

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT
COURSE CURRICULUM

Course Title: Weaving Technology:-1
Course Code: 3322902

Diploma Programmes in which this course is offered	Semester in which offered
Diploma in Textile Manufacturing Technology	Second Semester

1. RATIONALE

Weaving is one of the methods of fabric productions. The other methods are knitting, lace making, felting, and braiding or plaiting. In weaving two distinct sets of yarns or threads are interlaced at right angles in various patterns to form a fabric or cloth of numerous designs. The longitudinal threads are called the warp and the lateral threads are the weft or filling. There is continuous pressure on industries to reduce cost, use automations, and increase quality with variety and designs as early as possible. Therefore, as a textile technologist, the knowledge of weaving process, power looms, and weaving preparatory processes and machines is very essential. In this course, the students are exposed to knowledge of weaving process, power looms, its preparatory processes and production calculations.

2. COMPETENCY

The course content should be taught and implemented with the aim to achieve different types of skills so that students are able to acquire the following competency:

- i. **Weave the simple fabric with the help of power loom including yarn preparation in winding and pirn winding, along with production calculations.**

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	200
3	0	4	7	70	30	40	60	

Legends: L-Lecture; T – Tutorial/Teacher Guided Student Activity; P -Practical; C – Credit;; ESE -End Semester Examination; PA - Progressive Assessment.

Note: It is the responsibility of the institute heads that marks for **PA of theory & ESE and PA of practical** for each student are entered online into the GTU Portal at the end of each semester within the dates specified by GTU.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I Yarn preparation- Winding	1a. Describe objectives of winding 1b. Explain process for winding. 1c. Explain winding machine and automatic with mechanisms. 1d. Describe defects in winding process. 1e. Carryout production calculations in winding machines.	1.1 Sequence of weaving preparatory process. 1.2 Objects of winding. 1.3 Methods of package driving and yarn take up. 1.4 Methods of yarn traversing. 1.5 Type of wind. 1.6 Yarn clearing device, Tensioning device , Balloon breaker, Automatic thread stop motion, Driving arrangement, Anti-patterning device etc. 1.7 Super Speed winding machine. 1.8 Automation in winding (Knotter, Types & quality of knot, Splicing, Comparison of knotting & splicing) 1.9 Defects of winding package 1.10 Requirement of package for shuttle less weaving machine, knitting machine, Beam & sectional warping and yarn dyeing 1.11 Production calculations
Unit– II Pirn Winding	2a. Describe purpose of Pirn winding. 2b. Explain automatic Pirn winding machine along with adjustments. 2c. Describe faults & remedies in pirn winding process. 2d. Carryout production calculations.	2.1 Objects of Pirn winding 2.2 Advantage of rewound weft over direct weft 2.3 Automatic Pirn winding machine 2.4 Various adjustments on auto pirn winding Machine. 2.5 Unifil loom winder in brief 2.6 Package fault in pirn winding 2.7 Production calculations
Unit–III Basics of Weaving	3a. Explain mechanisms and motions of a plain power loom- basic cloth making machine. 3b. Describe cloth defects & remedies in a power loom, and their remedies. 3c. Carry out production calculations for a power loom.	3.1 Passage of warp and cloth through a plain power loom 3.2 Primary motion of loom. (Objects, Types) 3.3 Shedding motion- Different shedding mechanism, Types of shed, Negative tappet shedding motion with timing and settings, Early and late shedding, Heald staggering, Dwell period. 3.4 Picking and checking motion -different types of picking, Over pick and Under motion with timing and settings, Picking accessories, Shuttle box. 3.5 Beating up motion - Beat up motion with timing and settings, Different types of reed and Heald shaft, Reed Count and Heald count. 3.6 Secondary motion of loom with objects and different type -Seven wheel take up, Negative let off 3.7 Auxiliary motions -Objects and type of warp protector motion, Working of different Warp protector motion, Objects and type of Weft stop motion, Working of

Unit	Major Learning Outcomes	Topics and Sub-topics
		Side weft fork stop motion, Temples, Brake 3.8 Cloth defects their causes and remedies. 3.9 Production calculations

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks (Duration – 2.5 Hours)			
			R Level	U Level	A Level	Total
I	Yarn Preparations -Winding	12	4	8	6	18
II	Pirn Winding	06	2	4	2	08
III	Basics of Weaving	24	8	24	12	44
Total		42	14	36	20	70

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as only general guideline for students and teachers. The actual distribution of marks in the question paper may vary from above table.

6. SUGGESTED LIST OF PRACTICAL/EXERCISES:

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills that students are able to acquire above mentioned competency

S. No.	Unit No.	Practical /Exercises	No of hours
1	I	Observe & study passage of warp through high speed winding m/c	04
2	I	Observe & study passage of warp through super speed winding m/c	04
3	I	Observe & study Mechanical and Electrical yarn clearer & yarn tensioning device bunch length	04
4	II	Set pirn diameter, taper & length of wind on pirn winding m/c	04
5	II	Study of passage of warp through 100m identify the various parts	04
6	III	Set over pick motion	06
7	III	Set under Pick motion	06
8	III	Set Negative tappet shedding motion	06
9	III	Set Beating up motion	06
10	III	Set Negative let off motion	04
11	III	Set seven wheel take up motion	04
12	III	Set side weft fork motion	04
Total			56

7. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the list of proposed student activities like: course/topic based seminars, internet based assignments, teacher guided self learning activities, course/library/internet/lab based mini-projects---etc.

- Collection of various Textile fabrics.
- Visit to weaving preparatory unit, and preparing report with sketches.
- Visit to weaving unit, and preparing report with sketches.

8. SUGGESTED LEARNING RESOURCES

A. List of Books

S.No.	Title of Books	Author	Publication
1	Technology of Fabric Manufacture – I (Yarn preparation & Shuttle weaving)	R. Muthusamy & S. Kathirvelu	SSM Institute of Textile Technology & Polytechnic College, Komarapalayam
2	Principle of Weaving	Marks & Robinson	
3	Weaving machine, material & management	D.B. Ajgaonakar & Talukdar	

B. List of Major Equipment/ Instrument

- i. Textile Laboratory – One Winding machine, One Pirn winding machine & two to three Plain power looms.

C. LIST OF SOFTWARE /LEARNING WEBSITES-

Searching engine could be used to locate textile related sites

- i. <http://www.textileassociationindia.org/>
- ii. <http://www.nitma.org/>
- iii. <http://www.sitra.org/>
- iv. www.itamma.org/
- v. <http://www.uttaindia.org/>
- vi. <http://www.cottonjouney.com/Storyofcotton/page5.asp>
- vii. <http://textiletechinfo.com/spinning/BLOWROOM.htm>
- viii. <http://en.wikipedia.org/wiki/weaving>
- ix. <http://textilelearner.blogspot.in>
- x. <http://sazidrahman.blogspot.in/2009/02/lecture-notes-on-weaving-technology.html>
- xi. <http://www.elearning-textiles.co.uk/CatalogueofModules/>

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE**Faculty Members from Polytechnics**

- **Prof. V. N. Soni**, HOD Textile Manufacturing , RCTI, Ahmedabad
- **Prof. R. T. Patel**, Lecturer in Textile Manufacturing, RCTI, Ahmedabad
- **Prof (Ms.) S.S. Parmar**, Lecturer in Textile Manufacturing, RCTI, Ahmedabad
- **Prof S. M. Zala**, Lecturer in Textile Manufacturing, Shri BPTI, Bhavanagar

Co-ordinator and Faculty Member from NITTTR Bhopal

- **Dr. C. K. Chugh**, Professor and head Dept. of Electronic Media
- **Dr. S. K. Gupta**, Professor and coordinator for state of Gujarat