

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**COURSE CURRICULUM
COURSE TITLE: FABRIC STRUCTURE -II
(Code: 3342904)**

Diploma Programmes in which this course is offered	Semester in which offered
Textile Manufacturing Technology	4 th Semester

1. RATIONALE

Knowledge of other special woven structures is required as per the specific need of industries and society. It is necessary to describe and correlate special fabric structure and its properties with view of end use of product. Fabric structure plays vital role in fabric properties like strength, feel, drape and appearance etc. It is necessary to develop design on graph paper with all necessary details like weave, draft, peg-plan and denting required for actual fabric production on machine. With use of suitable mechanical device movement of warp group can be controlled and order of lifting can be planned. This course is aimed to provide the necessary knowledge, skills and attitudes to produce fabrics like- Bedford cord, welts and pique, pile fabrics and warp backed, welt backed and wadded backed structure (Warp and weft).

2. COMPETENCY

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

- **Develop structures, derivatives and “special structures” with design, draft, peg-plan, denting plan for various weaves like- Bedford cord, welts and pique, pile fabrics and warp backed, welt backed and wadded backed structure (Warp and weft).**

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.

- Explain principle of Bedford cord
- Develop design, draft, peg plan and cross-section for different type of Bedford cord
- Explain principle of welts and pique.
- Develop design, draft, peg plan and cross-section for different type of Welt and pique structure
- Explain principle of Pile structure
- Describe the uses of pile fabrics
- Develop design, draft, peg plan and cross-section for different type of pile structure
- Describe the structure of backed cloth
- Develop design, draft, peg plan and cross section for warp backed, welt backed and wadded backed structure (Warp and weft)
- Development of different fancy effect using coloured warp, coloured weft and weave.
- Perform the Yarn & Fabric calculation

4. Teaching and Examination Scheme

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				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 Theory Practice; P - Practical; C – Credit ESE - End Semester Examination; PA - Progressive Assessment.

5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Bedford Cord	1a. Describe Bedford cord effect. 1b. Describe the methods for producing cord effects. 1c. Develop design draft peg. plan & Cross section for (a) Plain face Bedford cord structures. (b) Twill face Bedford cord structures. (c) Wadded Bedford cord. (d) Structure arranged on alternative picks. (e) Crepon Bedford cord.	1.1 Principle of Bedford cord & its features. 1.2 Methods for producing cord effects. 1.3 Plain face Bedford cord structure. 1.4 Twill face Bedford cord structure. 1.5 Wadded Bedford cord structure. 1.6 Arranged on alternate pick. 1.7 Crepon Bedford cord.
Unit– II Welt and pique structure and its features.	2a. Explain Use and need of welts and pique structure. 2b. Describe the method for producing cord effectively. 2c. Develop design, draft, peg plan and cross section of (a) Ordinary welt structure. (b) Wadded welt structure. (c) Fast beck welt. (d) Waved pique.	2.1 Method for producing cord effect in pique structure. 2.2 Ordinary welt structure. 2.3 Weft wadded welt. 2.4 Fast back welt.
Unit–III Warp and weft pile structures	3a. Describe the principle of warp and weft piles. 3b. Explain the principle of formation of terry pile. 3c. Describe the uses of pile fabrics. 3d. Develop design, draft, pegplan and cross section for 2,3,4,5 pick (pile on one side and both side and fancy terry weaves.) 3e. Describe the causes and remedies for uneven terry pile structure. 3f. Describe the principle of formation of true pile. 3g. Develop the design and cross section for true pile design with the help of wire loom. 3h. Develop the design and cross section for velvet and double plush fabric.	3.1 Formation of Terry pile fabric. 3.2 Ornamentation of Terry piles. 3.3 Formation of True warp piles. 3.4 Formation of Velvet & double plush fabrics. 3.5 Formation of weft piles. -Velvet structure. -Plain and Twill back. -Corded velveteen. (Corduroy fabric) 3.6 Factor effecting on length of pile & density of the pile in warp and weft pile structure.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	3i. Develop design draft, peg plan and cross section for plain back velveteen, twill back velveteen and corduroy. 3j. Describe the factors affecting the length of pile and density of the pile in warp and weft pile structure.	
Unit–IV Backed cloth its features and objects for production	4a. Describe purposes and uses of producing backed cloth. 4b. Discuss the structure of warp and weft backed cloth. 4c. Describe the principle of tying the backed cloth. 4d. Develop design, draft, peg plan and cross section for warp backed, welt backed and wadded backed structure (Warp and weft) 4e. Describe the loom equipment for producing backed fabric.	4.1 Warp backed structure. 4.2 Weft backed structure. 4.3 Wadded backed structure.
Unit–V Simple colour and weave effects	5a. Describe the classification of colour and weave effects. 5b. Describe the method of producing variety of effect in the same weave and Colour. 5c. Produce following effects by using simple weave and colour Combination on graph paper. <ul style="list-style-type: none"> - Continuous line effect. - Hound's tooth pattern. - Bird eye and spot effect. - Step pattern. - All over effect. 	5.1 Classification of colour and weave effect. 5.2 Method of producing variety of effect in the same weave & colour. 5.3 Example of simple weave & colour combination. <ul style="list-style-type: none"> - Continuous line effect - Hounds tooth pattern - Bird eye and spot effect - Step pattern. - All over effect.
Unit–VI Cloth analysis and relevant Calculations of fancy cloth.	6a. Calculate each types of warp and weft per unit space. 6b. Judge count of threads, and read count. 6c. Draw design, draft and peg plan. 6d. Calculate weight of fabric. 6e. Suggest loom equipment and end uses of fabric Blanket, Terry Towel, Velvet, corduroy . 6f. List the quality parameters for the special structure for Blanket, Terry Towel, Velvet, corduroy	6.1 Yarn & Fabric calculation. Selection of weave according to end use of the fabric and features / Quality Particulars of special structure for Blanket, Terry Towel, Velvet, corduroy

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 Marks
I	Bedford Cord	06	02	06	02	10
II	Welt and pique structures and its features.	06	01	07	02	10
III	Warp and weft pile structures	14	02	14	04	20
IV	Backed cloth its features and objects for production	06	02	06	02	10
V	Simple colour and weave effects	06	02	06	02	10
VI	Cloth analysis and relevant calculation of fancy cloth	04	01	02	07	10
	Total Hrs	42				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)	Approx. Hrs. required
1	I	Draw Structural design for 'Bedford cords' on graph paper of the following. -Plain Face Bedford cord structure -Twill face Bedford cord structure -Wadded Bedford cord structure -Arranged on alternate pick -Crepon Bedford cord	04
2	I	Prepare of fabric sample of simple Bed ford cord on a sample loom.	04
3	I	Draw the Structural design of welt and Pique on graph paper. -Ordinary welt structure -Weft wadded welt	02

		-Fast back welt	
4	I	Prepare the welt sample on sample loom.	02
5	I	Draw designs, draft, peg plan & cross section for 'Terry piles', True piles and weft pile for the following. -All over or plain Velveteen -Weft Plushes -Corded Velveteen or Courduroys/ Fustians -Terry Piles (3 pick, 4 pick, 5pick,6pick) -Wire piles (Fast structures, Loose structures)	20
6	I	Draw structural design for warp and weft Back fabric.	08
7	II	Draw following effect by simple colour & weave combination on graph paper : - Continues line effect - Step pattern - Hounds Tooth Pattern - Birds eye / spot effect - All over effect	04
8	II	Analyze the color theory for the following list. - Bedford Cord / welt - Backed cloth - Terry pile / velvet	04
9	II	Calculate EPI, PPI, warp weight, weft weight, fabric weight and draw design of the given sample on graph paper	04
10	II	Prepare chart for the quality particulars weave and end use of the fabric.	04
Total			56

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.

- Survey the market and collect various fabric samples with their specifications and unit price .
- Visit to nearby mills and prepare report with sketches.
- Visit to the design development studio of weaving mill.
- Prepare sample on sample loom
- Preparation of charts for quality particulars and end use of fabric

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Show as many samples of different type of fabric designs in the class and discuss their manufacturing procedure. Take help of video/animation films to explain the manufacturing plans.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

S. No.	Title of Book	Author	Publication
1.	Elementary Textile Design and Colour	William Wattson	Longmans Green & co., London

2.	Advance Textile Design	William Wattson	Longmans Green & co.,1955, London
3.	Watson's Textile Design and Colour	Z. Grosiky	Universal Publishing Corporation, 534, Kalbadevi Road, Dhobi Talao, Bombay-400002
4.	Watson's Advance Textile Design	Z. Grosiky	Universal Publishing Corporation, 534, Kalbadevi Road, Dhobi Talao, Bombay-400002
5.	Grammar of Textile Design	Nisbet	Ernest Benn Limited, Boutverie House, 154 Fleet Street, London
6.	Fabric Structure and Design	N. Gokarneshan	New Age International (P) Limited, Publishers, New Delhi
7.	Weaving calculation	R. Sengupta	

B. List of Major Equipment/ Instrument with Broad Specifications

1. Textile Laboratory – Sample loom

C. List of Software/Learning Websites

- i. www.handweaving.net
- ii. <http://www.cs.arizona.edu/patterns/weaving/articles770.html>
- iii. www.colourmatters.com
- iv. <http://www.mariaclaudiacortes.com/colors/Colors.html>
- v. <http://www.worqx.com/resource-recommends.htm>
- vi. www.micro.magnet.fsu.edu
- vii. www.textilearts.net/directory/techniques/colour
- viii. www.members.cox.net/mrsparker2
- ix. www.teonline.com
- x. www.bharatextile.com/directory
- xi. www.en.wikipedia.org/wiki/Textile_design
- xii. www.fibre2fashion.com
- xiii. www.designdiary.nic.in
- xiv. www.handlooms.com
- xv. <http://mytextilenotes.blogspot.com/>
- xvi. <http://www.textileassociationindia.org/>
- xvii. <http://textilelearner.blogspot.in>
- xviii. <http://www.designdiary.nic.in/>

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. V.N. Soni**, HOD Textile Manufacturing , R.C Technical Institute, Ahmedabad
- **Prof. Y. M. Gandhi** HOD Textile Manufacturing , Sir B.P.T.I, Bhavnagar
- **Prof. R. T. Patel** Lecturer in Textile Manufacturing, R.C Technical Institute, Ahmedabad

- **Prof. D.V. Bihola** Lecturer in Textile Manufacturing, R.C Technical Institute, Ahmedabad
- **Prof. S. M. Zala**, Lecturer in Textile Manufacturing, Sir B.P.T.I, Bhavnagar

Coordinator and Faculty Members from NITTTR Bhopal

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