PETX THEORY AND DESIGN OF TEXTILE MACHINES (3-0-0)

Module-I (12 Hours)

1. Design of various opener and cleaning and their position in a modern Blow room line, Analysis of piano feed regulating motion. Theories of carding and transfer mechanism of fibres – design aspects and factors for cylinder load and transfer efficiency, Improvement in technology of carding for increased production and improved quality of sliver, high speed carding: designs of carding machines for improved performances. Theories of drafting- Design features of high drafting system and roller weighting in draw frame, speed frame and ring frame. Recent developments in design of drawing, lap preparation, combing processes, speed frames, basic principle of design of autolevellers. Differential motion used in speed frames, Designing of cone drums for speed frame.

Module-II (14 Hours)

2. Design changes in drafting zone of ring frame for compact spinning system, Theory of ballooning in ring spinning, Forces acting and yarn tension in ring spinning, Development in design of spindle, ring and traveller, Design of cam and building mechanism in modern ring frame, drives on modern ring frames.
Design of opening roller, naval and rotor in rotor spinning system
Design features of TFO twister and its advantages over ring twister.

3. Mechanics of winding and tension variation in winding. Winding parameters, uniform build of conical packages. Design and operation of modern winding machine, design of grooved drum for various packages, package density analysis of yarn tension, Different yarn clearing systems. Patterning, modern anti-patterning process

Module-III (14 Hours)

3. Design of Beam warping drive for high speed warping machine, Design of sectional warping drum, Cone angle and traverse in sectional warping, Principle of latest automatic control in sizing machine, Stretch control in sizing, Design of modern sow box, squeezing, drying.

4. Kinematics of sley and heald motion, Shed depth and interference factor, Shedding cam design, Mechanism of picking, Shuttle retardation and its importance, Causes of pick variation, Cloth fell equation, Bumping condition.

Books recommended

1. Chattopadhyay R, "*Advances in Technology of Yarn Production*", 1st Ed, NCUTE, IIT Delhi (2002).
2. Mechanics of Spinning Machines-R.S.Rengaswamy, NCUTE Publication
3. *"Winding"*, BTRA Monograph series, The Bombay Textile Research Association, Bombay (1981).
4. *"Warping and Sizing*", BTRA Monograph Series, The Bombay Textile Research Association, Bombay (1981).
5. Marks R and Robinson A T C, "*Principle of Weaving*", The Textile Institute, Manchester (1986).
6. Mechanics for Textile Students –W.A.Hantoon, Textile Institute, Butterworth, 1960.
7. Textile Mechanics Vol. I & II – K. Slater, Textile Institute, Manchester, 1977.
8. An Introduction to Textile Mechanisms – P. Grosberg, Ernest Benn Ltd., London,1968
9. Textile Mathematics, Vol-I,II&III - J.E.Booth, Textile Institute, Butterworth