

## 4.1 LEATHER MANUFACTURE - III

**L T P Cr**  
**3 - 6 6**

### RATIONALE

Several processing steps are involved in obtaining finished leather for manufacturing of leather goods from wet blue leather. These steps involve selection of wet blue leather, neutralisation, dyeing, fat liquoring, stuffing, stripping, bleaching and water proofing. The students of diploma holders in leather technology must acquire knowledge and relevant skills related to these processing steps besides knowledge of finishing operations like sammying, setting, drying, sawdusting, buffing, snuffing etc. Awareness about pigments and binders will provide added advantage to the students. For this purpose it is essential that students should be given adequate knowledge and skills for enabling them to perform effectively on the shop-floor of leather manufacturing. Hence this subject.

### DETAILED CONTENTS

#### THEORY

1. Selection (4 hrs)  
Selection of wet blue leather, sammying, splitting, shaving operations
2. Neutralisation (4 hrs)  
Different chemicals used in neutralisation and their application in the order of preference. Principle of neutralisation, and reactions involved in formulation
3. Dyeing (6 hrs)  
Various types of dyes, their elementary chemistry and behaviour towards leather. Different types of dyeing auxiliary (levelling, fixing agents etc.). Principle and methods of dyeing for use of different end products with different recipes.
4. Fat Liquoring (6 hrs)  
Oil, fats, waxes, emulsions and their types. Different types of fat liquors and their uses. Preparation of fat liquors and their properties and formulation in the manufacture of different types of leathers. Factors affecting choice of fat liquor, mechanism of fat liquoring.
5. Stuffing (4 hrs)  
Various types of fats, oils and waxes and their properties, recipes and uses. Application of stuffing

6. Stripping and Bleaching (6 hrs)  
Principles involved in stripping and bleaching of leathers, effect of bleaching and stripping chemicals in their order of preference
7. Water Repellent Agents (4 hrs)  
Different water repellent agents used, their applications and elementary reactions
8. Finishing (Machine Operations) (6 hrs)
- a) Sammying, Setting and Drying  
Object of sammying and setting, drying process and method of drying with reference to vegetable tanned leather, chrome tanned leather and softy leathers. Vacuum drawing - elementary mechanism and application
  - b) Saw dusting or Conditioning  
Method and object of conditioning - nailing and toggling, object of nailing, toggling and staking
  - c) Buffing and Snuffing  
Object of buffing and snuffing. Use of emery paper for different purposes
9. Finishes (8hrs)
- a) Composition and Classification:  
General structure and composition of finishes, classification of finishes
  - b) Materials
    - i) Pigments  
Classification of pigment, their properties and uses in leather finishing, preparation of pigments and applications
    - ii) Binders  
Type of binders – casein/shellac, mucilage and gums, properties and uses  
Plasticizers and lusters -names of various materials used and method of their applications, resin binder or polymer binders - types and classification of different binders available in the market  
Filling and impregnation agents and methods  
  
Nitrcellulose lacquers, properties and uses. N.C. Lacquer emulsion classification, formulation, dilutable with water or organic solvent with reference to fastness to wet rubbing. Elementary knowledge of PVC lacquer, polyvinyl acetate, Co-polymer lacquer and polyurethane - their applications.
  - c) Techniques  
Seasons, their formulations and methods of application Spraying, Glazing, Hot plating, Measuring

## LIST OF PRACTICALS

1. Exercises involved in dyeing and finishing like spraying, glazing, hot plating, measuring operations
2. Seasons, their formulations and method of applications
3. Visits to tanneries, auxiliaries and chemical units
4. Quiz competition
5. Identification, selection and grading of finished leather for export.
6. Practical exercises (in detail) involving dyeing, finishing and making of all varieties of leathers manufacturing. Students should undertake rigorous practical exercises on leather making involving some of the following type of processes from wet blue/E.I/Crust leathers and remaining should be studied during factory visit.
  - i) Clothing Leathers
  - ii) Waxy Upper leather
  - iii) Antique Finish Leathers
  - iv) Softy Upper Leather
  - v) Split leather
  - vi) Ammunition leather
  - vii) Shruken Grain Leathers
  - viii) Aniline/Semi Aniline Finshed Leather
  - ix) Saddlery leather
  - x) Two-tone Finished Leathers
  - xi) Lining leather

## INSTRUCTIONAL STRATEGY

This is a practical oriented subject. Teacher should lay emphasis on practical exercises for developing skills in the students, in making footwear and leather goods. Experts from the industry may be invited to deliver extension lectures on latest trends, specifications and BIS codes related to footwear and leather goods. Students should be encouraged to visit some of the footwear and leather goods manufacturing houses so that they are able to appreciate the practices being followed in the industries. Students may also be asked to prepare catalogues of specifications for different types, sizes and styles of footwear and leather goods manufactured by different leading companies.

## RECOMMENDED BOOKS

1. Manual on Shoe Making by Clark's
2. FDDI Publications
3. CLRI Publications
4. SATRA Publications UK

5. LASR Publication, New Zealand
6. Textbook of Footwear Manufacture by JH Thornton, Heywood London
7. Textbook of Footwear Material by JH Thornton, Heywood London
8. How to Sew Leather Suede by G Philips W Schewebke, Machmillan, New York

#### SUGGESTED DISTRIBUTION OF MARKS

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1	4	8
2	4	8
3	6	12
4	6	12
5	4	8
6	6	12
7	4	10
8	6	12
9	8	18
<b>Total</b>	<b>48</b>	<b>100</b>

## 4.2 ORGANIC CHEMISTRY - II

L T P Cr  
2 - 4 4

### RATIONALE

Diploma holders in leather technology are required to supervise laboratories and should have practical and theoretical understanding which is to be applied in the leather technology (Leather Manufacturing). It is very essential that the students should have adequate knowledge of theory and practical skills for enabling them to perform effectively and efficiently on the shop-floor. Hence through this subject, it is expected from the teacher to provide/lay greater emphasis on theory and practicals in organic chemistry which are necessary element and are part and parcel of the leather manufacturing principles and processes

### DETAILED CONTENTS

#### THEORY

1. Dicarboxylic Acid (4 hrs)  
Malonic acid, succinic acid - Acid derivatives Acetylchloride, Acetic dihydroxide - higher fatty acids -members from C<sub>12</sub>-C<sub>18</sub> saturated and unsaturated sources, properties and uses of sulphation and sulphonation, saponification and acid value only
2. Ester (2 hrs)  
Ethyl acetate - Laboratory method of preparation, properties and uses
3. Amines (2 hrs)  
Primary, Secondary, Tertiary - Preparation, properties and uses of methyl and ethyl amine
4. Amino Acids (2 hrs)  
Laboratory Method of preparation, properties and uses of glycine
5. Carbohydrates (4 hrs)  
Preparation, properties and uses of glucose, fructose and sucrose. Proteins - Composition - nature - classification, physical and chemical properties, test and uses (brief study)

6. Coal (2 hrs)  
Destructive distillation of coal - fractional distillation of coal tar
7. Aromatic Compound (6 hrs)  
Difference between aliphatic and aromatic compounds, preparation of benzene from coal tar -its properties and uses. Substitution in benzene ring and side chain. Preparation, properties and uses of chlorobenzene, phenol, benzaldehyde, acetophenone benzoic acid, anilines dyes
8. Lubrication (6 hrs)  
Principles of lubrication; characteristics of lubricants such as viscosity, oiliness, acidity, flash point, fire point emulsification; selection of lubricant, types of lubricants - solid (graphite) liquid, moible oil and semi-solid (grease)
9. Plastics (4 hrs)  
Introduction to organic chemistry of plastics, saturated and unsaturated hydrocarbons, condensation, polymerisation, therosetting and thermo-plastic. Cold setting and hot setting plasticisers. Names of common plastics and their uses

### LIST OF PRACTICALS

1. Identification of organic compounds.
2. Detection of functional group of carbohydrates.
3. Detection of primary/secondary tertiary amine.
4. Preparation of soaps.
5. Detection of Glucose or Sucrose in the given sample.
6. Preparation of Chlorobenzene.

### INSTRUCTIONAL STRATEGY

The understanding of chemistry is a must for the students for better appreciation of leather technology subjects. Teachers should give brief introduction to various topics and they should try to develop a co-relation of chemistry and its applied aspects to leather technology. Teachers may give appropriate tutorial exercises to the students. Use of charts may be made during the theory classes. Experiments given in the list of practical should be performed by individual students under the supervision of teachers. The safety precautions, while working on experiments, should be taken to avoid any accidents.

**RECOMMENDED BOOKS**

1. Principles of Physical Chemistry by Puri, Sharma and Pathania
2. Chemistry in Engineering and Technology Vol. I and II by JC Kuriaese and J Rajaram
3. Organic Chemistry V edition by RT Morison and RN Boyd; Prentice Hall of India Pvt. Ltd., New Delhi 1990
4. A Text Book of Organic Chemistry by KS Tewari SN Mehrotra and NK Vishnoi; Vikas Publishing House, New Delhi
5. Chemical Engineering Handbook by JH Perry
6. Riegel's Handbook of Industrial Chemistry by JA Kent, Ed., Van Nostrand Reinhold, 1974
7. Shreve's Chemical Process Industries 5<sup>th</sup> Edition by GT Austin; McGraw Hill International Book Co., Singapore 1984
8. Inorganic Chemistry by Cotton and Wilkinson
9. Chemical Technology by Kirk and Arthor
10. Physical Chemistry of Leather Manufacture by Bienkiewicz, 1952
11. Chemistry of Tanning Process by KH Gustavson; New York

**SUGGESTED DISTRIBUTION OF MARKS**

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	4	12
2	2	6
3	2	6
4	2	6
5	4	12
6	2	6
7	6	18
8	6	18
9	4	16
<b>Total</b>	<b>32</b>	<b>100</b>

### 4.3 ANALYTICAL CHEMISTRY

**L T P Cr**  
**3 - 4 5**

#### RATIONALE

Diploma holder in Leather Technology should have competency to analyse water, curing and pretanning process. The knowledge of pH measurement, degree of tannage and mineral oxide content is helpful in quality control of tanned leather for quality assurance. Physical testing help in analysing quality of leather as per norms. The knowledge about some common instruments which are necessary in routine working of tanneries is necessary to create self confidence in the students.

#### DETAILED CONTENTS

#### THEORY

1. Analysis of Water (8 hrs)
 

Types of water- Principles of analytic methods employed in analysis of water. Effect of hardness of water on various processes in leather manufacture- Softening of water.
2. Analysis of Various Chemicals and Auxiliaries used in Leather Processing (10 hrs)
  - 2.1 Salt, lime, sodium, sulphide, ammonium salts, deliming acids, bates, neutralising agents.
  - 2.2 Oils and fats, sulphatd oils, soap, fatliquors and other auxiliaries like sodium and potassium bichromate resin binders, wax emulsions etc.
3. Analysis of Fresh and Used Liquors of Beam House Processes (12 hrs)
 

Soak liquor, lime liquor and pickle liquor.
4. Analysis of Tanning Agents (12 hrs)
  - 4.1 Vegetable tanning materials and extracts, Formaldehyde.
  - 4.2 Chrome extracts and liquors, Zirconium and aluminium tanning agents.
  - 4.3 pH measurement, indicators and their uses in testing.
5. Instrumental Methods of Analysis used in Leather Chemistry (6 hrs)
 

Spectrophotometry and colorimetry, ion exchange resins etc. In testing of tanning chemicals.



## LIST OF PRACTICALS

1. Water analysis-hardness of water (temporary & permanent), chloride content, sulphate content.
2. Analysis of common salt.
3. Analysis of lime-purity of lime, total bases.
4. Analysis of Sodium Sulphide.
5. Analysis of Delimiting Agents-analysis of ammonium salts, analysis of organic acids.
6. Analysis of Pickle Liquor-acid and salt contents.
7. Analysis of Oils-moisture, acid value, iodine value, saponification value.
8. Analysis of Sulphated oils-moisture, pH, acid value.
9. Qualitative analysis of Vegetable Tannins-moisture, total solid, total soluble, insoluble, non-tannins, pH.
10. Analysis of Chrome Tanning Agents-chrome powder, moisture, chrome contents, basicity, pH.

## INSTRUCTIONAL STRATEGY

The understanding of chemistry is a must for the students for better appreciation of leather technology subjects. Teachers should give brief introduction to various topics and they should try to develop a co-relation of chemistry and its applied aspects to leather technology. Teachers may give appropriate tutorial exercises to the students. Use of charts may be made during the theory classes. Experiments given in the list of practical should be performed by individual students under the supervision of teachers. The safety precautions, while working on experiments, should be taken to avoid any accidents.

## RECOMMENDED BOOKS

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7. Shreve's Chemical Process Industries 5<sup>th</sup> Edition by GT Austin; McGraw Hill International Book Co., Singapore 1984
8. Inorganic Chemistry by Cotton and Wilkinson
9. Chemical Technology by Kirk and Arthor
10. Physical Chemistry of Leather Manufacture by Bienkiewicz, 1952
11. Chemistry of Tanning Process by KH Gustavson; New York

#### SUGGESTED DISTRIBUTION OF MARKS

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1	8	16
2	10	20
3	12	24
4	12	24
5	6	16
<b>Total</b>	<b>48</b>	<b>100</b>

#### 4.4 COMPUTER APPLICATIONS IN LEATHER TECHNOLOGY

L T P Cr  
- - 4 2

##### RATIONALE

Computers play a very vital role in present day life, more so, in the professional life of engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers. The knowledge of C language will be reinforced by the practical exercises during the course of study.

##### DETAILED CONTENTS

##### THEORY

1. Information Storage and Retrieval
  - 1.1 Need for information storage and retrieval
  - 1.2 Creating data base file
  - 1.3 Querying database file on single and multiple keys
  - 1.4 Ordering the data on a selected key
  - 1.5 Programming a very simple application
  
2. Programming in "C"
  - 2.1 Basic structure of C programs
  - 2.2 Executing a C program
  - 2.3 Constants, variables, and data types
  - 2.4 Operators and expressions
  - 2.5 Managing Input-Output operations like reading a character, writing a character, formatted input, formatted output through print, scan, getch, putch statements etc.
  - 2.6 Decision making and branching using IF ..... else, switch, goto statements.
  - 2.7 Decision making and looping using do-while, and for statements
  - 2.8 Arrays - one dimensional and two dimensional
  
3. Computers Application Overview
  - 3.1 Commercial and business data processing application
  - 3.2 Engineering computation
  - 3.3 CAD, CAM, CAE, CAI
  
4. Use of computers for measurement and control. Overview of a computer based data acquisition & control system. Practice in the use of the systems.

## LIST OF PRACTICALS

1. Creating database.
2. Querying the database.
3. Report generation.
4. Programming in dbase
5. Use of spread sheets/Matlab/Mathematics/Eureka (or any other package) for engineering computers.
6. Use of design packages (appropriate design packages may be selected depending upon the branch)
7. Use of CAI packages.
8. Programming for DAS & control.
9. Exercises on data acquisition.
10. Exercises on control - on/off switch, and proportional control.
11. Programming exercise on executing a C programme.
12. Programming exercise on editing a C programme.
13. Programming exercise on defining variables and assigning values to variables.
14. Programming exercise on arithmetic and relational operators.
15. Programming exercise on arithmetic expressions and their evaluation.
16. Programming exercise on reading a character.
17. Programming exercise on writing a character.
18. Programming exercise on formatting input using print.
19. Programming exercise on formatting output using scan.
20. Programming exercise on simple IF statement.
21. Programming exercise on IF .... ELSE statement.
22. Programming exercise on SWITCH statement.
23. Programming exercise on GOTO statement.
24. Programming exercise on DO-WHILE statement.
25. Programming exercise on FOR statement.
26. Programming exercise on one dimensional arrays.
27. Programming exercise on two dimensional arrays.

## INSTRUCTIONAL STRATEGY

The teachers should try to procure the relevant software and demonstrate the students their applications in leather processing, footwear manufacturing and leather goods manufacturing. Experts may be invited to deliver lectures and expose the students to different applications of computers in leather processing. Students should be given sufficient exercises on CAD in leather technology.

## RECOMMENDED BOOKS

1. CAD/CAM Computer-Aided Design and Manufacturing by Mikell P Groover and Emory W Zimmers Jr., Prentice Hall of India, New Delhi

2. Computer Aided Production Management by Publication Mahpatra, Prentice Hall of India, New Delhi
3. Automation, Production Systems and Computer Integrated Manufacturing by Mikell P, Grover, Lehigh University, Prentice Hall of India, New Delhi

## 4.5 TANNERY WASTE MANAGEMENT

<b>L</b>	<b>T</b>	<b>P</b>	<b>Cr</b>
<b>3</b>	<b>-</b>	<b>2</b>	<b>4</b>

### RATIONALE

The control of environmental pollution is very essential to establish healthy working atmosphere in and around tanneries. The students should have knowledge of tannery wastes treatment and their safe disposal to check atmospheric pollution. Tannery wastes can also be utilised for manufacturing of certain products and students should be provided sufficient knowledge about the same.

### DETAILED CONTENTS

#### THEORY

- |     |  |         |
|-----|--|---------|
| 1.  | Sources, composition, types and characteristics of tannery wastes.   | (4 hrs) |
| 2.  | Hazards created by untreated tannery effluents.  | (4 hrs) |
| 3.  | Legislation for disposal of tannery effluents.   | (4 hrs) |
| 4.  | Environmental problems caused by various pollutants. Methods of disposal, BIS/CPCB/SPCB standards for disposal.                        | (4 hrs) |
| 5.  | Recovery and reuse of chrome from wastes chrome liquor, elementary idea of different treatment methods, primary secondary and tertiary | (6 hrs) |
| 6.  | Sludge treatment and disposal, model treatment plants  | (6 hrs) |
| 7.  | Various solid wastes, their composition and characteristics  | (4 hrs) |
| 8.  | Environmental problems in handling tannery solid wastes  | (4 hrs) |
| 9.  | Utilisation and disposal of tannery solid wastes   | (4 hrs) |
| 10. | Manufacture of Glue and Gelatin  | (4 hrs) |
| 11. | Manufacture of Leather boards  | (4 hrs) |

### LIST OF PRACTICALS

1. Determination of total and dissolved solvents.
2. Determination of sulphate, chloride, acidity, alkalinity and organic nitrogen in tannery influence.
3. Special guest lectures of experts may be arranged at suitable times.
4. Students should be taken to common treatment plant in leather complexes.
5. Students should be taken to leather tannery having independent treatment plant attached with it.
6. Visits of units manufacturing leather based bi-products.

### SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	4	8
2	4	8
3	4	8
4	4	8
5	6	14
6	6	14
7	4	8
8	4	8
9	4	8
10	4	8
11	4	8
<b>Total</b>	<b>48</b>	<b>100</b>

## 4.6 FOOTWEAR AND LEATHER GOODS MANUFACTURING

**L T P Cr**  
**2 - 4 4**

### RATIONALE

Some of the Diploma holders in Leather Technology may assume the responsibility of supervising leather footwear and leather goods manufacturing like selection of materials/inputs; upper, lining and grinders, process, quality checks, production, planning, pricing factors, scheduling, delivery commitment, packaging and forwarding - quality assurance operations. For this purpose it is essential that they should be given adequate knowledge and skills like anatomy of foot, types of lasts, material inputs, various processes, techniques of manufacturing and related topics, machining operations, tools and equipment, type and construction of footwear and leather goods, so as to enable them to perform effectively on shop-floor. These knowledge and skills shall be developed through this subject.

### DETAILED CONTENTS

#### PART-A (FOOTWEAR MANUFACTURING)

- |     |  |         |
|-----|--|---------|
| 1.  | Brief history of footwear  | (1 hr)  |
| 2.  | Foot Anatomy: Structure of foot bones, arches of human foot, foot movements                                      | (2 hrs) |
| 3.  | Foot abnormalities, foot ailments, cures   | (2 hrs) |
| 4.  | Shoe lasts, materials, different types of shoe lasts   | (1 hr)  |
| 5.  | Size systems, classifications/types of footwear  | (1 hr)  |
| 6.  | Designing and pattern cutting, its importance, grading of patterns, upper, lining and bottoming parts/components | (2 hrs) |
| 7.  | Different materials for upper, lining and textile etc.   | (1 hr)  |
| 8.  | Materials for insole, sole, adhesives – their characteristics etc.   | (2 hrs) |
| 9.  | Clicking and closing of uppers, in-process quality control, standardization of footwear grinders                 | (2 hrs) |
| 10. | Tools, equipments and machinery for footwears  | (1 hr)  |
| 11. | Elementary knowledge of layout, cost analysis and marketing strategy   | (1 hr)  |



**PART-B**  
**(LEATHER GOODS)**

12. Brief history of leather goods industry, its impact and importance in modern life (2 hrs)
13. Classification of leather goods such as shopping bags, hand bags, patch bags, pouches and wallets, mobile cases, men's business satchels, executive accessories, petty articles and leather garments etc. and their fabrication. (2 hrs)
14. Materials and their selection, characteristics, standardization of fittings and accessories (4 hrs)
15. Tools, equipments and machinery used in leather goods manufacturing (2 hrs)
16. Elementary knowledge of layout, costing and marketing (2 hrs)
17. Study of manufacture of leather based sports goods such as cricket ball, hokey ball, volley ball, foot ball, basket ball and other sports materials etc. (4 hrs)

**LIST OF PRACTICALS**

1. Preliminary practice of various operation viz clicking, skiving, edge treatment, stitching
2. Designing and pattern cutting of various footwear - upper and bottoming
3. Manufacturing of men's and ladies, chappals, sandals and shoe from clicking to finishing
4. Preliminary practice of different operation such as clicking, skiving, edge treatment, stitching
5. Pattern cutting and designing of various leather goods articles
6. Manufacturing of various articles of leather goods such as leather garments, shopping bags, hand bags, patch bags, pouches and wallets, suitcases, brief case, men's business satchels
7. Executive accessories, fur articles and other petty articles
8. Visits to different sections of leather goods manufacturing units
9. Visits to various sections of footwear manufacturing units

## INSTRUCTIONAL STRATEGY

This is a practical oriented subject. Teacher should lay emphasis on practical exercises for developing skills in the students, in making footwear and leather goods. Experts from the industry may be invited to deliver extension lectures on latest trends, specifications and BIS codes related to footwear and leather goods. Students should be encouraged to visit some of the footwear and leather goods manufacturing houses so that they are able to appreciate the practices being followed in the industries. Students may also be asked to prepare catalogues of specifications for different types, sizes and styles of footwear and leather goods manufactured by different leading companies.

## RECOMMENDED BOOKS

1. Manual on Shoe Making by Clark's
2. FDDI Publications
3. CLRI Publications
4. SATRA Publications UK
5. LASR Publication, New Zealand
6. Textbook of Footwear Manufacture by JH Thornton, Heywood London
7. Textbook of Footwear Material by JH Thornton, Heywood London
8. Howe to Sew Leather Suede by G Philips W Schewebke, Machmillan, New York

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	1	4
2	2	6
3	2	6
4	1	4
5	1	4
6	2	6
7	1	4
8	2	6
9	2	6
10	1	4
11	1	4
12	2	6
13	2	6
14	4	12
15	2	6
16	2	4
17	4	12
<b>Total</b>	<b>32</b>	<b>100</b>

## ENTREPRENEURIAL AWARENESS CAMP

The employment opportunities for diploma holders especially in public sector are dwindling. The diploma holders need to explore the possibilities of becoming entrepreneurs. For this, they must be acquainted with entrepreneurship development, scope of setting up small-scale industry, existing business opportunities, financial support available and various aspects of managing business. In this context, an entrepreneurial awareness camp is suggested. During the camp, experts from various organizations such as banks, financial corporations, service institutes etc. may be invited to deliver expert lectures. Successful entrepreneurs may also be invited to interact with the students.

The camp is to be organized at a stretch for two to three days during fourth semester. Lectures will be delivered on the following broad topics. There will be no examination for this subject

1. Who is an entrepreneur?
2. Need for entrepreneurship, entrepreneurial career and self employment
3. Scenario of development of small scale industries in India
4. Entrepreneurial history in India, Indian values and entrepreneurship
5. Assistance from District Industries Centres, Commercial Banks, State Financial Corporations, Small industries Service Institutes, Research and Development Laboratories and other Financial and Development Corporations
6. Considerations for product selection
7. Opportunities for business, service and industrial ventures
8. Learning from Indian experiences in entrepreneurship (Interaction with successful entrepreneurs)
9. Legal aspects of small business
10. Managerial aspects of small business