GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: TEXTILE PROCESSING
SUBJECT NAME: ADVANCED TEXTILE PROCESSING MACHINERIES
(DEPARTMENTAL ELECTIVE - III)
SUBJECT CODE: 2182805
B.E. 8th SEMESTER

Type of course: Textile Processing Engineering

Prerequisite: Zeal to learn the subject

Rationale: This subject gives idea of actual working and principles of various machineries used in textile wet processing. Accordingly it also teaches students the advanced modifications occurred in the same machineries with their advantages and disadvantages. It is very useful from industrial point of view.

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		
3	0	2	5	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.	Content	Total Hrs.	Weightage (%)
1	Fundamental Principle of Working of Textile Processing Machineries.	08	14
2	Brief Introduction to Working of Conventional Processing Machineries.	06	10
3	Advances in Preparatory Processing Machineries such as Jiggers, Continuous Bleaching Range, Mercerization Machine, Washing Machines, W.R Machine, etc.	10	18.5
4	Advances in Dyeing Machineries such as Dyeing Jiggers, Winch, Jet Dyeing M/C, Beam Dyeing M/C, CDR, etc.	11	19
5	Advances in Printing Machineries such as Screen Printing M/C, Digital Printing M/C, Agers, etc.	10	18
6	Advances in Finishing Machineries such as Dryers, Stenters, Sanforizing M/C, Decatising M/C, Calendaring, Emerizing, Raising, Milling Machineries, etc.	11	19.5

Suggested specification table with marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
14	20	22	3	3	8

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

1. Hand Book of Textile Processing Machinery – R. S. Bhagwat
2. Textile Printing - L.W.C. Miles
3. Engineering in Textile Colouration - C. Duckworth

Course outcome:

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

1. Get technical know how about all machineries.
2. Maintain the auxiliaries' requirements as per the machine capacity.
3. Take maximum advantage of machineries required for a particular process.
4. Modify the machine parts as and when required.

List of Experiments:

1. To study the working and various parts of jumbo jigger meant for preparatory processes.
2. To study the effect of various processing parameters on bleaching of cotton fabric.
3. To study the working and various parts of mercerizing machine.
4. To study the effect of concentration of caustic on mercerization of cotton fabric.
5. To study the effect of dwell time on mercerization of cotton fabric.
6. To study the working and various parts of dyeing jigger.
7. To determine the percentage exhaustion and fixation of reactive dye.
8. To study the working and various parts of stenter.
9. To study the effect of heat setting temperature on dye uptake by polyester.
10. To study the working and various parts of screen printing machine.
11. To study the effect of type and fixation parameters on printing of disperse dye on polyester.
12. To study the effect of curing parameters on anticrease finishing treatment.
13. To study the effect of different silicone finishing cotton and synthetic fabrics.

Design based Problems (DP)/Open Ended Problem:

1. To compare the result of advanced machinery against the conventional.
2. To design the set up to convert macro particles to nano.
3. To estimate the cost of the product processed using advanced machinaries with the conventional.
4. To modify designs of conventional equipments for better and faster result.
5. To design the parts of machines for ease of process.

Major Equipments: Water heating bath, Laboratory H.T.H.P beaker dyeing machine, screens printing system, pressure and loop agers, oven, scientific weighing balance

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.