

GUJARAT TECHNOLOGICAL UNIVERSITY

TEXTILE PROCESSING (28) TECHNOLOGY OF DYEING – II SUBJECT CODE: 2162801 B.E. 6th SEMESTER

Type of course: Textile Processing Engineering

Prerequisite: Zeal to learn the subject.

Rationale: This subject covers the colouration techniques of natural fibres other than that of cotton. It includes in detail the dyeing of all synthetic textiles like Nylon, Polyester, Acrylic, etc. It also includes the dyeing of CDPET and micro denier polyester fibres. It further involves the study of different dyeing machines.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks					Total Marks	
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		ESE (V)		PA (I)		
	PA	ALA		ESE	OEP					
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Topic	Teaching Hours	Module Weightage (%)
1	Machines used for dyeing: Principle, materials of construction and working of various dyeing machineries for fibre, yarn and fabrics.	08	19.5
2	Dyeing of wool and silk fibres with acid, acid mordant, pre-metallised, basic, direct, reactive dyes etc.	06	14
3	Dyeing of nylon with acid, metal complex, reactive, disperse dyes etc.	06	14
4	Dyeing of polyester: Mechanism, processes, dyeing of various types of polyester viz. textured, micro denier, etc.	08	19.5
5	Dyeing of CDPET with different dyes.	04	9.5
6	Dyeing of acrylics with basic/cationic dyes.	04	9.5
7	Dyeing of blends such as polyester/cotton, polyester/viscose rayon, polyester/wool etc.	06	14

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
8	12	10	16	16	8

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Reference Books:

1. Chemistry of dyes & principles of dyeing - Shenai V. A.
2. Technology of dyeing - Shenai V. A.
3. Dyeing & chemical technology of textile fibre - Trotman E. R.
4. Wool dyeing - Lewis D.M.
5. Chemical principles of synthetic fibre dyeing - Burkinshaw

Course outcome:

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

- Know the differences in dyeing behaviour and dyeing method of natural and synthetic fibres.
- Gain in depth knowledge about the working and construction of all the existing dyeing machines.
- Capable of designing dyeing module for synthetic fibres like Nylon, Polyester, Acrylic, etc.
- Know possible dye combinations of blended fabric and their dyeing methods accordingly.

List of Experiments:

1. To carry out dyeing of wool with acid dye.
2. To carry out dyeing of wool with metal complex dye.
3. To carry out dyeing of silk with acid dye.
4. To carry out dyeing of silk with metal complex dye.
5. To carry out dyeing of nylon with acid dye.
6. To carry out dyeing of polyester with disperse dye. (Carrier method)
7. To carry out dyeing of polyester with disperse dye. (HTHP method)
8. To carry out dyeing of polyester with disperse dye. (Thermo Fixation method)
9. To carry out dyeing of CDPET with cationic dye.
10. To carry out dyeing of acrylic with basic dye.

Design based Problems (DP)/Open Ended Problem:

- To develop dyeing auxiliaries for polyester fabrics.
- To construct a model of different dyeing machineries.
- To develop different dyeing techniques other than conventional methods.
- To develop accelerator for dyeing of polyester by thermosol dyeing method.

Major Equipments:

Water heating bath, HTHP beaker dyeing machine, padding mangle, oven 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.