GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: ELEMENTS OF TEXTILE PROCESSING
(Code:-3342906)

Diploma Program in which this course is offered	Semester in which offered
Textile Manufacturing Technology	4th Semester

1. RATIONALE

Processing of the textiles is one of the important processes in textile manufacturing. This gives the textile required finish, colour and print. The processing is a vast complex area in itself and hence there is a separate branch of engineering known as textile processing. This course provides only basic knowledge about textile wet processing including the chemical and mechanical technology involved in the wet processing of textiles. This course is therefore a key course for textile engineers.

2. LIST OF COMPETENCIES

The course content should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competency, pretreatment, dyeing, printing and finishing technology for different textiles.

- **Plan and supervise pretreatment, textile wet processing and finishing operations using machines.**

3. COURSE OUTCOMES (COs)

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Describe concepts of textile wet processing
ii. Explain pretreatment before wet processing for textiles
iii. Explain dyeing technology for textiles.
iv. Explain printing technology for textiles
v. Explain finishing technology for textiles

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
3	0	2	5	70	30	20	30	150

Legends: L-Lecture; **T** – Tutorial/Teacher Guided Student Activity; **P** - Practical; **C** – Credit; **ESE** - End Semester Examination; **PA** - Progressive Assessment.

5. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I **Introduction to Textile Wet Processing**	1a. Describe Objective & Importance of textile wet processing. 1a.1 List the Sequence of different mechanical & chemical processing operations 1b. Describe grey inspection 1c. Explain mechanical & chemical processing operations for wet processing.	1.1 Objective & Importance of textile wet processing 1.2 Sequence of different mechanical & chemical processing operations 1.3 Grey inspection
Unit– II **Pretreatment Technology**	2a. Describe Objective & importance of pretreatment. 2b. Describe stitching, brushing, shearing 2c. Describe scouring, bleaching, mercerization 2d. Explain various machines used for pretreatment	2.1 Objective & importance of pretreatment technology 2.2 Stitching, brushing & shearing 2.3 singeing & desizing 2.4 Scouring & bleaching 2.5 Mercerisation & optical whitening 2.6 Machineries used for various pretreatment technology
Unit– III **Dyeing Technology**	3a. Explain objective & importance of dyeing 3b. Describe dyes & its classification 3c. Explain dyeing of natural & synthetic fibres. 3d. Explain various machines used for Dyeing	3.1 Objective & importance of Dyeing technology 3.2 Dyes & its classification 3.3 Dyeing of natural fibres 3.4 Dyeing of synthetic fibres 3.5 Machineries used for Dyeing
Unit– IV **Printing Technology**	4a. Explain Objective & importance of printing 4b. Describe printing styles & printing methods 4c. Explain printing of natural & synthetic fibres. 4d. Explain various machines used for printing	4.1 Objective & importance of printing technology 4.2 Methods & Styles of textile printing 4.3 Printing of natural textiles 4.4 Printing of synthetic textiles 4.5 Machineries used for textile printing.
Unit – V **Finishing Technology**	5a. Describe Objective & importance of finishing 5b. Describe types of finishing 5c. Explain various finishing treatment for textiles 5d. Explain various machines used for finishing.	5.1 Objective & importance of finishing Technology 5.2 Types of finishing 5.3 Heat setting, Delustering, starch finish, calendaring, anti shrink, resin finish, soil release finish, crepe finish, softening 5.4Machineries used for various finishing

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	Introduction to Textile Wet Processing	04	2	4	2	08
2.	Pretreatment Technology	09	4	6	4	14
3.	Dyeing Technology	10	4	8	6	18
4.	Printing Technology	10	4	8	6	18
5.	Finishing Technology	09	2	6	4	12
	Total	**42**	**16**	**32**	**22**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

7. SUGGESTED LIST OF EXPERIMENTS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills **(outcomes in psychomotor and affective domain)** so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Note*: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of* ***Course Outcomes*** *related to affective domain. Thus over all development of* ***Programme Outcomes (****as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

S. No.	Unit No.	Experiment (Outcomes' in Psychomotor Domain)	Approx Hours Required
1	2	Carry out desizing of sized fabrics	02
2	2	Scour the various natural textiles	02
3	2	Scour the various synthetic textiles	02
4	2	Perform bleaching of various natural textiles	02
5	2	Perform bleaching of various synthetic textiles	02
6	2	Apply optical brightening agents various textiles	02
7	2	Apply direct dye on applicable textiles	02
8	2	Apply reactive dye on applicable textiles	02
9	2	Apply disperse dye on applicable textiles	02

10	2	Apply acid dye on applicable textiles	02
11	2	Print the natural textiles by different methods & styles	04
12	2	Print the synthetic textiles by different methods & styles	04
13	2	Carry out various finishes like:- Delustering, stiffening, resin finish, soil release, softening on various textiles	04
		Total	**32 Hours**

8. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the proposed list of student's activities such as:

i. Literature survey of various wet processing used in textiles.
ii. Collection and Study of various samples of different various wet processing.
iii. Group discussion on recent Innovation in wet processing.
iv. Seminar/Quiz/Presentation on recent developments in the field of wet processing.
v. Visit to nearby textile wet processing unit.

9. SPECIAL INSTRUCTIONAL STRATEGY

i. Sample book preparation
ii. Guest lecturers from industry experts for contemporary practices in industries
iii. Display of video/animation films and photographs related to different textile processes.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr. No.	Author	Title of Books	Publication
1.	Textile Association of India	Chemical processing of cotton & polyester/cotton blends	The Textile Association (INDIA), Ahmedabad unit
2	SSM ITT Komarapalayam	Textile Wet Processing	AAM IIT Komarapalayam - 638183
3	R. S. Prayag	Bleaching, Mercerising & Dyeing of cotton materials	Shree J. Printers, Pune
4.	R. S. Prayag	Dyeing of wool, silk & manmade fibres	Shree J. Printers, Pune
5	R. S. Prayag	Technology of printing	Shree J. Printers, Pune
6.	R. S. Prayag	Textile finishing	Shree J. Printers, Pune

B. List of Major Equipment/ Instrument

i.Water Heating Bath
ii.Padding Mangle
iii.Laboratory Oven/steamer
iv.Screen Printing Table & Screens, wooden blocks

C. List of Software/Learning Website

i.http://www.en.wikipedia.org/wiki/textile_processing
ii.http://textilefashionstudy.com
iii.http://textilelearner.blogspot.in
iv.http://www.niir.org

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. J N Shah**, Lecturer, Textile Processing Dept., R C Technical Institute, Ahmedabad.
- **Prof. R D Joshi**, Lecturer, Textile Processing Dept., R C Technical Institute, Ahmedabad.
- **Prof. C R Madhu**, Adhoc Lecturer, Textile Processing Dept., R C Technical Institute, Ahmedabad.
- **Prof. A S Shah**, Textile Processing Dept., Dr. S & S S Ghandhy College of Engg. & Tech., Surat

Coordinator and Faculty Member from NITTTR Bhopal

- **Dr. C. K. Chugh**, Professor, Department of Mechanical Engineering
- **Prof. S. K. Gupta,** Professor **&** Coordinator for State of Gujarat