GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Diploma

Branch: Textile Manufacturing Technology

Course / Subject Code : DI03029041

Course / Subject Name : Woven Fabric Design-I

w. e. f. Academic Year:	2024-25
Semester:	3rd
Category of the Course:	PCC

Prerequisite:	**Basic knowledge of loom mechanism.**
Rationale:	Knowledge of woven structure is prime requirement for production of fabric. Fabric structure plays vital role in fabric properties like strength, feel, drape and appearance etc. It is necessary to develop design on point paper with all necessary details like weave, draft, peg-plan and denting required for actual fabric production on machine.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
CO-01	Use methods to represent the weave on point paper.	RU
CO-02	Develop basic fabric structure with design, draft and peg-plan.	UAC
CO-03	Develop derivatives of basic fabric structure with design, draft and peg-plan.	UAC
CO-04	Develop special fabric structures with design, draft and peg-plan.	UAC
CO-05	Calculate fabric particulars.	UAC

**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
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA(M)	PA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Representation of Weave on Graph Paper with fabric particular and trade name.** 1.1. Develop draft, Design and Peg-plan on point paper. 1.2 Explain different methods to represent interlacement of warp & weft. 1.3 Selection of weave according to end use of the fabric. 1.4 List different type of software use for fabric designing. 1.5.Features and quality particulars of special structures like - Calico, Rubia, Voiles, Denim, Jean, Poplin, Georgette etc.	06	13%
2.	**Construction of Basic fabric weave and features.** 2.1 Construction of basic weaves and its features. a) Plain Weave. b) Twill Weave. c) Sateen/Satin weave. 2.2 Identify End uses of Plain, Twill and Sateen/Satin weaves. 2.3Ornamentation of Plain Weave. 2.4 Differentiate between Satin and Sateen weaves. 2.5 Influence of yarn twist direction on twill line appearance.	08	18%
3.	**Modification of Plain, Twill & Sateen/ Satin Weaves.** 3.1 Develop derivatives of Plain Weave. a) Rib Weave. b) Matt Weave (Regular, Irregular and Fancy) 3.2 Develop derivatives of Twill Weave. a) Pointed Twill. b) Broken Twill. c) Transposed Twill. d) Rearranged Twill. e) Herringbone Twill. 3.3 Develop Crepe Weave. 3.4 Develop Cork-screw Weave (Warp and Weft). 3.5 Develop Diamond & Diaper weave 3.6 Loom equipment required for above Weaves.	13	29%
4.	**Special Fabric Structures** 4.1 Develop Specific weaves like: a. Ordinary Honeycomb b. Brighton honeycomb	13	29%

	c. Huckaback d. Mock-Leno 4.2 Identify End uses of Honey comb, Huckaback and Mock-leno weaves. 4.3Loom equipment required for above Weaves. 4.4 Develop Distorted Weaves. a) Warp distorted effect. b) Weft distorted effect. 4.5 Develop Extra Warp & Extra Weft Figuring with Loom equipment.		
5.	**Yarn and Fabric Calculation** 5.1 Calculate Average count. 5.2 Calculate Resultant count. 5.3 Discuss Heald count and Reed count. 5.4 Calculate weight of warp and weight of weft.	05	11%
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
03	**25**	**21**	**6**	**00**	**15**

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, William Wattson,Forgotten Books, United states 2018, ISBN-13-
978-1528462143, ISBN-10 – 1528462149.
2. Advance Textile Design, William Wattson, Kessinger Publishing, LLCUnited states 2010, ISBN-13-978-
1166485962, ISBN-10 - 116648596X.
3. Watson's Textile Design and Colour, Z. Grosiky, Woodhead Publishing Limited,
England, 1975, ISBN-13: 978-185573-995-6, ISBN-10: 978185573995.
4. Watson's Advance Textile Design, Z. Grosiky, Woodhead Publishing, UK 1977, ISBN-13 : 978-1855739963,
ISBN-10 : 9781855739963.
5. Grammar of Textile Design, Nisbet, Forgotten Books, United states 2018, ISBN-13- 978-1330304280,, ISBN-10

- 97813303042.
6. Fabric Structure and Design, N. Gokarneshan, New Age International Private Limited New Delhi, India 2008,
ISBN-13 : 978-8122424706, ISBN-10 : 8122424708.
7. Weaving calculation, R. Sengupta, Imprint 1979, ISBN-13: 978-0906216613,ISBN-10: 0906216613.

(b) Open source software and website:

1. http://www.textileassociationindia.org/
2. http://www.fiber2fashion.org/
3. http://www.nift.ac.in/
4. www.itamma.org/
5. www.en.wikipedia.org/wiki/Textile_design
6. http://www.designdiary.nic.in/
7. http://textilelearner.blogspot.in
8. https://textilestudycenter.com/
9. http://www.textileschool.com/
10. https://textilestudycenter.com/textile-books-free-donwload/

Suggested Course Practical List:

1. Prepare graphical representation of the weave.
2. Prepare structural design for plain weave on point paper.
3. Draw structural design of twill weave on point paper.
4. Draw structural design of satin/sateen weave on point paper.
5. Prepare fabric sample of plain weave on sample loom.
6. Prepare fabric sample of twill weave on a sample loom.
7. Prepare fabric sample of satin/sateen weave on a sample loom.
8. Analyse fabric sample of plain/twill/satin/sateen (design, draft, peg plan).
9. Draw designs on a point paper - Plain derivatives.
10. Draw designs on a point paper - Twill derivatives.
11. Prepare sample of plain/twill derivative on sample loom.
12. Develop design on a point paper - Crepe, Diamond, Diaper and Cork-screw weaves.
13. Develop design on point paper - Honeycomb, Huckaback and Mock-leno weaves.
14. Draw design and cross section of warp and weft distorted effect.
15. Draw design of Extra warp figuring and Extra weft figuring effect.
16. Identify and calculate various particulars from the samples like weave, draft, peg plan, approximate count of threads, threads density, heald & reed calculation, weight of warp and weft.

List of Laboratory/Learning Resources Required:

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

Suggested Project List:

a) **Plain, Twill and Satin/Sateen weave:** Collection of various samples of Plain, Twill and Satin/Sateen weave and analyse it.

b) **Modification of plain weave:** Collection of various samples of modified plain weave and analyse it.

c) **Modification of twill weave:** Collection of various samples of modified twill weaves and analyse it.

d) **Towelling weave:** Collection of various samples of towelling weave and analyse it.

e) **Special structure:** Collection of various samples of Special weaves and analyse it.

Suggested Activities for Students:

a) Collect samples of various basic weave fabrics and label them with its design, draft and peg plan.

b) Collect samples of various derivatives of basic weave fabric and label them with its design, draft and peg plan.

c) Present a seminar on any relevant topic of fabric structure.

d) Explore library/internet for search for specification of different popular fabric (with its trade name) in market.

e) Prepare showcase portfolios of various fabric with their trade names.

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