GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Textile Designing

Subject Code: DI04059011

Subject Name: Textile Chemical Process - II

w. e. f. Academic Year:	2025-26
Semester:	4th
Category of the Course:	PCC

Prerequisite:	Basic information about textile materials and its applications in designs, creative thinking and have a willingness to explore about colouration techniques for textiles including printing & finishing processes.
Rationale:	The textile designer should be aware of different chemical processes. Processing of the textiles is one of the important stages in designing textiles. Textile designers need to design & develop various textile products. This demands to have certain knowledge of chemical processing for textiles including colouration& finishing processes. Hence this course aims to gain basic knowledge & hands-on practice for various printing and finishing techniques.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Identify and analyze chemicals for printing paste formulation.	A, N
02	Select various printing methods & styles to imprint design on fabric.	U, A
03	Develop print on natural & manmade textiles using appropriate dyes.	U, A
04	Identify suitable finishing technique based on end-use requirements.	U, A

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE(E)	PA(M)	PA(I)	ESE(V)	
3	0	2	4	70	30	20	30	150

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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Fundamentals of printing** 1.1 Dyeing and Printing: Purpose and differentiation 1.2 Printing stages 1.3 Print paste: Ingredients and their functions 1.4 Thickeners: Classification, Advantages and limitations	9	20
2.	**Printing of Natural & Man Made Fabrics** 2.1 Printing of natural textiles using various dyes • Print paste formulation • Process sequence 2.2 Printing of synthetic textiles using various dyes • Print paste formulation • Process sequence 2.3 Pigment printing: • Principle, mechanism, print paste formulation • Process sequence of printing • Advantages and disadvantages	8	15
3.	**Methods of Textile Printing** 3.1 Definition of printing Methods 3.2 Classification of printing Methods 3.3 Methods of printing 3.4 Advantages and limitations of above methods. 3.5 Recently developed printing methods	10	25
4.	**Styles of Printing** 4.1 Definition of Printing Styles 4.2 Classification of Printing Styles 4.3 Styles of Printing 4.4 Recently developed printing styles	10	25
5.	**Fundamentals of basic Textiles Finishes** 5.1 Objects of textile finishing 5.2 Classification of textile finishing 5.3 Basic finishes 5.4 Recent trends in finishing of textiles	08	15
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	**40**	**30**	**10**	**-**	**-**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Textiles and Fashion Materials, Design and Technology	Rose Sinclair	WoodheadPublishing ltd. ISBN: 9780857095619, 0857095617
2	Technology of Printing Vol – IV	Dr. V. A. Shenai	Sevak Publication, Mumbai 1990
3	Textile Printing	L.W.C. Miles	Society of Dyers and Colourists, 1981, ISBN: 9780901956330
4	Introduction to Textile Printing	W. Clarke	Wood-head Publishing Ltd., Cambridge, ISBN: 9781855739949
5	Technology of Printing	R. S. Prayag	Shree J. Printers, Pune
6	Principles of Cotton Printing	D. G. Kale	Mahajan Brothers
7	Digital Printing of Textiles	Hitoshi Ujiie	Woodhead Publishing Ltd.
8	Textile finishing	R. S. Prayag	Shree J. Printers, Pune
9	HANDBOOK of Textile Fibers, Dyes & Finishes	Howard L. Needles	Garland STPM press (1980), ISBN-10 : 0824070461 ISBN-13 : 978-0824070465
10	Handbook of Textile Processing Machinery	R. S. Bhagwat	Colour Publication PVT. LTD., Mumbai ISBN - 8175250771, 9788175250772
11	Technology of Textile Finishing (Vol-X)	Dr. V. A. Shenai	Sevak Publications, Mumbai
12	An introduction to Textile Finishing	J. T. Marsh	B. I. Publication Pvt. Ltd.
13	Sustainable Fibres and Textiles	S. S. Mutthu	Elsevier Science ISBN: 9780081020425, 0081020422

(b) Open source software and website:

1. https://nptel.ac.in/courses/
2. https://ndl.iitkgp.ac.in
3. http://www.textileworld.com/
4. www.learningseed.com
5. http://www.teonline.com/knowledge-centre/
6. http://www.sitra.org.in
7. http://www.btraindia.com
8. www.nitratextile.org/
9. http://www.textileassociationindia.org/
10. http://www.nitma.org/
11. www.itamma.org/
12. http://www.ittaindia.org/
13. https://www.fibre2fashion.com/
14. www.zimmer-usa.com
15. http://en.wikipedia.org/wiki/Finishing_(textiles)
16. http://www.textileschool.com/articles/418/textile-fabric-finishing
17. http://textilefashionstudy.com
18. Textile Industry - Niir Project Consultancy Services

Suggested Course Practical List:

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Compare printing & dyeing processes for colouration of textiles.	I	02
2	Prepare a Thickening Paste for printing.	I	02
3	Print a design on a fabric using Block printing method.	I	02
4	Print a design on a fabric using Stencil printing method.	II	02
5	Prepare screen for screen printing.	II	02
6	Print a design on a fabric using Screen printing method.	II	02
7	Print a design on a fabric using Transfer printing method.	II	02
8	Print a design on a fabric using Spray printing method.	II	02
9	Create a design by printing on fabric using Resist print style.	III	02
10	Create a design by printing on fabric using Discharge print style.	III	02
11	Create a design by printing on fabric using Brasso / Crimp style.	III	02
12	Create a design by printing on fabric using Khadi / Flock print style.	III	02
13	Produce a Glitter print/ Foil print/ Metallic print/ Swarovski crystal print on garment.	III	02
14	Develop at least two samples of finished fabrics.	IV	04
	Total		**30**

List of Laboratory/Learning Resources Required:

S. No.	Equipment Name with Broad Specifications	PrO. No.
1	Electronic weighing balance	2 to 14
2	Glass-wares: Beaker, Pipette, Glass-rods, measuring cylinder, etc.	2 to 14
3	Different elements of printing i.e. Block, Stencil, Screens, Rubber Squeegee etc.	2 to 14
4	Printing table	2 to 14
5	Laboratory Stirrer (Motorized)	2 to 14
6	Lab Padding Mangle	2 to 14
7	Laboratory Oven	2 to 14
8	Electric iron, Hot blower	2 to 14
9	Laboratory steamer	2 to 14
10	Heating stove (Gas stoves, electric stoves and induction cook-tops)	2 to 14

Suggested Project List:

- **Classify colouration processes**: Collect samples of differently printed & finished fabrics and prepare analytical report based on the processes involved for manufacturing. (**Duration: 6-8 hours**)
- **Printing Machine study:** Prepare a report on various machines involved in preparatory processing. (**Duration: 8-10 hours**)
- **Finishing study:** Prepare a report on various finished effects resulted by various finishes. (**Duration: 8-10 hours**)

Suggested Activities for Students: If any

a) Prepare chart of different fabric printing methods & styles.
b) Explore library/internet for application/technologies being used for different fibers and dyes.
c) Visit to processing industry and preparing report with specifications.
d) Prepare line diagram of machineries for different processes.
e) Undertake micro-projects in teams.
f) Give seminar on any relevant topic.

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