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Introduction To Industry 4.0 And Industrial Internet Of Things - Course

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# Introduction To Industry 4.0 And Industrial Internet Of Things

By Pref Sudip Misra | IIT Kharagpur

Learners enrolled: 13145

Introduction to Industry 4 0 and Industrial Internet of Things



#### BOUT THE COURSE:

visitive 4.0 concerns the transformation of industrial processes through the integration of modern technologies such as sensors, communication, and computational processing echnologies such as Cyber Physical Systems (CPS), Internet of Things (IoT). Cloud Computing, Machine Learning, and Data Analytics are considered to be the different drivers ecessary for the transformation. Industrial Internet of Things (IIoT) is an application of IoT in Industries to modify the various existing industrial systems. Ito F links the automation ystam with enterprise, planning and product lifecycle. This course has been organized into the following modules:

NTENDED AUDIENCE : CSE, IT, ECE, EE, Instrumentation Engg, Industrial Engineering, Industry Professionals RE-REQUISITES : Basic knowledge of computer and internet NDUSTRY SUPPORT : All Industrial Sectors

#### Summary

Completed Course Status : Core Course Type : 12 weeks Duration : Computer Science and Engineering Category : 3 Credit Points: Postgraduate Level

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Start Date :	
End Date :	
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Exam Date : 20 Oct 0000 tour	
Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.	
an endowing. You can check final exam date on your hall ticket.	
This is an AICTE approved FDP course	
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(https://www.addtoany.com/share#url=https%3A%2F%2Fonlinecourses nptel.ac.in%2Fnoc22_cs95%2Fpreview&title=Introduction%20To%20Industry%204.0%20And%20Industrial%20Internet%20 %20Course)	0f%20Things%20
Course layout	
Week 1 💠 Introduction: Sensing & actuation, Communication-Part I, Part II, Networking-Part I, Part II	
Week 2 Industry 4.0: Globalization and Emerging Issues, The Fourth Revolution, LEAN Production Systems, Smart and Connected Business Perspective, Smart Factor	
Neek 3 : Industry 4.0. Cyber Physical Systems and Next Generation Sensors, Collaborative Platform and Product Lifecycle Management, Augmented Reality and Virtua	l Reality,
Artifical Intelligence, Big Data and Advanced Analysis	
Week 4 : Cybersecurity in Industry 4.0, Basics of Industrial IoT: Industrial Processes-Part I, Part II, Industrial Sensing & Actuation, Industrial Internet Systems.	
Week 5 : IIoT-Introduction, Industrial IoT: Business Model and Referece Architecture: IIoT-Business Models-Part I, Part II, IIoT Reference Architecture-Part I, Part II.	
Week 6 : Industrial IoT- Layers: IIoT Sensing-Part I, Part II, IIoT Processing-Part I, Part II, IIoT Communication-Part I. Week 7 : Industrial IoT- Layers: IIoT Communication-Part II, Part III, IIoT Networking-Part I, Part II, Part II.	
Week 8 : Industrial IoT: Big Data Analytics and Software Defined Networks: IIoT Analytics - Introduction, Machine Learning and Data Science - Part I, Part II, R and Julia	Programming
Deta Monogement with Hadoop.	, i oʻgi ciri i ringi
Week 9 Industrial IoT: Big Data Analytics and Software Defined Networks: SDN in IIoT-Part I, Part II, Data Center Networks, Industrial IoT: Security and Fog Computing	Cloud
Computing in IloT-Part I, Part II.	
Week 10 : Industrial IoT: Security and Fog Computing - Fog Computing in IIoT, Security in IIoT-Part I, Part II, Industrial IoT- Application Domains: Factories and Assembly	Line, Food
edustry.	
Week 11 : Industrial IoT- Application Domains: Healthcare, Power Plants, Inventory Management & Quality Control, Plant Safety and Security (Including AR and VR safety	applications),
Facility Management.	
Week 12 : Industrial IoT- Application Domains: Oil, chemical and pharmaceutical industry, Applications of UAVs in Industries, Real case studies :	
Dane study - I: Milk Processing and Packaging Industries	
Crise study II: Manufacturing Industries - Part I	
Dase study - III : Manufacturing Industries - Part II	
Case study - IV : Student Projects - Part I	

Case study - V : Student Projects - Part II

Case study - VI : Virtual Reality Lab

Case study - VII : Steel Technology Lab

## Books and references

1. S. Misra, A. Mukherjee, and A. Roy, 2020. Introduction to IoT. Cambridge University Press. V > Misra, A. Mukherjee, and A. Roy, 2020. Introduction to To T. Cambridge Units and Availability: https://www.amazon.in/Introduction-IoT-Sudip-Misra/dp/1108959741/ref=sr\_1\_1?dchild=1&keywords=sudip+misra&qid=1627359928&sr=8-1 (https://www.amazon.in/introduction-ioi-Sudip-Misra/dp/1108959741/ref=sr\_1\_1?dchild=1&keywords=sudip+misra&qid=1627359928&sr=8-1) 2) S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things and Industry 4.0. CRC Press. 2) S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things and A Analysis and A Mukherjee, 2020. Introduction to Industrial Internet of Things and A Analysis and A Analy dchild=1&keywords=sudip+misra&qid=1627359971&sr=8-3) 3) Research Papers

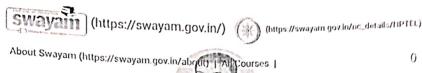
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# Introduction To Industry 4.0 And Industrial Internet Of Things - Course

nstructor bio



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#### Prof. Sudip Misra

Such Misra is a Professor in the Department of Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Yale University (USA). Nortal Naturaties (Computer Science and Engineering at the Indian Institute of Technology Kharagour. Prior to this he was associated with Cornell iversity (USA). Nortal Naturaties (Computer Science and Prior to the Naturaties (Computer Science at the Naturat versity (USA), Yale University (USA), Nortel Networks (Canada) and the Government of Ontario (Canada). He received his Ph.D. degree in Computer Science from Carleton iversity in Ottawa, Canada. He has several verse of successful and the Government of Ontario (Canada). He received his Ph.D. degree in Computer Science from Carleton iversity, in Ottawa, Canada. He has several years of experience working in the academia, government, and the private sectors in research, teaching, consulting, project management hitecture, software design and product engineering roles. His current research interests include Wireless Ad Hoc and Sensor Networks, Internet of Things (IoT). Computer tworks, Learning Systems, and algorithm design for emerging communication networks. Dr. Misra is the author of over 260 scholarly research papers, including 140+ reputed imal 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 might tion. He was awarded the fellow of NASI. He was also awarded the IEEE ComSoc Asia Pacific Outstanding Young Researcher Award at IEEE GLOBECOM 2012, Anaheim, lifornia, 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 en st Avard (Systems Society of India), Young Engineers Award (Institution of Engineers, India), (Canadian) Governor General's Academic Gold Medial at Carleton University, the iversity Outstanding Graduate Student Award in the Doctoral level at Carleton University and the National Academy of Sciences, India - Swarna Joyanti Puraskar (Golden Jubiles vard) 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 rving the editorial boards of distinguished journals such as the Transactions on Vehicular Technology, Transactions on Mobile Computing, International Journal of Communication stems (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 pringer). Security and Communication Networks Journal (Wiley), and the EURASIP Journal of Wireless Communications and Networking, IET Communications Journal, and the omputers and Electrical Engineering Journal (Elsevier) Dr. Misra has published 10 books in the areas of wireless ad hoc networks, wireless sensor networks, wireless mesh tworks communication networks and distributed systems, network reliability and fault tolerance, and information and coding theory, published by reputed publishers such as a bridge University Press, Springer, Wiley, and World Scientific

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ily the e certificate will be made available. Hard copies will not be dispatched.

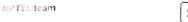
ace again, thanks for your interest in our online courses and certification. Happy learning,

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### Department: Electronics and Telematics Engineering

2022-23

#### REPORT

### FDP on "Introduction To Industry 4.0 And Industrial Internet Of Things"

Date of program: 2022-2023

Resource person: Prof. Sudip Misra, IIT Kharagpur

I P.Sreesudha attended the FDP on Introduction To Industry 4.0 And Industrial Internet Of Things by NPTEL.

Introduction: Sensing & actuation, Communication-Part I, Part II, Networking-Part I, Part II Industry 4.0: Globalization and Emerging Issues, The Fourth Revolution, LEAN Production Systems, Smart and Connected Business Perspective, Smart Factories Industry 4.0: Cyber Physical Systems and Next Generation Sensors, Collaborative Platform and Product Lifecycle Management, Augmented Reality and Virtual Reality, Artifical Intelligence, Big Data and Advanced Analysis Cybersecurity in Industry 4.0, Basics of Industrial IoT: Industrial Processes-Part I, Part II, Industrial Sensing & Actuation, Industrial Internet Systems. IIoT-Introduction, Industrial IoT: Business Model and Referece Architerture: IIoT-Business Models-Part I, Part II, HoT Reference Architecture-Part I, Part II. Industrial IoT- Layers: HoT Sensing-Part I, Part II, HoT Processing-Part I, Part II, HoT Communication-Part I. Industrial IoT- Layers: IIoT Communication-Part II, Part III, HoT Networking-Part I, Part II, Part III. Industrial IoT: Big Data Analytics and Software Defined Networks: IIoT Analytics - Introduction, Machine Learning and Data Science - Part I, Part II, R and Julia Programming, Data Management with Hadoop. Industrial IoT: Big Data Analytics and Software Defined Networks: SDN in IIoT-Part I, Part II, Data Center Networks, Industrial IoT: Security and Fog Computing: Cloud Computing in HoT-Part I, Part II. Industrial IoT: Security and Fog Computing - Fog Computing in IIoT, Security in IIoT-Part I, Part II, Industrial IoT- Application Domains: Factories and Assembly Line, Food Industry. Industrial IoT- Application Domains: Healthcare, Power Plants, Inventory Management & Quality Control, Plant Safety and Security (Including AR and VR safety applications), Facility Management. Industrial IoT- Application Domains: Oil, chemical and pharmaceutical industry, Applications of UAVs in Industries, Real case studies

Signature of the Faculty member

P.Sreesudha, Asst. Prof, ETE

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