Industrial Engineering and Management Syllabus 2021

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Mechanical and Mechatronics Department

Pre-requisites: NIL

Course objectives:

- Methods of optimization of processes
- Planning, Scheduling, Forecasting methods for industries
- Study of production planning and control by using charts

Course Outcomes:

- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to identify, formulate and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A recognition of the need for, and an ability to engage in life-long learning
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

UNIT – I Concept and definition of Industrial Engineering,

Historical development of IE, Role of Industrial Engineer, Applications of IE Concept of Productivity, Work Study and Productivity, Techniques of work study, basic procedure, approach to method study, method study charts and diagrams, principles of motion economy, Work measurement; basic procedure, techniques: Stop watch time study and work sampling, rating, determination of standard time.

UNIT-II Plant layout

Introduction, main objectives of scientific layout, plant location, principles of plant layout, factors influencing layout, methods of plant layout, material flow pattern, factors affecting flow pattern, work station design, line balancing, Material handling principles and equipments, relation between plant layout and material handling.

UNIT – III Evolution of Management Theory

Scientific management, Contributions of Taylor, Fayol, Mayo to scientific management, Levels of Management Administration and Management, fundamental functions of management, Decision making. **Business Forms and Organization:** Forms of Business: Single proprietorship, partnership, Joint Stock Company, co-operative society, State undertakings. Formation of Joint Stock Companies: Registration, issue of Prospectus, Commencement Certificate. Organization: meaning, Types of organization; Line, Functional, Line Staff organization and line Staff Committee organization, span of control.

UNIT – IV Finance & Financial Statements: Introduction

Needs of Finance, Kinds of Capital, Sources of fixed capital, Shares. Borrow capital, surplus profits. Sources of working capital and its management, Profit & Loss Statement, Balance Sheet, Financial ratios: Liquidity ratio, Profits investment ratio, equity ratio, inventory ratio.

UNIT – V Time value of money:

Simple and compound interest, Time value equivalence, Compound interest factors, Cash flow diagrams, Calculation of time –value equivalences. Present worth comparisons, Comparisons of assets with equal, unequal life, comparison of deferred investments, Future worth comparison, payback period comparison. Rate of return, internal rate of return, comparison of IRR with other methods.

UNIT – VI Depreciation

Causes, Basic methods of computing depreciation charges; Straight line, Sinking fund, Declining Balance and Sum of year's digits method. Breakeven analysis: Basic concepts, Linear Breakeven analysis for single product, Breakeven charts, Dumping.

TEXT BOOKS:

1- Introduction of Operations Research – Hillier & Liberman Holden.
2- Production Systems: Planning & Control: J. L. Giggs, John Wiley & Sons
3- Motion & Time Study: R. M. Barnes, John Wiley & Sons.

REFERENCE BOOKS:

1- Prasad, L.M., Principles and practice of Management, Sultan Chand & Sons.
2- Sushil Kumar Basu, K. C. Sahu, N. K. Datta, Works Organisation & Management, Oxford & IBH.
3- Dexter S. Kimball, Principles of Industrial Organization, Read Books.
4- Leon Pratt Alford, Henry Russell Beatty, Principles of Industrial Management, Revised Edition, Ronald Press Co.
5- Essentials of Industrial Management, McGraw-Hill Industrial organization and management series, Lawrence L. Bethel, McGraw-Hill.
6- Riggs, J.L., Bedworth, D.J., Randhawa, S.U., Engineering Economics, Tata McGraw-Hill.