3.1 TEXTILE MATHEMATICS

L	T	P
3	-	-

RATIONALE

Textile Mathematics forms the backbone of textile design discipline. Contents have been included in the curriculum as foundation course and to provide base for continuing education to the students.

DETAILED CONTENTS

1. Use of logarithms in calculations (6 hrs)

2. Area and perimeter of rectangle, parallelogram, triangle, trapezoid, regular polygon, circle, sector volume and surface areas of cylinder and cylinder with a central hole. (12 hrs)

3. Definition and simple calculations of arithmetic mean, median, mode (individual and direct series) (12 hrs)

4. Ratio properties, direct proportion and inverse proportion, percentage, averages (6 hrs)

5. Permutations and combinations, value of ${}^{n}P_{r}$ and ${}^{n}C_{r}$, its properties and simple problems (4 hrs)

6. Control charts and their use (short term, medium term and long term variations and random variations) (4 hrs)

7. Calculations of fibre diameter and fabric cover factor (4 hrs)

INSTRUCTIONAL STRATEGY

The Students should be asked to practice on the numerical problems of the above topic for better understanding of the subject.

RECOMMENDED BOOKS

1. Statistical Mathematics by S P Gupta
2. Applied Mathematics, Vol. I & II by S S Sabharwal and others; Eagle Prakashan
3. Engineering Mathematics, Vol. I; Ishan Publishing House
4. Textile Mathematics, Vol. I by J E Booth

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	12
2	12	26
3	12	26
4	06	12
5	04	08
6	04	08
7	04	08
Total	**48**	**100**

3.2 PREPARATORY WET PROCESSES

L T P
3 - 4

RATIONALE

Diploma students of Textile Design should have an overall view of all preparatory wet processes used in modern textile industries. In this subject, students learn about all the preparatory and post dyeing processes in schematic manner.

DETAILED CONTENTS

1. Impurities in raw cotton, wool and silk (4 hrs)

2. Introduction to different pretreatment processes for the preparation of cotton fabric such as: (25 hrs)
   - Shearing and cropping.
   - Singeing-purpose and working of roller, plate and gas singeing Machine.
   - Desizing-purpose and methods used for desizing.
   - Scouring-purpose, working of Pressure Kiers
   - Bleaching - purpose and different bleaching methods of Cotton using H_2O_2, Sodium hypochlorite and sodium Chlorite
   - Mercerization- Purpose, fundamentals
   - Introduction to Mercerization and Machines- pad chain, pad chainless machines.

3. Bleaching of Wool by H_2O_2 (4 hrs)

4. Silk Degumming, bleaching of silk with H_2O_2, Sodium hydrosulphite. (4 hrs)

5. Definition and brief history of dyeing, classification of dyes (natural, mineral and synthetic). (3 hrs)

6. Printing - Introduction about styles and method of printing (4 hrs)

7. Objectives of finishing, Classification of finishes on the basis of mechanical and chemical treatment. (4 hrs)

LIST OF PRACTICALS

1. To desize the given cotton sample by acid steep method.
2. To desize the given cotton sample by enzyme steep.
3. To scour the given the cotton sample.
4. To bleach the given cotton sample by sodium hypo chlorite.
5. To full bleach a given cotton sample by hydrogen peroxide.
6. To bleach the cotton fabric with bleaching powder.

7. To scour given sample of wool.
8. To bleach the given wool sample by hydrogen peroxide.
9. To bleach the given wool sample by sodium hypo chlorite.
10. To bleach the given silk sample by hydrogen peroxide.

INSTRUCTIONAL STRATEGY

The Students should be taken to textile dying industry to show them various post dying processes and its machinery so that the students can know various dying processes being used by textile industry.

RECOMMENDED BOOKS

1. Technology of Bleaching - VA Shenai.
2. Scouring and Bleaching - ER Trotman.
3. Technology of Dyeing - VA Shenai.
4. Chemical Tech of Fibrous Material - ER Trotman.
5. Chemistry of Dyes and Principal of Dyeing - V.A. Shenai.
6. Art of Dyeing – B S Chauhan.
7. The Dyeing of Textile Materials – Puente Cegarra.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	04	08
2	25	60
3	04	05
4	04	08
5	03	04
6	04	10
7	04	05
Total	**48**	**100**

3.3 WEAVING PREPARATION

L	T	P
3	-	4

RATIONALE

The students of textile design have the knowledge of preparatory processes for proper weaving. The yarn is passed from various processes for the better quality of the fabric. Hence this subject, to make the students capable of understanding the complicated processes.

DETAILED CONTENTS

1. Winding- warp winding, objective of winding, yarn faults, yarn packages, package faults and their remedies, objects of yarn clearers and yarn tensioners. Introduction to auto-cover (16 hrs)

2. Warping- Objectives of warping, types of warping – beam warping, sectional warping. Difference between direct warping and indirect warping. Types of creels. (08 hrs)

3. Sizing- Objectives of sizing and passage of warp sheet through slasher sizing machine. Size recipe and ingredients for 100% cotton. (10 hrs)

4. Drawing in- objectives, denting, beam gaiting. (4 hrs)

5. Weft Winding/pirn winding- objectives of weft winding, passage of a yarn through prin winding machine. (6 hrs)

6. Yarn numbering, direct and indirect yarn numbering systems (4 hrs)

LIST OF PRACTICALS

1. To find English count of a given yarn and conversion of English count into tex and denier
2. To study passage of material through a winding machine
3. Demonstration of beam warping machine and preparation of warp beam
4. Demonstration of sectional warping
5. Preparation of pirn on pirn winding machine
6. Practice of drafting and denting

INSTRUCTIONAL STRATEGY

The students may be able to understand and do practice on winding, warping and pirn winding machine.

RECOMMENDED BOOKS

1. Weaving Mechanism Vol. I and II by NN Banerjee.
2. Winding and Warping by BTRA.
3. Warp Sizing by JB Smith.
4. Principle of Weaving by Marks and Robinsons.
5. Yarn Preparation Vol. I and II by R Sen Gupta.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	16	36
2	08	16
3	10	20
4	04	08
5	06	12
6	04	08
Total	**48**	**100**

3.4 FABRIC MANUFACTURE-I

L	T	P
3	-	4

RATIONALE

The diploma holders in textile design are supposed to have knowledge and skills related to various looms and manufacturing of fabric. Thus in this subject, student will learn manufacturing techniques and mechanism employed to produce fabric.

DETAILED CONTENT

1. Introduction and classification of loom. Passage of material through conventional non- automatic loom. Explaination of their parts. (6 hrs)

2. Objectives of loom and various motions(primary, secondary and auxiliary motions) of loom. (7 hrs)

3. Tappet shedding, negative tappet shedding, positive tappet shedding, heald reversing motion(roller reversing motions, spring reversing motion). Limitation of the tappet shedding. (5 hrs)

4. Picking motions, overpick, side lever underpick mechanism (6 hrs)

5. Beat up mechanism (crank beat up). Loom timing (3 hrs)

6. Let off mechanism – objectives of positive and negative let off motions and their working (4 hrs)

7. Take up motions intermittent and continuous take up motions. 5- wheel and 7-wheel take up motions (5 hrs)

8. Warp stop motions- electrical and mechanical warp stop motions (4 hrs)

9. Warp protecting motions- objectives, loose reed and fast reed warp protecting motions. (5 hrs)

10. Weft stop motions- objectives, principle and working of side weft fork motion. (3 hrs)

LIST OF PRACTICALS

1. To study the passage of yarn through the non automatic conventional loom.

2. To study the working of the tappet shedding and heald reversing motions.

3. To study the working of overpick motion.

4. To study the working of underpick motions.

5. To study the working of beat up motions.

6. To study the negative let off motions and its working principle.

7. To study working of 5- wheel take up and 7 – wheel take up motions.

8. To study the principle and working of mechanical warp stop motion.

9. To study the principle and working of loose reed and fast reed warp protecting motion.

10. To study the principle and working of side weft fork motion.

11. To calculate the speed, production and efficiency of loom.

INSTRUCTIONAL STRATEGY

The students should be given practice on various looms and motions so that they can integrate theory with practice.

RECOMMENDED BOOKS

1. Weaving Mechanism Vol.I, by NN Benerjee.
2. Mechanism of weaving TW Fox.
3. Principles of weaving by Marks and Robinsons.
4. Weaving – Machines, Mechanics, Management by Talukdar.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	12
2	07	14
3	05	10
4	06	12
5	03	08
6	04	08
7	05	12
8	04	08
9	05	12
10	03	04
Total	**48**	**100**

3.5 STRUCTURAL FABRIC DESIGN-III

L T P
3 - 4

RATIONALE

The students of textile design are supposed to have knowledge and skill regarding various advanced weaves and their construction. Hence, in this subject, students will learn different weaves, their method of employment to acquire competency for production of woven designs for different end uses.

DETAILED CONTENTS

1. Double cloth- self stitched double cloth, reversible self stitched double cloths, selection of suitable stitching position, wadded double cloths. Center stitched double cloths-center warp stitching, center weft stitching. Introduction of the tubular fabric and treble cloths and fabric opening to double width (21 hrs)

2. Gauze and Leno Structures- Principle of leno structure, bottom and top douping, basic sheds of leno weaving. Comparison of gauze with leno. Russian cord (14 hrs)

3. Damasks and brocades - A simple design (5 hrs)

4. Weft pile Fabrics- construction of velveteen, weft plushes and corded velveteen (8 hrs)

LIST OF PRACTICALS

1. Analysis of fabrics
   - Objects and methods of analyzing fabric
   - Particulars to be analyzed
   - Identifying warp and weft in the fabric

2. Analysis of following fabrics.
   - Gents Shirting (Cotton)
     - Stripes on loom
     - Small geometrical motifs on dobby loom
   - Gents Suitings
     - Trouser length with colour effect in plain weave in cotton
     - Tweed material for jackets in wool
   - Ladies dress material
   - Pile Fabrics

3. Making of damask and brocade designs on graph paper.

INSTRUCTIONAL STRATEGY

Student should be able to understand different weaves from fabric samples and by weaving. They must be taken to Textile Industries for showing above mentioned various processes. Visit to various state emporiums, trade fair/tex styles etc. for better understanding through demonstration.

RECOMMENDED BOOKS

1. Grammer of Textile Design – Nisbet

2. Structural Fabric Design by – Kilby

3. Woven Structures and Design – Doris Goerner; British Textile Technology Group WIRA House, Leeds UK

4. Fibre to Fabric by Ghosh

5. Watson's Advance Textile Design and Colour

6. Watson's Textile Design and Colour

7. Knitting Technology – Spencer

8. Warp Knit Fabric Construction by Charis Wildens U. Wilkens Verlog Germany

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	21	44
2	14	30
3	05	10
4	08	16
Total	**48**	**100**

3.6 BASICS OF INFORMATION TECHNOLOGY

L	T	P
-	-	4

RATIONALE

Information technology has great influence on all aspects of our life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools of MS Office/Open Office and internet form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Note:

Explanation of Introductory part should be dovetailed with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Information Technology – its concept and scope, applications of IT, ethics and future with information technology
2. Impact of computer and IT in society.-- Computer application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, air and railway ticket reservation, robotics, military, banks, Insurance financial transactions and many more
3. Generations of computer, block diagram of a computer, CPU, memory, data – numeric data, alpha numeric data, processing of data.
4. Computers for information storage, information seeking, information processing and information transmission, computer organization, computer hardware and software; primary and secondary memory: RAM, ROM, PROM etc. Input devices; keyboard, mouse, scanner, etc ; output devices ; VDU and Printer(Impact and non-Impact printers), Plotter etc. Primary and Secondary Storage (Auxiliary Storage), Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CD-RW and DVD Memory)
5. Introduction to Operating Systems such as MS-DOS and Windows, difference between DOS and Windows
6. Basics of Networking – LAN, MAN,WAN

LIST OF PRACTICALS

1. Identify and list functions of various components and peripherals of given computer.
2. Installation of operating system viz. * Windows XP, *Windows 2007 etc.
3. Installing a computer system by giving connection and loading the system software and application software and various sources to install software
4. Exercises on entering text and data (Typing Practice)
5. Features of Windows as an operating system:
   a) Start , shutdown and restore
   b) Creating and operating on the icons
   c) Opening, closing and resizing the windows
   d) Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file , creating and operating on a folder
   e) Introduction to all properties such as changing settings like, date, time, calculator, colour (back ground and fore ground)
   f) Using short cuts
6. Word Processing (MS Office/Open Office)

   a) File Management:

      Opening, creating and saving a document, locating files, copying contents in some different file(s)

   b) Editing a document:

      - Entering text, cut, copy, paste using toolbars
      - Use of spell check
      - PDF file and its conversion in different file formats (MS Word/Excel etc.)
      - Scanning, editing and printing of a document

   c) Formatting a document:

      - Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
      - Aligning of text in a document, justification of document ,Inserting bullets and numbering

- Formatting paragraph, inserting page breaks and column breaks, line spacing
- Use of headers, footers, inserting footnote, end note, use of comments
- Inserting date, time, special symbols, importing graphic images, drawing tools

d) Tables and Borders:

- Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
- How to change docx file to doc file
- Print preview, zoom, page set up, printing options
- Using Find, Replace options

7. Spread Sheet Processing (MS Office/Open Office)

a) Starting Excel

open worksheet, enter, edit data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets

b) Menu commands:

Create, format charts, organize, manage data, solving problem by analyzing data, creating graphs

c) Work books:

- Managing workbooks (create, open, close, save, rename), working in work books
- Editing a worksheet: copying, moving cells, pasting, inserting, deleting cells, rows, columns, find and replace text, numbers of cells, formatting worksheet

d) Creating a chart:

- Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
- Using a list to organize data, sorting and filtering data in list

e) Formulas:

Addition, subtraction, division, multiplication, percentage and auto sum

8. Power Point Presentation (MS Office/Open Office)

a) Introduction to PowerPoint
   - How to start PowerPoint
   - Working environment: concept of toolbars, slide layout, templates etc.
   - Opening a new/existing presentation
   - Different views for viewing slides in a presentation: normal, slide sorter etc.

b) Addition, deletion and saving of slides

c) Insertion of multimedia elements
   - Adding text boxes, importing pictures, tables and charts etc.

d) Formatting slides
   - Text formatting, changing slide layout, changing slide colour scheme
   - Changing background, Applying design template

e) How to view the slide show?
   - Viewing the presentation using slide navigator, Slide transition
   - Animation effects etc.

9. Antivirus

a) What is virus and its types

b) Problems due to virus

c) Installation and updation of antivirus (anyone out of Kaspersky, Mcafee, Norton, Quickheal etc).

d) How to scan and remove the virus

10. Internet and its Applications

a) Log-in to internet, introduction to search engine

Browsing and down loading of information from internet

b) Creating e-Mail Account
   - Log in to e-mail account and Log out from e-mail account

c) Managing e-Mail

- Creating a message
- Sending, receiving and forwarding a message
- Attaching a file
- Deleting a message

INSTRUCTIONAL STRATEGY

Since this subject is practical oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals etc. and proficient in making use of MS Office/Open Office in addition to working on internet. The student should be made capable of working on computers independently. This subject should be taught with the help of LCD projector, (while teaching a group) using PowerPoint presentation slides.

RECOMMENDED BOOKS

1. Fundamentals of Computer by E Balagurusamy,Tata McGraw Hill Education Pvt. Ltd, New Delhi
2. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
3. Fundamentals of Computer by Sumita Arora by Dhanpat Rai and Co , New Delhi
4. Computers Today by SK Basandara, Galgotia Publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. Information Technology for Management by Henery Lucas; Tata McGraw Hill Education Pvt Ltd , New Delhi
10. MS Office by BPB Publications, New Delhi

4.1 DYEING TECHNOLOGY –I

L T P
2 - 4

RATIONALE

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

DETAILED CONTENTS

1. General terminologies and definitions used in technology of dyeing. (2 hrs)
2. The principle, properties and methodology of application of direct dyes. (4 hrs)
3. The principle, properties and methodology of application of Azoic dyes (4 hrs)
4. The principle, properties and methodology of application of Reactive dyes (4 hrs)
5. The principle, properties and methodology of application of Vat dyes. (4 hrs)
6. Properties, mechanism and methodology of application of solublized vat dyes. (4 hrs)
7. Properties, mechanism and methodology of application of Sulphur Dyes. (4 hrs)
8. Properties, mechanism and methodology of application of Acid dyes. (2 hrs)
9. Optical/fluorescent brightening agents- method of application and importance. (2 hrs)
10. Water – Hardness of water, type, methods of removal. Impotance of soft water in dying (2 hrs)

LIST OF PRACTICALS

1. Dyeing of the cotton sample with direct dyes.
2. To study the after treatment effect of direct dyed material using a cationic dye fixing agent and compare its washing and rubbing fastness with original sample.
3. Dyeing of wool with direct dye.
4. Dyeing of silk with direct dye.

5. Dyeing of cotton material with cold brand reactive dyes.

6. Dyeing of cotton material with vat dye.

7. Dyeing of cotton material with soluble vat dye.

8. Dyeing of cotton with sulphur dye.

INSTRUCTIONAL STRATEGY

The students should be taken to textile dyeing industry to show them various dyeing processes of dyeing and its machinery so that the 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 – B S Chauhan.

5. The Dyeing of Textile Materials – Puente Cegarra.

6. Dyeing and chemical Technology of Textile Fibres- E R Trotman

7. Textile Fiber to Fabric – Bernard P. Corbman

SUGGESTED DISTRIBUTION OF MARKS

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

4.2 FABRIC MANUFACTURE - II

L	T	P
3	-	4

RATIONALE

The diploma holders in textile design are supposed to have knowledge and skills related to various looms and manufacturing of fabric. Thus in this subject, student will learn manufacturing techniques and mechanism employed to produce fabric.

DETAILED CONTENTS

1. Introduction to multiple box motion, its objects, classification of multiple box motion, mechanism and working principle of cow burn/Eccles's box motion. Chain making for 4x4 box motion. Definition of pick-at-will motion, pick-and-pick-loom. (16 hrs)

2. Dobby Shedding- Single lift, double lift dobby, construction and working of climax dobby and paper dobby shedding devices. (12 hrs)

3. Jacquard shedding- Principle and working of following jacquards (14 hrs)
   - Single lift single cylinder jacquard
   - Double lift single cylinder jacquard
   - Double lift double cylinder jacquard
   - Inverted hook jacquard
   - Cross-boarder jacquard
   - Leno jacquard

4. Principle of harness building, harness ties, card cutting. (6 hrs)

LIST OF PRACTICALS

1. To study the principle and working of 4x1 drop box motion.
2. To make a pattern chain for a particular weft pattern for the Eccle's drop box motion.
3. To study the principle and working automatic pirn change mechanism along with weft feelers.
4. To study the principle and working of the single lift dobby.
5. To study the principle and working of the double lift dobby(climax dobby)
6. To study the principle and working of the single lift single cylinder jacquard.
7. To study the harness building for a particular repeat size on jacquard.
8. To study card cutting for a particular design for jacquard.

INSTRUCTIONAL STRATEGY

Student may be asked to do all the work on handloom or power loom machines to develop the knowledge and skill in fabric manufacturing.

RECOMMENDED BOOKS

1. Weaving mechanism Vo.I and Vol.II by N N Benerjee

2. Fancy weaving by KT Aswani

3. Principles of weaving by marks and Robinsons.

4. Mechanism of weaving by TW Fox.

5. Jacquard-EK Saral Vidya by S.S. Satsangi (Bilingual)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	16	40
2	12	30
3	14	20
4	06	10
Total	**48**	**100**

4.3 STRUCTURAL FABRIC DESIGN – IV

L	T	P
3	-	3

RATIONALE

The students of textile design are supposed to have knowledge and skill regarding various weaves and their construction. Hence, in this subject, students will learn different weaves, their method of employment to acquire competency for production of woven designs for different end uses.

DETAILED CONTENTS

1. Terry pile structures – principle of formation of three pick and four pick terry fabrics (6 hrs)

2. Ornamentation of terry fabrics (3 hrs)

3. Warp pile fabrics produced with the aid of wires-valvet, alternate pile ends of alternate wires (6 hrs)

4. Formation of warp pile fabrics on face to face principle (4 hrs)

5. Tapestry – introduction and definition only (3 hrs)

6. Harness and design calculations – sett of harness, casting-out in jacquards (5 hrs)

7. Construction of squared paper designs, process of drafting a sketch design, design from woven fabrics, development of figures (11 hrs)

8. Methods of composing jacquared designs, conditions to observe in designing figured fabrics (10 hrs)

PRACTICAL EXERCISES

1. Analysis of curtain cloth (Damsak, Brocade, Tapestry), terry pile, warp pile.

2. Preparation of paint paper jacquard designs from original printed designs. Applied design for damask, brocade, tapestry fabrics. Four woven jacquard designs to be produced by every group of four students separately.

INSTRUCTIONAL STRATEGY

Student should be able to understand different weaves from fabric samples or by weaving and should be taken for a visit to Museum for tapestry/carpets demonstration.

RECOMMENDED BOOKS

1. Watson’s Textile Design and Colour
2. Watson’s Advanced Textile Design
3. Grammar of Textile Design by Nisbet
4. Structural Fabric Design by Kilby.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	14
2	03	06
3	06	14
4	04	08
5	03	06
6	05	10
7	11	22
8	10	20
Total	**48**	**100**

4.4 PRINTING TECHNOLOGY

L T P
3 - 4

RATIONALE

A diploma holder in textile design must have enough knowledge about principles and practices employed for printing. He must be aware of various operation, materials, equipments and processes used for printing.

DETAILED CONTENTS

1. Introduction to printing and its historical background. (2 hrs)

2. Composition of printing paste, printing ingredients, their function and importance. (5 hrs)

3. Styles of printing (12 hrs)

   a) Direct style- Introduction and definition.
   b) Discharge style- Introduction and definition, methods of white and coloured discharge printing on direct, reactive and vat dyed grounds
   c) Resist style - Introduction and definition

4. Methods of Printing- Brief introduction of block printing, screen printing, roller printing, non conventional printing and their advantages and limitations. (9 hrs)

5. After treatment of printed material (5 hrs)

   - Drying
   - Steam ageing/curing
   - Washing off

6. Developments in printing methods- (10 hrs)

   - Automatic flat bed screen printing machine, advantages and limitations of flat bed screen printing.
   - Rotary screen printing – Introduction, working of swivel , magnetic and other squeeze systems , comparison of rotary screen printing and roller printing method

7. Transfer printing (5 hrs)

   - Sublimation transfer printing
   - Melt and film release transfer printing
   - Wet transfer printing

LIST OF PRACTICALS

1. To prepare thickening paste by using different thickeners like C.M.C, sodium alginate and guar gum.
2. To make different designs of flower on cotton fabric using a film stencil.
3. To make different themes like geometric pattern on cotton fabric using a film stencil.
4. To make different designs of leaves on cotton fabric using a film stencil.
5. Printing of the cotton fabric by direct dyes using block printing method.
6. Printing of the cotton fabric by reactive dyes using block printing method.
7. Printing of the cotton fabric by direct dyes using screen printing method.
8. Printing of the cotton fabric by reactive dyes using screen printing method.
9. Printing of the cotton fabric by tie and dye technique in single and multi colour.
10. To print the cotton fabric by Batic printing in single and multi colour.
11. To print the silk fabric by tie and dye techniques in single and multi colour.
12. To demonstrate the working of a roller machine in a process/ print house.

INSTRUCTIONAL STRATEGY

The students should be taken to textile printing industry to show them various printing processes and machinery so that the students can know various printing processes being used by textile printing industry. Visit to Rajasthan state emporium, trade fair/tex styles and other printing houses will be add on advantage.

RECOMMENDED BOOKS

1. Technology of Printing by VA Shenai
2. Technology of Printing by Kalley
3. A glimpse of Chemical Technology of Fibrous Materials by RR Chakravorty
4. Dyeing and Printing by Varke
5. Dyeing and Printing by Jyoce storey
6. Introduction to Textile Printing by Clark
7. Screen Printing Designs and Technique by Biegelesien and Cohn
8. Manual of Textile Printing by Story
9. Technology of Textile Printing – R S Prayag

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	02
2	05	10
3	12	24
4	09	20
5	05	12
6	10	20
7	05	12
Total	**48**	**100**

4.5 TESTING AND QUALITY CONTROL-I

L T P
3 - 3

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. Textile testing - its aim and scope. Concept of quality control and its importance. (3 hrs)

2. Importance of fixing standards. (2 hrs)

3. Need of sampling, Sampling techniques. Random and biased samples. Precautions during fabric sampling (3 hrs)

4. Methods of yarn numbering, direct, indirect and universal systems, simple numerical problems based on yarn numbering system and conversion from one system to another. Calculation of resultant count. (8 hrs)

5. Importance of Moisture relation and its influence on fibre properties. Definition of humidity, absolute humidity, relative humidity, moisture content and moisture regain. (5 hrs)

6. Trash content in cotton fibre and its measurement with the help of Shirley trash analyzer. (5 hrs)

7. Fibre maturity and its importance, measurement with the help of caustic soda swelling method. (6 hrs)

8. Measurement of fibre length with the help of Baer sorter and its analysis. (4 hrs)

9. Importance of fibre fineness and its measurement with the help of airflow method (Sheffield Micronaire). (6 hrs)

10. Yarn twist and its measurement, direction of twists. Function of twist in yarn structure. Effect of twist on yarn Properties. Use of twist multiplier. Measurement of twist in single and ply yarns (straighten fibre method, twist de twist method) (6 hrs)

LIST OF PRACTICALS

1. Measurement of English count with the help of wrap reel method.
2. Measurement of hank of given card sliver and roving.
3. Measurement of RH with the help of wet and dry bulb hygrometer.
4. Measurement of moisture content, moisture regain of cotton with the help of conditioning oven.
5. Determination of fibre maturity with the help of caustic soda method.
6. Determination of staple length, effective length, mean length and short fibre percentage with the help of Baer sorter
7. Measurement of yarn twist with the help of twist contraction method.
8. Measurement of yarn twist with the help of twist tester.
9. To find out the diameter of the given yarn.

INSTRUCTIONAL STRATEGY

Student must be taken to textile industries/Mills for practice and study of inspection and quality control operations so that the students are aware of the industry practices.

RECOMMENDED BOOKS

1. Textile Testing by JE Booth
2. Textile Testing by Grover and Hamley
3. Textile Testing by John H.Skinkle; DB Taraporewala and Sons, Bombay

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	06
2	02	06
3	03	06
4	08	16
5	05	10
6	05	10
7	06	12
8	04	08
9	06	14
10	06	12
Total	**48**	**100**

4.6 CAD IN TEXTILE DESIGN - I

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RATIONALE

The term CAD has found its way into all major discipline that has 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

PRACTICAL EXERCISES

1. Introduction to latest corel draw and Photoshop softwares
2. Use of various tools in corel draw and Photoshop.
3. Formation of designs using different tools and application of design on graph paper.
4. Application and selection of suitable colours for a particular design.
5. Scan a design with the help of Photoshop
6. Change of colour scheme of the design.
7. Enlargement and reduction of design

NOTE:

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

RECOMMENDED BOOKS

1. SAMS Corel Draw-II
2. SAMS Adobe Photoshop-I

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. Students may be encouraged to read papers or give seminar during the camp on Entrepreneurship Development related topics.

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

INDUSTRIAL TRAINING OF STUDENTS

(during summer vacation after IV Semester)

It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training of a minimum of one month duration to be organised during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization.

Equally important with the guidance is supervision of students training in the industry/organization by the teachers. A minimum of one visit per week by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An internal assessment of 50 and external assessment of 50 marks have been provided in the study and evaluation scheme of V Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behaviour, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from industry.

Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.