# GUJARAT TECHNOLOGICAL UNIVERSITY

**Program Name: Diploma in Engineering**

**Level: Diploma**

**Branch: Textile Manufacturing Technology**

**Course / Subject Code : DI02029021**

**Course / Subject Name : Weaving Technology - II**

| | |
|---|---|
| **w. e. f. Academic Year:** | 2024-25 |
| **Semester:** | 2nd |
| **Category of the Course:** | Professional Core Courses |

| | |
|---|---|
| **Prerequisite:** | **Basic knowledge of Warping, Sizing and dobby weaving.** |
| **Rationale:** | Fabric is final end product of mainline textile activity. The yarn is required to pass through preparatory processes before actual fabric making starts. Weaving preparatory plays very significant role for the success of fabric formation process. To produce better quality of fabric, weaving preparatory is most important process, which requires greatest care and attention. Warping and sizing processes are very important processes for fabric formation and quality of the fabric. To achieve higher productivity and improved fabric quality, it is desired to prepare yarn sheet with proper care. To produce fancy designs, better control on warp and operational knowledge of different dobby mechanism is required. In this course, the students are exposed to knowledge of weaving preparatory processes and dobby mechanism. |

**Course Outcome:**

After Completion of the Course, Student will able to:

| No | Course Outcomes | RBT Level |
|---|---|---|
| 01 | Understand the objectives, process & functions of warping process. | R,U,A,N |
| 02 | Understand the objectives, process & functions of sizing process. | R,U,A,N |
| 03 | Understand the objectives, working & functions of dobby mechanism. | R,U,A,C |
| 04 | Calculate the production of warping and sizing. | A,N,U,E |

**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 / CA (M) | PA/CA (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.Warping Process** | Objects of warping process.<br>Object & Classification of warping process.<br>Passage of material through warping & Sectional warping<br>Type of creel of warping machine.<br>Various mechanism like tensioner, stop motion, expandable comb, drum drive, beam drive, brake, traverse, leasing, beam pressing, doffing, donning, etc.<br>Comparison between direct warping and sectional warping.<br>Features of modern warping machines.<br>Defects in warping beams. | 12 | 28% |
| **2.Sizing process** | Object & Classification of Sizing Machine.<br>Types of creel.<br>Types of size box.<br>Methods of drying.<br>Various control devices on sizing machine.<br>Sizing ingredients & their functions.<br>Preparation of sizing recipe.<br>Different methods of sizing.<br>Sizing for various types of yarn.<br>Defects & remedies in sized beams.<br>Doffing, donning, maintenance in sizing<br>Recycling of preparatory waste. | 15 | 36% |
| **3.Dobby Mechanism** | Need & Classification of dobby.<br>Comparison of single lift & double lift dobby system<br>Construction & working of different dobbies like climax, cross border, cam, paper and electronically controlled dobby.<br>Dobby cloth defects & its remedies. | 13 | 26% |
| **4.Production calculation** | Production calculation for warping.<br>Production calculation for sizing. | 5 | 10% |
| | **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** |
| **30** | **30** | **20** | **10** | **5** | **5** |

*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. Weaving machine, material & management, Ajgaonakar D.B. & Talukdar, Mahajan Publisher Private Limited. Ahmedabad.1998. ISBN:81-85401-16-0
2. Weaving: conversion of yarn to fabric, Lord P.R. & Mohamed M.H., Merrow Publishing Limited, England, 1992ISBN:0-900 -54178-4
3. Fundamentals of Yarn Winding, Korrane Milind, Woodhead Publication India PVT Ltd., New Delhi, 2013, ISBN: 978-93-80308-38-8
4. Weaving Preparation Technology, Gokarneshan N., Abhishek Publications, Chandigarh, ISBN: 978-81-8247-247-1
5. Principle of Weaving, Marks & Robinson, The Textile Institute, Manchester, England,1976, ISBN:0-900739258
6. The mechanisms of Weaving, Thomas W. Fox, Textile Book Service, New Jersey, 1992.
7. Textile Sizing by B. C. Goswami, Rajesh Anandjiwala & David M. Hall Publisher : CRC Press; 1st edition (13 February 2004) ISBN-10 : 0824750535

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

a) http://nptel.ac.in/
b) http://www.textileassociationindia.org/
c) http://www.sitra.org.in/
d) http://www.itamma.org/
e) https://textilestudycenter.com/
f) http://www.textileschool.com/
h) https://textilestudycenter.com/textile-books-free-donwload/
i) http://www.cottonsjourney.com/Storyofcotton/page5.asp
j) http://textilelearner.blogspot.in/
k) http://www.rieter.com

**Suggested Course Practical List:**

1. Demonstrate the passage of yarn through warping machine.
2. Demonstrate the passage of yarn through sectional warping machine.
3. Demonstrate various types of creel in warping machine.
4. Demonstrate the passage of yarn through sizing machine.

5. Demonstrate various types of creel in sizing machine.
6. Demonstrate size box in sizing machine.
7. Demonstrate yarn drying system in sizing machine.
8. Demonstrate yarn splitting system in sizing machine.
9. Demonstrate various control devices in sizing machine.
10. Demonstrate working of climax dobby.
11. Demonstrate working of cross border dobby.
12. Demonstrate working of cam dobby.
13. Demonstrate working of paper dobby & electronically controlled dobby.
14. Prepare peg lattice for various dobby design.
15. Calculate the production of warping and sizing machine.

**List of Laboratory/Learning Resources Required:**

| Sr.No. | Equipment Name: |
|---|---|
| 1. | Miniature warping machine |
| 2. | Miniature Sizing machine |
| 3. | Dobby |

**Suggested Project List:**

a) **Warping:** Prepare the report of different warping machines with their specifications.
b) **Sizing:** Prepare the report of different sizing machines with their specifications.
c) **Dobby:** Prepare the report of different dobby mechanism with their specifications.
d) **Beam defect:** Prepare a portfolio of samples of different types of beam defects.
e) **Dobby cloth defects:** Prepare a portfolio of samples of different types of dobby cloth defects.
f) **Recycling of weaving waste:** Observe the methods adopted in industries to minimize preparatory waste.

**Suggested Activities for Students:**

a) Prepare report on warping machine based on industrial visit.
b) Prepare report on sizing machine based on industrial visit.
c) Prepare report on dobby based on industrial visit.
d) Collection of various machine specifications and process parameters for warping, sizing and dobby.
e) Prepare a comparative report from e-brochures and manuals available from different machine manufacturers for warping, sizing and dobby.
f) Present seminar on recent technological advancement of warping, sizing and dobby.

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