

HANDLOOM TECHNOLOGY / TEXTILE TECHNOLOGY/

TEXTILE MANUFACTURE

(DIPLOMA STANDARD)

SUBJECT CODE: 339

UNIT- I: FIBRE PROPERTIES AND MAN-MADE FIBRE SPINNING

- i) Properties of textile fibres
- ii) Classification of Textile fibres – vegetable, animal, mineral, regenerated, synthetic
- iii) Microscopic, physical and chemical test methods for fibre identification
- iv) Physical & Chemical properties of Vegetable fibres – Cotton, Jute, linen
- v) Physical & Chemical properties of Animal fibres – Wool, Silk
- vi) Physical & Chemical properties of Regenerated Cellulosic fibres – Viscose and Acetate Rayon, Cuprammonium Rayon
- vii) Physical & Chemical properties of Synthetic fibres – Polyester, Nylon
- viii) Requirements of fibre forming polymers
- ix) Spinning of Polymers - Melt Spinning, Wet spinning, Dryspinning
- x) Post Spinning Operations – Drawing, Crimping, Heat setting, Texturisation and spin finish application

UNIT- II: SPUN YARN FORMATION

- i) Ginning – Principle, machines and gin out-turn.
- ii) Objectives / Principles of opening, cleaning and mixing/blending machines
- iii) Working mechanisms of blowroom, card, drawframe, comber, comber preparatory, speedframe, ringframe, doubling machinery.
- iv) Salient features of blowroom, card, drawframe, comber, comber preparatory, speedframe, ringframe, doubling machinery.
- v) Working principles and features of open end spinning machines – rotor, airjet and airvortex
- vi) Norms and Critical settings related to quality / production in spinning machinery.
- vii) Yarn conditioning, reeling, bundling and baling
- viii) Maintenance of spinning machines

UNIT- III: TEXTILE CALCULATIONS

- i) Calculations of speed, draft, hank, production and efficiency in spinning machines.
- ii) Production and efficiency calculations in Winding, Warping, Sizing and Weaving
- iii) Indirect count systems –English, French, Worsted, linen and metric
- iv) Direct count systems – Tex and Denier.
- v) Conversion of yarn count from one system to other -Within Indirect, within Direct systems
- vi) Conversion of yarn count from indirect to direct systems and vice versa
- vii) Resultant count of folded yarn, Average count, Yarn Costing
- viii) Reed and heald calculations; Fabric cover, Fabric Costing.

UNIT- IV: FABRIC FORMATION

- i) Objectives of preparatory processes
- ii) Preparatory processes for handloom industry
- iii) Warp winding - random and precision winding, winding drum parameters
- iv) Stop motions, yarn clearers, tensioners and knotters/splicers
- v) Warping –Types of warping, Creels, Length measurement, stop motion
- vi) Working principles of Pirn winders
- vii) Sizing –Ingredients, Size recipes for cotton, silk and blends of cotton with polyester and viscose.
- viii) Principles of Drawing-in and Denting.
- ix) Primary, Secondary and Tertiary motions of loom, Loomtiming diagram.
- x) Tappet, Dobby and Jacquardshedding, Handloom shedding motion, Drop Box mechanism.
- xi) Features of Pit loom, raised pit loom, frame loom, semi-automatic loom and improved handlooms.
- xii) Principles of Shuttleless Weft insertionsystems.
- xiii) Maintenance of shuttle and shuttleless looms
- xiv) Fabric defects – causes and remedies

UNIT- V: FABRIC STRUCTURE

- i) Elements of woven fabric design – weave, draft and peg plan
- ii) Construction of Weaves - Plain weave and its derivatives, Regular and Modified Twills, Sateen and Satin, Crepe, Honey comb, Brighton honey comb, Mock-leno, Huck-a-back, Bedford cords, Welt, pique, backed cloth, Double Cloth, Triple Cloth, Tubular cloth, damask, tapestry, patent satin.
- iii) Extra warp and Extra weft figuring
- iv) Terry Pile – 3 pick, 4 pick, 5 pick and 6 pick terry weaves.
- v) Cut Pile – Velvets and Velveteens.
- vi) Gauze and Leno structures
- vii) Colour and Weave Effect
- viii) Computer Aided Textile Designing (CATD) – Photoshop, Coreldraw, Paintshop Pro and CATD softwares

UNIT - VI: CHEMICAL PROCESSING

- i) Preparatory processes – Desizing, Scouring and Bleaching – Objectives, Machines and Methods
- ii) Mercerisation – Objectives, Machines and Methods
- iii) Dyeing techniques for cotton, silk and blends– Direct, Reactive, Vat, Acid, Basic and Disperse dyes.
- iv) Batchwise and Continuous dyeing. Dyeing machines.
- v) Styles of printing – Direct, Resist, Discharge.
- vi) Printing techniques – Roller, Rotary Screen, Flat bed.
- vii) Mechanical and chemical finishing – calendaring, anti-shrink, resin finish, water repellent finish, flame retardant finish.

UNIT - VII: KNITTING, GARMENTS & MODERN DEVELOPMENTS IN HANDLOOMS

- i) Knitting - Yarn quality requirements, principles of weft and warp knitting
- ii) Basic weft and warp knitted structures and its properties – plain, rib, interlock and purl.
- iii) Garments - Pattern making, Spreading, Cutting, Sewing
- iv) Developments in Handlooms – Solid border weaving, multiple putta weaving, pneumatic / electrical lifting devices for jacquard, electronic jacquard for handlooms.

UNIT - VIII: TESTING & QUALITY CONTROL

- i) Important terms in Textile quality control – Mean, Median, Mode, SD, SE and CV.
- ii) Calculations related to test of significance.
- iii) Control charts and their applications in textile quality control.
- iv) Sampling techniques – objectives and types of sampling
- v) Humidity control – Standard and Testing atmosphere, Measurement of Relative Humidity.
- vi) Measurement of fibre length, strength, fineness, maturity and trash
- vii) Determination of yarn count, twist – Twist per unit length, twist multiplier; strength - CSP, RKM; elongation, hairiness, Evenness
- viii) Determination of fabric strength, stiffness, handle, drape, thickness, GSM, crease resistance, abrasion resistance, pilling resistance, air / water permeability, dimensional stability.
- ix) Determination of fastness to washing, rubbing, light.
- x) Inspection and Merchandising.

UNIT- IX: NONWOVENS, TECHNICAL TEXTILES& HANDLOOM FABRICS

- i) Classification of Nonwovens - Mechanical, Thermal and Chemical bonded fabrics
- ii) Technical Textiles- Belts, Tyre-cords, Coated abrasives, Airbags, Flame Resistant fabrics, Ballistic protective fabrics, Geotextiles, Medical Textiles.
- iii) Quality Particulars of handloom fabrics – Sarees, dhotis, angavastrams, bedsheets, towels, lungies, fabrics reserved for exclusive production on handlooms.
- iv) Traditional handloom Saris – Banaras, Kanchipuram, Jamdhani, Paithani, Chanderi, Patola, Sungudi, Ikats of Andhrapradesh and Orissa.

UNIT- X: TEXTILE MILL MANAGEMENT

- i) Plant location, lay out, material handling in textile mills
- ii) Selection and balancing of preparatory machines and looms
- iii) Costing – Elements, Balance sheet, Profit & Loss Account
- iv) Production, Planning & Control.
- v) Total Quality Management, Management Information System.

- vi) Human Resources management – Selection, recruitment, training, Industrial relations and Labour laws
- vii) Role of BIS, AEPC, HEPC, IIHT, WSC, Textile Committee, Textile Commissioner Office.
- viii) New Textile Policy.
- ix) Pollution Control: Types - Air, Water, Noise; Characteristics of Effluent and Effluent treatment of Wet Processing industry
- x) Energy audit and conservation
