

**COURSE TITLE** : **INDUSTRIAL MANAGEMENT AND SAFETY**  
**COURSE CODE** : **2004**  
**COURSE CATEGORY** : **C**  
**PERIODS/WEEK** : **4**  
**PERIODS/ SEMESTER** : **72**  
**CREDITS** : **4**

**TIME SCHEDULE**

<b>MODULE</b>	<b>TOPIC</b>	<b>PERIODS</b>
I	1.1 Principles of Management	<b>17</b>
	1.2 Human Resource Management	
	1.3 Wages and Incentives	
	Test I	<b>1</b>
II	2.1 Quality Planning and its development	17
	2.2 Materials and sales management	
	Test II	1
III	3.1 Project Management Techniques	17
	3.1 Quantitative techniques in Management	
	Test III	1
IV	4.1 Industrial Safety	17
	4.2 Environmental pollution and control	
	Test IV	1
<b>TOTAL</b>		<b>72</b>

**OBJECTIVES**

**MODULE – I**

**1.1.0 Understand the principles of management.**

- 1.1.1 Explain the meaning of Management.
- 1.1.2 Explain the development of management theory of F.W.Taylor and Henry Foyal.
- 1.1.3 Compare the contributions of Taylor and Fayol .
- 1.1.4 State and explain the functions of management .
- 1.1.5 State the forms of business organization.
- 1.1.6 Explain different types of ownership .
- 1.1.7 Explain different types of organizational structure .

**1.2.0 Appreciate the functions of Human Resource Management (HRM)**

- 1.2.1 Outline the importance of HRM.
- 1.2.2 State and explain the functions of HRM .
- 1.2.3 Explain the process of man power planning.
- 1.2.4 Explain Job analysis, job evaluation, merit rating, performance appraisal .
- 1.2.5 Describe the steps in selection of workers.
- 1.2.6 Explain the objectives of training.
- 1.2.7 State and explain the methods of training.
- 1.2.8 Define labour turn over.

**1.3.0 Understand the principles of wage payment system**

- 1.3.1 Define different types of wages.
- 1.3.2 Define incentives.

- 1.3.3 Identify financial, non-financial and semi financial incentives.
- 1.3.4 Discuss different types of financial incentive plans.
- 1.3.5 Compute the wages under different plans.

## **MODULE – II**

### **2.1.0 Understand quality planning and its developments.**

- 2.1.1 Define quality .
- 2.1.2 List the dimensions (characteristics) of quality .
- 2.1.3 List the objectives of quality planning .
- 2.1.4 Three prong approach to quality planning.
- 2.1.5 List the developments in quality planning.
- 2.1.6 Explain the concept and role of ISO standards.
- 2.1.7 List and explain the various elements of ISO 9000 series.
- 2.1.8 List the steps for ISO 9000 installation.
- 2.1.9 List the objectives of quality audit.
- 2.1.10 Understand the concept of Total Quality Management (TQM).
- 2.1.11 Discuss the link between ISO and TQM.
- 2.1.12 List the ten “manthras” of TQM.
- 2.1.13 Explain mission, vision and quality policy.

### **2.2.0 Appreciate the functions of materials and sales management.**

- 2.2.1 List the objectives of purchase department.
- 2.2.2 Explain buying techniques.
- 2.2.3 Explain purchase procedure.
- 2.2.4 Define inventory.
- 2.2.5 Explain the classification of inventory.
- 2.2.6 Explain inventory models such as EOQ and ABC.
- 2.2.7 List the objectives of stores management.
- 2.2.8 Explain the functions of store keeping.
- 2.2.9 List the duties of a store keeper.
- 2.2.10 List and explain the store keeping records.
- 2.2.11 Explain the concept of store layout.
- 2.2.12 Describe the centralised and de-centralised store.
- 2.2.13 Outline the importance of sales department.
- 2.2.14 List the functions of sales department.
- 2.2.15 Explain the process of sales forecasting.

## **MODULE – III**

### **3.1.0 Apply the principles of Project management techniques**

- 3.1.1 Outline the network technique .
- 3.1.2 List different applications of CPM and PERT
- 3.1.3 Outline scope of PERT and CPM
- 3.1.4 Define the terms used in CPM .
- 3.1.5 Explain numbering system in network technique using Fulkersons rule.
- 3.1.6 Explain the procedure for finding the critical path.
- 3.1.7 Compute the project duration, slack and critical path by using AOA method only.
- 3.1.8 Distinguish between CPM and PERT.
- 3.1.9 Define the terms used in PERT .
- 3.1.10 Explain the procedure for finding the critical path in PERT.
- 3.1.11 Explain the terms pessimistic, optimistic and most likely time.
- 3.1.12 Calculate the expected time for each activity.

3.1.13 Compute the project duration slack and mark the critical path .

**3.2.0 Apply the principles of Quantitative techniques in management.**

3.2.1 List the different quantitative techniques.

3.2.2 Formulation of Linear Programming Problem (LPP).

3.2.3 Graphical solution of given LPP on maximisation and minimisation.

3.2.4 Explain the scope of transportation problem.

3.2.5 Compute the initial feasible solution of transportation problem by using North West corner rule( NW R) and Vogels Approximation Method (VAM).

3.2.6 Explain game theory.

3.2.7 Computation of saddle point, optimum strategy of the game two – person – zero sum using maxmin and minimax principle.

**MODULE – IV**

**4.1.0 Recognize the features of Industrial Safety**

4.1.1 Explain the importance and need for safety measures in industries

4.1.2 Define the meaning of the terms – factory, accident, frequency rate, severity rate, incidence rate, performance index, accident proneness, unsafe acts, unsafe conditions, job safety analysis, plant safety inspections, industrial safety policy.

4.1.3 Identify the various accident factors, mechanical factors, environmental factors, and personal factors.

4.1.4 Discuss the 4 E's of accident prevention technique.

4.1.5 Recognize the roles of safety officers, supervisors, workers and trade unions in practising safety procedures.

4.1.6 Discuss the role of safety council and safety officer.

4.1.7 Discuss emergency preparedness and response.

4.1.8 Discuss the precautions to be observed in preventing accident while working in hazardous environment like toxic atmosphere, flammable atmosphere, electrical shock and material handling.

**4.2.0 Recognize the causes of environmental pollution and its control.**

4.2.1 Explain the impact of industrial development on environment.

4.2.2 Explain the effects of air pollution and its control.

4.2.3 Discuss the methods of solid waste management.

4.2.4 Discuss the effects of water pollution and its control.

4.2.5 List and explain the causes, effects and control of noise pollution.

**COURSE CONTENT**

**MODULE – 1**

**1. Principles of management**

Introduction – meaning of management – development of management theory: - Taylor's scientific management, contributions of F.W. Taylor, Henry Fayols principles of management (brief description), compare F.W. Taylor and Henry Fayol's contributions

Functions of management: -

a) Planning: - concept, steps in planning

b) Organizing: - concept and process steps, steps in organizing

c) Staffing: - concept, list functions of staffing

d) Directing: - concept, list the elements of directing

e) Controlling: - concept, list the steps in controlling process

f) Decision making: - concept, steps in decision making, scientific approach to decision making

Different types of ownership: - Sole proprietorship, partnership, private Ltd company, public Ltd company, co-operative society (brief description only)

Organizational structure: - Definition of organization, different types of organizational structure—line, functional, line & staff organization (brief description with advantages and disadvantages)

## **2. Human Resource Management (HRM)**

Concept of HR Management – functions of HRM – requirements of manpower

planning – factors affecting the manpower planning – job evaluation – steps required for job

evaluation – methods for job evaluation – merit rating – objectives and methods – performance

appraisal - training – importance of training – methods of training – advantages of training (brief description only) , labour turn over.

## **3.The principles of a good wage payment system**

Importance of good wage plan—types of wages - nominal, real, living, fair, and minimum wages –

requirement of a good wage payment system – Incentives - definitions, types of incentive plan for

direct workers - non financial and semi financial incentives – financial incentive plans - straight

piece rate system, straight piece rate with guaranteed minimum wage, differential piece rate system,

Halsey plan, Rowan plan, Gantt plan – simple problems

## **MODULE - II**

### **1. Quality Planning and its developments**

Definitions of quality– dimensions of quality– list the objectives of quality planning –

three prong approach to quality planning: - (1) Product planning (2) Managerial and

Operational planning (3) Documentation–Quality management system.

ISO 9000 & Installation –Concept and role of ISO 9000, elements of ISO 9000, steps for

installation of ISO 9000 - preparatory step, implementation step, registration and certification step–

Quality Audit - objectives

TQM –Concept, ten mantras of TQM, the link between ISO 9000 and TQM –mission,vision and quality policy.

### **2.Materials and sales management.**

Inventory management –definition and classification –purchase procedure –buying techniques –spot

quotation –floating the limited enquiry –tenders –single and open –earnest money –security

deposit–inventory models –EOQ and ABC.

Stores management –introduction –store keeping functions –duties of store keeper –store layout –

centralised and decentralised store –store records –indent forms –bin card –store ledger.

Sales –importance –functions of sales department –sales forecasting.

## **MODULE – III**

### **1. Project Management Techniques .**

Introduction to Network analysis – application of CPM and PERT –scope of CPM and PERT –

commonly used terms in CPM: - Operation, pre-operation, post operation, concurrent operation,

earliest finish time (EFT), latest finish time (LFT), critical activities, critical path, event, slack or

float, dummy activity –construction and numbering of network diagram –Fulkerson's rule –

procedure for CPM –simple problems on CPM (by AOA method only).

PERT - comparison between CPM and PERT –procedure for PERT – calculation of expected time –

commonly used terms in PERT, event, activity, successor event, predecessor event, Earliest

expected time, Latest allowable time, slack – simple problems in PERT.

## **2 Quantitative techniques in management.**

Introduction –methods –Linear programming: - Formulation of LPP –solution of given LPP using graphical method –transportation problem –meaning –initial feasible solution of transportation problem –north west corner rule, Vogel's approximation method –simple problems. – game theory – concept –two-persons zero sum game –the maxi-min and mini-max principle – optimal strategy – saddle point – simple problems .

## **MODULE – IV**

### **1. Industrial safety.**

Importance of safety in work place –increasing trends in industrial accidents –terminology –factory –accident –incident –severity rate -- frequency rate –incidence rate –safety performance index – accident proneness –unsafe acts –job safety analysis –plant safety inspection –industrial safety policy –list the causes of accidents: - Mechanical, Environmental, personnel factors –accident prevention techniques – 4 E'S of accident prevention technique –organizing safety –role of management –safety officers –supervisors –workers –government norms –factories act of 1948 – factories rule 1960 –emergency preparedness and response –precautions to be observed in hazardous situations like toxic atmosphere,flamable atmosphere,electrical shock and material handling.

### **2. Environmental Pollution control**

Impact of industrial development on environment -effects of air pollutants on human beings, prevention and control of air pollution-solid waste management-effects of water pollution and its control-causes of noise pollution and its control

## **REFERENCE BOOKS**

1. Industrial Engineering and management-O P Khanna. Dhanpat Rai and sons, New Delhi
2. Quantitative techniques in management.-N D Vohra, TMH, New Delhi
3. PERT and CPM principles and applications -LS Srinath,East West Press Pvt Ltd. New Delhi
4. Production Management- S K Hajra Choudhury, Nir jhar Roy, A K Hajra Choudhury, Media Promoters and publishers pvt Ltd, Mumbai
5. Industrial safety management -L M Deshmukh. TMH New Delhi