

**Program Name** : Diploma in Fashion and Clothing Technology  
**Program Code** : DC  
**Semester** : Fourth  
**Course Title** : Fabric Structure  
**Course Code** : 22468

### 1. RATIONALE

Fashion designing students have to deal with different fabrics to produce novelty garments. The study of woven fabric structure helps them to identify different types of fabrics according to the end use of the garment. Study of basic concepts of fabric structure such as design, draft and peg plan help them to design innovative fabrics. Basic knowledge of different fabric structures helps to identify and set fashion trends in the industry.

### 2. COMPETENCY

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- **Develop different point-paper designs using principles of interlacement for setting fashion trends.**

### 3. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Develop different interlace diagrams using basics of fabric structure.
- Identify the relevant derivatives of plain weave.
- Use relevant derivatives of twill weave for creation of fashion.
- Select relevant satin weave for developing apparel garment.
- Identify the relevant fancy weave for fashion trends.
- Use of relevant compound fabrics.

### 4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme			Credit (L+T+P)	Examination Scheme												
L	T	P		Theory						Practical						
				Paper Hrs.	ESE		PA		Total		ESE		PA		Total	
					Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
3	-	2	5	3	70	28	30*	00	100	40	25@	10	25	10	50	20

(\*): Under the theory PA, Out of 30 marks, 10 marks are for micro-project assessment to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for the assessment of the cognitive domain UOs required for the attainment of the COs.

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

### 5. COURSE MAP with sample COs, PrOs, UOs, ADOs and topics)

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the



course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

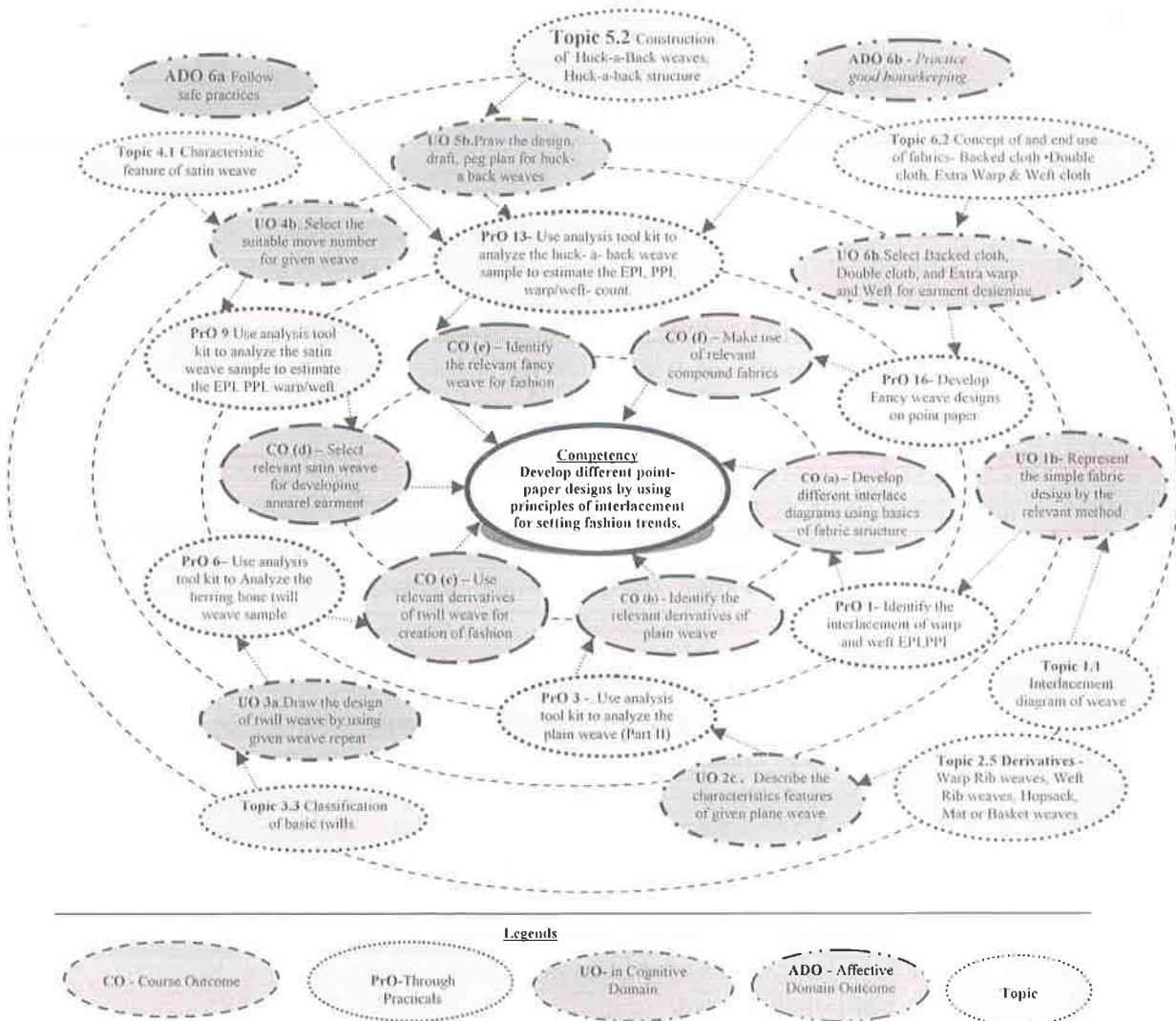


Figure 1 - Course Map

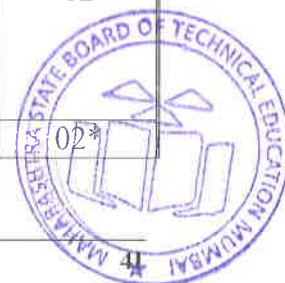
6. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1	Use fabric samples to : a. Identify the interlacement of warp and weft. b. Identify and Mark warp and weft direction. c. Determine ends per Inch and Picks Per Inch	I	02*
2	Use analysis tool kit to analyze the plain weave ( Part I): a. Estimate the EPI, PPI, warp/weft- count plain weave fabric. b. Calculate cover factor, weight per unit area.	II	02*
3	Use analysis tool kit to analyze the plain weave ( Part II) : Represent the design on point paper.	II	02*



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
4	Use analysis tool kit to analyze the warp/weft Rib weave sample: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	II	02*
5	Use analysis tool kit to analyze the Matt Rib weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	II	02
6	Use analysis tool kit to Analyze the basic twill weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	III	02
7	Use analysis tool kit to Analyze the herring bone twill weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design on point paper.	III	02
8	Use analysis tool kit to analyze the pointed twill weave sample to: a. Estimate the EPI, PPI, warp/weft- count b. Calculate cover factor, weight per unit area. c. Represent the design	III	02
9	Use analysis tool kit to analyze the satin weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	IV	02
10	Use analysis tool kit to analyze the crepe weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	V	02
11	Use analysis tool kit to analyze the honey comb weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design point paper.	V	02
12	Use analysis tool kit to analyze the Brighton honey comb weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	V	02
13	Use analysis tool kit to analyze the huck- a- back weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design	V	02
14	Use analysis tool kit to analyze the mock leno weave sample to: a. Estimate the EPI, PPI, warp/weft- count. b. Calculate cover factor, weight per unit area. c. Represent the design.	V	02
15	Develop Basic weave designs and its directives of on point paper.	II,VI	02*



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
16	Develop Fancy weave designs on point paper.	VI	02*
	<b>Total</b>		<b>32</b>

**Note:**

- i. A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.
- ii. The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1	Handling of tools	20
2	Accuracy	20
3	Safety measures	10
4	Creativity	10
5	Paper representation of weave design	20
6	Answer to sample questions	10
7	Submission of report in time	10
	<b>Total</b>	<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- a. Follow safety practices.
- b. Practice good housekeeping.
- c. Practice energy conservation.
- d. Demonstrate working as a leader/a team member.
- e. Maintain tools and equipment.
- f. Follow ethical Practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year and
- 'Characterising Level' in 3<sup>rd</sup> year.

## 7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications



S. No.	Equipment Name with Broad Specifications	PrO. No.
1	Reflex type 1 inch counting glass ,plain weave fabric sample with 50 EPI X 20 PPI and 70 EPI X 50 PPI.	1
2	Fabric samples of various weaves for fabric analysis,	All
3	Fabric Analysis kit	All
4	Wrap reel and Weighing balance with weight range of Min 0.2gm to Max. 500g.	4,5,6
5	Cone Winding machine ( Model 338 RM, count range 2 to 100 Ne, yarn traverse 3 to 6 inch)	9,10,11, 15
6	Classimat instrument with Uster quantum 2	7,8
7	Ring yarn with count range 5, 10, 15 Ne and Manmade yarns with 150D, 300D.	1,3,8
8	Defective packages	16

### 8. UNDERPINNING THEORY COMPONENTS

The following topics are to be taught and assessed in order to develop the sample UOs given below for achieving the COs to attain the identified competency. More UOs could be added.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Basics of Fabric Structure</b>	1a. Draw interlacement diagram of given design. 1b. Represent the given simple fabric design by the relevant method. 1c. Define the design, draft, peg plan and weave repeat for the given fabric. 1d. Select relevant draft for given design with justification. 1e. Justify the relationship between draft and peg plan for given design with sketches.	1.1 Interlacement diagram of weave 1.2 Fabric Quality particulars- i) Threads/cm or Threads/Inch EPI-EPcm-EPdm PPI-PPcm-PPdm ii) Warp count Tex, Denier, English cotton count Weft count iii) Warp cover factor ,Weft cover factor, Fabric cover factor iv) Weight in gms/m <sup>2</sup> 1.3 Concept of Design, Draft, Lifting plan, denting order. 1.4 Characteristics features of following fabric; Poplin, Voile, Cambric, Chiffon, Dhoti, Lawn. 1.5 Concept of design, draft and peg plan and their relationship.
<b>Unit– II Plain woven Structures</b>	2a. Draw design, draft, and peg plan for the given weave. 2b. Classify the given plain weaves into different categories. 2c. Describe the characteristics features of the given weave. 2d. Create the design by using given fabric weave repeat. 2e. Develop the rib effect by using the warp and weft rib weaves.	2.1 Interlacing Diagram plain weave, Design, draft, lifting plan and denting order of plain weave. 2.2 Classification of plain woven fabric. 2.3 Characteristic features , Cross – sectional views of plain weave. 2.4 Weave repeat: Rib and cord effects produced in plain weave 2.5 Derivatives -Warp Rib weaves, Weft Rib weaves, Hopsack, Mat or Basket weaves.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – III Twill Weave Structures</b>	3a. Draw the design of twill weave by using given weave repeat. 3b. Classify the given weave into different categories of twill weave. 3c. Develop design of balanced/unbalanced twill weave using the given repeat. 3d. Develop designs, drafts, peg plans for given derivatives of twill weave. 3e. Differentiate between weaves and fabrics for the given two derivatives of twill weave.	3.1 Design of Basic Twills, characteristic feature of twill woven fabric, Classification of basic twills. 3.2 Balanced twill-Design, draft, denting order and lifting plan 3.3 Unbalanced twill- Warp and weft faced twill, Design, draft, denting order and lifting plan with cross section. 3.4 Derivatives of Twill weave- Design, draft, denting order and lifting plan of following twills: a. Pointed twill b. Herring bone c. Transposed twill weave d. Diamond twill weave
<b>Unit– IV Satin/Satin Weaves</b>	4a. Describe with features of the given types of weaves 4b. Select the relevant move number for the given weave repeat to construct satin weave with justification. 4c. Draw the design, draft, peg plan for the given satin weave.	4.1 Characteristic feature of satin and sateen woven fabrics, Interlacement diagram, Concept of move number. 4.2 Development of regular satin weave, Draft, denting order and lifting plan, interlacing diagram of regular satin. 4.3 Development of irregular satin weave, Draft, denting order and lifting plan, Interlacing diagram of regular satin irregular satin weave.
<b>Unit –V Fancy woven Fabrics</b>	5a. Describe the features of the given types of weaves. 5b. Draw the design, draft, peg plan for the given type of fabric. 5c. Draw the design, draft, peg plan for the given type of crepe weaves 5d. Distinguish the features between the given types of honey comb.	5.1 Characteristic features of Crepe, Huck-a-back structures , Ordinary Honey-comb structures , Simple Mock- Leno Structure 5.2 Development of Huck-a-Back structures-, Huck-a-back structure on six, ten and twelve picks, Development of Honey-comb structures-, Honey-comb structure having equal warp and weft floats, Development of Mock- Leno Structure, Construction of on 6x6, Mock- Leno Structure on 8x8,10x10, 5.3 Construction of Crepe weaves, Constructions of crepe weaves upon sateen bases, Combination of floating weave upon plain threads. 5.4 Comparison of different structures of honeycomb



Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit –VI Basics of Compound Fabric Structure</b>	6a. Develop the Marking Design, Draft, Peg plan and denting order for the given situation. 6b. Select Backed cloth, double cloth, and Extra warp and Weft for garment designing. 6c. Identify Leno structure for fashion style. 6d. Classify pile structure.	6.1 Marking Design, Draft, Peg plan and denting order for Plain faced Bedford cord and ordinary Welt. 6.2 Concept and end use of following fabrics: backed cloth, Double cloth, Extra Warp and Weft cloth 6.3 Principles of Leno structure and its application 6.4 Classification of pile structure

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' and above of Bloom's 'Cognitive Domain Taxonomy'*

## 9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Basics of Fabric Structure	06	2	4	4	10
II	Plain Woven Structures	06	2	4	4	10
III	Twill Weave Structures	10	2	4	10	16
IV	Satin/Satin Weaves	05	2	2	8	12
V	Fancy woven Fabrics	12	2	6	4	12
VI	Basics of Compound Fabric Structure	09	2	4	4	10
<b>Total</b>		<b>48</b>	<b>12</b>	<b>24</b>	<b>34</b>	<b>70</b>

**Legends:** R=Remember, U=Understand, A=Apply and above (Bloom's Revised taxonomy)

**Note:** This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess students with respect to attainment of UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary from above table.

## 10. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related **co-curricular** activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- Prepare journals based on practical performed in workshop.
- Collect different samples of fabrics and identify their end uses.
- Visit different trade fair to identify fabric trends in fashion.
- Library survey regarding fabric parameters used for different fashion seasons.
- Prepare power point presentation on fabrics used for different collections.

## 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:



- a. Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- b. '**L**' in *item No. 4* does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- c. About **15-20% of the topics/sub-topics** which is relatively simpler or descriptive in nature is to be given to the students for **self-directed learning** and assess the development of the COs through classroom presentations (see implementation guideline for details).
- d. With respect to item No.10, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- e. Guide student(s) in undertaking micro-projects.

## 12. SUGGESTED MICRO-PROJECTS

**Only one micro-project** is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project are group-based. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student ought to submit micro-project by the end of the semester to develop the industry oriented COs.

A suggestive list of micro-projects are given here. Similar micro-projects could be added by the concerned faculty:

- a. Collect ten woven fabric samples and mark warp weft direction.
- b. Develop swatches of plain weave and its derivatives sample using sample loom.
- c. Develop swatches of twill weave and its derivatives sample using sample loom.
- d. Develop swatches of satin weave and its derivatives sample using sample loom.
- e. Develop swatches of colour and weave effect samples using sample loom.
- f. Develop swatches of fancy weave structure using sample loom.

## 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Woven Structure and design – Part 1 Single cloth Construction	Doris Goarner	WIRA Technology Group - 1986 ISBN: 0-900820179
2	Watson's Textile Design and Colour	Z.J.Grosicki	Woodhead Publishing limited,Cambridge England.1975.ISBN:978185739956
3	Watson's Advanced Textile Design	Z..J.Grosicki	Woodhead Publishing limited, Cambridge England., ISBN:185573 9968
4	Fabric Structure And Design	N.Gokarneshan	New age international (P) limited, New Delhi. ISBN : 8122423078

## 14. SUGGESTED SOFTWARE/LEARNING WEBSITES





1. <http://textilefashionstudy.com/properties-of-crepe-weave-types-of-crepe-weave/>
2. <https://textileapex.blogspot.in/2014/03/huckaback-mockleno-wave.html>
3. <https://www.slideshare.net/bhushanaec/huckaback-weave-60106128>
4. <http://nptel.ac.in/courses/116102005/26>
5. <http://nptel.ac.in/courses/116102005/27>
6. <http://nptel.ac.in/courses/116102005/28>



