INDUSTRIAL ENGINEERING AND MANAGEMENT

Course Introduction

BME III/II

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Lecture overview

- Objective of course
- Course outline
- Evaluation Scheme
- Assignment topics
- Contents of assignment
- Short Documentary

Objective of the course

The main objective of this course is to provide fundamental knowledge of industrial engineering. After completion of this course the students will be able:

1. To describe production systems; loading and scheduling techniques.
2. To describe forecasting techniques, inventory control and material requirement planning.
3. To apply knowledge and skills for plant maintenance, quality control and management.

Course outline

1. Introduction to Industrial Engineering and Management (1 hour)

- 1.1 Historical Development
- 1.2 System Concept

2. Design of Production Systems (18 hours)

- 2.1 Plant Location
  - 2.1.1 Importance of Plant Location
  - 2.1.2 Factors Affecting Plant Location
- 2.2 Factory Building and Plant Layout
  - 2.2.1 Types of Factory Building
  - 2.2.2 Types of Plant Layout
  - 2.2.3 Flow Patterns
- 2.3 Material Handling
  - 2.3.1 Engineering factors and Economic factors
  - 2.3.2 Classification of Material Handling Equipments
- 2.4 Production, Planning and Control
  - 2.4.1 Types of Production System
  - 2.4.2 Routing, Scheduling and Loading
- 2.5 Product Research, Development and Design
  - 2.5.1 Tools for Product Development
  - 2.5.2 Standardization
  - 2.5.3 Simplification and Specialization
- 2.6 Process Planning Introduction

CONTD…

3. Loading and Scheduling Techniques (4 hours)

- 4.1 Gantt Chart
- 4.2 Critical Path Method (CPM)
- 4.3 Program Evaluation and Review Technique (PERT)

4. Inventory Control (4 hours)

- 5.1 Economic Order Quantity
- 5.2 Safety Stock; Reorder Quantity; Lead Time
- 5.3 ABC Analysis

5. Material Requirement Planning (MRP I and MRP II) (6 hours)

- 6.1 Introduction
- 6.2 MRP Concept
- 6.3 Benefits and Application
- 6.4 MRP II (Manufacturing Resource Planning)
- 6.5 The Japanese approach to MRP
- 6.6 Comparing MRP and Just in time (JIT) Concept

CONTD…

6. **Forecasting** **(4 hours)**
   - **6.1 Forecasting Techniques**
     - **6.1.1 Qualitative Techniques**
     - **6.1.2 Quantitative Techniques**
     - **6.1.3 Causal Quantitative Techniques**
   - **6.2 Forecast Errors**
7. **Plant Maintenance** **(4 hours)**
   - **7.1 Introduction**
   - **7.2 Preventive Maintenance**
   - **7.3 Scheduled Maintenance**
   - **7.4 Break – down Maintenance**
   - **7.5 Total Productive Maintenance (TPM)**
   - **7.6 Total Planned Quality Maintenance (TPQM)**
8. **Quality Management** **(4 hours)**
   - **8.1 Evolution of Quality Management**
   - **8.2 Quality – Definitions**
   - **8.3 Total Quality Management**

Reference Books:

- M. Mahajan, "*Industrial Engineering and production Management*" ,Dhanpat Rai and Co. (P) Ltd. , Delhi, 2002
- E. S. Buffa and R. K. Sarin "*Modern Production / Operations Management*", *8th Edition, Wiley, 1987*

Evaluation Scheme

1. **Internal Assessment = 20 marks**
   I. Assignment: 5
   II. Assessment: 5 + 5 = 10
   III. Attendance: 5
2. **Final exam = 80 marks**

Unit	Chapters	Topics	Marks Distribution
1	1	All	16
	2	2.1 & 2.2	
2	2	2.3 to 2.6	16
3	3 & 4	All	16
4	5 & 6	All	16
5	7 & 8	All	16
Total			**80**

Assignment topics

- Roll wise, 3 member in each group
- Report with Presentation of 10 minute
- Submission date: Last of Jestha 2074

1. Airbus
2. Tata motor
3. Pepsi cola
4. Air conditioner
5. Structural Steel
6. Washing machine
7. Textile
8. Biscuit
9. Pre-fabricated structure
10. Bearing
11. Steam iron
12. Lawn mover
13. Petroleum product
14. Printer
15. Wall clock
16. Electric bike

Contents of assignment

- Introduction to product and company
- Plant Location
- Factory Building and Plant Layout
- Material Handling
- Production, Planning and Control
- Product Research, Development and Design
- Process Planning
- Loading and Scheduling Techniques
- Inventory Control
- Material Requirement Planning
- Forecasting
- Plant Maintenance
- Quality Control
- **Production Video**

Short Documentary

- Coal, Steam, and The Industrial Revolution_ Crash Course World History #32.mp4

THANK YOU