Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS)
B. Tech. (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*				
BBAI501	AECC	Human Values and Professional Ethics	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.

To download detailed syllabus of this

Subject visit web link

of

Shri Vaishnav School of Management

at

SVVV website.

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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*				
BTTX601	DCS	FABRIC MANUFACTURING III	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
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Course Educational Objectives (CEOs):

1. The students will be able to describe the working of various mechanisms automatic loom.
2. To describe the working of Various Auxiliary Motion.
3. The students will be able to describe the working of multiple box looms.
4. The students will be able to describe the working of various mechanism of terry loom.

Course Outcomes (COs)

Student will be able

1. Demonstrate the knowledge of Let-off mechanism and Take-up mechanism and adjust the desired PPI.
2. Demonstrate the knowledge of working mechanism of auto loom and can prepare fabric of desired quality.
3. To use the knowledge of auxiliary motions and maintain the quality of fabric.
4. Use the knowledge of multiple box looms and can prepare fabric of desired weft pattern.
5. Demonstrate the knowledge of working mechanism of Terry loom and can prepare terry towel of desired quality.

Course Contents:

Unit I

Let-off and Take-Up motions: positive/controlled, warp tension control, working principles and features of Ruti, Bartlet and Saurer let-off motions. Continuous Positive type take-up motion, electronic let-off and take-up motions.

Unit II

Automatic looms: different types of mechanical weft feelers e.g. side sweep and depth feelers, electrical & electronic weft feelers, shuttle protecting motion, pirn changing and shuttle changing mechanism, temple cutters and unifil loom winder.

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BTTX601	DCS	FABRIC MANUFACTURING III	60	20	20	30	20	3	0	2	4

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

Warp stop motion: mechanical and electrical types; Weft stop motion: Side and center weft fork motion, Warp protecting motion: loose reed and fast reed warp protecting motion and Warp easing motion.

Unit IV

Multiple boxes– weft patterning and mixing, pick at will type multiple box loom, Cowburn & Peck (Eccles); preparation of card chain for 4x1 eccles box motion for different weft pattern, introduction to card saving device.

Unit V

Terry Loom: essential requirement of terry weaving, different terry mechanisms: cam driven 3-pik terry mechanism, dobby driven 3-pik terry mechanism, heading motion, fringing motion.

List of Practical (Expand it if needed):

1. To study the working of Ruti-B positive let-off motion.
2. To study the continuous positive Take-up motion.
3. To study the working of Weft Feeler and Shuttle Protector Mechanism.
4. To study the working of the pirn change mechanism in automatic looms.
5. To study the working of the Side Weft Fork mechanism.
6. To study the working of Loose Reed mechanism.
7. To study the working of Fast Reed mechanism.
8. To study the working of Mechanical warp stop motion.
9. To study the working of electrical warp stop motion.
10. To study the working of 4 x 1 Eccle's drop box motion.

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BTTX601	DCS	FABRIC 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/

References:

1. Weaving Vol. II - Bannerjee N N
2. Fancy Weaving – Aswani K T
3. Principle of Weaving - Marks & Robinson
4. Preparation & Weaving Machinery - Ormerod A
5. Woven Fabric Production – II - NCUTE Publication (2002) – 1st Edition
6. Dobby, Jacquard; Drop Box & Terry loom
7. Weaving Machines, Mechanisms and Management - Talukdar M K Sriramulu P K
8. Mechanism of Weaving - Ajgaonkar D B , Fox
9. Loom shed –Silver Jubilee Monograph Series. - BTRA
10. Fabric Forming - Hasmukharai B
11. Electronic Controls for Textile Machines; NCUTE Pub.(2003) - Joshi Hiren and Joshi Gauri
12. Weaving Tech. & Operations - Ormerod Allan and Sondheln Walter S

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BTTX602	DCS	TEXTILE CHEMICAL PROCESSING 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 be able to use effectively principles and mechanisms roller printing and rotary screen printing on textile goods according to their end use.
2. Students will be able to impart different types of fabric finish as per end use.
3. Students will be able to impart Flame Retardent finish on textile goods as per end use.
4. Student will be able to select eco friendly chemicals

Course Outcomes (COs)

Student will be able to

1. Apply different methods and style of printing on natural and synthetic fiber fabric and blends.
2. Develop and design printed products as per demand
3. Create different finished fabric according to their application.
4. Explain various types of dyeing, printing and finishing processes

Course Contents:

Unit I: Introduction of Printing

Introduction to printing, different methods of printing-block printing, manual screen printing, flat bed screen printing, rotary screen printing, transfer printing, different styles of printing-direct printing, discharge printing, resist printing. Detailed study of different types of printing machines e.g. block, flat screen, roller and rotary screen printing.

Unit II: Modern development.

Different modern techniques of printing; pigment printing, role of binder and thickener, rheology of printing paste, printing of cotton, jute, flax and viscose rayon fabric with direct dye, reactive dye, vat dye and azoic dye; printing of silk, wool and nylon fabric

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BTTX602	DCS	TEXTILE CHEMICAL PROCESSING 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/

with reactive dye and acid dye; printing of polyester fabric with disperse dye; After treatment of different printing materials.

Unit III: Finishing

Introduction to finishing of natural and man-made fiber fabrics; Classifications of various finishes, finishing materials - their chemistry and application; Padding mangles, drying ranges, stenter, calendaring, raising and milling machines.

Permanent and semi permanent finishes, Crease resistant finishing, softeners, silicon finishing, anti shrink finishing, water proof and water repellent finishing, flame proof and flame retardant finishing, heat setting of synthetic fibre fabrics, finishing of wool, Textile preservatives

Unit IV: Eco-friendly Textile Processing

Low wet pickup, foam finish, hydroextraction, hazardous chemicals and dyes used in textile chemical processing and their treatment. Eco friendly processing, chemicals and their eco friendly substitutes.

Unit V: Effluent Treatment and eco system

Textile industry and population, eco-friendly processing, chemicals and their eco-friendly substitutes. Hazardous chemicals and dyes, Effluent Treatment in textile industry.

List of Practical (Expand it if needed):

1. Study of detail process flow in textile printing
2. Printing of cotton fabric sample with pigment
3. Printing of cotton fabric sample with reactive dye
4. Printing of silk fabric sample with acid dye
5. Printing of polyester fabric sample with pigment

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BTTX602	DCS	TEXTILE CHEMICAL PROCESSING 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/

6. Printing of polyester/cotton blended fabric sample with pigment
7. Printing of cotton fabric sample with discharge style of printing
8. Printing of cotton fabric sample with resist style of printing
9. Printing of silk fabric sample with resist style of printing
10. Determination of washing fastness of dyed cotton fabric sample
11. Determination of color strength and color difference of two dyed fabric samples

References:

1. Technology of printing Vol. IX V. A. Shehnai
2. Technology textile finishing Vol. X V. A. Shehnai
3. Engg. of Textile Colouration C. Duck Worth
4. Textile Finishing W.S.Murphy
5. Printing on Textiles by direct and transfer technique R.W. Lee
6. Electronics Control for Textile Machines Hiren Joshi, Gouri Joshi (NCUTE Pub.)
7. A Glimpse of the Chemical Technology of Textile Fibres R.R. Chakraverty
8. Trouble shooting in wet processing : Acetate, Rayon/Lycocell and Spandex Blends, Dunes

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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*				
BTTX605	DCS	APPAREL QUALITY CONTROL	0	0	0	0	50	0	0	4	2

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 about garment quality control during garment manufacturing process.
2. Student can assess the functional and aesthetic properties of fabric as per their application & requirement.

Course Outcomes (COs)

Student will be able

1. To understand and monitor process of quality control in garment industry.
2. To know sources of various defects in the garment manufacturing process.
3. To assess the effect of thread tension on the seam strength.
4. To solve problem occur during garment inspection.
5. To improve the quality of garment manufacturing process.

List of Practical (Expand it if needed):

1. To understand the process of apparel quality control.
2. To discuss the assessment of apparel quality
3. To study fabric inspection system
4. To study the latest garment measurement system .
5. To study the sewability and calculate seam efficiency of given fabric.
6. To test the zippers and fastners, sewing threads.
7. To inspect the quality of zipper, buttons, sewing threads and interlinings.
8. To study the different checking points during garment manufacturing.
9. To study the various types of garment defects (visual inspection before dispatch).

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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*				
BTTX605	DCS	APPAREL QUALITY CONTROL	0	0	0	0	50	0	0	4	2

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

References:

1. Managing Quality in the Apparel Industry - Pradip V. Mehta, S. K. Bharadwaj
2. Progress in Textiles Science and Technology Vol.I Testing and QM; V. K. Kothari
3. Knitted Clothing Technology - Terry Brackenbury
4. Sewing for fashion Design, Relis, Nuris and Strauss Gail, PHI 1997
5. Innovation and technology of woman's intimate apparel, Yu W Fan J & Harlock S C, Woodhead.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX 613	DSE	STATISTICS AND QUALITY CONTROL FOR TEXTILE INDUSTRY	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):
To introduce the students with the Fundamentals of the Statistics used in the Textile Technology.

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 modern probability theory in the Textile Technology.
2. Understand and design the experiment, conduct statistical tests, and analyse the results to arrive at the conclusions.
3. Know the fundamental principles of the sample distribution.

Pre-requisite: NIL

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

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Unit I Probability Distribution **9h**

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BTTX 613	DSE	STATISTICS AND QUALITY CONTROL FOR TEXTILE INDUSTRY	60	20	20	0	0	3	0	0	3

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Applications of Geometric, Binomial, Poisson, Normal and its approximations, T, Exponential, Chisquare, F and Weibull distributions.

Unit II Hypothesis Testing **9h**

Sampling distribution; significance tests applicable to textile parameters - normal test, t test, chi-square test and F test. Selection of sample size and significance levels with relevance to textile applications; acceptance sampling.

Unit III Analysis of Variance and Design of Experiments **9h**

ANOVA for different models, test of significance – comparison with a control, global comparisons. Non-parametric test - Rank test, Concordance test. 2 k full-factorial designs, composite designs, robust designs, process optimization.

Unit IV Linear Regression **9h**

Method of least squares – linear regression equation – correlation coefficient. Regression through origin – multiple regression. Confidence limits.

Unit V Control Charts **9h**

General principle of control charts – action and warning limits – interpretation of control charts. Control charts for variables and attributes – basis, development, interpretation, sensitizing rules, average run length. Cusum charts. Process capability analysis.

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BTTX 613	DSE	STATISTICS AND QUALITY CONTROL FOR TEXTILE INDUSTRY	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.

Text Books:

1. Montgomery D.C., "Introduction to Statistical Quality Control", John Wiley and Sons, Inc., Singapore, 2002.
2. Leaf G.A.V., "Practical Statistics for the Textile Industry, Part I and II", The Textile Institute, Manchester, 1984.
4. Douglas C. Montgomery, "Design and analysis of experiments", John Wiley & Sons, Inc, Singapore, 2000.
5. Ronald D. Moen, Thomas W. Nolan, Lloyd P. Provost, "Quality improvement through planned experimentation', McGraw-Hill, 1998.

References:

1. Leaf G A V, "Practical Statistics for the Textile Industry", Part I and II, The Textile Institute, Manchester, 1984.
2. Montgomery D.C., "Introduction to Statistical Quality Control", John Wiley and Sons, Inc., Singapore, 2002.
3. Ronald D Moen, Thomas W Nolan and Lloyd P Provost, "Quality Improvement Through Planned Experimentation", McGraw Hill, 1998.
4. Meloun M and Militky J, "Statistical Data Analysis: A Practical Guide", Woodhead Publishing Ltd. UK, 2011.
5. J. R. Nagla, "Statistics for Textile Engineers", Woodhead Publishing India Pvt. Ltd., 2014.
6. Hayavadana J, "Statistics for Textile and Apparel Management", Woodhead Publishing Ltd., UK, 2012.

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BTTX623	DCS	NONWOVEN 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 manufacturing process of nonwoven fabrics.
2. To provide knowledge on the technical requirements and the physical and mechanical properties of nonwoven fabrics

Course Outcomes (COs)

Student will be able

1. Explain the importance of the nonwoven fabrics.
2. Solve the problems occurred during manufacturing of nonwovens.
3. Develop the different structure of nonwovens.
4. Analyze the physical and mechanical behavior of nonwovens.
5. Explain the principle & manufacturing process of hydro entangled nonwoven fabrics.

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UNIT I: Introduction of Nonwovens

Historical background of nonwovens, definition, stages in Nonwoven manufacturing, Web Forming Techniques: carding parallel laid web and cross laid web .Classification of nonwoven– on the basis of use, manufacturing process, web formation and bonding.

UNIT II: Webs Formation Techniques

Dry laid webs -fibre selection, fibre preparation, web formationand layering. Wet laid nonwoven -Raw materials, production process, special features of the wet laid process and its product. Spun laced webs

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BTTX623	DCS	NONWOVEN 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: Nonwoven Bonding Techniques

Introduction of bonding techniques.Mechanical bonding, adhesive bonding (Chemical bonding) and Thermal bonding. Elementary idea of production of laminated and composite nonwoven material.

UNIT IV: Mechanical and Thermal Bonded Nonwovens

Mechanically bonded webs - needle punched nonwovens, Application of needle punching, stitch bonded nonwovens, applications. Thermally bonded nonwovens - binder, binding fibers, binding powder, binding webs, methods of thermal bonding - Hot calendaring, beltCalendaring, oven bonding, ultrasonic bonding, and radiant heat bonding.

UNIT V: Hydro Entanglement and Spun Lace Nonwovens.

Hydro entangled nonwovens, advantages and disadvantages, Bonding process, water system, web drying, properties of spun laced webs, applications.

References:

1. Nonwoven Process Performance & Testing by Turbak, TAPPI Press, 1993.
2. Handbook of Non-wovens by Stephen Russell, Woodhead Publishing Ltd., UK, 2007
3. Manual of Nonwovens by R.Krecma, The Textile Trade Press, Manchester, UK, 1971.
4. Thermal Bonding of Nonwoven Fabrics, Textile Progress 26 (2), 1-38, 1995.
5. Developments in Nonwoven Fabrics, Textile Progress, Vol. 12, No. 4, The Textile Institute, Manchester, UK, 1983.

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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*				
BTTX633	DCS	HOME TEXTILE	60	20	20	00	00	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. Correctly demonstrate the principle and manufacturing process of home textile products.
2. Understand the requirement, importance and application area of home textiles.

Course Outcomes (COs)

Student will be able

1. Design the product as per customer requirement.
2. Solve technical problems related to manufacturing of home textiles.
3. Develop the more technical property oriented products.

Course Contents:

Unit I

Textile for seating – Upholstery fabrics for domestic applications scope, fixed upholstery, non-stretch loose covers, stretch covers. Upholstery fabrics for contract use general, automotive applications, Commercial applications.

Unit II

Window Textiles – Sun filters (Sheers and nets), Semi-sheers, Reflective textiles, curtain fabrics & drapes, Blinds.

Unit III

Bed Textiles – Sheets & Pillow Cases, Quilted Textile, Blankets & Rugs - Jacquard blankets, Printed blankets, Fire proof blankets, Baby blankets. Bed Spreads, Mattress covers, (Ticking)

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BTTX633	DCS	HOME TEXTILE	60	20	20	00	00	3	0	0	3

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

Bathroom Textiles - General shower curtains, Terry Toweling.

Unit V

Table Textiles – Table cloths – Colour – Woven & Printed type, jacquard types, embroidered types, non-woven types. Table mats – Colour, woven, Printed jacquard, embroidered.

References:

1. Textile Floor coverings - G.H. Crawshaw
2. Textile Progress - Vol.9, No.2, TheTextile Inst. Publisher.
3. Interior Furnishings - Textile Progress, Vol.11, No.1, By Mortimer O.Shea, TheTextile Inst. Publication
4. Performance of Home Textiles - Subrata Das, Woodhead Publications India PvtLtd.

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BTTX614	DES	PROCESS CONTROL IN SPINNING AND WEAVING	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit.
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Course Educational Objectives (CEOs):

1. To outline the areas of process control in spinning and weaving technology.
2. To relate the importance of process control for achieving the desired quality and defect free product.
3. To illustrate the concepts of machinery audit and energy audit, machine maintenance, modern methods of house-keeping and material handling and different standard norms for various processes of the textile industry.

Course Outcomes (COs)

Student will be able to

1. Graduates will be able to construct process maps for different processes involved in spinning and weaving technology.
2. Graduates will be able to identify necessary process control check-points, so that these processes can be run at an optimum level of productivity.
3. Graduates will be able to summarize the reasons for generation of different types of defects in the final product.
4. Graduates will be able to demonstrate their skills in process inspections, machinery maintenance, machinery audit, energy audit.
5. Graduates will be able to describe the modern methods of house-keeping and material handling.

Syllabus

UNIT I: SCOPE OF PROCESS CONTROL IN SPINNING

Introduction, key variable of process control, standard norms collection and interpretation of data controle of mixing qulity and cost, controle of waste and cleaning in blowroom, location of substandard machines in blowroom. Bale management techniques.

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BTTX614	DES	PROCESS CONTROL IN SPINNING AND WEAVING	60	20	20	0	0	3	0	0	3

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UNIT II: IMPORTANCE OF QUALITY AND PROCESS PERFORMANCE

Process control in carding, lap formers and combers. Control of yarn count; strength; evenness, imperfections and yarn faults. Control of end breaks in ring spinning, yarn realization. Key variables in productivity and reasons for loss of productivity.

UNIT III: MACHINES AUDIT AND WASTE CONTROL

Concept of machinery audit and energy audit. House-keeping and material handling, statistical interpretation of data and waste control, Snap study. Importance and types of maintenance, Maintenance schedule in winding, warping, sizing and loom shed.

UNIT VI: PROCESS CONTROL IN WEAVING

Control for quality, machine stoppage and productivity in winding, warping, sizing, pirn-winding and weaving. Standard norms for setting, speeds and production rates.Fabric defects and their control. Control of norms and hard waste in various processes.

UNIT V: MACHINES AUDIT AND WASTE CONTROL IN WEAVING.

Calculations pertaining to production efficiency and machine allocation in windings; warping, pirn winding, sizing and looms. Process control of loom shed and reasons for loss of efficiency in looms. Loom data.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX614	DES	PROCESS CONTROL IN SPINNING AND WEAVING	60	20	20	0	0	3	0	0	3

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

1. The Textile Institute; Manual of Cotton Spinning Volume IV, V;
2. The Textile Institute; Manual of Textile Tech. – Short Staple Spinning series – Vol.4
3. Klein W; A Practical guide to Ring Spinning
4. Kulkarni HS and Murthy HVS; Two-For-One – Technology & Technique for spun yarn;
5. Chhatopadhyaya R. (Editor); Advances in Tech. Of Yarn Production – NCUE Publication
6. Salhotra KR et.al; Ring Spinning, Doubling & Twisting; NCUTE Pilot Programme Pub
7. Lawrence Carl A; Fundamentals of spun yarn tech

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BTTX624	DCS	MAN-MADE FIBER TECHNOLOGY	60	20	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 provide knowledge on the fundamentals of manufacturing process of man-made fibers, polymerization and raw materials
2. To provide knowledge on the technical requirements and the physical and mechanical properties of man-made fibers.

Course Outcomes (COs)

Student will be able

1. Explain the importance of the man-made fibers.
2. Solve the problems occurred during manufacturing of man-made fibers.
3. Effects of process parameters on structure and propereties of man-made fibers.
4. Analyze the physical and mechanical behavior of man-made fibers.
5. Explain the principle & manufacturing process of Polymerisation, Melt spinning, Dry Spinning and Wet Spinning Process.

Syllabus

UNIT I: INTRODUCTION TO MAN-MADE FIBERS

Definition of made fibres.Brief history of manmade Fibres. Relative merits and demerits of manmade fibres and natural fibres. Basic production systems of the man- made fibre. Meltspinning, solution dry spinning and solution wet spinning. Factors influencing selection of a Particular process for fiber formation, Relative merits and demerits of melt, dry and wet spinning processes,

UNIT II: CONVERSION OF POLYMERS INTO FIBRES ANDMELT SPINNING

Raw material, technology of polymerization and extrusion of polyester, nylon 6, nylon 66 and polypropylene. Variables of spinning, Different components of spinning process, i.e., extruder, gear pump, filters, manifold, spinning head, quenching chamber, winders. Different Quenching/solidification techniques, spinning of Polyester staple fibres (PSF) Technology and filaments. POY, and FDY Technology. High speed spinning. Effect of process parameters on structure and properties of melt spun filament.

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BTTX624	DCS	MAN-MADE FIBER TECHNOLOGY	60	20	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: SOLUTION DRY AND WET SPINNING

Dry spinning of cellulose acetate.Acetylation of cellulose, DopePreparation and spinning of cellulose diacetate and triacetate, Dry spinning of acrylic.

Process flow diagram and significance of each step for solution wet-spinning of viscose rayon. Chemistry of viscose rayon formation process, Influence ofvarious additives and temperature of the regeneration bath and their influence on the processand properties of viscose rayon, Various types of rayon, i.e. high wet modulus, Ten-X, etc.

Effect of process parameters on Structure and properties of solution dry and wet spun filament.

UNIT IV: DRAWING AND HEAT SETTING OF FIBRES

Object of drawing. Concept of neck drawing, Effect ofdrawing conditions on the structure and properties of fiber.Object of heat setting. Effect ofheat setting parameters on the structure and properties of fiber.

UNIT V: SPIN-FINISH

Objective, properties and application of spin finish for PSF, POY and FDY

References:

1. Vaidya A A, "Production of Synthetic Fibres", 1st Ed., Prentice Hall of India, New Delhi,1988.
2. "Manufactured Fibre Technology", 1st Ed. V B Gupta and V K Kothari, 1st Ed., Chapmanand Hall, London,1997.
3. Mark H F, Atlas S M, Cernia E, "Man Made Fibre Science and Technology", 1stEd.,Vol.1, 2, 3, Science Publishers, New York,1967.
4. Macintyre J E, "Synthetic Fibres", Wood head Fiber Science Series, UK,2003.
5. "Hand Book of Fibre Chemistry", Ed. M Lewin and E M Pearce, Mercel Dekker Inc.,1998.

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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*				
BTTX634	DCS	WOOL 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 Objective (CEOs):

The course will introduce the students with the knowledge of processing wool fibres and worsted manufacturing process to the extent of understanding the difference of normal manufacturing process and woolen process.

Course Outcomes (Cos):

Students will be able to:

1. Graduates will be able to choose suitable raw wool with necessary properties for the manufacturing of desired quality of woolen/worsted yarn or fabric.
2. Graduates will be able to demonstrate their skills in maufacturing of different types of recycled, wollen, semi-worsted and worsted yarn of desired quality standards from a given variety of fibres.
3. Graduates will be able to design various types of woolen/worsted fabrics of required quality characteristics by manipulating constituting yarn properties and fabric constructions.
4. Graduates will be able to select suitable dyes, chemicals and auxiliaries and also perform different chemical processes of wool in fibre, yarn or fabric form.
5. Graduated will be able to demostrate their skills in carrying out different mechanical and chemcial finishing of woolen/worsted fabrics.

Syllabus

UNIT I

Wool fibre and its properties: Morphological structure, components of fibre, fibre diameter, fibre contour, crimp, length, luster, specific gravity and refractive index, moisture relations, wet ability, fibre mechanical properties, gross composition of raw wool, molecular structures.

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BTTX634	DCS	WOOL TECHNOLOGY	60	20	20	0	0	3	0	0	3

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UNIT II

Blending of wool with manmade fibres: Purpose of blending, effect of blend composition on performance of fabrics. **Woolen or carded Yarns**: Preliminary processes, blending or mixing, oiling of the stock, woolen carding, woolen spinning, yarn number and wool grade.

UNIT III

Worsted top making and spinning of worsted yarn: Worsted carding, backwashing, oiling, gilling or preparing, worsted combing, tow-to-top conversion systems, worsted drawing, worsted yarn spinning, norms and modern developments.

UNT IV

Manufacture of woolen fabrics: Woven Fabrics produced by projectile and rapier weaving machines, knitted and nonwoven woolen fabrics, use of FAST in worsted garment manufacturing.

UNT V

Chemical Processing: Objects and different methods of carbonizing of wool batch and continuous methods of scouring fibre, yarn and fabric; peroxide and per-acetic acid bleach of wool; production of anti-shrink wool, basic principle of treatment and parameters; dyeing, printing and finishing, testing and quality control of woollen processing. Wool Dyeing: Chemistry of dyeing wool and blend with acid, mordant, metal-complex and reactive dyes, Top and tip dyeing of wool. Wool Finishing: Scooping, damping, decatising and paper pressing of wool, Testing and Quality Control.

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

1. Blended Textiles, Textile Association (India), 1981.
2. Lepenkov Y, "Wool Spinning", Vol. 1and 2, 1st Ed. Mir Publisher, Moscow, 1983.
3. Bergen W V, "Wool Handbook," vol.1 and 2, 3rd Ed., Interscience publisher, London.
4. Teasdale D C, "The Wool Handbook", 4th Ed., 1996.
5. Trotman E R, "Dyeing and Chemical Technology of Textile Fibres", Charles Griffin and Co. Ltd.; London, 1975

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