GUJARAT TECHNOLOGICAL UNIVERSITY

TEXTILE TECHNOLOGY (29)
SUBJECT NAME: PRINCIPLES OF TEXTILE PROCESSES
SUBJECT CODE: 2182901
B.E. 8th SEMESTER

Type of course: Engineering

Prerequisite: Students should have thorough knowledge of spinning and weaving machines and processes.

Rationale: This course covers different theories pertaining to various important spinning and weaving processes.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	0	4	70	20	10	00	00	00	100

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

Content:

Sr. No.	Content	Total Hrs	% Weightage
	SPINNING		
1.	Evaluation of Blow Room Cleaning efficiency.	04	7.14
2.	Calculation & Measurement of Cylinder load and Transfer efficiency on Card.	04	7.14
3.	Fibre Configuration in Card and Drawn sliver. Fibre straightening and Hook removal Theory. Derivation of Drafting Force equation.	04	7.14
4.	Evaluation of comber fractionation efficiency.	03	5.36
5.	Ballooning Theory & Forces acting on ring & traveller , Derivation of Winding Tension and Balloon tension	05	8.93
6.	Optimisation of yarn content on ring spun package.	03	5.36
7.	End breaks on speed frame & ring frame.	03	5.36
8.	Theory of end breaks in Open End spinning.	02	3.57

	WEAVING		
9.	Theory of unwinding tension of Ring spun package.	03	5.36
10.	Control of size pick up % & stretch on sizing machine.	03	5.36
11.	Sley Kinematics-Derivation of Equations for Sley velocity, acceleration, force etc;	03	5.36
12.	Interrelationship between Shedding and beating.	02	3.57
13.	Picking- factors affecting velocity of shuttle, relationship between shuttle velocity, loom speed and WIR Shuttle acceleration during picking, factors leading to uniform acceleration.	05	8.93
14.	Retardation and theory of shuttle checking.	04	7.14
15.	Design aspects of picking cam.	03	5.36
16.	Design of Negative let-off motion and its limitations.	02	3.57
17.	Theory of propulsion in air jet loom. Torsion rod mechanics and velocity and acceleration of projectile loom.	03	5.36

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	15	10	10	5

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. Principles of weaving Marks & Robinson
2. Weaving: Conversion of Yarn to fabric Lord & Mohammed
3. Textile Mathematics Vol. III Booth J. E.
4. Weaving : Technology & Operations Ormerod A.

Course Outcome:

After learning the course the students should be able to:

1. Carry out calculation regarding BALLON TENSION AND WINDING TENSION to control the end breaks.
2. Calculate Blow-room cleaning efficiency.
3. Calculate DRAFTING FORCE.
4. Calculate and analyse interrelation of Shuttle Velocity, Retardation Force , Loom speed .
5. Describe importance of Size Pick up and stretch control at Sizing
6. Calculate Sley velocity and acceleration
7. Describe Factors affecting Let off
8. Explain Velocity and acceleration of projectile loom

List of Open Source Software/learning website: http://nptel.iitm.ac.in, World Wide Web, Google Search Engine etc.

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.