

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

**COURSE TITLE: CHEMISTRY & EVALUATION OF TEXTILE AUXILIARIES
(COURSE CODE: 3352805)**

Diploma Program in which this course is offered	Semester in which offered
Textile Processing Technology	5 th Semester

1. RATIONALE

The polytechnic graduates are required to use textile auxiliaries in industry for pretreatment, dyeing, printing and finishing operations. The quality of processing and textile auxiliaries are very important to give desired finish. The basic knowledge of various textile auxiliaries and skills to evaluate these auxiliaries for various wet processing is of paramount importance for textile processors. This course on Chemistry & Evaluation of Textile Auxiliaries has been designed to provide basic knowledge and skills for evaluator methods of Textile Auxiliaries.

2. LIST OF COMPETENCY

The course content should be taught and implemented with the aim to develop required skills in students so that they are able to acquire following competency:

- **Evaluate various textile auxiliaries to use them for textile processing for quality production.**

3. COURSE OUTCOMES:

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.

- Explain functions, properties and applications of commercial and eco friendly textile auxiliaries.
- Test commercial textile auxiliaries using different evaluator methods
- Analyze problems of textile processing and provide sustainable solutions that meet needs of public health and safety, cultural, societal and environmental considerations.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
4	0	2	6	70	30	20	30	

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 Textile Auxiliaries in Wet Processing	1a.Explain textile auxiliaries 1b Classify textile auxiliaries	1.1 Definition of textile auxiliaries 1.2 Classification of textile auxiliaries 1.3 Advantages of textile auxiliaries
Unit– II Theory of Surface Active Agent	2a. Describe surface active theory & surface active agent 2b. Explain applications of surfactant of different types (Anionic, Cationic ,Non- ionic, amphoteric) 2c. Describe Biodegradability of surfactants	2.1 Definition & classification of surface active agents 2.2 Principles & theory of surface activity 2.3 Essential requirements of surfactant 2.4 Different types (Anionic, Cationic & Non- ionic, amphoteric) & applications of surfactants 2.5 Biodegradability of surfactants
Unit– III Application of Commercial Textile Auxiliaries	3a. Describe functions & properties of pretreatment, dyeing, printing and finishing auxiliaries i.e. commercial textile auxiliaries 3b.Describe applications of pretreatment, dyeing, printing and finishing auxiliaries i.e commercial textile auxiliaries	Commercial Textile auxiliaries 3.1 Functions of pretreatment, dyeing, printing and finishing auxiliaries 3.2 Properties of pretreatment, dyeing, printing and finishing auxiliaries 3.3 Applications of pretreatment, dyeing, printing and finishing auxiliaries
Unit– IV Evaluation of Textile Auxiliaries	4a.Explain evaluator methods for commercial textile auxiliaries 4b. Describe evaluation of Wetting agent, Detergency, Leveling agent, Cross – Linking agent , Optical brightening Agent , Water repellents , flame retarding agents , soil resistance & soil release agents, anti – static agents , anti – pilling agents	4.1 Evaluation of Wetting agent 4.2 Evaluation of Detergency 4.3 Evaluation of Leveling agent 4.4 Evaluation of Cross – linking agent 4.5 Evaluation of Optical brightening agent 4.6 Evaluation of Water repellents 4.7 Evaluation of flame retarding agents 4.8 Evaluation of soil resistance & soil release agents 4.9 Evaluation of anti – static agents 4.10 Evaluation of anti – pilling agents
Unit – V Role of Specialty Textile Chemicals	5a.Explain role of eco-friendly textile auxiliaries 5b.Describe role of specialty chemicals	5.1 Various Eco-friendly textile auxiliaries 5.2 Various specialty auxiliaries

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
1.	Textile Auxiliaries in Wet Processing	06	2	4	2	08
2.	Theory of Surface Active Agent	14	4	8	6	18
3.	Application of Commercial Textile Auxiliaries	18	6	8	6	20
4.	Evaluation of Textile Auxiliaries	10	4	8	6	18
5.	Role of Specialty Textile Chemicals	08	2	2	2	06
	Total	56	18	30	22	70

Legends: R = Remembrance; U= Understanding; A= Application 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.	Practical / Exercises (outcomes in psychomotor domain)	Hours
1	II	Determine cloud point of a non – ionic detergent	02
2	II	Determine solid content of textile auxiliaries	02
3	II	Determine ionic nature of surfactant	02
4	IV	Evaluate the efficiency of desizing agent	02
5	IV	Evaluate the efficiency of wetting agent	02
6	IV	Evaluate the efficiency of detergent	02
7	IV	Evaluate the efficiency of leveling agent	02
8	IV	Evaluate the efficiency of dye fixing agent	02
9	IV	Evaluate the efficiency of carriers (dyeing of Polyester)	02
10	IV	Evaluate the efficiency of exhausting agent (direct & reactive dye)	02
11	IV	Evaluate the efficiency of water repellents	02

12	IV	Evaluate the efficiency of softener	02
13	IV	Evaluate the efficiency of printing gums (colour aspects)	02
14	IV	Evaluate the efficiency of printing gums (Moisture content)	02
15	IV	Evaluate the efficiency of printing gums (pH)	02
16	IV	Evaluate the efficiency of printing gums (Ash content)	02
17	IV	Evaluate the efficiency of printing gums (Viscosity)	02
Total (Perform any practical for total 28 hours so that most units are covered)			34 Hours

8. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the proposed list of students activities like:

- Literature survey of Basic and innovative textile auxiliaries.
- Collection and Study of auxiliaries used in various textile wet processes
- Group discussion on recent development in specialty chemicals.
- Collection of data of various eco – friendly auxiliaries& Power point Presentation.
- Seminar/Quiz/Presentation on recent developments in the field of textile auxiliaries.
- Visit to various textile auxiliaries manufacturing industries to observe and report.

9. SPECIAL INSTRUCTIONAL STRATEGY (If Any)

- Industrial Demonstration for auxiliaries manufacturing & application as per unit III
- Visual demonstration of auxiliaries application in various wet processes
- Guest lecturers from industry experts for contemporary practices of industries.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr.No.	Author	Title of Books	Publication
1	Dr. V A Shenai	Chemistry of Textile Auxiliaries (Vol. – V)	Sevak Publication, Mumbai Latest Publications
2	A A Vaidya & S S Trivedi	Textile Auxiliaries & Finishing Chemicals	ATIRA, Ahmedabad Latest Publications
3	Dr. V A Shenai & R H Mehra	Evaluation of Textile Chemicals (Vol. – VIII)	Sevak Publication, Mumbai Latest Publications
4	C N Sivaramakrishnan	Anthology of Speciality Chemicals for Textiles	Colour Publications Pvt. Ltd., Mumbai, Latest Publications

B. List of Major Equipment/ Instrument

- Laboratory Oven/steamer
- Padding Mangle
- Screen Printing Table & Screens
- Crock meter
- Sublimation fastness tester
- Pilling tester

C. List of Software/Learning Websites

- www.texauxchemicals.com
- <http://books.google.co.in>
- <http://www.niir.org/books>

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. C R Madhu**, Adhoc Lecturer, Textile Processing Dept., R C Technical Institute, Ahmedabad.
- **Prof. R D Joshi**, Lecturer, Textile Processing Dept., R C Technical Institute, Ahmedabad.
- **Prof. R M Pandya**, Lecturer, Textile Processing Dept., Dr. S & S S Ghandhy College of Engg. & Tech.
- **Prof. D S Das**, Adhoc Lecturer, Textile Processing Dept., Dr. S & S S Ghandhy College of Engg. & Tech.

Cordinator and Faculty Members from NITTTR Bhopal

- **Prof. C.K Chugh**, Professor, Department of Mechanical Engineering
- **Prof Shashi Kant Gupta**, Coordinator for State of Gujarat.