

FABRIC CONSTRUCTION AND WOVEN FABRIC ANALYSIS

Paper No HSCT (202)

CC-5

Credits : 3+1=4

SEM – II (M.Sc. C.T.)

Marks : 100 + 35= 135

Objective

- To enable students to understand and learn methods of developing fabrics using different fibers, yarn and fabric making techniques.
- To gain knowledge and understanding of fundamentals of weaving machinery and processes.
- To analyse different weave patterns and learn principles of creating design through weaving.

Unit - 1

principles of yarn manufacture – yarn processing

- For natural fibers - cotton, wool & worsteds, jute, linen by conventional systems and recent developments like:
 - a. OE Spinning – Rotar, Vortex, Friction, Airjet Electrostatic, Twistless (Bobtex, cover, signal twilo).
 - b. Self twisting
 - c. Fasciated
 - d. Yarn from fibers
 - e. Laminated yarns
- Yarn nomenclature and measurement – Yarn numbering systems
- Geometry of different classes of yarns and its relationship to fabric properties.

Unit - 2

Modern developments in yarns and at their manufacture

- Modern yarn production – principles of spinning in production of man made fiber; hot & cold drawing; spun yarn; blend yarn and bicomponent yarn
- Textured yarn technology – principles methods and process variable in texturing & their effect on properties of textured yarns : morphological changes induced by texturing.
- Core yarns, network and film yarns and laminated yarns.
- Designing through variable in yarns.

Unit - 3

Principles of fabric manufacture – basic principles, characteristics and significance of different processes – woven, knitted, non woven, laces, braids.

- a. Weaving
 - Parts and functions of handloom
 - Types of weave – basic & decorative
- b. Knitting
 - Knitting machines, types of knitting
 - Properties
- c. Felts & Non wovens
 - Knitting, braiding and lace making
 - Types of weave – basic & decorative
- d. Introduction to Technical Textiles – geo textiles.
 - Parts and functions of handloom
 - Types of weave – basic & decorative
 - Types of weave – basic & decorative

Unit -4

Fabric faults – fiber, yarn and fabric defects and their remedies.

Woven: Sequence of operations in warp and weft preparations:

- Various types of looms and their drive.
- Fabric classification and analysis of fabrics for its construction weaves.

- Basic and decorative weaves plain, twill and stain derivatives. Dobby and jacquard shedding and weaving terrypile.
- Principle of colour and design in weaving: preparation of pattern for doobby and jacquard looms; brocade, damask, tapestry, warp and weft pile weaving.
- New developments in woven fabrics – new looms and loom developments. Triaxial weaving, knit and weave construction.
- Textile design through weaving.

Practicals

1. Setting up of a simple loom – calculation of raw materials.
2. Weaving on simple loom, plain, rib, matt and twill structures.
3. Fabric analysis for design, repe at, draft, peg plan and other details.
4. Creating designs for stripes, checks, doobby and jacquards.
5. Visit to weaving mills.
6. Survey - Various fabrics available.

References

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2. American Cotton Handbook - Merrill
3. Subodh Kumar Aggarwal (1980): Textile Processing And Auxiliaries.
4. Textiles – Burker – (1988) Abhishek Publication.
5. Essentials Of Textiles – M. Joseph, Holf Rinechants, Winston Publication.
6. Irene Waller: Designing With Threads.
7. Edward Miller (1992) Textiles.
8. Corbman B.: Fiber To Fabric.
9. Book – Textiles – Prop & Behaviour in Clothing Use – Year (1992).
 - a. What is Textiles, page 10-13.
 - Woven Fabrics
 - Knitted Fabrics
 - f. Fabric structure (86-94)

- Woven fabric, fabric width, fabric weight, woven fabric structure, weaves, weave variety, plains, twill, stains weave.
10. Book – Textiles
 - Year 1998
 - Chapter 7, Principles of Weaving
 - Pg. 154 - 171
 11. Book – From Fibers to Fabrics, Gale, E., 1968, p.54.
 12. Colour and Weave – Margret & Thomas, Winderkuechd.
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 16. Aswani, K.T.: Weaving Mechanisms – Mahajan Book Distributors, Ahmedabad.
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 21. Kulkarni, M.M.: Weaving Technology; Virinda Publication, Jalgaon.
 22. Amalsar, D.M.: Yarn and Cloth Calculation.
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 25. Ajgaonkar, D.B.: Knitting technology, Universal Publishing Corp., Mumbai.
 26. Ingold, T.S. & Miller, K.S.: Geotextiles Handbook – Thomas Telford, London.