



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Program Name: Diploma Engineering**

**Level: Diploma**

**Branch: Textile Manufacturing Technology**

**Subject Code: DI04029051**

**Subject Name : Woven Fabric Design - II**

<b>w. e. f. Academic Year:</b>	2025-26
<b>Semester:</b>	4 <sup>th</sup>
<b>Category of the Course:</b>	Professional Elective - I

<b>Prerequisite:</b>	Basic Weaving Principles, Fabric Structure & Analysis
<b>Rationale:</b>	<p>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.</p>

### Course Outcome:

After Completion of the Course, student will able to:

No	Course Outcomes	RBT Level
01	Develop different colour and weave effect.	RUAC
02	Develop cord effect on fabric using Bedford cord, welt and pique structures.	RUAC
03	Develop various pile structures.	RUAC
04	Develop designs for backed cloth.	RUAC
05	Analysis and relevant calculation for fabric.	RUA

*\*Revised Bloom's Taxonomy (RBT)*

### Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE(E)		PA(M)	PA(I)	ESE(V)	
3	0	2	4	70	30	20	30	150



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## Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	1.1 Classification of colour and weave effect. 1.2 Methods of producing variety of effects in the same weave & colour. 1.3 Develop Colour and weave effect of: a) Continuous line effect. b) Hound's tooth pattern. c) Bird's eye. d) Spot effect. e) Step pattern. f) All-over effect.	5	14%
2.	2.1 Principle of Bedford cord, End uses and its features. 2.2 Develop Design, Draft and Peg-plan of: (a) Plain face Bedford cord structure. (b) Twill face Bedford cord structure. (c) Wadded Bedford cord structure. (d) Arranged on an alternate pick. (e) Crepon Bedford cord. 2.3 Develop Design, Draft and Peg-plan of Welt and Pique structures: (a) Ordinary welt structure. (b) Weft wadded welt. (c) Fastback welt. (d) Waved pique.	15	30%
3.	3.1 Pile formation in Terry. 3.2 Types of Terry structures. 3.3 Formation of Wire pile structure. 3.4 End uses of Velveteen /Weft pile fabrics and Warp pile fabrics. 3.5 Develop Design, Draft and Peg-plan of: a) Velveteen structure. b) Plain back structure. c) Twill back structure. d) Corded velveteen. e) Corduroy fabric.	15	30%



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	3.6 Factors affecting on length of pile & the density of the pile in warp and weft pile structure.		
4.	4.1 Describe the purposes and end uses of producing backed cloth. 4.2 Stages involved in the construction of backed fabrics. 4.3 Compare between warp and weft backed structures. 4.4 End uses of Backed fabrics. 4.5 Develop Design, Draft and Peg-plan of: (a) Warp-backed structure. (b) Weft-backed structure. (c) Wadded backed structure.	5	16%
5.	5.1 Yarn & Fabric calculation. 5.2 Selection of weave according to end use of the fabric and features / Quality Particulars of special structure for Blanket, Terry Towel, Velvet, corduroy.	5	
<b>Total</b>		<b>45</b>	<b>100</b>

### Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
10	10	40	0	0	40

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

### References/Suggested Learning Resources:

#### (a) Books:

1. Elementary Textile Design and Colour by William Wattson . Publication-Forgotten Books, United states 2018, ISBN-13- 978-1528462143, ISBN-10 - 1528462149
2. Advance Textile Design by William Wattson . Publication-Kessinger Publishing, LLC United states 2010, ISBN-13- 978-1166485962, ISBN-10 - 116648596X
3. Watson's Textile Design by Z. Grosiky . Publication-Woodhead Publishing Limited,
4. and Colour by. Publication-England, 1975, ISBN-13: 978185573-995-6, ISBN-10: 978185573995
5. Watson's Advance Textile Design by Z. Grosiky Publication-Woodhead Publishing, UK 1977, ISBN-13 : 978-1855739963, ISBN-10 : 9781855739963
6. Grammar of Textile Design by Nisbet Publication-Forgotten Books, United states 2018, ISBN-13- 978-1330304280, ISBN-10 - 97813303042



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7. Fabric Structure and Design by N. Gokarneshan. Publication New Age International Private Limited New Delhi, India 2008, ISBN-13 : 978-8122424706, ISBN-10 : 8122424708
8. Weaving calculation by R. Sengupta Publication Imprint 1979, ISBN-13: 9780906216613, ISBN-10: 0906216613

**(b) Open source software and website:**

1. <https://textilestudycentre.com/>
2. [https://youtu.be/t0am\\_aOBWQ4?si=qRLzxZvbQQ8imeks](https://youtu.be/t0am_aOBWQ4?si=qRLzxZvbQQ8imeks)
3. <https://youtu.be/cSH51xhcJdw?si=wvnOGrZAmTgtC8xR>
4. <https://youtu.be/-fwc1qXMfsI?si=BPK733dK6d1wLWyq>
5. <https://youtu.be/BUChpj2bIP0?si=Nu5vKozdJS9PPMWK>
6. <https://youtu.be/G-N-ukyMIvU?si=qveN4bsT5qDa18YF>
7. <https://youtu.be/LuVYIHtmUuE?si=VTERDHDKW462IAym>
8. <https://youtu.be/cSH51xhcJdw?si=6om11dOwJCFQI1u6>
9. [https://youtu.be/RI0X-OJs0\\_E](https://youtu.be/RI0X-OJs0_E)
10. <https://youtu.be/FPuRc32QJV8>
11. <https://youtu.be/XE4mR42KZW4>
12. [https://youtu.be/BRE3f\\_PiAdA](https://youtu.be/BRE3f_PiAdA)
13. <https://youtu.be/2QhTdHdrKTI>
14. <https://youtu.be/j0VTQECjkrY>
15. <https://youtu.be/VxWSaef0H3E>
16. [https://youtu.be/7U0Y8VIM\\_ho](https://youtu.be/7U0Y8VIM_ho)
17. <https://youtu.be/sWpSs8ntTrY>
18. [https://youtu.be/RI0X-OJs0\\_E](https://youtu.be/RI0X-OJs0_E)
19. <https://youtu.be/6p9RFDKqExo>

**Suggested Course Practical List:**

1. Draw following effect by simple colour & weave combination on point paper :
  - a) Continues line effect
  - b) Step pattern
2. Draw following effect by simple colour & weave combination on point paper :
  - a) Hounds Tooth Pattern
  - b) Birds eye / spot effect
3. Draw following effect by simple colour & weave combination on point paper :
  - a) All over effect
4. Prepare any one sample of colour and weave effect.
5. Draw Structural design for 'Bedford cords' on point paper of the following:
  - a) Plain Face Bedford cord structure.
  - b) Twill face Bedford cord structure.
  - c) Wadded Bedford cord structure.



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6. Draw Structural design for 'Bedford cords' on point paper of the following:
  - a) Plain faced Bedford cord structure.
  - b) Twill faced Bedford cord structure.
  - c) Wadded Bedford cord structure.
  - d) Arranged on an Alternate pick.
  - e) Crepon Bedford cord.
7. Prepare any one sample of Bedford cord structure.
8. Draw the Structural design of welt and pique on point paper.
  - a) Ordinary welt structure
  - b) Weft wadded welt
  - c) Fastback welt
9. Draw designs, draft, peg plan & cross section for following.
  - a) All over or plain Velveteen
  - b) Weft Plushes
10. Draw designs, draft, peg plan & cross section for following.
  - a) Corded Velveteen or Corduroys/ Fustians
  - b) Wire piles (Fast structures, Loose structures)
11. Draw designs, draft, peg plan & cross section for following.
  - a) Terry Piles (3 pick, 4 pick, 5pick,6pick)
12. Draw designs, draft, peg plan & cross section for following.  
Wire piles (Fast structures, Loose structures)
13. Draw structural design for Warp Back fabric.
14. Draw structural design for Weft Back fabric.
15. Draw design of the given sample on point paper
16. Calculate EPI, PPI, warp weight, weft weight and fabric weight of the given sample.

## List of Laboratory/Learning Resources Required:

- 1 Point paper
- 2 Pick glass
- 3 Hand loom

## Suggested Project List:

1. **Colour and weave:** Collection of various samples of colour and weave and analyze it.
2. **Bedford cord weave:** Collection of various samples of Bedfordcord weave and analyze it.
3. **Welt and pique structure:** Collection of various samples of welt and pique structure and analyze it.
4. **Terry pile structure :** Collection of various samples of terry pile structure and analyze it.
5. **Weft pile structure :** Collection of various samples of weft pile structure and analyze it.



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6. **Warp pile structure** : Collection of various samples of warp pile structure and analyze it.
7. **Backed cloth**: Collection of various samples of Backed cloth and analyze it.

## Suggested Activities for Students:

1. Collect various samples of Colour & weave effect.
2. Collect various samples of various Pile structures.
3. Present a seminar on any relevant topic of fabric structure.
4. Explore library/internet for search for specification of different popular fabric (with its trade name) in market.
5. Prepare showcase portfolios of various fabric with their trade names.

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