



# PRINCIPLES OF INDUSTRIAL ENGINEERING

**PROF. D K DWIVEDI**

Department of Mechanical Engineering  
IIT Roorkee

**TYPE OF COURSE** : New | Core | UG

**COURSE DURATION** : 12 weeks (27 Jan' 20 - 17 Apr' 20)

**EXAM DATE** : 26 Apr 2020

**PRE-REQUISITES** : Nil

**INTENDED AUDIENCE** : UG/PG Students of Industrial Engineering & Practicing Engineers

**COURSE OUTLINE :**

The course content is designed to have systematic and comprehensive understanding on various aspects related with industrial engineering and its relevance in the industrial environment. It is proposed to include organizational structure, plant location and plant layout, production planning and control, scheduling, forecasting, statistical quality control, total quality management, work study, method study and work measurement, ergonomics. Presentations will be supported with case studies for effective communication of concepts and techniques.

**ABOUT INSTRUCTOR :**

D K Dwivedi obtained BE (mechanical engineering), in 1993 from GEC Rewa, ME (welding engineering) from Univ. of Roorkee in 1997 and PhD in Met. Engineering from MNIT, Jaipur in 2003. He has about 9 years teaching experience at NIT Hamirpur and 14 years at IIT Roorkee in subjects related to manufacturing at UG level and Welding Engineering related subjects at PG level. He has published more than 120 research papers in SCI/SCIE indexed journals and undertaken 20 sponsored research and 50 industrial consultancy projects. He has authored two books entitled "Production and Properties of Cast Al-Si Alloys with New Age International, New Delhi (2013) and Surface Engineering with Springer, New Delhi (2018).

**COURSE PLAN :**

**Week 1:** Introduction of Industrial Engineering, Organizational structure

**Week 2:** Traditional organizational structure, Product and process organizational structure  
Matrix organizational structure, Plant location: factors consideration

**Week 3:** Selection of plant location method, Types of plant layout, Factors affecting  
plant layout, Product, process and cellular layout, Selection of Plant building

**Week 4:** Materials handling equipment & selection, Production planning control: functions  
Forecasting: Need and Methods

**Week 5:** Forecasting: methods II, Forecasting: errors, Production planning

**Week 6:** Scheduling, Project management

**Week 7:** Inventory, Inventory models

**Week 8:** SQC, Control chart for variable I & II, Control chart for attributes I & II

**Week 9:** TQM: Introduction & Definition, Understanding Quality, Customer satisfaction, Team work

**Week 10:** 5S, Time management, Tools for quality control, QFD, Acceptance sampling

**Week 11:** Productivity: Introduction and need, Partial and total productivity, Methods to  
improve the productivity, Elements of work

**Week 12:** Method study, Work measurement, Standard time, Ergonomics, Organization of work