GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: WEAVING TECHNOLOGY-III
(Code: 3342903)

Diploma Programme in which this courses offered	Semester in which offered
Textile Manufacturing Technology	4th Semester

1. RATIONALE

Society requires large quantity and quality with different designs of fabrics. Traditional power looms are not the solution, engineering and technological changes have brought about automation in weaving looms to increase production rates, different designs and quality of fabrics. The diploma graduates are required to manage production in automated looms and jacquard looms in industries. This course aims at providing necessary knowledge and skills to the diploma students in automated looms and jacquard looms in construction, operation and maintenance of looms.

2. COMPETENCY

The course content should be taught and curriculum should be implemented with the aim to develop required skills in students so that they are able to acquire following competency.

- **Plan and Supervise fabric production on Automatic and Jacquard Looms.**

3. COURSE OUTCOMES (COs)

The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Explain the need, construction and function of automated looms.
ii. Demonstrate pirn changing and shuttle changing principle.
iii. Explain use of jacquard in weaving.
iv. Describe different types and parts of jacquard.
v. Explain the need of box motion.
vi. Describe the importance and types of let-off and take-up.

4. TEACHING AND EXAMINATION SCHEME

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

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

5. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Automatic weaving machine.	1a. Classify the looms automatic looms and non-automatic looms 1b. Describe types of Automatic looms. 1c. Explain the characteristic & advantages of automatic looms over non-automatic looms 1d. Compare cop changing over shuttle changing looms 1e. List the Accessories for pirn changing mechanism 1f. Differentiate Auto loom shuttle and Plain loom shuttle. 1g. List the types of weft feelers 1h. Differentiate / Compare Mechanical, Electrical , optical electronic types of Weft feelers. 1i. Explain working of Mechanical , Electrical, optical electronic types weft feeler. 1j. Explain working of pirn changing mechanism. 1k. Explain working of Let-off motion. 1l. Explain timing and setting of motion. 1m. List the types of Automatic Warp stop motion 1n. Describe need of warp stop motion. 1o. Explain working of Mechanical & Electrical type warp stop motions.	1.1 Automatic looms & non-automatic looms 1.2 Types of Automatic looms. cop changing & shuttle changing looms. 1.3 Accessories for pirn changing mechanism. a) Shuttle b) Pirn c) Shuttle box d) Battery 1.4 Weft feelers a) Mechanical(Midget) b) Electrical(Two pronged feeler) c)Photo electrical (optical electronic) 1.5 Pirn change mechanism a) Northrop b) Ruti 1.6 Automatic Let-off motion a) Roper b) Bartlett c) Ruti 1.7 Automatic Warp stop motion a) Mechanical - Northrop warp stop motion b) Electrical warp stop motion 1.8 Environmental aspects in weaving dept.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit– II Multiple box motion	2a. Discuss use and need of Multiple boxes. 2b. Explain in detail working of Drop box motion 2c. Prepare card chain for given weft pattern 2d. Explain working of Leveling device. 2e. Explain working of Locking device. 2f. Explain working of Safety device. 2g. Explain working of Card saving device	2.1 Types of Multiple boxes 2.2 Working of Eccle's Drop box motion 2.3 Different devices of Drop box a) Leveling device b) Locking device c) Safety device d) Card saving device 2.4 Different types of cards and Pegs 2.5 Preparation of card chain
Unit–III Jacquard	3a. Differentiate different types of jacquard. 3b. State function of each parts. 3c. Calculate capacity of jacquard. 3d. Explain in detail working principle of jacquard 3e. Describe different types of ties. 3f. Describe cloth defects 3g. List the causes of cloth defects 3h. List the remedies of cloth defects	3.1 Need & Classification of Jacquard 3.2 Important parts of jacquard 3.3 Construction & Working of following jacquard a) Single lift single cylinder jacquard b) Double lift single cylinder jacquard c) Double lift Double cylinder jacquard d) Cross border jacquard e) Electronic jacquard 3.4 Different ties a) Straight tie or Norwich tie b) Cross tie or London tie c) Repeating tie d) Center tie e) Border tie f) Combination tie 3.5 Cloth defects

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

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	Automatic weaving machine	20	4	20	4	28
II	Multiple box motion	10	4	14	4	22
III	Jacquard	12	4	14	2	20
Total Hrs		42	12	48	10	**70**

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

7. SUGGESTED LIST OF EXERCISES / PRACTICALS:

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills **(outcomes in psychomotor and affective domain)** so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes (**as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

S. No.	Unit No.	Practical/ Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Sketch working of different types of feelers and explain	04
2	I	Demonstrate weft threading in Automatic loom Shuttle	02
3	I	Draw sketch and explain working of pirn changing mechanism.	04
4	I	Draw sketch and explain working of Let-off motions. (Roper, Bartlett and Ruti)	04
5	I	Draw sketch and explain working of Mechanical Warp stop motion	04
6	I	Draw sketch and explain working of Electrical Warp stop motion	04
7	I	Demonstrate mounting of drop pin on warp sheet	02
8	II	Describe different part of Drop box on loom	02
9	II	Draw sketch and explain working of Eccle's Drop box motion	06
10	II	Demonstrate different position of pin and box leveled	06
11	II	Prepare card chain for given weft pattern	06
12	II	Draw sketch and explain use of Leveling, Locking and safety device on Drop box loom	04
13	III	Draw sketch and explain working of Single lift single cylinder jacquard	04
14	III	Draw sketch and explain working of Double lift single cylinder jacquard	04
15	III	Draw sketch and explain working of Double lift double cylinder jacquard	06
16	III	Draw different types of ties	04
		TOTAL	66

8. SUGGESTED LIST OF 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.

- Literature survey of Multiple box motion
- Collection of loom specification for Automatic loom
- Visit to market to collect the samples of different types of Jacquard designs.
- Visit to weaving unit and prepare report with sketches

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- Show Video/animation films showing automated and advance weaving methods..
- Arrange a visit to a modern weaving plant.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr.No.	Title of Books	Author	Publication
1	Weaving machines, mechanisms & management	Talukdar, Sriramulu & Ajgaonakar	Mahajan Publishers Private Limited, Ahmedabad
2	Principles of Weaving	R. Marks & A.T.C. Robinson	The Textile Institute Manchester
3	Weaving mech.Vol- II	Prof, N. N . Banerjee	Textile Book House, West Bengal.
4	Automatic looms	Mr. K.Krishnamurthy	TAIRO
5	Woven Fabric Production – II		NCUTE Publications

B. List of Major Equipment/ Instrument with Broad Specifications

i.Textile Laboratory – Weaving Laboratory
ii. Automatic loom, multiple box motion in loom, Jacquard

C. List of Software/Learning Websites

Searching engine could be used to locate textile related sites

A.http://www.lakshmiautomatic.com/
B.http://en.wikipedia.org/wiki/Jacquard_loom
C.http://www.shaktiautolooms.com/
D.http://collections.infocollections.org/ukedu/en/d/Jh2379e/5.4.html
E.http://www.cs.arizona.edu/patterns/weaving/books/pea_jacq_1.pdf
F.http://encyclopedia2.thefreedictionary.com/Jacquard+loom

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof.V.N.Soni**, HOD Textile Manufacturing , R.C T I, Ahmedabad
- **Shri R T Patel**, Lecturer in Textile Manufacturing, R.C T I, Ahmedabad
- **Ms. S.S.Parmar**, Lecturer in Textile Manufacturing, R.C T I, Ahmedabad
- **Shri S.M.Zala,** Lecturer in Textile Manufacturing, B.P.T I, Bhavnagar

Co-ordinator and Faculty Member from NITTTR Bhopal

- **Dr. C. K. Chugh**, Professor, Department of Mechanical Engineering
- **Prof. S. K. Gupta,** Professor **&** Coordinator of Gujarat State