PTX3I103 FABRIC MANUFACTURE – I

Course Objectives

To enable the students to learn about :

- Need of various preparatory processes to woven fabric manufacturing.
- Principle of woven fabric manufacturing,
- Mechanism of machineries involved in preparatory processes and manufacturing of woven fabric and their operational principle.
- Selection and control of process variables during weaving preparatory and weaving fabric.
- Various setting of loom.

Course Outcomes

After successful completion of this course, the students should be able to

- Outline the process flow for woven fabric manufacturing
- Explain the mechanisms and working principle of various machineries involved in each stage of preparatory processes of woven fabric manufacturing.
- Understand the function of various elements and mechanism of conventiona loom.
- Select and control process variables and the various settings used to produce fabric of desired quality.
- Identify the trouble shooting problems and their solutions at each stage manufacturing.
- Calculate speed, production etc. at each stage of woven fabric manufacturing.

Module-I (12 Hrs)

Winding Process – Objectives, types of packages, types of winding machines - precision winding and drum winding, driving the package e.g., constant surface speed, constant angular speed, varying angular speed, uniform build of yarn package. Study of working principles of warp winding machines- mechanism of yarn traversing, Machine traverse ratio, angle of wind, packages density. Mechanical and electronic type yarn clearer. Yarn tensioners: Additive, multiplicative, combined and compensating type. Patterning: Reasons and remedies. Yarn fault classifying systems. Basic features of auto winders like Autoconer, Barbar colmman,. Murata etc.

Module II (10 Hrs)

Latest developments. Types and working principles of pirn winding machines. Pirn types and dimensions. Pirn bunching. Pirn winding defects causes and remedies. Production calculations of cone and pirn winders.

Warping Process: Objectives of warping, material flow in beam warping and creels used in warping machines; sectional warping machines. Package faults, Latest developments in warping. Performance assessment and calculations pertaining to beam and sectional warping machine.

Module III (10 Hrs)

Sizing Process : Objectives of sizing; sizing materials and recipe used for different types of fibers; size preparation equipment; sizing machines; Size add on %; Factors affecting size add on; Sizing defects and production calculations; Concept of single end sizing, combined dyeing and sizing. Control concepts in modern sizing machine.

Drawing-in operations : Need for drawing-in operation, manual and automatic drawing- in. Selection and care of reeds, healds and drop pins, control of cross ends and extra ends and calculations.

Module IV (08 Hrs)

Weaving Mechanism : Concept of woven fabric formation. - Overall concept about looms-Classification of looms; constructional features and mechanism of conventional power loom; Introduction to plain and twill weave.

Books Recommended:

1. 'Winding', BTRA Monograph Series, Bombay Textile Research Association, Bombay, 1981.
2. 'Warping and Sizing', BTRA Monograph Series, Bombay Textile Research Association,Bombay, 1981.
3. Talukdar M K, Srirammulu P K and Ajgaokar D B, "Weaving – Machine, Mechanism and Management", Mahajan Publisher Private Ltd., Ahmedabad, India, 1998.
4. Booth J E, "Textile Mathematics", Vol.II & III, Textile Institute, Manchester, 1977.
5. Goswami B C, Anandjiwala R D and Hall D M, "Textile Sizing", Marcel Dekker,
6. Ajgaonkar D.B, Talukdar M.K. Wadekar "Sizing: Materials, Methods, Machines"
7. Yarn Winding NCUTE Publication
8. Textile Mathematics Vol. II & III JE Booth
9. Sengupta R "Yarn Preparation", Vol. I & II, Popular Prakasam, Bombay, 1970.
10. Lord P.R. and Mohammed M.H., Weaving – Conversion of Yarn to Fabric||, Merrow Publication, 2001.

TENTATIVE Likely to be Modified