# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
## Shri Vaishnav Institute of Textile Technology
## Choice Based Credit System (CBCS) in Light of NEP-2020
## B. Tech. in Textile Engineering
## (2021-2025)

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | | | | |
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| BTTX501 | DCC | YARN MANUFACTURING III | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

**Legends**: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. To disseminate the theory and practice of yarn manufacturing with reference to the constructional features, working of a ring spinning machine, ring-doubler and T.F.O.
2. To outline the overall processes involved in Silk Spinning, Wool Spinning, Semi-Worsted, Worsted, Jute and Flax Spinning.
3. To deal with the theoretical and quality aspects of doubling, the influence of machine parameters on the quality of ring yarn

**Course Outcomes (COs)**

Student will be able

1. Comprehend the working principle for any type of ring spinning machine and manipulate the process parameters for the production of any type of ring yarn with desired quality.
2. Justify the importance of doubling for different types of yarn and will also be able to evaluate the quality aspects of doubled yarn.
3. Interpret the different processes involved in Silk Spinning, Wool Spinning, Semi-Worsted Spinning, Worsted Spinning, Jute and Flax Spinning; and also demonstrate their skills for manufacturing of good quality yarn on these spinning systems.

**Syllabus:**

**UNIT I: Ring Spinning**

Objectives of Ring frame, constructional details of ring frame, theory related to drafting, twisting, winding, spinning balloon, yarn tension and selection of Ring and traveler, recent development in Ring spinning, compact spinning, calculations related to draft, speed, production.

**UNIT II: Ring Spinning Process Conditions and Yarn Defects**

Production of blended yarn/synthetic short and long staple fibre, spinning of natural, synthetic fibre, its blend in ring spinning. Ring spinning process parameters setting, environmental conditions and its effects, maintenance schedule and supervisory check

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

points, Common defects in yarn, causes and remedies.

**UNIT III: Twisting and Doubling**

Objectives, types of doubling, dry and wet doubling, merits and demerits, feed material preparation, constructional details and theory of ring doubling and TFO, developments in TFO and various type of doubling, calculation of production, twist for each case, selection of traveler and ring, general idea of material and package faults and their remedies, environmental condition and supervisory checkpoints.

**UNIT IV: Reeling and Bundling**

Reeling and bundling-objectives of reeling and bundling, brief idea about machines, working, merits and demerits of different types of reeling, production calculation and supervisory checkpoints.

**UNIT V: Other Fibers Spinning Process**

Introduction to woolen, semi worsted and worsted systems of spinning, Jute and flax spinning. Manufacturing of different types of fancy yarns. Polyester Recycled fibre spinning.

**List of Practical (At least 10 practical experiments to be performed by each student):**

1. To study the drafting, twisting and winding zone in ring frame.
2. Study and calculation of draft constant, twist constant, TPI, and production of ring frame.
3. To perform various settings and maintenance operations on ring frame such as: Ring rail leveling, spindle gauging, spindle eccentricity, lappet eccentricity.
4. Prepare a ring yarn sample by changing the draft and twist pinion.
5. To study the effect of shore hardness on yarn quality in ring frame (Mill Study).
6. To study the package building mechanism in a ring frame.
7. To study the drafting, twisting and winding zone in ring doubler.
8. Study and calculation of draft constant, twist constant, TPI, and production of ring

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

doubler.

9. To perform various settings and maintenance operations on ring doubler such as: Ring rail leveling, spindle gauging, spindle eccentricity, lappet eccentricity.
10. To study the package building mechanism in a ring doubler.
11. To study the drafting, twisting and winding zone in TFO.
12. Study and calculation of draft constant, twist constant, TPI, and production of TFO.
13. To study the safety devices in ring frame and ring doubling machine.

**References:**


1. Two-For-One Technology & Technique for Spun Yarn by Kulkarni H S and Murthy HVS, Tecoya Publication, Bombay, 1992.
2. A Practical Guide to Ring Spinning by Klein W, Textile Institute, 2000.
3. Cotton Ring Spinning by Gilbert R. Merrill, Universal Publication, UK, 1959
4. Cotton Spinning by Taggart W. S, Macmillan, 1911.
5. Fancy Yarns-Their Mfg. and Application by Gong R.H.& Wright R.M., Elsevier, 2002.
6. Textile Yarns Technology, Structure & Applications by Goswami B.C.Wiley India, 2010.
7. Ring Spinning, Doubling & Twisting by Salhotra K. R., NCUE Publication, 2000.
8. Advances in Technology of Yarn Production by Chattopadhyay R.,NCUE Publication.
9. Fundamentals of Spun Yarn Technology by Lawrence Carl A. CRC press London, 2003.


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| BTTX502 | DCC | APPAREL MANUFACTURING AND MERCHANDISING | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. Students will be able to understand the apparel manufacturing process line along with different types of apparel production system.
2. Students will be able to understand the role of the merchandiser in garment industry.
3. Students will be aware of apparel Industry along with different retail firm structure.

**Course Outcomes (COs) :**

Student will be able

1. Understand and describe the apparel manufacturing process along with different apparel production system.
2. Understand different type of machines used in garment manufacturing process.
3. Explain different type of store formats in retail business along with marketing strategy
4. Explain different type of merchandising process

**Syllabus**

**UNIT I: Introduction to Apparel Industry & Production system** **09 Hours**

Introduction to Apparel Industry: Nature & size, Apparel industry in India. Production System & it's basic components, Apparel Manufacturing Production Systems- Batch Production, Mass production, Continuous Production. Make Through, Progressive Bundle System, One Piece Flow System, UPS. Flow chart of different garment production process, Capacity planning, Operation breakdown.

**UNIT II: Overview on Apparel Manufacturing Process** **10 Hours**

Apparel Manufacturing Process: Introduction & Overview. Pre garmenting Process: Fabric Inspection, Marker Planning, Grading, Pattern Making. Spreading and Cutting

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

with Objects & Types. Seams & Stitches .Different types of sewing machines. Different types of Garment Accessories, Garment Finishing Process. Concept of ratio packing

**UNIT III: Marketing Concepts** **07 Hours**

Introduction of Marketing Management: Definition, Functions, Key concepts of Marketing & Market research. Marketing Mix, Segmentation, Targeting & Positioning (STP). Difference between Selling & Marketing. Product Life Cycle.

**UNIT IV: Merchandising Process** **7 Hours**

Merchandising: Definition, Objects, Functions .Types of merchandising .Role & responsibilities of Merchandiser. Difference between Visual Merchandising with Fashion Merchandising . Introduction of Garment costing. Sourcing, Time and action Calendar. Type of samples.

**UNIT V: Introduction of Fashion retailing Process** **07 Hours**

Retail Firm Structure, Types of Buyer, Buying house, Fashion buyer: Role & Responsibilities. Retailing: Planning, Forecasting, Buying and Selling. Range: Planning & Development. Document formats: order sheet, packing list, invoice, inspection and testing reports etc. Use of ERP in apparel industry.

**List of Practical's**

1. To study the flow chart of Garment Process Line.
2. To study plant layout of Garment manufacturing unit.
3. To study the spreading and layering techniques of fabric
4. To study the garment cutting methods
5. To study the sewing machine and its parts
6. To study the types of stitches

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7. To study the types of seams
8. To study the work aids used in sewing machine
9. To study the retail merchandising process flow chart
10. To study the Retail Store layout with working procedure

**References:**


1. Garment Technology for Fashion Design by CooklinGerry, Wiley-Blackwell; 2 edition, 2012.
2. Introduction to Clothing Manufacture by CooklinGerry, John Wiley & Sons, 2006.
3. Technology of Clothing Manufacture by Carr& Latham, John Wiley & Sons,·1994.
4. Introduction to Clothing Production Management by Chuter A.J., John Wiley & Sons, 1995.
5. Pattern Making byMartin Shoben, Butterworth-Heinemann, 1987.
6. Pattern.Making by Armstrong and Helen Joseph, Pearson, 2009.
7. Fashion from concept to consumer by Gini Stephens Frings. Prentice Hall,1987.
8. Marketing Management by Philip Kotler,Prentice Hall,2002,8th Edition.
9. Managing Productivity in Apparel Industry by Rajesh Bheda, CBS Publisher & Distributor,2016


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| BTTX503 | DCC | TEXTILE CHEMICAL PROCESSING I | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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**Course Educational Objectives (CEOs):**

1. Students will be able to use effectively principles and mechanisms of pre-treatment processes on textile goods.
2. Students will be able to dye different types of fabric accurately according to requirement.

**Course Outcomes (COs)**

Student will be able

1. Apply various principles and mechanisms of pre-treatment processes in textile wet processing.
2. Differentiate the various chemicals used in the preparatory and Dyeing processes and utilize them according to end use

**UNIT I: Introduction of Textile Processing and Preparatory.**

Sequence of chemical processing of textiles. Natural and added impurities in textiles. Introduction of various preparatory processes e.g. singeing, desizing, scouring and bleaching for different natural and synthetic materials and blends.

**UNIT II: Mercerization and Heat Setting**

Mercerizing of cotton, Optical whitening agents and their use, heat setting of synthetic fibre fabrics.

**UNIT III: Concept & Theory of Colour.**

Colour and chemical constitution, Primary and secondary colour, additive and substractive colours, complementary colours, Properties of dyes and pigments, Computer

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

Colour-maching, Beer Lambert law, Kubelka-munk equation, Measurement of colour strength and colour difference, construction and working of spectrophotometer

**UNIT IV: Dyeing of Textiles**

Theory of dyeing – adsorption, absorption and fixation of dye on fiber. Classification of different classes of dyes according to their chemical composition and application; Brief introduction to dyeing of natural and synthetic fibrewith various dye classes e.g. Direct, Basic, Acid, Sulphur, Vat, Solubilized vat, Azoic and Reactive.

Disperse dye: Free volume model, different methods of dyeing polyester and other synthetics fibers using disperse dye: carrier dyeing, high temperature high pressure (HTHP) dyeing. Jet-dyeing and Thermosol dyeing.

**UNIT V: Dyeing of Yarn and Fabric. Dyeing Machines.**

Brief introduction to dyeing of yarns and fabrics with various dye classes

Different machines involved in the dyeing processes, dyeing of blends. Colour fastness of dyed textiles, shade percentage and its measurement.Introduction of denim Processing and process flow.Calculation & mill practices.

**List of Practical (At least 10 practical experiments to be performed by each student):**

1. To study the process flow of textile chemical processing.
2. Scouring of cotton using sodium hydroxide
3. Bleaching of cotton with hypochlorite and Hydrogen peroxide.
4. Construction and working of spectrophotometer
5. Dyeing of cotton fabric sample using direct dye
6. Dyeing of cotton fabric sample using reactive dye

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7. Dyeing of cotton fabric sample using sulphur dye
8. Dyeing of cotton fabric sample using vat dye
9. Dyeing of cotton fabric sample using azoic dye
10. Dyeing of silk fabric sample using reactive dye
11. Dyeing of silk fabric sample using acid dye
12. Dyeing of wool fabric sample using acid dye
13. Dyeing of polyester fabric sample using disperse dye
14. Dyeing of nylon fabric sample using acid dye

**References:**


1. Scouring and Bleaching by Shenai, V. A. Sevak Publications, Wadala Mumbai, 1987.
2. Technology of Dyeing by Shenai, V. A., Sevak Publications, Wadala Mumbai, 1984
3. Textile Scoring & Bleaching by Trotman E.R., Hodder Arnold, 1968
4. Cellulosic Dyeing by Shore John, Bradford : Society of Dyers and Colourists, 1995
5. Handbook of textile and industrial dyeing; M. Clerk(Editor); Woodhead publishers, 2011
6. Cellulosic Dyeing; John Shore; Bradford : Society of Dyers and Colourists, 1995
7. Textile Preparation and Dyeing; Asim Kumar Roy Choudhury, Science publishers, 2006


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| BTTX504 | DCC | TEXTILE TESTING II | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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**Course Educational Objectives (CEOs):**

1. Students will have knowledge of tensile testing and its Principle and will be accurately assess the textile material as per the requirement.
2. Graduate will accurately assess and test the fabric properties (functional and aesthetic) according to their application & requirement.

**Course Outcomes (COs)**

Student will be able

1. Measure evenness and irregularity techniques of textile testing.
2. Describe tensile properties and its principle.
3. Demonstrate the methods to evaluate fabric properties
4. Asses the fabric properties and its importance in real life situations.

**Syllabus Contents**

**Unit I: Yarn Evenness Testing**

Concepts of evenness, Schematic diagram and working of Uster evenness tester, index of irregularity, nature and causes of irregularity, length–variance curve, various methods of measuring and assessing irregularity, evaluation and interpretation of test results by spectrograph, analysis of spectrograph, like periodic fault, drafting wave, peaks, effects of irregularities. Evenness tester for filament yarns. Testing conditions for POY and DTY and interpretation of results.

**Unit II: Tensile Testing Principle**

Terms and definition about different tensile testing principle, such as CRE, CRL and CRT. Concept and application of tensile testing principle in testing machine .Factors

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affecting the result of tensile experiments. Terms and definition with respect to load-elongation curve and its conversion to stress-strain curve.

**Unit III: Yarns and Fabric Tensile Testing**

**(a)Yarn Strength Testing**

The pendulum lever principle with constant rate of traverse, The Strain gauge, transducer principle, Machines working on these principles. Yarn lea strength testing,description of lea strength tester, count strength product (CSP) or Break factor & its significance. Ballistic or Impact tensile testing of textiles. Factors affecting results of tensile test. testing conditions and interpretation of results.

**(b) Fabric Strength:**

Fabric tensile test by strip test & grab test, fabric tear strength test, Fabric bursting strength test.

**Unit IV: Testing of Physical and aesthetic properties of Fabric**

Physical parameters measurement of fabric. e.g. length, width, weight/length, thickness, crimp % in warp and weft, Shrinkage testing etc. fabric properties e.g. drape, handle, stiffness, crease recovery, pilling, wear and abrasion resistance of fabric.

**Unit V: Special fabric testing**

Air permeability, water permeability, water-proofing, color fastness tests– washing, rubbing, sublimation, perspirations, dry cleaning, flammability test- assessment of aesthetic of fabrics by Kawabata.

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| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BTTX504 | DCC | TEXTILE TESTING II | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

**Legends**: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**List of Practical (At least 10 practical experiments to be performed by each student):**

1. To test Single yarn strength by using Instron tensile tester.
2. To test Lea strength of yarn by using lea strength tester.
3. To test fabric tensile strength (strip) & elongation by using Instron tensile tester
4. To test fabric tensile strength (Grab method)by using Instron tensile tester
5. To test fabric tearing strength by using Elmendrof Tearing strength tester
6. To test fabric Bursting strength.
7. To test crease recovery of fabric by using crease recovery tester
8. To test color fastness of a fabric by using crock-meter.
9. To Check length, width and GSM of fabric.
10. To test Fabric stiffness by using stiffness tester
11. To test Fabric Water repellency
12. To test Pilling resistance of fabric
13. To test Abrasion resistance of fabric by using martindal abrasion resistance tester
14. To test Drape coefficient of fabric by using drape meter.
15. To test thickness of fabric by using thickness tester.
16. To test work of rupture of fabric by using Ballistic tester.

**References:**


1. Principle of Textile Testing - Booth J.E.
2. Handbook of Textile Testing & Quality Control - Grover BE and Hamby DS
3. Progress in Textiles Science and Technology–Vol.1, Testing & Quality Management - Kothari VK
4. Physical properties of Textile Fiber- Morton &Hearle
5. Textile Testing - Angappan P, R. Gopalakrishnan.
6. Management of Quality in the Apparel industry - Mehta Pradip V &BhardwajSatish K


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| | | | THEORY | | | PRACTICAL | | L | T | P | CREDITS |
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| BTTX505 | SEC | ART AND DESIGN IN TEXTILES | 0 | 0 | 0 | 0 | 50 | 0 | 1 | 4 | 3 |

**Legends**: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. To understand and design basic of color pattern as per requirements.
2. To identify and differentiate between color pattern and textured.

**Course Outcomes (COs):**

Students will be able to

1. To develop new colour pattern.
2. To design block as per requirement.
3. To design customized pattern.

**Course content:**

Introduction: about surface ornamentation.

**List of Practical's**

1. Prepare sheet for fabric surface ornamentation
2. Prepare colour schemes for monochromatic, analogous colour
3. Prepare colour schemes for colour contrasting (single complimentary, Double complimentary, analogous complimentary, split complimentary, triad complimentary).
4. Prepare colour schemes for Neutral harmonies, neutral contrasts, other colour variations
5. Create physical and visual textures on paper.
6. Prepare swatch for fabric samples and combinations.
7. Prepare motifs and patterns using various lines, shapes, etc.
8. Create stylized motifs and patterns using sources of inspiration (e.g. mango, fish, leaves, etc.)
9. Create compositions of motifs and patterns.

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| BTTX505 | SEC | ART AND DESIGN IN TEXTILES | 0 | 0 | 0 | 0 | 50 | 0 | 1 | 4 | 3 |

**Legends**: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

10. Create patterns based on method of rendering ( print, embroidery, textures etc.) and type of garment
11. Prepare different patterns of block printing.
12. Prepare different patterns of screen printing
13. Prepare samples of one, two and three colour motifs using stencils
14. Prepare samples using various strokes of fabric painting.
15. Prepare samples of yarn craft - drawn thread and beading, macramé, crocheting, U-pin, cross-stitch, nail and thread, etc.

**References:**


1. Textile Arts of India - Vastra, Satheesan
2. Design for applied decoration in crafts by john Farleigh, G. Bell and sons ltd., U.K.
3. Design in Embroidery, Violet M. Endacott, Great Britain
4. Tie dyed Textiles of India,Veronica Murphy and Rosemary Crill, Rizzoli Internafional Publication, 1991
5. Hand Painted Textiles for Home, Kazz Ball and Valerie Janitch, David and Charles, 1991
6. Batik with Noel Dyrenforth, John Houston, Orbis Publishing House, London, 1975
7. Fabric Dying and Printing, Stuart and Patricia Robinson, Butterworth and Co. U.K.
8. Tie Dying and Batik, Fay Anderson, Octopus Books Ltd., London, 1977
9. Shibori, Elfriede Moller, Search Press
10. Textiles-A Handbook for Designers, Marypaul Yates, W.W. Norton and Company, N.Y. London
11. Pustak Mahal series dying, printing and painting techniques


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| BTTX516 | DSE | KNITTING TECHNOLOGY | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends**: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. To provide knowledge on the fundamentals of warp and weft knitting technology.
2. To understand different pattern, design & techniques of weft and warp knitting and to apply knowledge in knitting industries

**Course Outcomes (COs)**

Student will be able

1. Apply their knowledge on the various functions of the Knitting technologies.
2. Understand the different the knitted fabric
3. Solve the different problem & understand the quality aspects for the knitting.
4. Use their conceptual knowledge for knitting industries

**Syllabus**

**UNIT I: Introduction of Knitting and Elements of Weft Knitting.**

Introduction . to knitting and its comparison with weaving. Weft Knitting classification,specification of various knitting machines, elements of machine knitting, needle gaiting, principle of operation of different single jersey and double jersey machines, knitting cycle, positive yarn feeder, production calculation.

**UNIT II: Different weft Knitting Fabric Structure.**

Basic single jersey and double jersey structures and their derivatives, horizontal strippingand plating, Designing by different, mechanisms e.g. pattern wheel, pattern drum and jacquard.

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| BTTX516 | DSE | KNITTING TECHNOLOGY | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends**: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**UNIT III: Elements of Warp Knitting**

Introduction to warp knitting, application of warp knitted fabric. Comparison between warp knitting and weft knitting. Structure properties of warp knitted fabric. Classification of warp knitting and their scope and uses, element of warp knitting machine, various advantages of warp knitting machine and their area of application.

**UNIT IV: Different Warp Knitting Machines and Warp Knitting Structure**

Introduction to TricotandRaschelknitting machine,knitting elements of TricotandRaschelknitting machine, working principle and pattern mechanism in TricotandRaschelknitting machine.

**UNIT V: Modern Development in Knitting and Quality Control**

Application of electronics and automation in knitting machines.Modern Developments in Weft Knitting Machine.Control of yarn feeding in warp knitting machines; requirement of yarn quality for knitting; dimensional stability of knitted structures.

**References:**


1. Knitting Technology by Ajgaonkar D. B., Universal Publication, 1998.
2. Knitting Technology by Spencer, Woodhead Publishing ,Abington Hall, Abington, 2001
3. Knitting Technology by Pitman, Tubbs, M, 1948.
4. Knitted Clothing Technology by Brackenbury Terry, Wiley India, 1992.


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| BTTX526 | DSE | TEXTURED YARN TECHNOLOGY | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends: L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. To provide knowledge about the manufacturing process of textured yarns.
2. To understand the principle of air textured yarn and to find the applications of textured yarn.

**Course Outcomes (COs)**

Student will be able to

1. Explain the core concept of texturing process.
2. Solve the problems occurred during manufacturing of textured yarns.
3. Develop the different structure of textured yarns.
4. Analyze the physical and mechanical behavior of Textured yarns.
5. Explain the principle & manufacturing process of air jet textured yarn.

**Syllabus**

**UNIT I: Introduction of Texturising**

Objective of Texturising, Drawbacks of flat filament yarns, requirement of raw material for texturising, drawing process. Definition and concept of Texturising, Classification and characteristics of textured process and texturised yarn. Other Methods of Texturising like BCF draw texturising processes and Yarns: - BCF draw texturising machines, process variables. Edge crimping, Stuffer box crimping, Knit-de-knit, Gear Crimping, Chemical texturising of natural fibres.

**UNIT II: False Twist Texturising Process**

Scientific principles in False twist Texturising, Methods of production of stretched (single heater) and modified stretched (double-heater) yarns by conventional methods.

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| BTTX526 | DSE | TEXTURED YARN TECHNOLOGY | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends**: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

Properties of such yarn.Draw Texturising, Concept of sequential and simultaneous draw texturising, Study of simultaneous draw texturising process.

**UNIT III: Draw TexturisingMachine and Process Variables**

Draw texturising Machine Details: - Machine profiles, Twisting devices, Heaters, Cooling devices, Coning oil application, Process variables, Defects and remedies in draw textured yarns. Quality of draw textured yarns. Technological developments in draw texturising technology.

**UNIT IV: Air-Jet Texturing.**

Air Jet Texturising, Principle of loops formation, Air-jet Texturising machine, air- jets, wetting systems, stabilizing devices, process variables in air texturising, Quality of air textured yarns, blending of filaments in air texturising. Properties of air jet textured yarn

**UNIT V: Quality and Process Control**

Testing of texturized yarn, Denier, Tensile properties, Crimp properties – Texturmat-ME, TYT, Heberline Crimp tester. TKD (Tube-Knitting-Dyeing) test and gradation. On-line tension (OLT) control and gradation system. Classification of Physical defects, inspection procedure and gradation.

**References:**


1. Yarn Texturing Technology byHearle J.W.S.,HollickL.&WilsonD.K.(Woodhead Publishing)
2. Textile Yarn Technology Structure and ApplicationbyGoswami B.C., Martindale, J.G., Scardino F.L., (Wiley Publication) 1977, U.S.A.


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| BTTX526 | DSE | TEXTURED YARN TECHNOLOGY | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends**: L - Lecture; T - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/


3. Production of Textured Yarns by the False Twist Technique-Textile Progress, Vol. 21, No.3,Wilson D.K. and Kollu T.(Textile Institute, Manchester, U.K.,1991).
4. Production of Textured Yarns by Methods Other than False Twist Technique by Wilson D.K. and Kollu T., Text. Prog., Vol. 16, No.3., (Textile Institute, 1981).
5. Winter School on Man-made Fibers – Production, Processing, Structure, Properties and Applicationsby Gupta V.B. Vol. 1, 1988.
6. Yarn Texturing Technology by Hes L. Ursiny P.,Eurotex, U.K., 1994.
7. An Analysis of the Air Jet Yarn Texturing Process Part-I: A Brief history of developments in the process by AcarM. and Wray G.R., Journal of Text. Institute, Vol.77,No.1, p19-27, (1986)
8. Spinning of Manmade Fibres and Blends on Cotton Systems by Salhotra K. R. The textile Association, India 2004,
9. The Industrial Application of the Stress-Strain Relationship by Hamburger, W: J., Journal of Textile Inst. 40, 700 (July 1949),


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| BTTX536 | DSE | Dyeing of Synthetic and Blends | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 0 | 3 |

**Legends**: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**Course Educational Objectives (CEOs):**

1. To teach the principles and mechanisms of pre-treatment processes on synthetic textile materials.
2. To train the students on dyeing of different synthetic fabrics according to requirement.

**Course Outcomes (COs)**

Student will be able to

1. Apply various principles and mechanisms of pre-treatment processes in wet processing of synthetic fabrics.
2. Dye different synthetic fabrics and assess the fastness properties of dyed materials

**Syllabus**

**UNIT I: Preparation of synthetic textile materials and blends**

Need and objectives of preparatory processes of synthetic textiles, Singeing, Desizing: Hydrolytic and oxidative desizing methods, Heat setting: Dry heat setting, steam setting, hydro setting, Scouring of synthetic fibers: Scouring of acetate fibers, scouring of nylon, scouring of polyester, scouring of acrylic fibers

**UNIT II: Theory of dyeing**

Properties of dye and pigments, Colour and chemical constitution: Chromophore, auxochrome and solubilising groups, Colour measuring instrument, Classification of dye according to chemical constitution and according to application, Dyeing process: Adsorption of dye, absorption of dye, fixation of dye, Fastness requirement: Light fastness, washing fastness, rubbing fastness, perspiration fastness, sublimation fastness, dry cleaning fastness, dry heat fastness.

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| BTTX536 | DSE | Dyeing of Synthetic and Blends | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 0 | 3 |

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

**UNIT III: Mass colouration with pigments**

Mass colouration of synthetic fibers: Mass colouration of viscose, Mass colouration of acetate, Mass colouration of acrylic, Mass colouration of nylon, Mass colouration of polyester

**UNIT IV: Dyeing of synthetic textile material**

Disperse dye, Dyeing of acetate fiber with disperse dye, Dyeing of polyester fiber with disperse dye: Carrier dyeing method, HTHP dyeing method, Thermosol dyeing method, Dyeing of nylon with disperse dye, acid dye, metal complex dye and reactive dye, Dyeing of acrylic fiber with basic dye

**UNIT V: Dyeing of blended materials**

Dyeing of cotton-viscose blends, wool-cellulose blends, Nylon-wool blends, Acetate-nylon blends, polyester-nylon blends, polyester-wool blends, polyester-cellulose blends, polyester-acrylic blends, nylon-acrylic blends, wool-acrylic blends, acrylic-cellulose blends, machines used for dyeing synthetic textile materials and blends

**References:**


1. Chemical principles of synthetic fiber dyeing - Burkinshaw, S.M., Springer, 1995.
2. Technology of Dyeing; V. A. Shenai, Sevak Publications, Mumbai, 1996
3. Dyeing and Chemical Technology of Textile Fibers; E. R. Trotman, Hodder Stoughton, 1984
4. Handbook of textile and industrial dyeing; M. Clerk(Editor); Woodhead publishers, 2011
5. Textile Preparation and Dyeing; Asim Kumar Roy Choudhury, Science publishers, 2006
6. Chemical Technology in the Pre-treatment Process of Textiles -. Karmakar S. R.,Elsevier sciences B.V.,1999


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