GUJARAT TECHNOLOGICAL UNIVERSITY

TEXTILE PROCESSING (28)
SCOURING & BLEACHING – I
SUBJECT CODE: 2142808
B.E. SEMESTER IV

Type of course: Textile Processing Engineering

Prerequisite: Zeal to learn the subject

Rationale: This subject involves the primary preparatory processes for textile wet processing of cotton textiles. It includes the fundamental and basic knowhow required to acknowledge the course. The coloration of textiles is only possible after following preparatory processes involved in the subject.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		PA (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	3	7	70	20	10	20	10	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment; OEP-Open Ended problem; AL-Active learning;

Content:

Sr. No.	Course content	Total Hrs.	Weightage (%)
01.	General introduction and objectives of preparatory processes of cotton fabric. An overview on various types of impurities present in cotton fabric	3	6
02.	Preliminary inspection and mending of grey cotton fabric: lot number, sort number, spot cleaning, stitching, etc.	3	6
03.	Shearing and Cropping: Importance, process and machinery	2	4
04.	Singeing: Objective, methods, construction and working of different types of machines, advantages and disadvantages of these methods.	3	6
05.	Desizing: Objective, different methods of desizing, chemistry and process, merits and demerits these desizing methods.	5	9
06.	Scouring of white and coloured woven cotton goods: Technological routine, various ingredients, processes etc.	8	14
07.	Bleaching of cotton fabric: Techno-chemical aspects, methods, parameters, ecological aspects and merits and demerits of following bleaching agents: Chlorinated bleaching agents-Calcium hypochlorite, Sodium hypochlorite etc: Formation of oxycellulose, hydrocellulose, copper number, cupraammonium fluidity, etc.	10 8	18 14

	Peroxides- Hydrogen peroxide: Role and types of catalysts and stabilizers Peracetic acid	2	4
08.	Machineries for scouring and bleaching of cotton fabric: Batch-wise, semi-continuous and continuous	5	9
09.	Recent developments in processing methods and machineries for cotton preparatory processes	2	4
10.	Principle, classification, chemistry and applications of optical brightening agents	3	6

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
24	15	25	04	02

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate 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

Reference Books:

Sr. No.	Title	Author
1.	Technology of bleaching and mercerizing, Vol.III	V. A. Shenai
2.	Textile scouring and bleaching	E. R.Trotman
3.	Textile chemistry, Vol. II	R.H. Peters
4.	The chemical technology in the coloration of textiles, Vol. I	S. R. Karmakar

Course outcome:

After learning the content of the subject the students will be able to understand:

1. About the impurities present in the fabric coming for processing
2. The requirements of dry preparatory processes like Grey inspection, stitching, shearing & cropping, singeing, etc.
3. The requirements of wet preparatory processes like desizing, scouring, bleaching, optical brightening, etc.
4. Analysis and Comparison of different methods for the said preparatory processes from inventory, environment and industrial point of view
5. Adopting the best method suitable as per the requirement
6. Surveying the alternative approaches e.g. continuous scouring & bleaching using continuous range, etc
7. About various machineries available for such processes

List of Experiments:

1. To carry out Acid Desizing of given cotton fabric.
2. To carry out Enzymatic Desizing of given cotton fabric.
3. To carry out Oxidative Desizing of given cotton fabric.
4. To carry out scouring of given desized cotton fabric. (Open Bath)
5. To carry out scouring of given desized cotton fabric. (Kier Scouring)
6. To study the effect of concentration of sodium hydroxide on scouring of desized cotton fabric.
7. To study the effect of concentration of sodium silicate on scouring of desized cotton fabric.
8. To carry out bleaching of given scoured cotton fabric using sodium hypochlorite.
9. To carry out bleaching of given scoured cotton fabric using hydrogen peroxide.
10. To carry out full bleaching of given scoured cotton fabric.

11. To carry out optical brightening of given bleached fabric.

Design based Problems (DP)/Open Ended Problem:

- Optimization of caustic soda concentration in scouring of cotton fabric.
- To study the effect of Sodium hypo chlorite concentration on strength of material in hypochlorite bleaching of cotton textiles.
- To study the effect of enzymes available from various sources on desizing efficiency.
- To determine the pH profile of various enzymes.
- To develop silicate free stabilizer for peroxide bleaching.

Major Equipments:
Water heating bath, kier, padding mangle, etc.

List of Open Source Software/learning website:

1. http://www.wto.org/
2. http://www.wtin.com/
3. http://textileinformation.blogspot.in/
4. http://www.fibre2fashion.com/
5. http://textilelearner.blogspot.in/
6. http://www.fashion-era.com/

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.