

5.1 FOOTWEAR TECHNOLOGY - IV

L T P
5 - 8

RATIONALE

A diploma holder in Footwear and Leather goods manufacturing is supposed to possess knowledge of various manufacturing processes/steps involved in the manufacture of single sole construction of different footwear, preparation of bottom components and their proper placement, use of bottoming tools and safety precautions, manufacturing techniques, proper design, bottom clicking and making of footwear.

Diploma holders in Footwear and Leather goods manufacturing are to possess the knowledge of various methods of footwear construction i.e. direct and indirect methods. Directed moulded construction, direct vulcanisation process, injection moulding of P.C.C. injection moulding of P.U. construction. Students should also be equipped with the knowledge of preparation of bottom components and their proper placements. Knowledge of finishing processes and their objects. Inspection of complete shoe and its packing techniques.

THEORY

1. Tools and Machines of Bottoming Section (2 hrs)
 - 1.1 Introduction and preparation of bottoming tools.
 - 1.2 Introduction of machines used in bottom section.
 - 1.3 Safety precautions for tools and machines used in bottoming department.

2. Bottom Components (4 hrs)
 - 2.1 Introduction, preparation and proper placement of bottom component such as:-
 - a) Toe-puff.
 - b) Stiffener
 - c) Insole.
 - d) Shank
 - e) Welt
 - f) Side lining. (Re-enforcement)
 - g) Sole
 - h) Heel

3. Lasting (6 hrs)
 - 3.1 Introduction and importance of lasting.
 - 3.2 Importance of Hoisting and Drafting.
 - 3.3 Heel-l setting

- 4 Importance and placement of different types of shanks. (4 hrs)
- 5 Importance of bottom filling. (2 hrs)
- 6 Roughing and buffing of lasted upper and soles. (2 hrs)
- 7 Methods of sole Attachment. (8 hrs)
 - 7.1 Adhesive application on both upper and sole.
 - 7.2 Proper attachment of soles by hand and by machine.
 - 7.3 Single Sole attachment.
 - 7.4 Nailing or reuniting attachment.

- 8 Introduction and preparation of single sole construction slipper, ladies belly, Tumbler moccasin, casual, derby Jodhpur, children shoes. (8 hrs)
 - 8.1 Veld schoen construction.
 - 8.2 Slip Lasting.
 - 8.3 Turn shoe.
 - 8.4 Delmake
 - 8.5 Delwelt.

- 9 Sequence of operation of single sole constructions shoes as slipper, ladies belly, casual, Derby, Jodhpuri and children shoes. (4 hrs)

- 10 Introduction and preparation of different methods used for direct attachment constructions. (4 hrs)
 - 10.1 Machine sewn (Black or Mercury sewn)
 - 10.2 Little way locks stitch
 - 10.3 Cemented construction
 - 10.4 Riveted. Construction
 - 10.5 Riveted, screwed stitched
 - 10.6 Stroble constructions.

- 11 Introduction and preparation of different methods used for indirect attachment constructions. (4 hrs)
 - 11.1 Good Year welted
 - 11.2 Silhou welt
 - 11.3 Lock stitch through sewn welt
 - 11.4 Fair stitched.
 - 11.5 Welted Moccasin
 - 11.6 Staple welted.

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|-----|--|---------|
| 12. | Introduction and preparation of moulded construction | (4 hrs) |
| | 12.1 Direct vulcanisation | |
| | 12.2 Injection moulding. PVC (Poly Vinyl Chloride) | |
| | 12.3 Injection moulding. P.U. (Poly urethane) | |
| 13. | Introduction and preparation of California slip lasted. | (4 hrs) |
| 14. | Introduction and preparation of spring lasting. | (4 hrs) |
| 15. | Sequence operations of Oxford, Monk, Brogue, Moccasin, Ankle boot and long boots. | (4 hrs) |
| 16. | Machinery, tools and equipments. | (4 hrs) |
| | 16.1 Introduction and use of tools, equipments and machines used in bottom section | |
| | 16.2 Safety precautions of tools, equipments and machines during operations. | |
| 17. | Finishing | (4 hrs) |
| | 17.1 Objects of finishing-Kinds of finishing | |
| | 17.2 Processes involved in finishing of footwear. | |
| 18. | Inspection of complete shoe. | (2 hrs) |
| 19. | Description of packing material and packing techniques. | (2 hrs) |
| 20. | Study of footwear and leather good manufacturing plant and machinery their layout. | (4 hrs) |

PRACTICALS

- 1 Preparation of hand tools, required for lasting and making.
- 2 Practice of various types of stitches used for bottoming.
- 3 Practice in setting and operating the lasting and making machines.
- 4 Preparation and placement of bottoming components used in single Sole construction..
- 5 Practice of hoisting, drafting and lasting operations.
- 6 Preparation of different shoes of single sole. Construction. Such as:- Slipper, Ladies Belly, Tubler Moccasin, Casual, Derby, Jodhpuri & Children Shoes.
- 7 Practice of fixing shanks, bottom filling, buffing, roughing, scouring, edge trimming and fixing of soles etc.

8. Preparation of Toe-Puff, Stiffener, Insole and soles.
9. Practice of hoisting, drafting and lasting operations.
10. Practice of shank attaching and bottom filling.
11. Practice of heel building.
12. Preparation of Moccasin, Oxford, Monk, Brogue shoe, Ankle boot, long Boot, with direct and indirect constructions.
13. Practice of finishing of footwear.
14. Practice of packing techniques of footwear.
15. Practice of examining the complete shoe. (Final Inspection.
16. Visit to the footwear Industry, Exhibitions and shoe fairs.

INSTRUCTIONAL STRATEGY

The students should be taken to leather footwear and leather goods manufacturing units and export houses to demonstrate various operations. Maximum emphasis should be laid in developing practical skills among the students. Experts from industries may be invited from time to time to deliver expert lectures.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	04
2	04	04
3	06	08
4	04	04
5	02	04
6	02	04
7	08	12
8	08	12
9	04	04
10	04	04
11	04	04
12	04	04
13	04	04
14	04	04
15	04	04
16	04	04
17	04	04
18	02	04
19	02	04
20	04	04
Total	80	100

5.2 DESIGNING AND PATTERN CUTTING OF FOOTWEAR-III

L T P
3 - 4

RATIONALE

Designing and pattern cutting is very important subject in the field of Footwear manufacturing. Therefore, Diploma holders in Footwear and leather Goods manufacturing are required to get maximum knowledge and skills about different size systems prevailing in the world; Selection of last, right and left foot variation. Alteration Conversation of sizes, preparation of standard pattern of shoe and boots; Practice of pattern cutting on computer; Practice of pattern layout on the graph sheets in order to minimise the consumption of material; Grading of patterns by hand and machine etc..

DETAILED CONTENTS THEORY

1. Different size system prevailing in the world. (02 hrs)
2. Conversion of sizes into various measuring systems. (02 hrs)
3. Difference between the human foot and shoe making last. (02 hrs)
4. Right and left foot variations. (04 hrs)
5. Principles of selecting a suitable last for particular type of foot. (02 hrs)
6. Alteration of last according to the foot measurements. (02 hrs)
7. Difference between Plastic last and Wooden last. (02 hrs)
8. Preparation of standard pattern of Oxford, Brogue shoe, Court shoe, Ankle boots (Jodhpuri) Long boots along with section patterns of upper and lining. (08 hrs)
9. Preparation of patterns of bottom components (10 hrs)
10. Computer aided footwear designing, pattern making and pattern cutting. (06 hrs)
11. Introduction and demonstration of graphic system to find out correct area of patterns. (08 hrs)

PRACTICALS

1. Free hand sketching of footwear designs.
2. Preparation of section pattern of Oxford, Brogue shoe, Court shoe, Ankle boots (Jodhpuri), Long boots.
3. Preparation of bottom patterns of Oxford, Brogue shoe, Court Shoe, Ankle boots and (Jodhpuri) etc.
4. Practice of lay out of upper patterns on the graph sheet to ascertain the consumption of material.
5. Practice of computer aided footwear designing on computer sets.
6. Visit to Footwear and Last making industry, Exhibitions, Fashion shows, Shoe fairs and Footwear showrooms.

INSTRUCTIONAL STRATEGY

The students should be taken to leather footwear and leather goods manufacturing units and export houses to demonstrate various operations. Maximum emphasis should be laid in developing practical skills among the students. Experts from industries may be invited from time to time to deliver expert lectures.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	04
2	02	04
3	02	04
4	04	06
5	02	04
6	02	04
7	02	04
8	08	18
9	10	22
10	06	12
11	08	18
Total	48	100

5.3 TESTING AND QUALITY CONTROL

L T P
3 - 2

RATIONALE

Quality control is an essential part to be maintained by an industry for its products to have continuous demand by users. It is therefore important to have set listing procedure for the maintenance of quality which may involve physical as well as chemical testing. A diploma students equipped with testing techniques will certainly be useful for the industry in manufacturing of comfortable, suitable and durable products.

DETAILED CONTENTS THEORY

- 1) Sampling and Conditioning: Machine and apparatus used for carrying out physical and chemical tests on leathers, chemicals, materials, synthetic products, rubber and fabric such as physical balances , shrinkage tester, tens meter, abrasion resistance tester, flex meter, lastometer, rub fastness tester, stiffness tester, apparent density apparatus, thickness, measuring gauge. Soxhlet extractor, Colorimeter etc. (8 hrs)
- 2) Tensile strength Machine: Testing of different materials used in the manufacture of leather, footwear, and leather goods such as chemicals, leather board, shanks, threads, solutions, colours, polishes, waxes, fittings, shoe laces, eyelets, etc. (6 hrs)

Physical testing

- 3) Measurement of thickness, water absorption, apparent density, tensile strength, elongation and break at specified load, stitch tear resistance, abrasion shrinkage, permeability, dry and wet rub fastness, grain crack index, adhesion test, shape retention test, shoe flexing test, endurance test, fatigue test etc. (10 hrs)
- 4) Visual examination of thread used, neatness and straightness of stitching, number of stitches in an inch, proper fixing of zip fastners, correct sizes and measurements. (6 hrs)
- 5) Interpretation of the results of analysis and physical tests in comparison with the specifications. Official methods of sampling and analysis. Indian standard specifications for leather, synthetics rubber, foam, grinderies, fittings etc. (10 hrs)

- 6) Principles of inspection-in process inspection and built in quality control system in factories- Functions of inspection-inspection agencies such as quality marking centres, Indian standard Institution, export inspection agencies, testing laboratories and knowledge about I.S.O. 9002. (8 hrs)

PRACTICALS

Exercises in thickness measurement, density, water absorption, tensile strength, stitch tear resistance, abrasion resistance shrinkage, grain crack ness, flex resistance dry and wet rub fastness.

Value base extension lectures on quality control by Footwear Technologists.

INSTRUCTIONAL STRATEGY

The students should be taken to leather footwear and leather goods manufacturing units and export houses to demonstrate various operations. Maximum emphasis should be laid in developing practical skills among the students. Experts from industries may be invited from time to time to deliver expert lectures.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	18
2	06	07
3	10	25
4	6	07
5	10	25
6	8	18
Total	48	100

5.4 ESTIMATING AND COSTING

L T P
4 - -

RATIONALE

Knowledge of leather and leather products, their availability, marketing, storing, packing and despatch is necessary for Indian and Foreign trade of Footwear and Leather goods. Terms associated with consumption, distribution, demand and supply, budget and revenue in relation to Leather and footwear trade are useful to the students. Knowledge of book-keeping and accountancy, material management and marking techniques is an advantage to the diploma students in the footwear technology. Hence the subject.

DETAILED COMPONENTS THEORY

1. Principle of Estimating (8 hrs)

Principle of calculating quantity of material required for the manufacture of different types of Footwear and Leather Goods Classification and distribution of costs, raw materials, Labour, Plant, Overheads, Packing and forwarding costs. Profit ranges, allowances for fluctuation in rates. Calculating the owning and operating costs of machinery, cost recoverable by disposing waste products.
2. Cost Estimation (10 hrs)

Estimation of the cost of manufacturing different types of footwear and processes involved in footwear manufacture.
3. Availability of leathers and grinderies. (6 hrs)
 - a) Availability of various types of leathers and grinderies in different part of India price structure and marketing, foreign trade in footwear and leather goods.
 - b) Different types of grinder items, stores management, packing and despatch.
4. Elements of Economics (12 hrs)
 - a) Explanation of basic terms: consumption, goods, demand and supply, expenditure etc.
 - b) Elementary idea of demand analysis and forecasting cost analysis and pricing.
 - c) Time value of money - simple problems.
 - d) Depreciation and its calculation.
 - e) Investment appraisal, cost benefit and value analysis, Budgeting.

5. Book keeping, maintenance of ledger, profit & loss accounts, balance sheet etc. (10 hrs)
6. Principles of costs and accountancy, prime cost, working cost etc. (10 hrs)
7. Costing of various types of footwear, import-export policies, incentives, drawbacks. (8 hrs)

INSTRUCTIONAL STRATEGY

The students should be taken to leather footwear and leather goods manufacturing units and export houses to demonstrate various operations. Maximum emphasis should be laid in developing practical skills among the students. Experts from industries may be invited from time to time to deliver expert lectures.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	12
2	10	16
3	06	08
4	12	18
5	10	16
6	10	16
7	08	14
Total	64	100

5.5 LEATHER GARMENTS MANUFACTURE

L T P
2 - 2

RATIONALE

Besides Footwear and Leather Goods, these diploma holders are also engaged in preparation of garments. Therefore, Diploma holders are also required to provide with the knowledge of different leathers, lining, fittings used for manufacturing of leather garments. Students should also be well equipped with the knowledge of tools, equipment and machinery. Competencies related to garment designing, pattern cutting, stitching and finishing needs to be developed in the students.

DETAILED CONTENTS

THEORY

1. Introduction and importance of fashion leather garments. (2 hrs)
2. Introduction of designing and pattern cutting of leather garments. (2 hrs)
3. Principles of Clicking of Leather Garments with emphasis on sizes. (2 hrs)
4. Different methods of taking measurements and fittings. (4 hrs)
5. Material used for Leather Garments Mfg/Leather, Synthetics, Textile and characteristics of leathers used for garments such as: - (4 hrs)
 - a) Grain leather
 - b) Suede leather
 - c) Fur leather
 - d) Sheep leather.
 - e) Goat leather
 - f) Buff calf
 - g) Cow nappa leather.
6. Shades and colours matching in leather garments. (1 hrs)
7. Lining and padding material. (2 hrs)
8. Thread, Grinders, decorative fittings and Fastners. (1 hrs)
9. Lay-out of pattern to minimise the wastage of leather. (2 hrs)

10. Introduction of tools, equipment's and machines used for garments manufacturing as: - (4 hrs)
 - a) Industrial sewing machine including needle feed type, cloth cutting machine button hole and button stitching machines ironing press etc.
 - b) Tools used in leather garments manufacturing as gimping scissors, wooden and iron hammers, stone slab, measuring tapes, crayons etc. Special furniture and layout required for garments unit, Dummies for checking the fittings.
11. Cutting of components, colour matching, texture, feel etc. (2 hrs)
12. Type of stitches involved in leather garments manufacturing. (2 hrs)
13. Sequence of operations of leather garments such as Jacket, Safari, Ladies and Gents Coats, Skirts, Gloves and Half pants etc. (2 hrs)
14. Importance of in process checking and final checking in order to maintain the quality. (2 hrs)

LIST OF PRACTICALS

1. Free hand sketching of designs of Jackets, Ladies & Gents coats, Safari, skirts, half pants Gloves & caps.
2. Practice of taking measurements for sizes and fittings of leather garments.
3. Preparation of Sectional pattern. Of various leather garments.
4. Practice in cutting and stitching of above said garments.
5. Fabrication of leather garments.eg Kids, Ladies and Men.
6. Finishing and final checking and packing of leather garments.
7. Visit to Leather garments fairs, exhibitions, show rooms and industries etc.

INSTRUCTIONAL STRATEGY

The students should be taken to leather footwear and leather goods manufacturing units and export houses to demonstrate various operations. Maximum emphasis should be laid in developing practical skills among the students. Experts from industries may be invited from time to time to deliver expert lectures.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	06
2	02	06
3	02	06
4	04	12
5	04	12
6	01	04
7	02	06
8	01	04
9	02	06
10	04	12
11	02	06
12	02	08
13	02	08
14	02	06
Total	32	100

5.6 BASICS OF MANAGEMENT

L T P
3 - -

RATIONALE

The diploma holders are generally expected to take up middle level managerial positions, their exposure to basic management principles is very essential. Topics like Structure of Organization, Leadership, Motivation, Ethics and Values, Customer Relationship Management (CRM), Legal Aspects of Business, Total Quality Management (TQM), Intellectual Property Rights (IPR) etc. have been included in the subject to provide elementary knowledge about these management areas.

DETAILED CONTENTS

1. Principles of Management (06 hrs)
 - 1.1. Introduction, definition and importance of management.
 - 1.2. Functions of Management
Planning, Organizing, Staffing, Coordinating, Directing, Motivating and Controlling.
 - 1.3. Concept and Structure of an Organization

Types of industrial organization
 - a) Line organization
 - b) Functional Organization
 - c) Line and Functional Organization
 - 1.4. Hierarchical Management Structure
Top, Middle and Lower Level Management
 - 1.5. Departmentalization
Introduction and its advantages.
2. Work Culture (06 hrs)
 - 2.1. Introduction and importance of Healthy Work Culture in Organization
 - 2.2. Components of Culture
 - 2.3. Importance of attitude, values and behaviour
Behavioural Science – Individual and group behaviour
 - 2.4. Professional Ethics – Concept and need of Professional Ethics
3. Leadership and Motivation (06 hrs)

- 3.1. Leadership
 - 3.1.1. Definition and Need of Leadership
 - 3.1.2. Qualities of a good leader
 - 3.1.3. Manager vs. leader
 - 3.2. Motivation
 - 3.2.1. Definition and characteristics of motivation
 - 3.2.2. Factors affecting motivation
 - 3.2.3. Maslow's Need Hierarchy Theory of Motivation
 - 3.3. Job Satisfaction
4. Legal Aspects of Business: Introduction and need (06 hrs)
- 4.1. Labour Welfare Schemes
 - 4.1.1. Wage payment : Definition and types
 - 4.1.2. Incentives: Definition, need and types
 - 4.2. Factory Act 1948
 - 4.3. Minimum Wages Act 1948
5. Management Scope in different Areas (12 hrs)
- 5.1. Human Resource Development
 - 5.1.1. Introduction and objective
 - 5.1.2. Manpower Planning, recruitment and selection
 - 5.1.3. Performance appraisal methods
 - 5.2. Material and Store Management
 - a) Introduction, functions and objectives of material management
 - b) Purchasing: definition and procedure
 - c) Just in time (JIT)
 - 5.3. Marketing and Sales
 - a) Introduction, importance and its functions
 - b) Difference between marketing and selling
 - c) Advertisement- print media and electronic media
 - d) Market-Survey and Sales promotion.

- 5.4. Financial Management – Introduction
 - 5.4.1. Concept of NPV, IRR, Cost-benefit analysis
 - 5.4.2. Elementary knowledge of Income Tax, Sale Tax, Excise duty, Custom duty, Provident Fund
- 5.5 Maintenance Management
 - 5.5.1 Concept
 - 5.5.2 Preventive Maintenance
- 6. Miscellaneous topics (12 hrs)
 - 6.1. Customer Relationship Management (CRM)
 - a) Definition and Need
 - b) Types of CRM
 - c) Customer satisfaction
 - 6.2. Total Quality Management (TQM)
 - a) Inspection and Quality Control
 - b) Concept of Quality Assurance
 - c) TQM
 - 6.3. Intellectual Property Rights (IPR)
 - 3.3.1. Introduction, definition and its importance
 - 3.3.2. Infringements related to patents, copyright, trade mark

INSTRUCTIONAL STRATEGY

It is observed that the diploma holders generally take up middle level managerial positions, therefore, their exposure to basic management principles is very essential. Accordingly students may be given conceptual understanding of different functions related to management. Some of the topics may be taught using question answer, assignment or seminar method. The teacher will discuss success stories and case studies with students, which in turn, will develop appropriate managerial qualities in the students. In addition, expert lectures may also be arranged from within the institutions or from management organizations. Appropriate extracted reading material and handouts may be provided.

RECOMMENDED BOOKS

1. Principles of Management by Philip Kotler TEE Publication
2. Principles and Practice of Management by Shyamal Bannerjee: Oxford and IBM Publishing Co, New Delhi.
3. Financial Management by MY Khan and PK Jain, Tata McGraw Hill Publishing Co., 7, West Patel Nagar , New Delhi.
4. Modern Management Techniques by SL Goel: Deep and Deep Publications Pvt Limited , Rajouri Garden, New Delhi.
5. Management by James AF Stoner, R Edward Freeman and Daniel R Gilbert Jr. : Prentice Hall of India Pvt Ltd, New Delhi.
6. Essentials of Management by H Koontz, C O' Daniel , McGraw Hill Book Company, New Delhi.
7. Marketing Management by Philip Kotler, Prentice Hall of India, New Delhi
8. Total Quality Management by DD Sharma, Sultan Chand and Sons, New Delhi.
9. Intellectual Property Rights and the Law by Dr. GB Reddy.
10. Service Quality Standards, Sales & Marketing Department, Maruti Udyog Ltd.
11. Customer Relationship Management: A step-by-step approach, Mohamed & Sagadevan Oscar Publication, Delhi
12. Customer Relation Management, Sugandhi RK, Oscar Publication, Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1.	06	15
2.	06	10
3.	06	15
4.	06	10
5.	12	25
6.	12	25
Total	48	100

PERSONALITY DEVELOPMENT CAMP

This is to be organized at a stretch for two to three days during fifth or sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics. There will be no examination for this subject.

1. Communication Skills
2. Correspondence and job finding/applying/thanks and follow-up
3. Resume Writing
4. Interview Techniques: In-Person Interviews; Telephonic Interview' Panel interviews; Group interviews and Video Conferencing etc.
5. Presentation Techniques
6. Group Discussions Techniques
7. Aspects of Personality Development
8. Motivation
9. Leadership
10. Stress Management
11. Time Management
12. Interpersonal Relationship
13. Health and Hygiene