

**RCETMECHCC05 - Industry 4.0****Course outcomes:**

- Comprehend Business model innovation through Industry 4.0
- Comprehend IoT, cyber-physical systems, cloud computing and big data, smart factories and their role in Industry 4.0
- Understand drivers and enablers of Industry 4.0, including policy support
- Understand the nature of the fourth industrial revolution and theoretical concepts
- Understand the opportunities, and challenges brought through Industry 4.0

Syllabus:**UNIT 1****INTRODUCTION TO INDUSTRY 4.0**

Introduction, Historical Context, General framework, Application areas, Dissemination of Industry 4.0 and the disciplines that contribute to its development, Artificial intelligence, The Internet of Things and Industrial Internet of Things, Additive manufacturing, Robotization and automation, Current situation of Industry 4.0. Introduction to Industry 4.0 to Industry 5.0 Advances

UNIT 2**INDUSTRY 4.0 AND CYBER PHYSICAL SYSTEM.**

Introduction to Cyber Physical Systems (CPS), Architecture of CPS- Components, Data science and technology for CPS, Emerging applications in CPS in different fields. Case study: Application of CPS in health care domain.

UNIT 3**SMART ENERGY SOURCES**

Energy Storage for Mitigating the Variability of Renewable Electricity Sources-Types of electric energy storage, Potential of Sodium-Sulfur Battery Energy Storage to Enable Integration of Wind-Case study. Electric Vehicles as Energy Storage: V2G Capacity Estimation.



UNIT 4

SMART GRID

Smart grid definition and development Smart Grid, Understanding the Smart Grid, Smart grid solutions, Design challenges of smart grid and Industry 4.0.

UNIT 5

SMART APPLICATIONS

Understanding Smart Appliances -Smart Operation-Smart Monitoring-Smart Energy Savings-Smart Maintenance, Case study-Smart Cars, Self-Driving Cars, Introducing Google's Self-Driving Car, Intellectual Property Rights.

Reference Text Books

1. Jean-Claude André, —Industry 4.0, Wiley- ISTE, July 2019, ISBN: 781786304827,2019.
2. Diego Galar Pascual, Pasquale Daponte, Uday Kumar, —Handbook of Industry 4.0 and SMART Systems, Taylor and Francis,2020
3. Miller M, —The internet of things: How smart TVs, smart cars, smart homes, and smart cities are changing the world, Pearson Education, 2015, ISBN: 9780134021300.
4. Pengwei Du and Ning Lu, —Energy storage for smart grids: planning and operation for renewable and variable energy resources VERs, Academic Press, 2018, Reprint edition, ISBN-13:978-0128100714