

Devi Ahilya Vishwavidyalaya, Indore, India Institute of Engineering & Technology				III Year B.Tech. (Mechanical) (Full Time)		
Course Code & Name	Instruction Hours per semester and Credits					
6RMPE3 Introduction To Industry 4.0 – Industrial Internet of Things	Classroom Instruction (CI)	Lab Instruction (LI)	Term Work (TW) and Self Learning (SL)	Total no. of Hours Per semester	Total no. of Hours Per semester	Total Credits (Total Hours/30)
	L	T	P	TW+SL	120	4
	20	10	20	70		

Learning Objectives:

1. To impart basic ideas in Industry 4.0.
2. To Impart knowledge of smart manufacturing for industry 4.0 for making student innovative.
3. To provide students with a good depth of knowledge of designing Industrial 4.0 Systems for various applications.
4. Learn the design and analysis of Industry 4.0 systems for Energy and smart vehicular applications.

Prerequisite(s):

COURSE CONTENT

UNIT-I

Introduction to Industry 4.0: The Various Industrial Revolutions - Digitalisation and the Networked Economy - Drivers, Enablers, Compelling Forces and Challenges for Industry 4.0 - The Journey so far: Developments in USA, Europe, China and other countries - Comparison of Industry 4.0 Factory and Today's Factory - Trends of Industrial Big Data and Predictive Analytics for Smart Business Transformation, LEAN manufacturing.

UNIT-II

Road to Industry 4.0: Internet of Things (IoT) & Industrial Internet of Things (IIoT) & Internet of Services - Smart Manufacturing - Smart Devices and Products - Smart Logistics - Smart Cities - Predictive Analytics, Cloud applications in manufacturing.

UNIT-III

Industrial Internet of Things (IIOT): Fourth Revolution – Sustainability assessment of Manufacturing Industry – Lean Production system – Smart and connected business perspective – smart factories – cyber-physical systems – collaboration platform and PLM.

UNIT-IV

APPLICATIONS: Inventory Management and Quality Control – Plant security and safety – Facility management – oil, chemical and Pharmaceutical Industry – Milk processing and packaging industries, Industry 4.0 in Car Manufacturing – Electronics Manufacturing – IOT Based Building Automation - Agricultural Automation.

UNIT-V

Business issues in Industry 4.0: Opportunities and Challenges - Future of Works and Skills for Workers in the Industry 4.0 Era - Strategies for competing in an Industry 4.0 world.

List of Practical Assignments:

1.

Learning Outcomes:

Upon Completing the Course, Student will be able to:

1. appreciate the recent manufacturing trends related to Industry 4.0 and its implementation.
2. Realize the need of industry 4.0 and its inter-connectivity.
3. Plan the uses of IOT, cloud computing, data analytics and Industry 4.0 technologies.
4. Understand the Concepts of Industrial IOT in various sectors.
5. Understand the Business issues in Industry 4.0.

Books Recommended:

- [1]. Klaus Schwab, The Fourth Industrial Revolution, World Economic Forum
 - [2]. Arsheep Bahga and Vijay Madisetti, Internet of Things: A Hands-On Approach University Press.
 - [3]. NOC: Introduction to Industry 4.0 and Industrial Internet of Things.
 - [4]. Jean-Claude André, Industry 4.0, Wiley- ISTE, July 2019, ISBN: 781786304827,2019.
 - [5]. Alasdair Gilchrist, Industry 4.0 –The Industrial Internet of Things, Springer Link, 2016.
 - [6]. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, ISBN: 978-1-119-99435-0, 2nd Edition, Willy Publications
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List of Practical Assignments:

Course Outcome:

Students earned credits will develop ability to

- CO1. Appreciate the recent manufacturing trends related to Industry 4.0 and its implementation.
- CO2. Realize the need of industry 4.0 and its inter-connectivity.
- CO3. Plan the uses of IOT, cloud computing, data analytics and Industry 4.0 technologies.
- CO4. Understand the Concepts of Industrial IOT in various sectors.
- CO5. Understand the Business issues in Industry 4.0.

Books Recommended:

- [7]. Klaus Schwab, The Fourth Industrial Revolution, World Economic Forum
- [8]. Arsheep Bahga and Vijay Madisetti, Internet of Things: A Hands-On Approach University Press.
- [9]. NOC: Introduction to Industry 4.0 and Industrial Internet of Things.
- [10]. Jean-Claude André, Industry 4.0, Wiley- ISTE, July 2019, ISBN: 781786304827,2019.
- [11]. Alasdair Gilchrist, Industry 4.0 –The Industrial Internet of Things, Springer Link, 2016.
- [12]. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, ISBN: 978-1-119-99435-0, 2nd Edition, Willy Publications

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The course is designed

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Course Outcome:

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	Appreciate the recent manufacturing trends related to Industry 4.0 and its implementation.	1,2,3,8,9
CO2	Realize the need of industry 4.0 and its inter-connectivity.	1,2,4,5,11
CO3	Plan the uses of IOT, cloud computing, data analytics and Industry 4.0 technologies.	1,2,3,5,7,10
CO4	Understand the Concepts of Industrial IOT in various sectors.	1,2,4,5,7
CO5	Understand the Business issues in Industry 4.0. & 5.0	1,2,4,5,7,9

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	0	0	0	0	1	2	2	2	0
CO2	3	3	2	3	2	0	0	0	0	1	2	2	2	0
CO3	3	3	3	2	2	1	2	0	0	1	2	2	2	0
CO4	3	3	3	2	3	1	2	0	0	1	2	2	2	0
CO5	3	3	2	3	2	2	3	0	0	1	2	2	2	1
Avg	3	3	2.4	3	2.4	0.8	1.4	0	0	1	2	2	2	0.2

* CO (rows) mention nil/very small/insignificant contribution to the PO(column)
 1→ relevant and small significance 2 → medium or moderate and 3 →strong

