6.1 PROCESS HOUSE MANAGEMENT

L	T	P
4	-	-

RATIONALE

Diploma holders in textile processing are responsible for production, planning and control. He is also required to ensure maintenance of equipment & machine , material handling, safety measures, etc. for better utilization of resources. Hence this subject.

DETAILED CONTENTS

1. Plant Layout (4 hrs)

   - Concept of plant layout
   - Types of layout (process, product and combination type)
   - Factors affecting plant layout

2. Production (10hrs)

   - Types of production-mass production, job production and batch production
   - Material planning and allocation
   - Process planning and process sheet
   - Record keeping regarding men, materials and machine
   - Inventory control: need of inventory control, levels in inventory control.
   - Duty & responsibility of shift incharge

3. Maintenance (4 hrs)

   - Objective and importance of maintenance
   - Types of maintenance-procedures and advantages

4. Material Handling (6 hrs)

   - Importance of material handling in a process house
   - Handling of dyes & chemicals - methods & precautions
   - Benefited systems of handling of processed goods.

5. Accidents & safety measures (6 hrs)

   - Types of accidents-fire, mechanical & chemical accidents
   - Common sources of different types of accidents and their prevention
   - Methods of minimising the accidents in a process house.

6. Cost Estimation (6 hrs)

   - Introduction and function of cost estimation
   - Estimation procedure
   - Elements of cost.

7. Environment Protection (16 hrs)

   - Important effluent characteristics- their effect on environment
   - Tolerance limit enforced by state Pollution Boards & its purpose.
   - Characteristics of process waste streams-process, possible pollutants & nature of waste water
   - Methods of disposal of industrial waste (from dye house & print house specially)
   - Various methods of effluent treatment
   - Design layout & functioning of an effluent treatment plant
   - Red listed dyes & chemicals

8. Water Energy (Steam) Source & its conservation (8 hrs)
   - Steam and water consumption
   - Reutilization of water
   - Recovery of chemicals from waste water
   - Methods of minimizing water & steam consumption

9. Need & scope of suitable ventilation & lightening system in a process house (4 hrs)

INSTRUCTIONAL STRATEGY

The teacher should lay emphasis on understanding of basic concepts and various terms used in the subject. The teacher is expected to teach all the students the application of this subject area in various fields.

RECOMMENDED BOOKS

1. Art of Dyeing by B.S. Chauhan.
2. Health hazards in a Textile Mill by NITRA.
3. Dye House Management; Colour Publication, Bombay.
4. Modern Textile Management by J.B. Rattan; Abhishek Publication, Chandigarh.
5. Water and Effluents in Textile Mills by ATIRA.
6. Economy, Energy and Environment in Textile Wet Processing by S.S. Trived.

7. Occupational Health and Safety in Textile Mills by Dr. V.A. Shenai; Sevak Publication, Mumbai.
8. Energy Conservation in Textile Wet Processing by Dr. M.L. Gulrajani; Mahajan Publication Pvt. Ltd., Ahemdabad.

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	Time Allotted (hrs)	Marks Allocation (%)
1	4	6
2	10	16
3	4	6
4	6	10
5	6	10
6	6	10
7	16	24
8	8	12
9	4	6
Total	**64**	**100**

6.2 GARMENT PROCESSING - II

L	T	P
3	-	3

RATIONALE

As garment industry is developing fast and expanding leaps and bound. Therefore, a diploma holder in Textile Processing must know about the various fabric materials, preparatory finishing and after-care processes/chemicals related to garments. Hence this subject.

1. Denim dyeing :- (10 hrs)

- Introduction to denim fabrics and its particulars.
- History and chemistry of Indigo dyes, Denim dyeing on continuous Indigo dyeing range.
- Indigo Dyeing Machine for: 1. Rope Form dyeing, 2. Sheet Form Dyeing, 3. Loop form
- Advancement in Indigo dyeing method machine and precautions, merits, demerits of these M/c.
- Dyeing of denim fabrics with mixture of Indigo and other dyes.

2. Finishing of garment made from denim fabric :- (2 hrs)

- Different concepts of finishing denim fabrics.
- Preshrinking of denim, integrated finishing and shrinking range, sanfor set process for wrinkle free finish, skewing, New finishing line for denim.

3. Washing of denim fabrics/garments :- (10 hrs)

- Objectives of washing treatments.
- Brief discussion on following type of washing processes.

a) Stone wash
b) Acid wash
c) Enzyme wash
d) Overdyed denim
e) Quick wash denims and their advantage
f) Definition of the following : uncommon denim like Aqua wash denim, black denim, crushed denim, dirty blue denim, double dyed denim, eco denim, destroyed effect, wash out denim, sandblasted, sun washing, marble denim, vintage, Icewash, camelon denim, dark wash denim, printed and engraved denim, denim blended with synthetic, tie dyed denim., Back staining, Blue white contrast in denim, Ozone fading of denims

4. Garment knitted goods dyeing machines: Various garment dyeing machines like Pedal dyeing, winch dyeing, soft overflow dyeing machine, their merits and demerits. (4 hrs)

5. Printing of Garments: Brief description of various techniques used in printing of garments - Block, screen, stencils and transfer printing. (4 hrs)

6. Finishing of garments. (6 hrs)
   - Distinction between fabrics and garments finishing.
   - Functional and novelty finishes:
     - Wash down effect ,
     - Wrinkle resistant effect by
       a) Pre cure process
       b) Post cure process
     - Cosmeto garments
     - Antimicrobial finish
     - UV protection finish
     - Fire retardant fabrics
   - General Problems faced during finishing of garments

7. Finishing of knits:- (6 hrs)
   - Stone wash finishing on T-shirt.
   - Dimensional stability of knitted garments.
   - Brief overview of the machines used for mechanical finishing of garments.

8. Quality control in garment finishing (6 hrs)
   - Knowledge of quality parameters required for international market
   - Quality control programme with following check points:
     (i) Sampling and inspection
     (ii) Colour, colour matching and shade sorting
     (iii) Care labelling
     (iv) Colour fastness and shrinkage
     (v) Flamability
     (vi) Product packaging and display, atmospheric pollution, consumer use
   - Ecological requirements related to garments.

LIST OF PRACTICALS

1. To print a Garment with stencil/screen printing method.
2. To print a garment with blocks.
3. To dye a cotton garment with suitable class of dyes.

4. To prepare a portfolio of different types of finished denim fabrics and to assess their difference.
5. To develop effect on Denim by Enzymes/acids.

INSTRUCTIONAL STRATEGY

Use of audiovisual aids should be made to show specialized operations. Expose the students to real life problems. Stress should be given to acquaint the students with relevant industrial practices.

RECOMMENDED BOOKS

1. Denim for All by S.S. Satsangi & Dr. Parmar, NITRA
2. Garment Finishing & Care Labelling by S.S. Satsangi Usha publishers 53-B/ACIV, Shalimar Bagh Delhi
3. Stain Removing Techniques by S.S. Satsangi; Usha Publishers 53-B/AC-IV Shalimar Bagh, Delhi
4. Fabric Care by Noemia D'SOUZA ,New age International Publisher, Dryagang, New Delhi
5. Changing Trends in Apparal Industry by N.S. Kaplan; Abhishek Publication, Chandigarh
6. Dry Cleaning, Souring, Dyeing of Garments, Furs and Rugs by Brannt; Abhishek Publication, Chandigarh
7. House Hold Textile and Laundry work by Durga; Indian Publication
8. Stains and their removal by O.P. Singh; Indian Publication

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	Time Allotted (hrs)	Marks Allocation (%)
1	10	22
2	02	04
3	10	22
4	04	08
5	04	08
6	06	12
7	06	12
8	06	12
Total	**48**	**100**

6.3 PROCESS QUALITY CONTROL IN TEXTILE WET PROCESSING

L	T	P
4	-	-

RATIONALE

A Diploma holder in Textile Processing has to deal with chemical processes related to preparation, dyeing, printing & finishing of textiles. He must be fully aware of the various check prints/control parameters, standards and necessary actions to improve production & quality of the processed fabric. Hence this subject.

DETAILED CONTENTS

1. Introduction (2 hrs)
   Scope of process and quality control in Textile Wet Processing

2. Processes & Quality Control in Preparatory Processes (16 hrs)
   Study of various check points/control parameters, quality standards and necessary actions and precautions required in the following processes

   2.1 Grey Fabric Inspection
   2.2 Stiching
   2.3 Shearing & cropping
   2.4 Singeing
   2.5 Desizing
   2.6 Scouring and Bleaching (Hypochlorite Bleaching & Hydrogen Peroxide Bleaching)
      a) In kier (Batch operation)
      b) In Pad-Roll system (Semi-continuous)
      c) In J-Box machine (Continuous process)
   2.7 Souring
   2.8 Mercerisation
   2.9 Heat Setting
   2.10 Washing

3. Process and quality control in Fibre Dyeing and Yarn Package dyeing (10 hrs)

   Study of various check points/control parameters (Process & machine parameters), quality standards, precautions and necessary action in the following.

   3.1 Objective – Basic expectations from Fibre or Yarn Package Dyer
   3.2 Fibre dyeing
   3.3 Hank dyeing

3.4 Package dyeing

4. Process and quality control in Fabric/cloth dyeing (16 hrs)

Study of various control parameters for process & quality improvement of dyed fabric, standards, precautions & necessary actions required to achieve quality in cloth dyeing.

4.1 Basic needs
4.2 General considerations: Selection of dyes, chemicals & Auxillaries
4.3 Process & quality control in Batch Dyeing machines
   a) Jigger dyeing: Steps to reduce shade variation in jigger dying.
   b) High Temperature/High pressure Beam dyeing: Control parameters and precautions
   c) Jet Dying.

Process and quality control parameters to avoid shade variation in Semi-continuous and Continuous dyeing.

- Pad bath chemicals control
- Padding Mangle (machine Parameters)
- Drying
- Polymeriser
- Steam ager
- Soaper

5. Process and quality control in Textile Printing (8 hrs)

5.1 Introduction to sequential operations of Textile Printing
5.2 Objectives of process control in Printing
5.3 Process/quality control parametes/ check points & general precautions to be taken for the following
   a) Flat Bed Screen Printing
   b) Roller Printing
   c) Rotary screen printing
5.4 Control parameters during drying, Fixation (Steaming or curing).
5.5 Objective & control parameters in after treatments to printed cloth.

6. Process and quality control in Textile Finishing (10 hrs)

Study of process/quality control parameters, precautions and necessary actions to be taken in the following processes

6.1 Stenter Finishing
6.2 Calendering
6.3 Sanforizing

6.4 Decatising
6.5 Carbonisation

7. General precautions, process & machine parameters to be taken care of during processing of delicate materials i.e. (2 hrs)

a) Silk, woolen material & their blends
b) Knitted goods

INSTRUCTIONAL STRATEGY

Use of audiovisual aids should be made to show specialized operations. Expose the students to real life problems. Stress should be given to acquaint the students with relevant industrial practices.

RECOMMENDED BOOKS

1. Process and quality control in Textile Chemical Wet Processing by A.A Vaidya ATIRA
2. Process control in Chemical Processing of Textiles by Mr Shah & Rastogi, ATIRA
3. Dyeing & Chemical Technology of Textile Fibres by E.R. Trotman
4. Stains & Stains Removal by S.S. Satsangi, U.B. Publisher, Delhi
5. Fabric Defect by S.S. Satsangi, U.B. Publisher, Delhi

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	**Time Allotted (hrs)**	**Marks Allocation (%)**
1	2	4
2	16	24
3	10	16
4	16	24
5	8	12
6	10	16
7	2	4
Total	**64**	**100**

6.4 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
    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
b) 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
a) Concept of NPV, IRR, Cost-benefit analysis
b) Elementary knowledge of Income Tax, Sale Tax, Excise duty, Custom duty, Provident Fund

5.5 Maintenance Management
a) Concept
b) 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)
- a) Introduction, definition and its importance
- b) 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**

6.5 EMPLOYABILITY SKILLS – II

L	T	P
-	-	2

RATIONALE

The present day world requires professionals who are not only well qualified and competent but also possess good communication skills. Our diploma students not only need to possess subject related knowledge but also soft skills to get good jobs or to rise steadily at their work place. The objective of this subject to prepare students for employability in job market and survive in cut throat competition among professionals.

DETAILED CONTENTS

1. Oral Practice

i)	Mock interview	(05 hrs)
ii)	Preparing for meeting	(05 hrs)
iii)	Group discussion	(05 hrs)
iv)	Seminar presentation	(05 hrs)
v)	Making a presentation	(12 hrs)

a) Elements of good presentation
b) Structure and tools of presentation
c) Paper reading
d) Power point presentation

6.6 MAJOR PROJECT WORK

L	T	P
-	-	16

Project work aims at developing skills in the students whereby they apply the totality of knowledge and skills gained through the course in the solution of particular problem or undertaking a project. The students have various aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. It is also essential that the faculty of the respective department may have a brainstorming session to identify suitable project assignments. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given for a group. The students should identify or given project assignment at least two to three months in advance. The project work identified in collaboration with industry may be preferred.

Each teacher is expected to guide the project work of 5-6 students.

A suggestive criteria for assessing student performance by the external (personnel from industry) and internal (teacher) examiner is given in table below:

Sr. No.	**Performance criteria**	**Max. marks**	**Rating Scale**				
			Excellent	**Very good**	**Good**	**Fair**	**Poor**
1.	Selection of project assignment	10	10	8	6	4	2
2.	Planning and execution of considerations	10	10	8	6	4	2
3.	Quality of performance	20	20	16	12	8	4
4.	Providing solution of the problems or production of final product	20	20	16	12	8	4
5.	Sense of responsibility	10	10	8	6	4	2
6.	Self expression/ communication skills	5	5	4	3	2	1
7.	Interpersonal skills/human relations	5	5	4	3	2	1
8.	Report writing skills	10	10	8	6	4	2
9.	Viva voce	10	10	8	6	4	2
Total marks		**100**	**100**	**80**	**60**	**40**	**20**

The overall grading of the practical training shall be made as per following table

	Range of maximum marks	Overall grade
i)	More than 80	Excellent
ii)	79 <> 65	Very good
iii)	64 <> 50	Good
iv)	49 <> 40	Fair
v)	Less than 40	Poor

In order to qualify for the diploma, students must get "Overall Good grade" failing which the students may be given one more chance of undergoing 8 -10 weeks of project oriented professional training in the same industry and re-evaluated before being disqualified and declared "not eligible to receive diploma ". It is also important to note that the students must get more than six "goods" or above "good" grade in different performance criteria items in order to get "Overall Good" grade.

Important Notes

1. **This criteria must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding marks as per the above criteria.**

2. **The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.**

3. **The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the students performance as per the above criteria.**

4. **It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.**

The teachers are free to evolve another criteria of assessment, depending upon the type of project work.

It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organisations in such an exhibition. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific industries are approached for instituting such awards.