

DEPARTMENT OF MANUFACTURING ENGINEERING**EMANVAC01- Industry 4.0****Unit I Introduction to Industry 4.0**

Evolution: Industry 1.0, Industry 2.0, Industry 3.0, Industry 4.0 - Definition of Industry 4.0 - Components - Difference between conventional automation and Industry 4.0 -Definition of a smart factory - Technological pillars of Industry 4.0

Unit II Industrial Internet of Things

Concept, Advanced Analytics, Peer (M2M)Communication, IT Tools and Methodologies, Role of Identification, Sensing, Actuation& Control, Challenges;

Cyber-Physical Systems: Concept, Features, Components, Impact on to Manufacturing; Fundamentals of Cloud Manufacturing

Unit III Artificial Intelligence

Concept, Basics of Heuristics, Markov Decision Process, Artificial Neural Networks and Machine Learning, Applications

Smart Sensors:Components, Industrial Sensors, Actuators, Transducers, SCADA

Unit IV Case Studies

Case Studies in Adaptive Machines, Smart Factories, Additive Manufacturing, Additive Manufacturing and Nanotechnology

Unit V Laboratory

Simple Experiments in Mechatronics laboratory -IoT laboratory - Machine Learning laboratory - Virtual reality laboratory - Robotics laboratory

Text Books

Alasdair Gilchrist, Industry 4.0: The Industrial Internet of Things, A Press, 2017

Kevin Knight, Elaine Rich and Shiv Nair, Artificial Intelligence, Hill Education, 2017

Patranabis, Sensors and Transducers, , PHI India, 2003

Rajeev Alur, Principles of Cyber-physical Systems, MIT Press, 2015

Schwab, The Fourth Industrial Revolution, Crown Business, 2017