

(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to

K.SWATHI

for successfully completing the course

Introduction to Internet of Things

with a consolidated score of 97 %

Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras

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Prof. Dilcep N. Malkhede
Advisor-I (Research, Institute & Faculty Development)
All India Council for Technical Education

Roll No: NPTEL19CS31S31452959 To validate and check scores: http://nptel.ac.in/noc

This candidate has studied the above course through MOOCs mode, has submitted online assignments and passed proctored exams. This certificate is therefore acceptable for promotions under CAS as per AICTE notifications dated 2nd July 2018 similar to other refresher / orientation courses. F.No. AICTE / RIFD / FDP through MOOCs / 2017 / 8

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Department: Electronics and Communication Engineering

2018-19

REPORT

FDP on " **Internet of Things**"

Date of program: 01/01/2019 to 01/04/2019

Resource person: Dr.Sudip Misra

About the Program:

The 12-week NPTEL Faculty Development Program (FDP) led by Dr. Sudip Misra was an extensive journey aimed at providing a comprehensive understanding of the Internet of Things (IoT) and its diverse applications. The course layout meticulously covered various aspects of IoT, networking fundamentals, programming languages, and practical implementations across different domains.

Week-by-Week Course Layout:

Week 1: Introduction to IoT and Basics of Networking

Covered foundational concepts of IoT and networking principles. Explored topics including sensing, actuation, and basic networking concepts.

Week 2-4: Communication Protocols and Sensor Networks

In-depth exploration of communication protocols in IoT. Detailed sessions on sensor networks and machine-to-machine communications.

Week 5-6: IoT Implementation and Programming Basics

Delved into IoT interoperability and Arduino programming fundamentals. Introduced Python programming and its application in IoT. Explored the use of Raspberry Pi for IoT implementation.

Week 7-8: SDN, Data Handling, Cloud Computing

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Introduced Software-Defined Networking (SDN) and its relevance in IoT. Covered data handling, analytics, and the fundamentals of cloud computing.

Week 9-10: Cloud, Fog Computing, and Smart Applications

Continued exploring cloud computing and its applications in sensor-cloud systems.

Introduced fog computing and its role in IoT.

Explored smart cities, smart homes, and their IoT implementations.

Week 11-12: Advanced IoT Applications

Covered advanced IoT applications like connected vehicles, smart grid, and industrial IoT.

Detailed discussions on use cases in agriculture, healthcare, and activity monitoring.

The 12-week NPTEL FDP, meticulously curated by Dr. Sudip Misra, offered a comprehensive and structured learning experience in IoT. Participants gained proficiency in networking fundamentals, programming languages, and practical implementation across various domains. The course layout effectively balanced theoretical knowledge with hands-on sessions, ensuring a holistic understanding of IoT and its applications in diverse fields. This FDP not only equipped participants with specialized skills but also empowered them to contribute effectively to the expanding realm of IoT technology.

Signature of the Faculty member

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