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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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 concerning the constructional features, working of a ring spinning machine, ring-doubler, and T.F.O.
2. To outline the overall processes involved in Wool Spinning, Semi-Worsted, Worsted, Jute, and Flax Spinning.

Course Outcomes (COs)

The student will be able to

1. Comprehend the working principle for any type of ring spinning machine and manipulate the process parameters for producing ring yarn.
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. Explain the yarn conditioning and packaging process.
4. Understand the different processes involved in Wool Spinning, Semi-Worsted Spinning, Worsted Spinning, Jute, and Flax Spinning.

Syllabus

UNIT I: Ring Spinning **10 h**

Objectives of Ring frame, working and constructional details of ring frame; selection of Ring and traveler; Spinning geometry, spinning balloon, yarn tension; Spindle drive, Cop building mechanism; Draft and production calculation; Development in Ring spinning- compact spinning, automation in ring spinning -linkconer.

UNIT II: Ring Spinning Process Conditions and Yarn Defects **8 h**

Production of blended yarn/synthetic short and long staple fibers in ring spinning; Ring spinning

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

process parameters, setting, end breakage – cause, effect and control; environmental conditions and its effect, the general idea of yarn faults and package faults and their remedies, and supervisory checkpoints.

UNIT III: Twisting and Doubling **10 h**

Objectives, types of doubling, twist and twist direction effects, Tension effects, Balanced and unbalanced yarn, Properties of folded yarn; feed material preparation, constructional details and theory of ring doubling and TFO, developments in TFO, Production of fancy yarns with yarn doubling, end uses. Production Calculations; environmental conditions, and supervisory checkpoints.

UNIT IV: Yarn Conditioning and Packaging **9 h**

Yarn Conditioning, objective, working of yarn conditioning machine; Yarn Packaging, Reeling, and bundling/baling, working, merits, and demerits of different types of reeling, Semi/Automatic cone packing machine, and supervisory checkpoints.

UNIT V: Other Fibers Spinning Process **8 h**

Introduction to woolen, semi-worsted, and worsted spinning systems; Jute and flax spinning; Outline of the production process of these spinning systems.

List of Practical

1. To study the passage of material through ring frame.
2. To draw and study the gearing diagram of ring frame machine.
3. To locate and study the change pinion-related draft constant, twist the constant in ring frame.
4. To study the cop building mechanism in a ring frame.
5. To study the passage of material through ring doubler.

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6. To draw and study the gearing diagram of ring doubler machine.
7. To calculate the twist constant, TPI, and production of ring doubler.
8. To study the package-building mechanism in a ring doubler.
9. To perform various operations on ring frame such as Ring rail leveling, spindle gauging, spindle eccentricity, and lappet eccentricity.
10. Prepare a ring yarn sample by changing the draft and twist pinion.
11. To study the scheduled and routine maintenance in ring frame and ring doubler.

Textbooks

1. A Practical Guide to Ring Spinning by Klein W, Textile Institute, 2000.
2. Fundamentals of Spun Yarn Technology by Lawrence Carl A. CRC press London, 2003
3. Ring Spinning, Doubling & Twisting by Salhotra K. R., NCUE Publication, 2000.

References:

1. Two-For-One Technology & Technique for Spun Yarn by Kulkarni H S and Murthy HVS, Tecoya Publication, Bombay, 1992.
2. Cotton Ring Spinning by Gilbert R. Merrill, Universal Publication, UK, 1959
3. Fancy Yarns-Their Mfg. and Application by Gong R.H.& Wright R.M., Elsevier, 2002.
4. Textile Yarns Technology, Structure& Applications by Goswami B. C. Wiley India, 2010.
5. Advances in Technology of Yarn Production by Chattopadhyay R., NCUTE Publication.

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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/participation in class/given that no component shall exceed more than 10 marks

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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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. Preparation of Gantt Chart ,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 apply different types of stitches on the given fabric
7. To apply different types of seams on the given fabrics

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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

Text Books:

1. Garment Technology for Fashion Design by Cooklin Gerry, Wiley-Blackwell; 2 edition, 2012.
2. Introduction to Clothing Manufacture by Cooklin Gerry, John Wiley & Sons, 2006.
3. Technology of Clothing Manufacture by Carr& Latham, John Wiley & Sons, 2008.

References:

1. Introduction to Clothing Production Management by Chuter A.J., John Wiley & Sons
2. Marketing Management by Philip Kotler,Prentice Hall,2002,8th Edition.
3. Managing Productivity in Apparel Industry by Rajesh Bheda, CBS Publisher & Distributor,2016

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BTTX 503	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 effective principles and mechanisms of pre-treatment processes on textile goods.
2. Students will be able to dye different types of fabric accurately according to the requirement.

Course Outcomes (COs):
After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The students will be able to
1. Apply various principles of pre-treatment processes in textile wet processing.
2. Prepare Ready for Dyeing (RFD) fabric sample which can be dyed and printed effectively.
3. Apply various principles of dyeing and produce dyed fabric samples.
4. Calculate all dyeing-related problems and use them in making a dyeing recipe according to machine availability.

Syllabus

UNIT I Pretreatment processes I (Cleaning) **10 h**
Sequence of chemical processing of textiles. Aims of preparatory processes, Water requirement and pretreatment, Surface active agents, Preparation of cotton materials: Inspection and mending, shearing and cropping, singeing, desizing, scouring, mercerization, Preparation of protein fiber based materials: Scouring of wool, Degumming of silk. Preparation of synthetic materials: Heat setting of synthetic textiles, scouring of synthetic textiles.

UNIT II Preparatory Processes II (Whitening) **8 h**
Aim of bleaching, oxidative and reducing bleaching agents, Bleaching of cotton: Hypochlorite bleaching, peroxide bleaching, chlorite bleaching, Peracetic acid bleaching, combined processes,

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Bleaching of jute, Bleaching of flax, Bleaching of silk and wool, Fluorescent Brightening agents, Assessment of whiteness.

UNIT III Theory of Dyeing **7 h**

Properties of dyes and pigments, Colour and chemical constitution: Chromophore, auxochrome and solubilizing group, substantivity and reactivity, Classification of dyes: based on chemical constitution and based on application, Commercial names of dyes, dyeing mechanism - adsorption, absorption and fixation of dye on fiber.

UNIT IV Dyeing of Textiles **10 h**

Method of dyeing of cellulosic fibers with Direct dye, reactive dye, Sulphur dye, Vat dye, and Azoic dye; Dyeing of protein-based fibers with acid dye, metal complex dye, basic dye, and reactive dye; Dyeing of polyester, nylon, acrylic and other synthetics fibers using disperse dye, reactive dye, and basic dye; Mass coloration; Stripping of dyes.

UNIT V Dyeing Machines **10 h**

Dyeing of loose stock and tops; Yarn dyeing machine: Hank dyeing machine, package dyeing machine, warp dyeing machine, rope dyeing machine; Fabric dyeing machine: Jigger, Winch, Jet dyeing machine, Beam dyeing machine, Padding mangles, Semi-continuous and continuous dyeing machines – CBR & CDR; Garment dyeing machine; Different drying methods: Mechanical, thermal, and radiation drying.

Textbooks:

1. Textile Scoring & Bleaching, E.R. Trotman, Hodder Arnold, 1968
2. Technology of Dyeing, V.A. Shenai, Sevak Publications, Wadala Mumbai, 1984
3. Scouring and Bleaching, V.A. Shenai, Sevak Publications, Wadala Mumbai, 1987.

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References:

1. Cellulosic Dyeing; John Shore; Bradford: Society of Dyers and Colourists, 1995.
2. Textile Preparation and Dyeing, Asim Kumar Roy Choudhury, Science publishers, 2006
3. Handbook of textile and industrial dyeing; M. Clerk (Editor); Woodhead publishers, 2011.

List of Experiments (Expand it if needed):

1. Desizing of grey cotton fabric sample.
2. Scouring of desized cotton fabric sample.
3. Bleaching of scoured cotton fabric sample.
4. Degumming of silk fiber/fabric sample.
5. Bleaching of silk fiber/fabric sample.
6. Scouring of jute fabric sample.
7. Bleaching of jute fabric sample.
8. Dyeing of cotton fabric sample with direct dye.
9. Dyeing of cotton fabric sample with reactive dye.
10. Dyeing of silk fabric sample with acid dye.
11. Dyeing of woolen fabric sample with acid dye.
12. Dyeing of polyester fabric sample with disperse dye.
13. Dyeing of Jute fabric sample with reactive dye.
14. Dyeing of nylon fabric sample with acid dye.
15. Dyeing of silk fabric sample with reactive dye.

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Course Educational Objectives (CEOs):

1. Students will have knowledge related to working principles used for yarn and fabric testing machines.
2. Students will be able to test the textile materials
3. Students can be able to assess the physical properties of yarns and fabric.

Course Outcomes (COs)

Student will be able

1. Measure evenness and irregularity techniques of textile material.
2. Understand tensile testing principle.
3. Evaluate tensile properties of yarn.
4. Evaluate fabric physical properties.
5. Able to know special fabric testing.

Syllabus

Unit I: Yarn Evenness Testing **10 Hours**

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 irregularity.

Unit II: Tensile Testing Principle **09 Hours**

Tensile testing machine working principle based on CRE, CRL and CRT. Use of Strain gauge, transducer principle in tensile tester. Ballistic or Impact tensile testing principes used in machine. Factors affecting the result of tensile experiments.

Unit III: Yarns Tensile Testing **08 Hours**

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Terms and definition with respect to load-elongation curve and its conversion to stress-strain curve, yarn lea strength testing, construction and working of lea strength tester, count strength product (CSP). Factors affecting results of tensile test. testing conditions and interpretation of results.

Unit IV: Testing of Fabric Properties **09 Hours**

Physical parameters measurement of fabric. e.g. length, width, weight/length, thickness, crimp % in warp direction and weft direction, Fabric Shrinkage testing, Fabric tensile test by strip test & grab test, fabric tear strength test, Fabric bursting strength test. Fabric drapeability testing, handle, stiffness, crease recovery, pilling tendency, wear and abrasion resistance of fabric.

Unit V : Special Testing **09 Hours**

Air permeability, water permeability, waterproofing, color fastness tests– washing fastness test, rubbing fastness test, sublimation fastness test, fabric perspiration testing, flammability testing, Introduction toe assessment of fabric low stress properties by Kawabata testing method.

List of Practical (Practical's performed according to ASTM/ISO standards)

1. To study testing of single yarn strength by using yarn tensile tester.
2. To study testing of lea strength of yarn by using lea strength tester.
3. To study testing of fabric tensile strength (strip) & elongation by using fabric tensile tester.
4. To study testing of fabric tensile strength (grab method) by using fabric tensile tester.
5. To test fabric tearing strength by using Elmendorf tearing strength tester.
6. To study testing of bursting strength of a woven fabric sample.
7. To test crease recovery of fabric by using crease recovery(Jasu bhai crease recovery tester).
8. To test colour fastness of a fabric by using crock-meter(Paramount crock meter).

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9. To check length, width and gsm of woven fabric sample(Paramount GSM Tester).
10. To test woven fabric stiffness by using fabric stiffness tester(Paramount tester).
11. To test woven fabric water repellence by shower test. (Paramount tester).
12. To test pilling resistance of knitted fabric samples by using ICI Pill box.
13. To test abrasion resistance of fabric by using Martindale abrasion resistance tester.
14. To test drape coefficient of fabric by using drape meter(Paramount Drape Tester).
15. To test thickness of fabric by using fabric thickness tester(Mitutoyo thickness Gauge).

Textbooks:

1. Amutha, K. (2016). *A practical guide to textile testing*. CRC Press.
2. Saville, B. P. (1999). *Physical testing of textiles*. Elsevier.

References:

1. Booth, J.E. (2018). *Principles of Textile Testing*. CBS Publishers and Distributors Pvt Ltd, ISBN: 978-8123905150.
2. Grover B.E .& Hamby, D.S. (2018). *Handbook of Textile Testing and Quality Control,* Wiley India Pvt Ltd. ISBN: 978-8126531752.
3. Hu, J. (Ed.). (2008). Fabric Testing.
4. Hearle, J. W., & Morton, W. E. (2008). *Physical properties of textile fibres*. Elsevier.
5. Kothari, V. K.(1999). *Progress in Textiles: Testing and Quality Management*. IAFL Publications, ISBN: 9788190103305.

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SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX505	SEC	CAD in Textiles	0	0	0	0	50	0	1	2	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To provide the knowledge about the preliminary functions of CAD in Textile
2. To impart conceptual knowledge for the Industry as a Fabric Designer.
3. To understand fabric structure, figure designing, artwork designing for mass production.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. To apply their knowledge on the various functions of the CAD in textile
2. To make different Fabric designing
3. To identify the fabric making process, print designing for fabric.
4. To use their knowledge for different tools of CAD in Textile.

Syllabus

List of Experiments:

1. To study woven design structure
2. To study application, uses & features of CAD in Textile
3. To study installation & hardware requirement for CAD software
4. To Study dobby CAD software with various menu commands
5. To prepare design on Dobby CAD software with proper parameters and color effects.
6. To manage dobby design library on CAD with plan and twill weave
7. To manage dobby design library on CAD with honey comb weave
8. To study Jacquard CAD software with various menu commands
9. To draw figured pattern on graph paper and apply to Jacquard CAD software

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX505	SEC	CAD in Textiles	0	0	0	0	50	0	1	2	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

10. To study Printex CAD software with various menu commands
11. To draw figured pattern on Printex CAD software
12. To study Vector tool in Printex CAD software.

References:

1. Fabric Structure & Design, Gokarneshnan, N., New Age International Publishers, 2020.
2. CAD Manual Inter Departmental CAD Standard, City of Seattle, 2019.
3. CAD-Cam Principles and applications – Rao, P. N., Mc Graw Hill Education, 2017.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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 types of the knitted fabric
3. Solve the different problem & understand the quality aspects for the knitting.
4. Use their conceptual knowledge for designing of knitted fabrics

Syllabus

UNIT I: Introduction of Knitting and Elements of Weft Knitting. **9Hour**

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. **9Hour**

Basic single jersey and double jersey structures and their derivatives, horizontal stripping and plating, Weft knitted spacer fabric . Designing by different, mechanisms e.g. pattern wheel, pattern drum and electronic jacquard knitting.

UNIT III: Elements of Warp Knitting **9Hour**

Introduction to warp knitting, application of warp knitted fabric. Comparison between

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/

warp knitting and weft knitting. Structure properties of warp knitted fabric. Classification of warp knitting with their scope, uses, features and area of application. Element of warp knitting machine.

UNIT IV: Different Warp Knitting Machines and Warp Knitting Structure **9Hour**

Introduction to Tricot and Raschel knitting machine, knitting elements of Tricot and Raschel knitting machine, working principle and pattern mechanism in Tricot and Raschel knitting machine. Warp-knitted spacer fabric

UNIT V: Modern Development in Knitting and Quality Control **9Hour**

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

Text Books:

1. Knitting Technology by Ajgaonkar D. B., Universal Publication, 2006.
2. Knitting Technology by Spencer, Woodhead Publishing ,Abington Hall, Abington, 2014
3. Knitting Technology by Mahak Mittal, Bioscientific Publisher ,2023.

References:

1. Knitted Clothing Technology by Brackenbury Terry, Wiley India,2013.
2. Fabric Manufacturing Technology: Weaving and Knitting by Dr. K. Thangamani, CRC Press; 1st edition ,2022
3. Fundamentals and Advances in Knitting Technology by Sadhan C Ray,Woodhead Publishing India in Textiles,2015

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/Participation in Class, given that no component shall exceed more than 10 marks.

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 behaviour of Textured yarns.
5. Explain the principle & manufacturing process of air jet textured yarn.

Syllabus

UNIT I: Introduction of Texturizing **6h**

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

UNIT II: False Twist Texturing Process **12h**

Scientific principles in False twist Texturing, Methods of production of stretched (single heater) and modified stretched (double-heater) yarns by conventional methods. Properties of such yarn. Draw Texturing, Concept of sequential and simultaneous draw texturing, Study of simultaneous draw texturing process.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III: Air-Jet Texturing **9h**

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

UNIT IV: BCF Texturing **9h**

Scientific principles in BCF Texturing, Production Line, Comparison with Air Jet and Staffer box Texturing processes. Properties and application of such yarn.

UNIT V: Quality and Process Control **9h**

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.

Textbooks:

1. Yarn Texturing Technology by Hearle J.W.S., Hollick L.& Wilson D.K.(Woodhead Publishing) 2001.
2. Textile Yarn Technology Structure and Application by Goswami B.C., Martindale, J.G., Scardino F.L., (Wiley Publication) 1977, U.S.A.
3. Production of Synthetic Fibres by Vaidya A.A., (Prentice Hall of India Pvt. Ltd.) 1988.

References:

1. 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.
2. 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.
3. Winter School on Man-made Fibers – Production, Processing, Structure, Properties and

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/Participation in Class, given that no component shall exceed more than 10 marks.

Applications by Gupta V.B. Vol. 1, 1988.

4. Yarn Texturing Technology by Hes L. Ursiny P., (Eurotex, U.K., 1994.
5. 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)
6. Spinning of Manmade Fibres and Blends on Cotton Systems by Salhotra K. R. The textile Association, India 2004,
7. The Industrial Application of the Stress-Strain Relationship by Hamburger, W. J., Journal of Textile Inst. 40, 700 (July 1949),

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/Participation in Class, given that no component shall exceed more than 10 marks.

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.
3. Use of machines for synthetic dyeing

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
3. Dye different blends of fibers according to the need of industry.

Syllabus

UNIT I: Preparation of synthetic textile materials and blends **9 h**

Need and objectives of preparatory processes of synthetic textiles, Singeing, Desizing: Hydrolytic and oxidative desizing methods, Heat setting- Dry heat setting, steam setting; Scouring of synthetic fibers: acetate rayon, nylon, polyester, etc.

UNIT II: Dyeing of synthetic textile material **9 h**

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, and reactive dye, Dyeing of acrylic fiber with basic dye.

UNIT IV: Dyeing of blended materials **9 h**

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
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/Participation in Class, given that no component shall exceed more than 10 marks.

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.

UNIT V: Fastness Properties **9 h**

Fastness requirement: Light fastness, washing fastness, rubbing fastness, perspiration fastness, sublimation fastness.

UNIT II: Mass colorations with pigments **9 h**

Mass coloration of synthetic fibers: viscose, acetate, acrylic, nylon, polyester, etc.

Text Books:

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. Nawab, Y., & Shaker, K. (Eds.). Textile engineering: an introduction. Walter de Gruyter GmbH & Co KG, 2023.

References:

1. Handbook of textile and industrial dyeing; M. Clerk (Editor); Woodhead publishers, 2011.
2. Textile Preparation and Dyeing; Asim Kumar Roy Choudhury, Science publishers, 2006.
3. Chemical Technology in the Pre-treatment Process of Textiles -. Karmakar S. R., Elsevier sciences B.V.,1999.

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BTTX 507	SEC	TEXTILE DESIGN AND COLOR	0	0	0	-	50	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
1. Drawing small figures and motifs, color theory and its effect on weaves, and arrangement of motifs with different bases.

Course Outcomes (COs):
After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The students will be able.
1. Apply the light and pigment color concept in design development.
2. Create different colors and weave effects.

List of Experiments (Expand it if needed):
1. Practice on drawing like small plants, flowers, and creepers.
2. Practice on developing traditional motifs like birds, animals, and flowers.
3. Prepare Color Wheel (Primary, Secondary, and Tertiary Colors).
4. Practice chart for color schemes
    a. Monochromatic
    b. Analogous
    c. Achromatic
    d. Complementary color
5. Create simple color and weave effects in a sheet by applying color schemes for the following (stripes, checks, step pattern, and Hound's tooth pattern)
6. Apply color schemes for figured color and weave effect for the following
    a. Simple and compound order of coloring
    b. Distinct figured effects
7. Arrange motifs or figures in different bases for drop device and drop reverse design
    a. Diamond base, Ogee base, Diamond wave line base, and Rectangular base
8. Arrange motifs or figures in different bases for the Sateen system of distribution

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX 507	SEC	TEXTILE DESIGN AND COLOR	0	0	0	-	50	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

a. Regular and irregular sateen arrangement
b. Layout preparation for shirting, Dhoti, saree, and Churidar

9. Prepare a fabric sample on the handloom using any of the above color and design concepts.

References:

1. Grosicki Z. J., "Watson's Textile Design and Color", Vol. I Woodhead Publications, Cambridge England, 2004.
2. Grosicki Z. J., "Watson's Advanced Textile Design and Color", Vol. II Butterworth, London, 1989.

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