

## ICS 405: PAPER AND TEXTILE TECHNOLOGY

### Course objectives:

1. To know fundamentals of Paper and textile technology.
2. To understand Pulp and paper science with pulp manufacturing.
3. To learn the techniques of Coating and recycling of paper and textile.

### UNIT I

12 hr

**Pulp and Paper Science:** Raw materials for paper, Important fiber producing plants, woody & non woody fibers used in paper industry, physical and chemical characteristics. Structure of wood, structural elements of wood and bark, cell wall & fiber morphology, chemical components of wood; **Pulp Manufacture:** Mechanical pulping, Thermomechanical and Refiner mechanical pulping, Semicheical & chemical pulping. Kraft pulping. **Papermaking:** Beating and Refining of pulp.

### UNIT II

10hr

**Textile Technology:** Brief history on origin of textiles. Introduction to textile fibers and basic requirements of textile fibers. Manufacture of eco-friendly regenerated fibre. Brief study of physical & chemical properties of cotton, wool, silk & bast fibers. Importance and need of ginning. Impurities in the cotton and remedies to minimize impurities in cotton.

### UNIT III

10 hr

Introduction to blending techniques and its types. Blends of Polyester/cotton and polyester/viscose. Introduction to synthetic fibres. Raw materials for productions of PET, modified viscose rayon and their applications. Brief outline on production of acetate and cupramonium rayon and their applications.

### UNIT IV

10 hr

**Coating and Recycling of paper and textile:** Introduction to coating of Paper and metal foils. Fillers used in papermaking. Pressing: Objectives, types of presses, Drying: Theory and types, Finishing: Unwinding and rewinding. Evaluation of Paper: Physical, optical, electrical properties and Chemical properties of paper. Objects of mixing and blending. Introduction to textile testing & quality control. Sampling techniques. Frictional, optical, electrical and thermal properties of textile. Recycling of paper and textile.

### Course Outcomes:

4. Fundamentals of Paper and textile technology.
5. Pulp and paper science with pulp manufacturing.
6. Coating and recycling of paper and textile.

### References

1. Bleaching of Pulp, R. P. Singh, TAPPI Press.
2. Joint Text Book Committee of the Paper Industry, Vol. I to X, Technical Editor Benjamin A. Thorp Series Editor Michael J. Kocurek, Published by the technical section Canadian Pulp and Paper Association.
3. Hand Book for Pulping and Papermaking, Christopher J. Biermann
4. Environmental Friendly Technologies for the Pulp and Paper Industries, Young and Akhtar TAPPI Press.
5. Hand Book for Pulp and Paper Technologists, Gary A. Smook
6. Formation of synthetic fibres, Walczalk.K. Gordon & Sci. London.
7. Manual of Cotton Spinning, Coulson. A.F.W. (Ed.), Vol. I to IV,
8. Textile Institute Pub., Manchester, 1989.
9. Spun Yarn Technology, Osteby, Butterworths, London, 1987.
10. Physical Testing of Textiles, B.P. Senville, Wood Head, 1999.
11. Principles of Textile Testing, Booth J. E., Butterworth, Wendon III Edition.
12. Technology of Textile Processing, Technology of Dyeing, Shenai, V.A. 4th Edn., Sewak Publications, Bombay, 1988