



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									
			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 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.

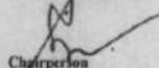
Syllabus:

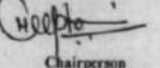
UNIT I: Ring Spinning

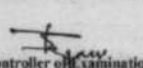
Objectives of Ring frame, constructional details of ring frame, theory related to drafting, twisting, winding, spinning balloon, yarn tension and selection of Ring and traveler, recent development in Ring spinning, compact spinning, calculations related to draft, speed, production.

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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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/ 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.

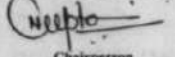
UNIT V: Other Fibers Spinning Process


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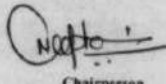
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/ doubler.

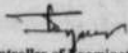
9. To perform various settings and maintenance operations on ring doubler such as: Ring rail leveling, spindle gauging, spindle eccentricity, lappet eccentricity.
10. To study the package building mechanism in a ring doubler.
11. To study the drafting, twisting and winding zone in TFO.
12. Study and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

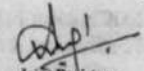
References:

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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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

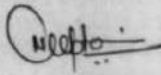
Introduction to Apparel Industry: Nature & size, Apparel industry in India. Production System & it's basic components, Apparel Manufacturing Production Systems- Batch Production, Mass production, Continuous Production. Make Through, Progressive Bundle System, One Piece Flow System, UPS. Flow chart of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

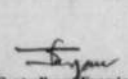
Retail Firm Structure, Types of Buyer, Buying house, Fashion buyer: Role & Responsibilities. Retailing: Planning, Forecasting, Buying and Selling. Range: Planning & Development. Document formats: order sheet, packing list, invoice, inspection and testing reports etc. Use of ERP in apparel industry.

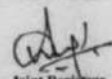
List of Practical's

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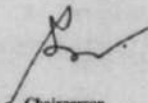
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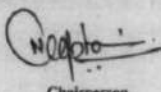
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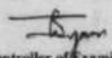
7. To study the types of seams
8. To study the work aids used in sewing machine
9. To study the retail merchandising process flow chart
10. To study the Retail Store layout with working procedure

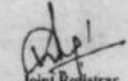
References:

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 by Martin 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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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 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):

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. 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 it in making dyeing recipe

Pre-requisite: Fiber Science I (BTTX301) and Fiber Science II (BTTX401)

COs	CO-POs & PSOs Mapping															
	Programme Outcomes (POs) & Programme Specific Outcomes															
	PO1	PO2	PO3	PO4	PO6	PO6	PO7	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		■	■													
CO2		■	■													
CO3		■	■													
CO4	■	■														

Syllabus

UNIT I Pretreatment processes I (Cleaning)

10 h

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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, bleaching of coloured goods, Bleaching of jute, Bleaching of flax, Bleaching of silk, Bleaching of wool, Fluorescent Brightening agents, Assessment of whiteness

UNIT III Theory of Dyeing

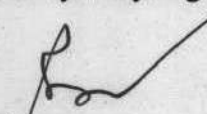
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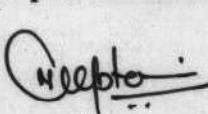
Properties of dyes and pigments, Colour and chemical constitution: Chromophore, auxochrome and solubilising group, substantivity and reactivity, Classification of dyes: based on chemical constitution and based on application, Commercial names of dyes, adsorption of dye on fiber: Langmuir, Freundlich and Nernst isotherm, absorption of dye on fiber: Pore model and free volume model, fixation of dye on fiber.

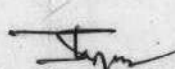
UNIT IV Dyeing of Textiles

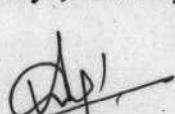
10 h

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


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reactive dye Dyeing of polyester, nylon, acrylic and other synthetics fibers using disperse dye, reactive dye and basic dye. Mass colouration. 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. Garment dyeing machine. Different drying methods: Mechanical, thermal and radiation drying

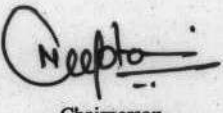
Textbooks:

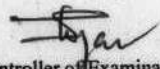
1. Textile Scoring & Bleaching, E.R. Trotman, Hodder Arnold, 1968
2. Technology of Dyeing, V.A. Shenai, Sevak Publications, Wadala Mumbai, 1984
3. Scouring and Bleaching, V.A. Shenai, Sevak Publications, Wadala Mumbai, 1987.

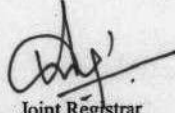
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1. Cellulosic Dyeing, John Shore, Bradford: Society of Dyers and Colourists, 1995 .
2. Cellulosic Dyeing; John Shore; Bradford: Society of Dyers and Colourists, 1995.
3. Textile Preparation and Dyeing, Asim Kumar Roy Choudhury, Science publishers,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


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COURSE CODE	CATEGORY	COURSE 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*				
BTTX 503	DCC	Textile Chemical Processing-I	60	20	20	30	20	3	0	2	4

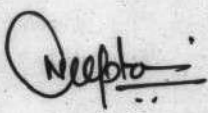
Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit.


*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.


List of Experiments (Expand it if needed):

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


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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*					
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/

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

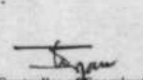
Concepts of evenness, Schematic diagram and working of Uster evenness tester, index of irregularity, nature and causes of irregularity, length-variance curve, various methods of measuring and assessing irregularity, evaluation and interpretation of test results by spectrograph, analysis of spectrograph,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

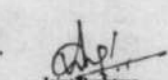
Unit II: Tensile Testing Principle

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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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/ 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.

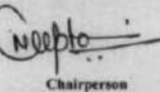
Unit IV: Testing of Physical and aesthetic properties of Fabric

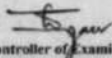
Physical parameters measurement of fabric. e.g. length, width, weight/length, thickness, crimp % in warp and weft, Shrinkage testing etc. fabric properties e.g. drape, handle, stiffness, crease recovery, pilling, wear and abrasion resistance of fabric.


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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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.

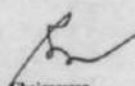
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/

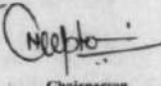
List of Practical (At least 10 practical experiments to be performed by each student):

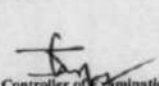
1. To test Single yarn strength by using Instron tensile tester.
2. To test Lea strength of yarn by using lea strength tester.
3. To test fabric tensile strength (strip) & elongation by using Instron tensile tester
4. To test fabric tensile strength (Grab method) by using Instron tensile tester
5. To test fabric tearing strength by using Elmendorf 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 & Bhardwaj Satish K


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BTTX 505	SEC	CAD in Textile	0	0	0	30	20	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/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 for mass production.
- 4.

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

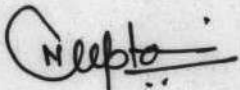
1. To apply their knowledge on the various functions of the CAD in textile
2. To make different Fabric designing
3. To identify the fabric making process, print designing for fabric.
4. To use their knowledge for different tools of CAD in Textile.

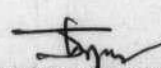
Pre-requisite: NIL

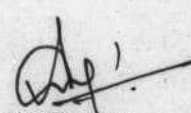
COs	CO-POs & PSOs Mapping															
	Programme Outcomes (POs) & Programme Specific Outcomes															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO11	PO12	PSO1	PSO2
CO1	■		■					■					■		■	
CO2	■	■			■										■	
CO3			■		■	■	■								■	■
CO4				■					■							

Syllabus


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BTTX 505	SEC	CAD in Textile	0	0	0	30	20	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/Participation in Class, given that no component shall exceed more than 10 marks.

List of Experiments:


1. To Study woven structure
2. To study colour and weave effect
3. To Study Installation of CAD software
4. To Study Various menu commands
5. To prepare design on doobby CAD software with proper parameters and color effects. Take a printout.
6. To manage doobby design library with twill and honey comb.
7. To manage doobby design library with huck a back design.
8. To draw figured pattern on graph paper and apply to Jacquard CAD software with proper parameters and color effects. Take a printout.
9. To manage jacquard design library with same figure to different weave.
10. To draw figured pattern on graph paper and apply to printex CAD software with proper parameters and color effects. Take a printout.
11. To manage printex design library with different yarn and color specification.
12. Introduction of electronic jacquard punching system

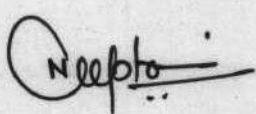
Text Books:

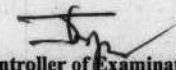
1. Fabric Structure & Design, Gokarneshnan, N., New Age International Publishers, 2020.
2. CAD Manual Inter Departmental CAD Standard, City of Seattle, 2019.


References:

1. CAD-Cam Principles and applications - Rao, P. N., Mc Graw Hill Education, 2017.


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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 stripping and plating, Designing by different mechanisms e.g. pattern wheel, pattern drum and jacquard.

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BITTX516	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 Tricotand Raschelknitting machine, knitting elements of Tricotand Raschelknitting machine, working principle and pattern mechanism in Tricotand Raschelknitting machine.

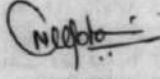
UNIT V: Modern Development in Knitting and Quality Control


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

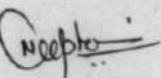
UNIT I: Introduction of Texturising

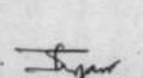
Objective of Texturising, Drawbacks of flat filament yarns, requirement of raw material for texturising, drawing process. Definition and concept of Texturising, Classification and characteristics of textured process and texturised yarn. Other Methods of Texturising like BCF draw texturising processes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

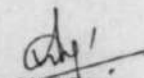
UNIT II: False Twist Texturising Process

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 Texturising Machine 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 by Hearle J.W.S., Hollick L. & Wilson D.K. (Woodhead Publishing)
2. Textile Yarn Technology Structure and Application by Goswami B.C., Martindale, J.G., Scardino F.L., (Wiley Publication) 1977, U.S.A.


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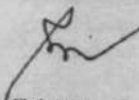
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B. Tech. in Textile Engineering
(2021-2025)

COURSE CODE	CATEGORY	COURSE 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*				
BTTX526	DSE	TEXTURED YARN TECHNOLOGY	60	20	20	0	0	3	0	0	3

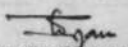
Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit.

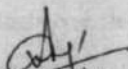
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/

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 Fibres - Production, Processing, Structure, Properties and Applications by 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 Acar M. 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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			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/

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

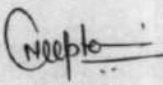
UNIT I: Preparation of synthetic textile materials and blends

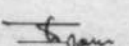
Need and objectives of preparatory processes of synthetic textiles, Singeing, Desizing: Hydrolytic and oxidative desizing methods, Heat setting: Dry heat setting, steam setting, hydro setting, Scouring of synthetic fibers: Scouring of acetate fibers, scouring of nylon, scouring of polyester, scouring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

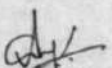
UNIT II: Theory of dyeing

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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			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/

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

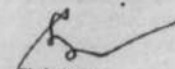
Disperse dye, Dyeing of acetate fiber with disperse dye, Dyeing of polyester fiber with disperse dye: Carrier dyeing method, HTHP dyeing method, Thermosol dyeing method, Dyeing of nylon with disperse dye, acid dye, metal complex dye and reactive dye, Dyeing of acrylic fiber with basic dye

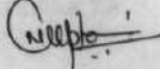
UNIT V: Dyeing of blended materials

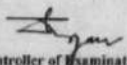
Dyeing of cotton-viscose blends, wool-cellulose blends, Nylon-wool blends, Acetate-nylon blends, polyester-nylon blends, polyester-wool blends, polyester-cellulose blends, polyester-acrylic blends, nylon-acrylic blends, wool-acrylic blends, acrylic-cellulose blends, machines used for dyeing synthetic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