BANGLADESH TECHNICAL EDUCATION BOARD

4-YEAR DIPLOMA-IN-ENGINEERING

PROGRAM

FOOTWEAR TECHNOLOGY (698)

SYLLABUS

FIFTH SEMESTER

Footwear Technology (698)
5th Semester

Sl No	Subject Code	Name of the Subject	T	P	C	Marks				Total
						Theory		Practical		
						TC	TF	PC	PF	
1	69851	Footwear Manufacture – IV	3	3	4	60	90	25	25	200
2	69852	Footwear Design& Pattern Making-I	3	3	4	60	90	25	25	200
3	69853	Industrial Health & Safety.	2	0	2	40	60	-	-	100
4	69854	Polymer Science – II	2	3	3	40	60	25	25	150
5	69855	Footwear Engineering Drawing	0	6	2	-	-	50	50	100
6	65852	Industrial Management	2	0	2	40	60	-	-	100
	Total		**12**	**15**	**17**	**240**	**360**	**125**	**125**	**850**

69851 Footwear Manufacture-IV

T	P	C
3	3	4

OBJECTIVE:

- To know about some special footwear construction
- To apply the direct moulding soles
- To demonstrate the all- moulded footwear
- To describe the Heel Attaching method
- To explain the finishing and shoe rooming
- To recognize the process monitoring and control
- To understand the packaging and shipping of footwear
- To apprehend the use of computers in footwear production

SHORT DESCRIPTION:

To provide an overview of footwear construction, covering areas of direct moulding soles, all-moulded footwear, heel attaching method and finishing and shoe rooming. To also understand the process and monitoring control with packaging and shipping of footwear covering the use of computers in footwear production.

DETAIL DESCRIPTION

Theory:

1. Understanding of some special footwear

1.1. Describe with flow diagram the sequence of operation for stitch down constructed footwear manufacture
1.2. Explain with flow diagram the operation for Sewn in sock constructed footwear manufacture
1.3. Describe with flow diagram the operation for Californian slip lasted constructed footwear manufacture
1.4. Outline with flow diagram the operation for Goodyear welted constructed footwear manufacture
1.5. Describe with flow diagram the operation for Moccasin shoe manufacture
1.6. Explain the operation for Sports shoe manufacture
1.7. Outline the operation for Long boot manufacture
1.8. Sketch the operation for Ankle boot manufacture
1.9. Outline the operation for String lasting footwear manufacture
1.10. Explain the operation for safety shoe manufacture

2. Understanding the direct moulding soles

2.1 Define direct moulding soles
2.2 Define DIP
2.3 Explain the basic process for direct moulded sole manufacture
2.4 State the process for upper preparations and adhesive systems: for direct vulcanized rubber
2.5 Outline the process for direct injected PVC
2.6 Outline the method of Injected-on thermoplastic rubber
2.7 State the process of Reaction-moulded polyurethane
2.8 Outline the process for PU reaction-moulding a midsole to rubber outsole

3. Understanding the all- moulded footwear

3.1 Define all-moulded footwear
3.2 Explain the basic process for all- moulded footwear manufacture
3.3 Describe Jellies in footwear manufacture
3.4 Describe EVA Footwear manufacture

4. Understanding the Heel Attaching

4.1 Mention the importance of Heel attaching
4.2 Describe the method of heel attaching: Inside and outside method
4.3 State the number, length and position of the heel pins in heel attaching
4.4 Explain Pin quality for heel attaching process
4.4 Explain the impact of Heel design features and material properties
4.5 Mention the importance of Shank type, size, position and material properties
4.6 Explain the impact of Insole thickness and material properties

5. Understanding the finishing and shoe rooming

5.1 Identification of leather upper for quality shoe finishing
5.2 State the process of cleaning leather
5.3 Identification of Non-leather uppers
5.4 Describe application method of Top dressing
5.5 Outline the application method of spraying
5.6 Describe the methods of removing stitch marks
5.7 Explain the methods of Hot blasting, ironing
5.8 Explain Labeling methods
5.9 State the importance of Insole tack clearing
5.10 Describe Sock insertion methods, attaching ornaments and inspection

6. Understanding the process monitoring and control

6.1 Explain the checklist points in footwear manufacture
6.2 Describe the essential controlling process for footwear manufacture
6.3 Describe the types of control in shoe manufacture
6.4 State the Indicators on machinery used in shoe manufacture
6.5 Explain the importance of time and temperature used in shoe manufacture
6.6 Explain the importance of pressure measurement in footwear manufacture.
6.7 Describe equipment checking procedure for shoe machineries
6.8 Describe the system and importance of process monitoring records
6.9 Describe the way of ensuring consistency of quality footwear

7. Understanding the packaging and shipping of footwear

7.1 Describe the logistics support for footwear packaging and shipping
7.2 Describe the importance of environmental protection for footwear packaging and shipping
7.3 Explain the mould prevention system in footwear manufacture, shipping and storing.
7.4 Outline impact of pressure in maintaining shoe quality
7.5 Interpret and summarize Final packing system
7.6 Describe the precautions in shoe packaging and shipping

Practical

1. Make prototype Moccasin shoe by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.

2. Produce prototype long boot by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
3. Make prototype ankle boot by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
4. Produce prototype sports shoe by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
5. Make prototype safety shoe by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
6. Produce prototype direct moulded shoe by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
7. Produce prototype moulded footwear by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
8. Make prototype string lasted shoe by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
9. Produce prototype shoe by Veldtschoen construction by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
10. Make prototype shoe by sewn in sock construction by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.
11. Produce prototype shoe by Goodyear welted construction by materials cutting, preparation, sewing, lasting, sole attaching, finishing operations.

REFERENCES:

1. Venkatappaiah B.- Introduction To The Modern Footwear Technology
2. Miller R. G. (Editor) - Manual Of Shoe Making
3. Korn J. (Editor) - Boot and Shoe Production
4. Thornton J. H.- Text Book of Footwear Manufacture
5. Spencer Crookenden - K Shoes -The first 150 years 1842-1992
6. Ruth Thomson - Making Shoes
7. Swayam Siddha - Product Knowledge
8. Swayam Siddha - The Skill of Seam Reducing
9. Foot Last Footwear: Structure, types and defects. Noor Mohammad, COEL & LFMEAB, Dhaka.

69852 Footwear Design & Pattern Making-I

T	P	C
3	3	4

OBJECTIVES

- To know about art and design in footwear manufacturing.
- To learn and differentiate among footwear fashion & styles in footwear manufacturing.
- To understand about market trends, design process, and product development procedure.
- To reproduce and co-ordinate the basic elements of design in range building and sample making in new footwear product development.
- To achieve skill about pattern making of different styles of footwear products.
- To manipulates the existing design and pattern to replicate the new footwear products.

SHORT DESCRIPTION

To provide an overview and realistic idea of design and pattern making related with footwear engineering as a basis for understanding how different styles of footwear will be developed so that students can understand and demonstrate about fashion trends, pattern making and fabrication for new footwear product manufacturing.

DETAIL DESCRIPTION

Theory

1. Understand Design, Style and Fashion

1.1 Define arts and Classify arts.
1.2 Distinguish between fine arts and craft
1.3 Define motif, newness, design, style and fashion.
1.4 Relate among culture, fashion, fads and craze.
1.5 Explain degree of newness.
1.6 Outline the elements of design and apply them to footwear design.
1.7 Analyze market segmentation and product design.

2. Realize Product development

2.1 Define product development (PD).
2.2 State the steps involved in PD.
2.3 Mention the design process and explain.
2.4 Define value addition and describe the procedure to add value in design stage of footwear.
2.5 Define theme board and style board and differentiate between them.
2.6 Give the contents of theme board and style board.
2.7 Write the benefits of theme board and style board.
2.8 Prepare a theme board for a footwear product.

3. Apprehend the Colour

3.1 Define colour and colour wheel.
3.2 Categorize colour and narrate them.
3.3 Depict the theories of colour mixing.
3.4 Relate the influence of colour on shoe design.
3.5 Predict colour for upcoming season.
3.6 Brief on aspect of colour and its effect on human psychology and shoe design.

3.7 Identify different colour schemes and give examples.

3.8 Initiate various colour schemes on footwear design.

4. Comprehend the Product Specifications.

4.1 Define specification,

4.2 Explain the necessity of specification.

4.3 Depict the style features of various styles of shoe last.

4.4 Build standard specification for different styles of last.

4.5 List out the contents of shoe design specification.

4.6 Make standard specifications for different styles of footwear products.

5. Recognize the Basic Pattern Making.

5.1 Define and classify pattern.

5.2 Point out the sequence of footwear pattern making.

5.3 Identify the required tools for pattern making.

5.4 Delineate mean form, standard pattern and sectional pattern.

5.5 Mention the systems available for form making.

5.6 Demonstrate the procedure of mean form making by masking technique.

5.7 Exhibit the procedure of Insole pattern making by masking technique.

6. Demonstrate the Standard Pattern Making.

1.1 Interpret the procedure of standard pattern making for a gent's classic sandal.

1.2 Practice the procedure of standard pattern making for a classic court shoe.

1.3 Show the procedure of standard pattern making for a classic oxford shoe.

1.4 Operate the procedure of standard pattern making for a classic derby shoe.

1.5 Exhibit the procedure of standard pattern making for a baby sandal.

7. Demonstrate the Sectional/Production Pattern Making.

7.1 Provide the procedure of sectional pattern making for a gent's classic sandal.

7.2 Demonstrate the procedure of sectional pattern making for a classic court shoe.

7.3 Explain the procedure of sectional pattern making for a classic oxford shoe.

7.4 Perform the procedure of sectional pattern making for a classic derby shoe.

7.5 Carry out the procedure of sectional pattern making for a baby sandal.

PRACTICAL

1. Identify various tools and their application in footwear design and pattern making.
2. Identify last features for various styles of footwear and their application in footwear design and pattern making.
3. Prepare an insole pattern for a gent's shoe and locate the important points.
4. Produce a mean form for a gent's shoe and locate the important points.
5. Construct an upper standard pattern for a classic court shoe and locate the important points and stich mark.
6. Generate a complete set of upper sectional patterns for a classic court shoe and indicate the pattern information.
7. Construct a lining standard pattern for a classic court shoe and locate the important points and stich mark.
8. Generate a complete set lining sectional patterns for a classic court shoe and indicate the pattern information.
9. Generate a complete set pattern for a classic sandal and indicate the pattern information.
10. Construct an upper standard pattern for a classic oxford shoe and locate the important points and stich mark.

11. Produce a complete set of upper sectional patterns for a classic oxford shoe and indicate the pattern information.
12. Construct a lining standard pattern for a classic oxford shoe and locate the important points and stich mark.
13. Generate a complete set of lining patterns for a classic oxford shoe and indicate the pattern information.

REFERENCE BOOKS

1. Introduction to the Modern Footwear Technology by Venkatappaiah B.
1. Manual of Shoe design- by CLRI.
2. Step by step pattern for footwear
3. Pattern cutting and making up by Martin Shoben.
4. Manual of shoe making by R.G. Miller.
5. Text Book of Footwear Manufacture by J. H Thornton.

69853 Industrial Health & Safety

T	P	C
2	0	2

OBJECTIVES:

- To understand the basic knowledge about workplace hazards
- To identify safety and ergonomics.
- To understand chemical hazards.
- To understand biological hazards.
- To understand physical hazards.
- To identify and categorize Risk Assessment and Hazard Control
- To interpret accident investigation.
- To analyze Risks and Hazards prevention

SHORT DESCRIPTION:

Students will be able to acquire the basic knowledge regarding work place hazards in the footwear industry covering areas of safety and ergonomics, chemical hazards, biological hazards, and physical hazards. They will also be able to know and familiarize with risk assessment, hazard identification, control and prevention and to acquaint with accident investigation.

DETAIL DESCRIPTION

Theory:

1. **Understanding basic knowledge about workplace hazards**
   - 1.1 Identify work place hazards
   - 1.2 Describe the classification of hazards
   - 1.3 Define events with hazardous occurrence
   - 1.4 Define incidents with hazardous occurrence
   - 1.5 Explain the work place accidents
   - 1.6 Describe work place injuries
2. **Understanding safety and ergonomics**
   - 2.1 Outline Unsafe Conditions
   - 2.2 Describe Ergonomic Factors
   - 2.3 Identify the ergonomic checkpoints
3. **Understanding the chemical Hazards**
   - 3.1 Define various chemical hazards
   - 3.2 Explain the routes of entry of chemicals into human body
   - 3.3 Explain the concentration and type of exposure in the industry
   - 3.4 Explain the general toxic effects of chemicals for the environment
4. **Understanding the biological hazards**
   - 4.1 Describe the bacterial agents
   - 4.2 Describe viral agents
   - 4.3 Explain the transmission and prevention of water borne diseases
   - 4.4 Outline vector borne diseases
   - 4.5 Explain vector control in the factory

5. Understanding physical hazards

5.1 Describe the impact and control of noise

5.2 Describe the impact and control of vibration

5.3 Outline the impact and control of thermal stress

5.4 Explain the impact and control of radiation

6. **Identify and categorize Risk Assessment and Hazard Control**

6.1 State Risk Assessment system

6.2 Explain how to use risk assessment matrix

6.3 Describe the impact and control of hazard

6.4 Explain and evaluate Pre-contact control

6.5 Explain and evaluate Contact Control

6.6 Explain Post-Contact Control

7. Interpret accident investigation

7.1 Explain factors in accident investigation procedure

7.2 Describe steps of accident investigation process

7.3 Identification of the causes of accident in the workplace

8. Understanding the Risks and Hazards prevention in Footwear factory

8.1 Explain the prevention of Noise hazards

8.2 Outline the prevention of Solvent hazards

8.3 Describe Fire hazards

8.4 Identify factory dust

8.5 Explain mechanical hazards

8.6 Explain manual handling

8.7 Explain ergonomic factors

8.8 Outline electrical dangers

8.9 Outline lighting problems

8.10 Using of Personal Protective Equipment to prevent the hazard

REFERENCES:

1. Guidelines on Risk Assessments and Safety statements published by the Health and Safety Authority.
2. Occupational safety and health aspects of leather manufacture by J. Buijan, A. Sahasranaman & J. Hannak, UNIDO & Council for Leather exports of India publications
3. Occupational Safety and Health, Bangladesh Employers, Federation with assistance from International Labor Organization, First edition 2012.
4. Technical guidance manual for leather/skin/hide processing industry by Il & Fs Ecosmart limited, Hyderabad, August 2010.
5. Code of practice on safety management by occupational safety and health branch labor department
6. Risk assessment handbook- The national archives, U.K., 2011.
7. Workplace safety and health management- Practical guidelines on the implementation and maintenance of an occupational safety, health and welfare management system
8. Safety Management Manual, 3rd edition 2013-International Civil Aviation Organization.

69854 Polymer Science – II

T	P	C
2	3	3

OBJECTIVES

- To explain the properties of natural and manmade polymer
- To understand the use of polymer in footwear manufacturing
- To demonstrate on recycling of polymeric materials and reuse them.
- To build up skill on polymer compounding and techniques.

SHORT DESCRIPTION

This course deals with the understand of natural polymer, coated fabric polymers, different polymeric materials, adhesive, structure and properties of polymer, factors affecting glass transition temperature of polymer, recycling of polymer and waste management, polymer degradation and environmental issues, polymer used in footwear industry.

DETAIL DESCRIPTION

Theory:

1. **Comprehend the polymeric materials and polymerization techniques**
   - 1.1 Define the chemistry of polymeric materials**.**
   - 1.2 Analysis the mechanism involved in different polymerization process**.**
   - 1.3 Describe stepwise, addition, ring opening, free radical polymerization**.**
   - 1.4 Explain Polymerization Techniques-Bulk,
   - 1.5 Narrate Solution, suspension and emulsion polymerization.
   - 1.6 Describe Co-polymerization, anionic and cationic polymerizations.
   - 1.7 Outline the chemistry & technology involved in Natural & synthetic rubber.
2. **Understand structure and properties of polymers**
   - 2.1 Describe Chemical and geometrical structure of polymer molecules.
   - 2.2 Narrate Glass transition temperature and related topics of polymers properties.
   - 2.3 Explain crystallinity in polymers.
3. **Understand the natural and man-made polymer**
   - 3.1 Define natural and man-made polymer.
   - 3.2 Classify natural and man-made polymer.
   - 3.3 Identify properties of natural and man-made polymer.
   - 3.4 Distinguish the advantages and disadvantages of using natural and man-made polymer.
   - 3.5 Describe source, properties and uses in footwear industry of-
     - 3.5.1 Fabrics
     - 3.5.2 Leather
     - 3.5.3 Rubber (Latex, Rubber solution, TPR, MCR, VR, etc.)
     - 3.5.4 Synthetics (PVC, PU, EVA, SBR, Nylon, Polychloropane, Polystyrene, etc)
4. **Recognize the Polymer Coated Fabrics**
   - 4.1 Define Polymer coated fabrics.
   - 4.2 Mention different types of polymer coated fabrics.
   - 4.3 Illustrate properties and applications in footwear industry of-
     - 4.3.1 PVC coated fabrics
     - 4.3.2 PU coated fabrics
     - 4.3.3 Rubber coated fabrics.
   - 4.4 Mention advantages and disadvantages of using coated fabrics in footwear manufacturing

4.5 Narrate manufacturing techniques of different types of coated fabrics-
  4.5.1 PVC coated fabrics
  4.5.2 PU coated fabrics
  4.5.3 Rubber coated fabrics.

5. Know about Adhesives used in footwear manufacturing

5.1 Define adhesive and its functions.
5.2 Mention different types of adhesive on the basis of polymer chemistry.
5.3 Identify physical, chemical and thermal properties of different adhesive.
5.4 Describe the mechanical interlocking and surface reaction process of adhesive.
5.5 Explain Adsorption process of adhesive.
5.6 Mention different factors for selection of adhesive.
5.7 Identify the quality parameters of various adhesives.

6. Know about Polymeric Soling material used in footwear manufacturing

6.1 Define sole and its functions.
6.2 Mention different types of polymeric sole on the basis of polymer chemistry.
6.3 Identify physical, chemical and thermal properties of different sole.
6.4 Mention different factors for selection of sole.
6.5 Identify the quality parameters of various polymeric sole.
6.6 Describe the manufacturing techniques of PVC, PU, TPR and EVA sole.
6.7 Narrate the rubber compounding for soling materials.

7. Comprehend the Polymer degradation, Recycling and Reuse

7.1 Define polymer degradation and recycling.
7.2 Describe various types of degradation and recycling process.
7.3 Narrate recycling process of
  7.3.1 Poly urethane (PU)
  7.3.2 Poly vinyl chloride (PVC)
  7.3.3 Thermo plastic rubber (TPR).
7.4 Narrate reusing process of-
  7.4.1 Poly urethane (PU)
  7.4.2 Poly vinyl chloride (PVC)
  7.4.3 Thermo plastic rubber (TPR).
7.5 Describe incineration and biodegradation process of waste management.

PRACTICAL:

1. Determine the melting point of crystalline polymers.
2. Measurement of glass transition temperature (Tg).
3. Determine molecular weight by end group analysis.
4. Determine molecular weight by solution viscosity.
5. Chemical identification of polymers-
   i) Unsaturation
   ii) Testing of functional group associated with polymers
6. Prepare thermosetting resins.
7. Determination of gravity of filler.
8. Identification of additives.
9. Measurement of abrasion resistance of polymer samples.
10. Identify different polymeric soling material used in footwear manufacturing.

REFERENCE BOOKS:

1. Adhesive and adhesion technology-A.V Pocius, Hans carl Hanser Verlag(2002).
2. Plastic waste management by Nabil Mostafa, Marcel Dekker, Inc(1993).
3. Recycling and recovery of plastic by J.Ed Bandrup, Hanser Gardner(1996).
4. Gowariker V.R.-Polymer Science.
5. Test book of polymer science by Fred W.Bellmeyer, Wiley,India, 2007.
6. Arora M.G. and Singh M.-Polymer Chemistry.
7. Fried J.R.-Polymer Science and Technology.
8. Ghosh P.-Polymer Science and Technology of Plastics and Rubbers.
9. Introduction to the Modern Footwear Technology by Venkatappaiah B.
10. Manual of Shoe Making by R. G. Miller (Editor)

69855 Footwear Engineering Drawing

T	P	C
0	6	2

OBJECTIVES

- To develop the ability to use various drawing instruments and materials
- To enable in constructing and using various types of scales in drawing
- To comprehend the sketch of fundamental footwear machines.
- To demonstrate the layout of footwear machineries and production layout.
- To develop skills on technical drawing of different styles of footwear.

SHORT DESCRIPTION

The course is designed to make enable the students to comprehend the basic footwear Engineering drawing so that they can apply and demonstrate machine layout, footwear production layout and the technical drawing of different styles of footwear products in the development of new product and production setup.

DETAIL DESCRIPTION

Practical:

1. Understand the Basic Drawing Equipment.

1.1 Draw the basic drafting techniques and standards.
1.2 Draw and identify the different types of lines.
1.3 Draw geometric shapes of cycloid and hypocycloid.
1.4 Sketch the intersections of prisms, pyramids, cylinders and cones.

2. Machine Sketch

2.1 Draw a swing arm clicking machine.
2.2 Sketch a traveling head clicking machine.
2.3 Illustrate the skiving machine with a net sketch.
2.4 Sketch a flatbed sewing machine.
2.5 Draw a post bed sewing machine.
2.6 Draw a cylinder bed sewing machine.

3. Production Layout.

3.1 Draw the layout of product development section.
3.2 Sketch a layout of cutting section of footwear industry.
3.3 Draw a standard layout of closing section.
3.4 Draw a standard layout of lasting section.
3.5 Sketch a layout of bottom section of footwear industry.
3.6 Sketch a standard layout of finishing section.
3.7 Draw a standard store room layout.

4. Machine Layout.

4.1 Draw a standard machine layout of cutting line.
4.2 Draw a standard machine layout of sewing line.
4.3 Illustrate with a net sketch the standard layout of lasting line.
4.4 Illustrate with a net sketch the standard layout of finishing line.

5. Footwear Technical Drawing

5.1 Sketch a classic court shoe with all necessary dimensions.

5.2 Sketch a classic Oxford shoe with all necessary dimensions.
5.3 Sketch a classic Derby shoe with all necessary dimensions.
5.4 Sketch a classic lady's sandal shoe with all necessary dimensions.
5.5 Sketch a classic sport shoe with all necessary dimensions.
5.6 Sketch a classic moccasin shoe with all necessary dimensions.
5.7 Show a classic casual shoe with all necessary dimensions.
5.8 Draw a classic gent's ankle boot with all necessary dimensions.
5.9 Draw a classic lady's ankle boot with all necessary dimensions.
5.10 Show a classic lady's knee boot with all necessary dimensions.

REFERENCE BOOKS:

1. Footwear Engineering Drawing of the Designing, Cutting and Grading Boot and Shoe Patterns-by Charles B. Hatfield.
2. Spencer and Hill- Technical Drawing.
3. Dr. Amalesh Chandra Mandal and Dr. Md. Qumrul Islam, Mechanical Engineering Drawing.
4. Dhawan, R.K; Engineering Drawing.
5. Giesecke, F.E.and et al, "Technical Drawing" 7th Edition 1985, McMillan Publishing co., Inc., New York.

65852 Industrial Management

T	P	C
2	0	2

AIMS

- To be able to develop the working condition in the field of industrial or other organization.
- To be able to understand develop the labor management relation in the industrial sector.
- To be able to develop the management techniques in the process of decision making.
- To be able to manage the problems created by trade union.
- To be able to understand Planning
- To be able to perform the marketing.
- To be able to maintain inventory.

COURSE OUTLINE

Basic concepts of management; Principles of management; Planning, Organization, Scientific management; Span of supervision; Motivation; Personnel management and human relation; Staffing and manpower planning ; Training of staff; Concept of leadership; Concepts and techniques of decision making; Concept of trade union; Inventory control; Economic lot size ; Break even analysis; Trade Union and industrial dispute, Marketing;

DETAIL DESCRIPTION

Theory

1. Basic concepts & principles of management.

1.1 Define management and industrial management.
1.2 State the objectives of modern management.
1.3 Describe the scope and functions of management.
1.4 State the principles of management.
1.5 State the activity level of industrial management from top personnel to workmen.
1.6 Describe the relation among administration, organization & management.

2. Concept of Planning

2.1 Define Planning
2.2 Discuss the importance of Planning
2.3 Discuss the Types of Planning.
2.4 Discuss the steps in Planning

3. Concepts of organization and organization structure.

3.1 Define management organization.
3.2 State the elements of management organization.
3.3 Describe different forms of organization structure.
3.4 Distinguish between line organization and line & staff organization.
3.5 Distinguish between line organization and functional organization.
3.6 Describe the features, advantages and disadvantages of different organization structure.

4. Concept of scientific management.

4.1 Define scientific management.
4.2 Discuss the basic principles of scientific management.

4.3 Explain the different aspects of scientific management.
4.4 Discuss the advantages and disadvantages of scientific management.
4.5 Describe the difference between scientific management and traditional management..

5. Concept of span of supervision.

5.1 Define span of supervision and optimum span of supervision.
5.2 Discuss the considering factors of optimum span of supervision.
5.3 Discuss advantages and disadvantages of optimum span of supervision.
5.4 Define delegation of authority.
5.5 Explain the principles of delegation of authority.
5.6 Explain the terms: authority, responsibility and duties.

6. Concept of motivation.

6.1 Define motivation.
6.2 Discuss the importance of motivation.
6.3 Describe financial and non-financial factors of motivation.
6.4 Describe Special Motivational Techniques.
6.5 Discuss the motivation theory of Maslow and Harzberg.
6.6 Differentiate between theory-X and theory-Y.

7. Concept of leadership.

7.1 Define leadership.
7.2 Discuss the importance and necessity of leadership.
7.3 Discuss the functions of leadership.
7.4 Describe the qualities of a leader.

8. Basic concepts and techniques of decision making.

8.1 Define decision making.
8.2 Discuss the importance and necessity of decision making.
8.3 Discuss different types of decision making .
8.4 Describe the steps in decision making.

9. Concept of personnel management and human relation.

9.1 Define personnel management.
9.2 Discuss the functions of personnel management.
9.3 Define staffing.
9.4 Define recruitment and selection of employees.
9.5 Describe various sources of recruitment of employees.
9.6 Describe the methods of selection of employees.
9.7 Define training and orientation of employee.
9.8 Discuss the importance and necessity of training.
9.9 Discuss the various methods of training of workmen, technicians and executive personnel.

10. Concept of inventory control & Economic lot size

10.1 Define inventory.& inventory control.
10.2 Describe the function of inventory control.
10.3 Define Economic lot size and the Method of determination of economic lot size.
10.4Discuss the effects of over supply and under supply.
10.5 Explain the following terms :
- Bin card or Bin tag.

- Purchase requisition.
- Store requisition.
- Material transfer note.
- First in first out (FIFO).
- Last in first out(LIFO).
-Safety stock
-Lead time

11. Concept of Break Even Point(BEP)

11.1 Define Break Even Point and Break Even Chart.
11.2 Describe the method of determination of BEP
11.3 Explain the terms: Break even analysis, Fixed cost, Variable cost

12. Concept of Marketing

12.1 Define marketing.
12.2 Discuss the function of marketing.
12.3 State the objectives of marketing.
12.4 Explain the terms : Purchase, Brand, Producer, Consumer, Customer, Copyright, Trade mark
12.5 Discuss product life -cycle and marketing strategies in different stages of a product life-cycle

13. Concept of trade union and industrial dispute

13.1 Define trade union.
13.2 Mention the objectives of trade union.
13.3 Discuss the function of trade union.
13.4 Describe different types of trade union.
13.5 Define industrial dispute
13.6 Discuss different type of industrial dispute

REFERENCE BOOKS

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