## 5.1 FABRIC MANUFACTURING - III

| L | T | P |
|---|---|---|
| 3 | - | 4 |

**RATIONALE**

The students of textile design are supposed to have knowledge and skill regarding various advanced weaving machines and their principle of working. Hence, in this subject, students will learn unconventional weaving systems for various fabrics and quality particulars of different textiles.

**DETAILED CONTENTS**

1. Introduction to unconventional weaving machines. Advantages against shuttle picking mechanism (10 hrs)

   - Type of unconventional picking
   - Advantages of modern picking mechanisms
   - Comparison with shuttle picking
   - Types of selvedges – conventional, tucked, cross leno, selvedges
   - Weft accumulator – principle and working

2. Weft Insertion by Projectile/Gripper (04 hrs)

   - Features and advantages of projectile weaving

3. Weft Insertion by Rapier (Main Features) (08 hrs)

   - Classification of rapiers- single and double phase rapiers
   - Introduction of Gabler and Dewas system of weft insertion. Advantages of rapier loom

4. Weft Insertion by Airjet (Features and Advantages) (18 hrs)

   - Jet nozzle and its working
   - Confusor and its function
   - Profiled reed and its importance
   - Problems during weft insertion in airjet

5. Weft insertion by Water jet (8 hrs)

   - Introduction and working principle of water jet loom
   - Advantages and disadvantages

## LIST OF PRACTICALS

1. Demonstration and practice on Projectile loom through mill visit
2. Demonstration and practice on Rapier loom through mill visit
3. Demonstration and practice on Air-jet loom through mill visit
4. Demonstration and practice on Water-jet loom through mill visit

## INSTRUCTIONAL STRATEGY

Student should be made to understand the working of modern weaving machines through practice and demonstrations.

## RECOMMENDED BOOKS

1. Weaving Mechanism, Vol.-II by Prof. N N Banerjee
2. Principles of Weaving by Mark and Robinson.

## SUGGESTED DISTRIBUTION OF MARKS

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 10 | 22 |
| 2 | 04 | 08 |
| 3 | 08 | 16 |
| 4 | 18 | 36 |
| 5 | 08 | 16 |
| **Total** | **48** | **100** |

## 5.2 DYEING TECHNOLOGY - II

**L T P**
**3 - 4**

**RATIONALE**

A diploma holder in textile design must have necessary knowledge of procedures used for dyeing. He must have sufficient knowledge and skills about principles of dyeing operation, materials, equipments and processes. He should be able to execute various recipes for dyeing.

**DETAILED CONTENTS**

1. Basic and modified basic dyestuff – Properties, mechanism and method of application. (4 hrs)

2. Properties, principle involved in application of metal complex and mordant on wool and silk (4 hrs)

3. Properties, preparation of polyster for dyeing, application of Disperse dyes on it. Carrier dyeing, HTHP and Thermosol dyeing (5 hrs)

4. Study of dyeing of blends with following dyes – their defects and remedies a) Disperse/Vat dye, b) Disperse/Acid Dye, c) Direct/Acid Dye and d) Disperse/Reactive dye (4 hrs)

5. Introduction to Washing Fastness, Rubbing Fastness, Light Fastness, Perspiration Fastness (5 hrs)

6. Description and working of different machines like:

   - Loose stock dyeing machine
   - Package dyeing- cone/cheese dyeing
   - Hank dyeing machine
   - Jet dyeing machine
   - Jigger and Winch machine
   - Beam dyeing machine
   - Union and cross dyeing machine
   - Continuous dyeing range, bleaching range, cold pad batch machine

   (23 hrs)

7. Introduction to natural/eco friendly dyes and chemicals used in different wet processes. Banned dyes and chemicals (3 hrs)

**LIST OF PRACTICALS**

1. To dye acrylic sample with basic dye

2. To dye acrylic sample with modified basic dye

3. To dye wool sample with basic dye
4. Dyeing of polyamide and polyester
5. Dyeing with disperse dyes
6. Dyeing of cot/wool blend
7. Dyeing of polyester/cotton blend
8. Industrial visit for demonstration of dyeing of blends.

**INSTRUCTIONAL STRATEGY**

The students should be taken to dyeing industry to show them various dyeing processes of dyeing and its machinery so that students can know various dyeing processes being used by textile industry.

**RECOMMENDED BOOKS**

1. Technology of Dyeing - VA Shenai
2. Chemical Tech of Fibrous Material - ER Trotman
3. Chemistry of Dyes and Principal of Dyeing - V.A. Shenai
4. Art of Dyeing - Chohan
5. The Dyeing of Textile Materials – Puente Cegarra
6. Dyeing and Chemical Technology of Textile Fibres- E R Trotman

**SUGGESTED DISTRIBUTION OF MARKS**

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 04 | 08 |
| 2 | 04 | 08 |
| 3 | 05 | 10 |
| 4 | 04 | 08 |
| 5 | 05 | 10 |
| 6 | 23 | 50 |
| 7 | 03 | 06 |
| **Total** | **48** | **100** |

## 5.3 TESTING AND QUALITY CONTROL - II

**L T P**
**3 - 4**

### RATIONALE

Diploma holders in textile design are responsible for testing and quality control of yarn and fabric at the shop floor. Thus in this subject, student will be made fully aware of different quality standards and their maintenance during manufacturing processes for the total quality concept.

### DETAILED CONTENTS

1. Yarn Strength Testing - Single yarn strength, importance, CRL, CRE principles. Single yarn strength tester of CRT principle. Lea strength, count strength product (CSP), its measurement. (08 hrs)

2. Fabric thickness, measurement of warp and weft crimp and its measurement by crimp meter, fabric weight (GSM) and its measurement. Cover factor of fabric. (08 hrs)

3. Fabric Strength- introduction, tensile strength and its measurement by cut strip method, revealed stripe method and grab method. Tearing strength testing and its measurement by Elmendorf tearing tester. Bursting strength and its measurement. (12 hrs)

4. Introduction of fabric stiffness, handle and drape. Measurement of fabric stiffness. (04 hrs)

5. Drape meter and its working. Crease recovery and its measurement. (04 hrs)

6. Pilling of fabric. Its measurement. (03 hrs)

7. Concepts of serviceability, wear and abrasion and its measurement by Martindale Abrasion tester. (04 hrs)

8. Common fabric defects, their analysis and remedial measures. Identification of Fabric faults. (05 hrs)

### LIST OF PRACTICALS

1. Measurement of single yarn strength by single thread strength tester.

2. Measurement of CSP of given yarn with the help of lea strength tester.

3. Measurement of fabric thickness.

4. Measurement of fabric weight (GSM) by round cutter and quadrant balance.

5. Measurement of tensile strength by revelled and cut stripe method.

6. Measurement of tearing strength by Elmendorf tearing tester.

7. Measurement of tearing strength of a given fabric by tongue tear tester.

8. Measurement of fabric stiffness by Shirley stiffness tester.

9. Measurement of crease recovery of a fabric.

## INSTRUCTIONAL STRATEGY

Students must be taken to textile industries/Mills for practice and study of inspection and quality control operations so that they are aware of the practices being followed in the industry.

## RECOMMENDED BOOKS

1. Textile Testing by JE Booth

2. Textile Testing by Grover and Hamley

3. Textile Testing by Angapan

4. Textile Testing by John H.Skinkle; DB Taraporewala and Sons, Bombay

## SUGGESTED DISTRIBUTION OF MARKS

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 08 | 16 |
| 2 | 08 | 16 |
| 3 | 12 | 26 |
| 4 | 04 | 08 |
| 5 | 04 | 08 |
| 6 | 03 | 06 |
| 7 | 04 | 10 |
| 8 | 05 | 10 |
| **Total** | **48** | **100** |

## 5.4 CAD IN TEXTILE DESIGN - II

**L T P**
**- - 4**

**RATIONALE**

The term CAD has found its way into all major discipline that have got anything to do with designing or drafting techniques. The major objective of this course is to expose the students to different softwares available in the field of textile design industry so that they are able to use those softwares in the design and construction of various textiles.

**DETAILED CONTENTS**

**RELATED THEORY FOR PRACTICAL EXERCISES**

1. Philosophy and utility of CAD system, working with various standard software packages like photoshop, coral draw

2. Understanding graphic representation, file conversion, drawing simple geometric figures, capturing a picture using CCD/Scanner

3. Use of computer to construct design on different bases with reference to various arrangements for woven designs

4. Use of CAD in various end uses viz a viz dress material, upholstry, furnishing, label, and embroidery,

**NOTE:**

Students should be instructed the fundamentals of the subject by assigning relevant projects.

**LIST OF PRACTICALS**

Software packages like Textronics/ Texstylers/ Wonderweave/ Scotweave /Ned Graphics Design systems may be adopted for doing following exercises (Any one may be choosen or any other latest software):

i) Preparation of Woven/Knitted Fabric Construction and Design

1. Selection of a fabric.
2. Use of CAD for creating fabric structure by selecting drafting and lifting plan
3. Selection of colour scheme and colour ways
4. Selection of yarn count, twist and its direction, and type of yarn
5. Presentation of simulated fabric design on computer screen and also on paper

ii) Modify/editing fabric design from original fabric and looking at the effect of modification (modification could be on yarn count, colour, twist, and its direction; fabric drafting and lifting plan)

iii) Preparation of printing and dyeing on fabric:

1. Selection of design either by selecting printe fabric or by generating figures based on ideas.
2. Selection of colour scheme
3. Finalizing the design on computer screen/paper.

**RECOMMENDED BOOKS**

1. CAD in clothing and textiles by W.Aldrich

2. A magazine on Computer in the world of textiles

## 5.5 ENVIRONMENTAL EDUCATION

| L | T | P |
|---|---|---|
| 3 | - | - |

**RATIONALE**

Education about environment protection is a must for all the citizens. In addition, a diploma holder must have knowledge of different types of pollution caused by industries and construction activities so that he may help in balancing the eco system and controlling pollution by adopting pollution control measures. He should also be aware of environmental laws related to the control of pollution.

**DETAILED CONTENTS**

1. Definition, Scope and Importance of Environmental Education (02 hrs)

2. Basics of ecology, biodiversity, eco system and sustainable development (03 hrs)

3. Sources of pollution - natural and manmade, causes, effects and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement (12 hrs)

4. Solid waste management – Causes, effects and control measures of urban and industrial waste (06 hrs)

5. Mining and deforestation – Causes, effects and control measures (04 hrs)

6. Environmental Legislation - Water (prevention and control of pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board, Environmental Impact Assessment (EIA) (10 hrs)

7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy) (04 hrs)

8. Current Issues in Environmental Pollution – Global Warming, Green House Effect, Depletion of Ozone Layer, Recycling of Material, Environmental Ethics, Rain Water Harvesting, Maintenance of Groundwater, Acid Rain, Carbon Credits. (07 hrs)

**INSTRUCTIONAL STRATEGY**

The contents will be covered through lecture cum discussion sessions. In addition, in order to have more appreciation of need for protection of environment, it is suggested that different activities pertaining to Environmental Education like video films, seminars, environmental awareness camps and expert lectures may also be organized.

**RECOMMENDED BOOKS**

1. Environmental Engineering and Management by Suresh K Dhameja; SK Kataria and Sons, New Delhi.
2. Environmental Science by Dr. Suresh K Dhameja; SK Kataria and Sons, New Delhi.
3. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
4. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
5. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
7. Environmental Studies by Erach Bharucha; UGC University Press.

**SUGGESTED DISTRIBUTION OF MARKS**

| Topic No. | Time Allotted for Lectures (Periods) | Marks Allotted (%) |
|---|---|---|
| 1 | 02 | 04 |
| 2 | 03 | 06 |
| 3 | 12 | 24 |
| 4 | 06 | 12 |
| 5 | 04 | 10 |
| 6 | 10 | 20 |
| 7 | 04 | 10 |
| 8 | 07 | 14 |
| **Total** | **48** | **100** |

## 5.6 EMPLOYABILITY SKILLS – I

| 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 is to prepare students for employability in job market and survive in cut throat competition among professionals.

**DETAILED CONTENTS**

1. Writing skills (08 hrs)

   i) Official and business correspondence
   ii) Job application - covering letter and resume
   iii) Report writing - key features and kinds

2. Oral Communication Skills (20 hrs)

   i) Giving advice
   ii) Making comparisons
   iii) Agreeing and disagreeing
   iv) Taking turns in conversation
   v) Fixing and cancelling appointments

3. Generic Skills (04 hrs)

   i) Stress management
   ii) Time management
   iii) Negotiations and conflict resolution
   iv) Team work and leadership qualities

## 5.7 DESIGN PORTFOLIO

| L | T | P |
|---|---|---|
| - | - | 5 |

**RATIONALE**

Portfolio provides a challenging platform for the students to demonstrate their analytical skills necessary for textile design. Thus the students should be able to design a catalogue depending on the various design themes for export houses, domestic markets and designers

**DETAILED CONTENTS**

**PRACTICAL EXERCISES**

1. Compilation of the relevant work done in previous semester e.g.

   - Important woven/printed/embroidered/knitted swatches
   - Design collection of various projects
   - Abstracts of craft demonstration
   - Important features of industrial training (Internship)
   - Any innovative concept/idea conceived.

## 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