

5.1 TECHNOLOGY OF DYEING - III

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3 - 4

RATIONALE

A diploma holder in textile processing must have sufficient knowledge and skills about principles of dyeing, operations, materials, equipment and process. He should be able to execute various recipes for dyeing. Hence this subject.

DETAILED CONTENT

1. Detailed Discussion on the following types of dyeing machines used for dyeing of textiles with their principles , operational procedures and neat line diagrams:
(20 hrs)
 - (a) Fibre dyeing: Hand dyeing machine, long close loose cotton dyeing machine, continuous dyeing of loose cotton
 - (b) Yarn Dyeing: Hank dyeing,.Cone dyeing : Cheese dyeing machine.Warp dyeing : beam dyeing machine, chain warp dyeing machine
 - (c) Fabric dyeing: Jigger, padding mangle, winch, HT/HP Beam dyeing m/c, Jet dyeing m/c, soft overflow dyeing m/c , semicontinuous and continuous dyeing machines.
2. Concept of blending and its advantages.Detailed study of dyeing of following types of blends by different suitable combination of dyes. (10 hrs)

Polyester/cotton(P/C), polyester/viscose(P/V), polyester/wool(P/W), polyester/cotton(or viscose)/ wool(P/C/W or P/V/W), cotton/wool, acrylic/ wool, acrylic/cotton, acrylic/nylon
- 3.. Concept of natural dyes and its importance.Introduction to different natural dyes, their sources , method of extraction and procedures of their application on different textile fibres. (6 hrs)
4. Major problem/defects encountered in dyeing of synthetics and its blends with other fibres and their remedies. (6 hrs)
5. Latest Developments in textile dyeing (machines/chemicals/procedures etc.). (3 hrs)
6. Computer colour matching concepts. (3 hrs)

LIST OF PRACTICALS

1. Dyeing of cotton with natural dyes (three dyes).
2. Dyeing of wool with natural dyes (three dyes)
3. Dyeing of Cot/wool blend.
4. Dyeing of Terry/wool blend (three dyes).
5. Dyeing of Terry/cotton blend (three dyes).
6. Dyeing of Terry/viscose blend (three dyes).
7. Dyeing of Acrylic/wool blend (three dyes).
8. Industrial visit for demonstration of dyeing of blends.

INSTRUCTIONAL STRATEGY

Teacher is expected to cover the topics keeping in view the industrial approach. They should be taken for industry visit to demonstrate various processes.

RECOMMENDED BOOKS

1. Technology of Dyeing by V.A Shenai; Sevak Publishers, Mumbai.
2. Dyeing and Chemical Technology of Fibrous Material by E.R Trotman; B.I. Production, New Delhi.
3. A Text Book of Dyes by Arora.
4. Dyeing and Synthetic fabrics by R.S Paryag.
5. Printing and Dyeing of fabrics by James.
6. Dyes and Dyeing by Charlese Pellow; Abhishek Publishers, Chandigarh.

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	Time Allotted (hrs)	Marks Allocation (%)
1	20	40
2	10	20
3	06	12
4	06	12
5	03	08
6	03	08
Total	48	100

5.2 TECHNOLOGY OF PRINTING - III

L T P
3 - 4

RATIONALE

A diploma holder in Textile Processing must have thorough knowledge about principles and practices employed for printing. He must be aware of various operations, materials equipments & Processes used for printing. Hence this subject.

DETAILED CONTENTS

1. Automatic Flat Bed, Screen Printing: (4 hrs)
Study of Buser, & Zimmer Automatic flat bed screen printing machines in respect Of their working principle, operational procedures and other salient features, Advantages & limitations of flat bed screen printing.
2. Rotary Screen Printing (10hrs)
Introduction and Principle of Rotary Screen Printing .Working of different squeeze systems used in Rotary Screen printing machines .Advantages of magnetic squeeze systems.Comparison of rotary screenprinting & Roller Printing Method. Brief discussion of different methods of making of Rotary Screens
(i) Emulsion Laquer Screen (ii) Laser Engraving (iii) Galvano Screen
Advantages & Limitations of Rotary screen printing
3. Printing of Woolen and Silk Materials (7 hrs)
- Preparation of woolen and silk material for printing
- Printing of woolen and silk fabric with different classes of dyes Printing of cotton/wool blends.. Printing of slivers.White & coloured discharge printing of silk.White & coloured resist printing of silk materials
4. Preparation & printing of Cellulose Acetate/Triacetate (2 hrs)
Preparation & printing of Cellulose Acetate & triacetate Rayon with Disperse Dye stuffs.
5. Preparation & printing of polyamide fibre, fabric & Blends (3 hrs)
Preparation & printing of polyamide fibre fabrics with Acid & Metal complex dyes, Reactive dye & disperse dyes. Printing of cellulose triacetate/polyamide blend with Acid & Metal complex dyes & cationic dyes.

6. Printing of polyester fabrics (4 hrs)
Preparation & printing of polyester fabrics with disperse dye stuffs by direct style & discharge style
7. Preparation & Printing of Polyester/cotton (PC), Polyester/viscous (P/V) Blended fabrics (6hrs)
- Printing with single class of colour
 - Pigment printing
 - Processes using two classes of colourants
 - Disperse/Reactive
 - Disperse/vat
 - Disperse/Solublised vat
8. Printing of Acrylic fibre and fabrics (6hrs)
- Preparation of Acrylic fibre fabric
 - Printing of Acrylic fibre, fabrics with cationic dyes & disperse dyes
 - Printing of Acrylic/cotton, Acrylic/nylon acrylic/polyester & acrylic wool blends with suitable dyes.
9. Yarn & Carpet Printing (4 hrs)
Brief description of Yarn & Carpet Printing
10. Advance ments in textile printing; (2 hrs)
Concept of Digital Printing, and its applications.

LIST OF PRACTICALS

1. Printing of polyester fabric with disperse dyes by thermo fixation methods
2. Printing of polyester fabric with disperse dyes by carrier method.
3. Printing of polyester fabric with pigment colour
4. Printing of silk fabric with acid dyes
5. Printing of woolen fabric with acid dyes
6. Printing of silk/woolen fabric with reactive dyes.
7. To study the effect of hygroscopic agent in printing.
8. Demonstration of flat bed Printing machine in a process house/prinhouse.
9. To print a polyester/cotton blended fabric with suitable class of dyes.
10. To print a woolen yarn to produce a multi colored yarn..

INSTRUCTIONAL STRATEGY

Topics should be covered keeping in view practical/industrial approach Mill visits may be arranged to show them various aspects of printing.

RECOMMENDED BOOKS

- 1 Technology of Printing by Dr. V.A. Shanai Sewak; Publication, Mumbai
- 2 Textile Printing by I.W.C. Miles
- 3 Textile Printing by Joyce Stoey; Thames & Hudson Ltd., London
- 4 The creative guide to fabric Screen Printing by Pam and Stall ebras; New Holland Publishers Ltd., London
- 5 The Principles and Practical of Textile Printing by D.Knecht, E Faturgill J.B.London
- 6 The Principles and Practicle of Textile Printing by Knecht, E and Fothergill; J.B. London
- 7 A guide to Printing Techniques by Bast; Japan

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	Time Allotted (hrs)	Marks Allocation (%)
1	4	8
2	10	20
3	7	16
4	2	6
5	3	6
6	4	8
7	6	12
8	6	12
9	4	8
10	2	4
Total	48	100

5.3 COMPUTER COLOUR MATCHING

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RATIONALE

A diploma holder in textile processing must have necessary knowledge & skills regarding colour theory, computer aided colour matching for textiles, colour analysis hardware and software in various colour systems. Hence this subject. The emphasis should be made on development of skills of computer colour matching system through practice.

DETAILED CONTENTS

LIST OF PRACTICALS

1. To study about the fundamentals of colour theory & colour mixing laws.
2. To study about concept of metamerism in textiles and matching of shade on colour matching cabinet
3. To study about the CIELAB system of specification of colour
4. To study about the colour matching instruments-spectrophometer and colorimeters used in textile industry.
5. Carrying out following on CCM system.
 - (i) Creation of a data file for a particular class of dye.
 - (ii) Strength analysis of dyes and interpretation of results.
 - (iii) Recipe formulation on different textile material with varying classes of dyes.
 - (iv) Reformulation of recipe
 - (v) Batch correction
 - (vi) Computation of colour difference between two pairs of dyed samples and interpretation of results with reference to grey scales.
 - (vii) Evaluation of shades in different systems within given tolerance limits and results (Pass/fail system)
 - (viii) Shade sorting according to 555 system.
 - (ix) Assessment of whiteness, yellowness and brightness indices and critical evaluation of results.

RECOMMENDED BOOKS

1. Computer colour Analysis –Textile applications by A.D. Sule; New age International Publishers, Delhi
2. Instrument Colour measurement & Computer Aided colour mathing for textiels- H.S Shah, R.S.Gandhi; Mahajan Book Distributors- Ahemadabad
3. Understanding Computer Colour Matching; N.S. Ganga Khedkar; Ritu Prakashan, Bombay, India
4. Principle of colour technology by Billmeyer F & Saltzman M.J. Wiley
5. Textile Colour Mixing by Peterson,; Abhishek Publication, Chandigarh

5.4 TECHNOLOGY OF FINISHING - II

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RATIONALE

A diploma holder in textile processing must have necessary knowledge & skills regarding principles & procedures used for finishing. For this, he should be acquainted with different types of processing machines used for finishing. In addition, relevant skills also need to be developed in him about operation of these machines.

DETAILED CONTENT

1. Special Finishes: Description, regarding Principle, Process, Chemicals. (8 hrs)
Methods of application of the following.
 - Special calendaring finishes
 - Water proof & water repellent finishes
 - Flame retarding & flame proof finishes
 - Soil release finishes and soil repellent finish
 - Anti bacterial & moth proof finishes.
 - Crease resistant/wrinkle resist finishes.

2. Stabilization finishes: Purpose, agents and applications of the following (10 hrs)
 - Mercerizing
 - Ammoniating
 - Shrinking
 - Chemical treatments/chlorination
 - Resin treatments
 - Stentering/Tentering – for dimensional stability
 - Fulling
 - Crabbing, potting
 - Decatising
 - Heat setting –Mechanism & Machines used.

3. Weightening of silk & Trubenising. (2 hrs)

4. Delustering of Rayons. (2 hrs)

5. Finishing of woolen fabrics: (4 hrs)
 - Acid & Alkaline milling of wool
 - Felting/non felting of wool
 - Permanent setting:-

- Decatising
 - London shrinking
 - Cylinder method
6. Description & working of rotary & paper press. (2 hrs)
 7. Finishing of synthetics: Heat setting, mechanism & process. (2 hrs)
 8. Anti static finish – agents & their applications. (2 hrs)
 9. Use of synthetic resins & rubber in finishing & their applications (2 hrs)
Thermoplastic resins
Thermosetting resins.
 10. Finishing routine – sequence of operations for long cloth, poplins, voiles, drills, organdie finish worsted woolens, woolen blankets, terry cot shirting/suiting, and terry wool. (6 hrs)
 11. Methods of evaluation of various finishes on textile materials. (2 hrs)
 12. Advancement in finishing (6 hrs)
 - Low wet pickup finishing
 - Foam finishing Technology
 - Kiss roll/luck roll Technology
 - Spraying techniques
 - Loop transfer technique

LIST OF PRACTICALS

1. To resin finish cotton fabric sample with resins in different concentrations.
2. To apply various chemical finishes in different kind of fabrics.
3. To draw the line diagram of different finishing machines.
4. Industrial visit to study the working of various finishing machines.

INSTRUCTIONAL STRATEGY

Teacher is required to explain the concept and its application keeping in view the practical/Industrial approach

RECOMMENDED BOOKS

1. Textile Finishing by V.A Shenai; Sewak Publisher.
2. Textile Finishing by J.T Marsh – B-I Publications, New Delhi.
3. Technology of Bleaching by V.A Shenai Sewak Publisher.

4. Textile Fibres & their use – Katharine Paddock HESS Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Textile Fibre to Fabric by Bernard P. Corbman; Mc Graw Hill International editions.
6. Textile Finishing by Murphy; Abhishek Publishers, Chandigarh.
7. Practical Cotton Finishing By Edge; Abhishek Publishers, Chandigarh.

SUGGESTED DISTRIBUTION OF MARKS

Sr. No	Time Allotted (hrs)	Marks Allocation (%)
1	8	18
2	10	20
3	2	4
4	2	4
5	4	8
6	2	4
7	2	4
8	2	4
9	2	4
10	6	12
11	2	4
12	6	14
Total	48	100

5.5 GARMENT PROCESSING - I

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RATIONALE

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

DETAILED CONTENTS

1. Aim and scope of garment field with special reference to Textile Processors. (2 hrs)
2. Study of various fabric materials used in Garment Manufacturing. (4 hrs)
3. Objective and brief overview of the following :- (3 hrs)
 - Fashion Designing
 - Fashion Illustration
 - Fashion forecasting, objective and consideration parameters for the forecast-colour, Texture, Climate, size, fabric quality.
4. Brief overview of different departments / activities related to Garment Manufacturing Technology (GMT) and Exports. (8 hrs)
5. Various accessories used in Garment construction - Brief Overview (2hrs)
6. Definition and concept of the following terms related to Garment Construction and quality check (4 hrs)
 - Proto Sample, Size Set, Trim Card, Lab Dipping , Scaled Sample, Comments, Fabric Sampling Deptt,
 - TNA
 - Spreading
 - Cutting
 - Ticketing
 - Cut Panel
7. Laundering : Objective, Laundering procedures for various fibre fabrics i.e. cotton and Linen, Woolen, Silks & Synthetics, various laundry equipments used in commercial laundries. (7 hrs)
8. Stain Removal : Object (with reference to garment processing), General procedure of stain removal. Classification of stains. Principles of stain removing.

- Classification of stain removers. Application techniques for stain removers; i) Local application ii) Bulk application (6 hrs)
9. Dry Cleaning : General introduction, objective and principle of the dry cleaning process, Dry cleaning chemicals, detailed description of dry cleaning operations (sequential steps) (6 hrs)
10. After care and Care Labelling of Garments : Objective of Care Labelling, Washing, Bleaching, drying, ironing, dry cleaning instructions and symbols used. Placement of labels on garments. After care of garments and storing (General steps taken to preserve the good appearance and protection against damage during storing). (6 hrs)

LIST OF PRACTICALS

1. To remove different types of stains from garments/fabrics.
2. To make a flow chart of the processes for garmenting.
3. To make a trim card for different types of garments.
4. To make a collection of different types of labels.
5. To Dry-clean a soiled woolen fabric

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.

REFERENCE 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 Apparel 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	2	6
2	4	8
3	3	6
4	8	16
5	2	8
6	4	8
7	7	14
8	6	12
9	6	12
10	6	12
Total	48	100

5.6 ENVIRONMENTAL EDUCATION

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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

5.7 EMPLOYABILITY SKILLS – I

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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

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