

PCTX4201 Fibre Science & Technology - I

Module-I

(10 Hrs)

Introduction:

- a) Classification of textile fibres according to their nature and origin,
- b) essential and desirable properties of textile fibres,
- c) staple fibre and continuous filaments,

Natural fibres:

- a) cotton: concept of varieties; ginning, baling ,
- b) jute, Flax:- varieties, retting process (extraction of fibre from bast),
- c) protein fibres:- wool:- classification, grading, scouring, silk:- classification, concept of sericulture, degumming, throwing, reeling.

Module-II

(10 Hrs)

Man-made fibres:

- a) Principles of melt spinning, dry spinning and wet spinning,
- b) Manufacturing process of regenerated fibres - viscose & diverse forms of viscose, cuprammonium and acetate rayon
- c) Manufacturing of synthetic fibres - principles of polycondensation with reference to polyesters, polyamides, principles of poly addition with reference to acrylics
- d) concept of quenching operation and finish application,

Module-III

(10 Hrs)

Properties of Fibres

Physical properties: Fibre length - Technical significance of fibre length, introduction to length distributions, Measurement of fibre length of cotton fibre - Baer sorter diagram, 2.5% and 50 % span length, Uniformity ratio, **Fibre fineness** : Fibre linear density, Technical significance of fibre fineness; methods of measuring fineness of cotton fibres, jute, flax, wool, silk and man-made fibres, Maturity of cotton fibre and its influence on fineness. Determination of maturity of cotton fibre by different methods. Maturity Co-efficient. concept of micro denier fibre **Moisture Content and Regain:** Moisture content and regain, relative and absolute humidity, effect of moisture on fibres, **Fibre density, Crimp** - Significance, measurement. **Tensile Strength** - Tensile strength of single fibre, bundle strength of cotton,

Chemical Properties of Fibres : Chemical properties of different cellulosic, protein and synthetic fibres such as cotton, jute, flax, pineapple, wool, silk, polyester, polyamide, polyacrylonitriles etc.

Text Books:

1. Manmade Fibres - R.W. Moncrieff,
2. Textile Fibre - V.A. Shenai
3. Dyeing and Chemical Technology of Textile Fibres by E.R. Trotman,

Reference Books :

4. Man-made Fibres Science and Technology, Vol. 1,2,3 - H.F. Mark, S.M. Atlas and E. Cernia,
5. Polyester Fibres Chemistry and Technology - H. Ludwig,
6. Textbook of Polymer Science by F.W. Billmeyer.
7. Production of Man-made Fibres – A.Vaidya
8. Principle of Testing – J.E.Booth