

B.E Semester: V Mechanical Engineering

Subject Name: Industrial Engineering

A. Course Objective

- To present a problem oriented in depth knowledge of Industrial Engineering.
- To address the underlying concepts, methods and application of different Industrial Engineering Concepts.

B. Teaching / Examination Scheme

| SUBJECT | | Teaching Scheme | | | | Total Credit | Evaluation Scheme | | | | | Total Marks |
|---------|------------------------|-----------------|-----|-----|-------|--------------|-------------------|-------|-------|-------|------------|-------------|
| | | L | T | P | Total | | THEORY | | IE | CIA | PR. / VIVO | |
| CODE | NAME | Hrs | Hrs | Hrs | Hrs | | Hrs | Marks | Marks | Marks | Marks | |
| ME504 | Industrial Engineering | 3 | 0 | 0 | 3 | 3 | 3 | 70 | 30 | 20 | - | 150 |

C. Detailed Syllabus

1. Location Selection and Plant Layout:

Nature of Location Decision, Importance of Plant Location, Dynamic Nature of Plant Location, Choice of site for selection, State regulations on location, Government policies on decentralization. Industrial Estates, Economic Survey of Site selection, SEZ, Comparison of location, Principles of Plant layout and Types, factors affecting layout, methods, factors governing flow pattern, travel chart, analytical tools of plant layout, layout of manufacturing shop, repair shop and services sectors.

2. Production Planning and Control:

Types of production systems and their characteristics functions and objectives of P.P.C., product design and development including standardization and simplification, Sales forecasting, concept, techniques, application, production planning and process planning, Sequencing, loading and scheduling, techniques and their selection, line of balance, assembly line balancing, dispatching, progress control.

3. Productivity and Work Demonstrate:

Definition of productivity, application and advantages of productivity improvement tools, reasons for increase and decreases in productivity. Areas of application of work demonstrate in industry. Reaction of management and labour to work demonstrate. Method Demonstrate: Objectives and procedure for methods analysis, Recording techniques, Micro motion and macro-motion demonstrate: Principles of motion economy, Normal work areas and work place design. Work Measurement: Objectives, Work measurement techniques – time demonstrate, work sampling, pre-determined motion time standards (PMTS) Determination of time standards. Observed time, basic time, normal time, rating factors, allowances, and standard time. Introduction to ergonomics

4. Job Evaluation and Wage Plan:

Objective, Methods of job evaluation, job evaluation procedure, merit rating (performance appraisal), method of merit rating, wage and wage incentive plans

5. Industrial Legislation and safety:

Need for Industrial legislation, Factories act 1948, Industrial dispute act 1947, The Indian trade unions act 1926, Industrial employment act 1946, Payment of wage act 1936, Workmen compensation act 1923, Payment of bonus act 1965, Employees provident fund scheme 1952, Industrial Safety Rules and Health, Safety and Environment Policies.

6. Inspection and Statistical Quality Control:

Inspection – functions, types, objectives and benefits, quality control – principles, Concepts of quality circles, Total quality management, Quality assurance, Quality audit, ISO, and six sigma, SQC Concept, variable and attributes, normal distribution curves and its property charts for variable and attributes and their applications and interpretation (analysis) process capability, Acceptance sampling, sampling plans, OC curves and AOQ curves

7. Entrepreneurship:

Concept, product identification, infrastructure facilities, preparation of project report, sources of industrial finance, Resources allocation, Government incentives to entrepreneurs.

D. Lesson planning

| SR.NO | DATE/WEEK | UNIT NO | %WEIGHTAGE | TOPIC NO |
|--------------|--|----------------|-------------------|-----------------|
| 1 | 1 ST , 2 ND , 3 RD | 1,2 | 20 | 1,2 |
| 2 | 4 TH , 5 TH , 6 TH | 3 | 20 | 3 |
| 3 | 7 TH , 8 TH , 9 TH | 4 | 20 | 4 |
| 4 | 10 TH , 11 TH , 12 TH | 5,6 | 20 | 5,6 |
| 5 | 13 TH , 14 TH , 15 TH | 7 | 20 | 7 |

E. Instructional Method & Pedagogy

1. At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2. Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
5. Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.

F. Students Learning Outcomes

- The student can identify different areas of Industrial Engineering.
- Can find the applications of all the areas in day to day life.

G. Recommended Demonstrate Materials

1. Industrial Engineering and Production Management – By M. Mahajan, Dhanpat Rai & Co.
2. Industrial Engineering and Production Management Martand Telsang S Chand & company.
3. Industrial Engineering and Production Management by Banga and Sharma, Khanna publishers.
4. Production System, Planning, Analysis and Control – By J.L. Riggs 3rd ed. Wiley
5. Industrial Engineering and Organization Management by S K Sharma, Savita Sharma, KATSON Books
6. Industrial Engineering and Management by Dr. B.Kumar Khanna Publishers.