

## **TEXTILE TECHNOLOGY**

### **(DEGREE STANDARD)**

**SUBJECT CODE: 306**

#### **UNIT- I: FIBRE IDENTIFICATION AND BLEND ANALYSIS**

- i) Textile fibre Classification
- ii) Fine, gross structure and properties of fibres
- iii) Microscopic, physical and chemical test methods for fibre identification; blend analysis
- iv) Morphology characterization – Density, XRD, Electron microscopy
- v) Thermal characterization methods - DSC, DMA / TMA, TGA.

#### **UNIT- II: PHYSICAL PROPERTIES OF FIBRES**

- i) Mechanical – Tensile, Elastic recovery, Time Effect, Bending, Twisting & Compression
- ii) Optical - Absorption and dichroism, Reflection and lustre.
- iii) Electrical and Thermal Properties - Dielectric property, Static Electricity, Structural changes in fibres on thermal treatment.

#### **UNIT- III: SYNTHETIC FIBRE SPINNING AND POST SPINNING OPERATIONS**

- i) Requirements of fibre forming polymers
- ii) Spinning of Polymers - Melt Spinning, Wet spinning, Dry spinning
- iii) Post Spinning Operations – Drawing, Crimping, Heat setting, Tow-to-top conversion, Texturing methods.

#### **UNIT- IV: SPINNING**

- i) Principles of opening, cleaning and mixing/blending of fibrous materials
- ii) Draft and Drafting, Irregularity introduced by drafting
- iii) Roller arrangements in drafting systems;
- iv) Combing cycle, combing efficiency, lap preparation;
- v) Mechanism of roving bobbin building, roving twist;
- vi) Ring Cop formation, forces acting on yarn and traveller;
- vii) Single and folded yarn twist, production of core spun / compact spun yarn.
- viii) Alternate Spinning systems - rotor spinning, air jet spinning, friction spinning.
- ix) Principles of long staple spinning – Jute, Wool.

#### **UNIT- V: WEAVING**

- i) Warp winding - random and precision winding, winding parameters
- ii) Yarn clearers and Tensioners; yarn splicing
- iii) Types of warping - beam and sectional warping, pirn winding process;
- iv) Sizing Techniques, sizing of spun and filament yarns

- v) Primary, Secondary and Tertiary motions of loom, Loom timings.
- vi) Tappet, Dobby and Jacquard shedding;
- vii) Principles of Shuttleless Weft insertion systems.
- viii) Principles of Circular and Multiphase weaving
- ix) Basic woven fabric constructions and its derivatives.

#### **UNIT - VI: TESTING & QUALITY CONTROL**

- i) Sample selection techniques using statistics.
- ii) Measurement of fibre length, strength, fineness, maturity
- iii) HVI and AFIS techniques
- iv) Determination of yarn count, twist and hairiness
- v) Tensile testing of fibres, yarns and fabrics
- vi) Evenness testing of slivers, rovings and yarns
- vii) fabric properties - air permeability, drape, crease recovery, tear / bursting strength & abrasion.
- viii) Objective Evaluation of fabric hand - FAST and KESF
- ix) Statistical analysis of experimental results – Mean, SD, CV%

#### **UNIT - VII: CHEMICAL PROCESSING**

- i) Preparatory processes for natural fibres, synthetics and common blends
- ii) Dyeing of fibres using various dye classes.
- iii) Batch-wise and continuous dyeing techniques
- iv) Styles of printing. Printing thickeners and auxiliaries.
- v) Printing of cotton with reactive dyes.
- vi) Printing of polyester with disperse dyes.
- vii) Mechanical and chemical finishing of cotton.

#### **UNIT - VIII: KNITTING & GARMENTS**

- i) Knitting - Yarn quality requirements, principles of weft and warp knitting
- ii) Basic weft and warp knitted structures and its properties
- iii) Garments - Pattern making, Spreading, Cutting, Marker efficiency
- iv) Stitches and Seams
- v) Types of Sewing machine
- vi) Sewing thread attributes
- vii) Inspection and Merchandising.

#### **UNIT- IX: NONWOVENS & TECHNICAL TEXTILES**

- i) Nonwovens - Web formation
- ii) Bonding methods – mechanical, thermal and chemical.
- iii) Finishing and Application of nonwovens
- iv) Technical Textiles - Property requirements
- v) Industrial Textiles - Belts, Ropes, Tyre-cords, Coated abrasives
- vi) Automotive Textiles - Filter fabrics, Airbags, Carpets
- vii) Geotextiles – Applications in civil engineering
- viii) Agriculture Textiles – Crop covers, bird nets, soil mats and sacks
- ix) Packaging Textiles – Food packing and bags.

## **UNIT- X: TEXTILE MANAGEMENT & ENVIRONMENT CONSERVATION**

- i) Industrial Engineering – Work study, method study,
- ii) Costing – Elements, Balance sheet, P & L Account
- iii) Tools – TQM, 5S, Kaizen, MIS.
- iv) Marketing Management
- v) Industrial relations and Labour laws
- vi) Energy conservation in textile production process
- vii) Characteristics of Effluent
- viii) Effluent treatment.

