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SUBJECT CODE			ТН	EOR	Y	PRACT	TICAL				-
	CATEGORY	SUBJECT NAME	END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDITS
BTMA401	ODS	STATISTICS AND QUALITY CONTROL	60	20	20	0	0	3	1	0	4

Name of Program: B.TECH (Textile Engineering)

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 of statistical analysis of test data.
- 2. To provide knowledge of quality control chart.
- 3. To build up skill and ability for R and D work through statistical analysis.

Course Outcomes (COs)

Student will be able:

- 1. To demonstrate the knowledge for statistical analysis of test data.
- 2. To make the quality control chart of the manufactured product.
- 3. To Indentify and analyse the reason of defect through statistical analysis and use the knowledge in developing the product

Course Contents:

Unit I

Collection and presentation of data, Measures of central tendency, Measures of variation, Skewness, Moments and kurtosis, Probability Theory, priori and posteriori probabilities, conditional probabilities Bay's theorem (Simple Problems).

Unit II

Probability distribution: discrete distribution, binomial and poison distributions .Continuous Normal Distribution, Exponential Distribution, central value theorem, Normal Probability curve, calculation of mean and variance From Normal Curve, Practical usefulness of normal Distribution, sampling distribution, Bivariate Distribution, Correlation and Regression, Analysis of Variance, significance of error R2 (one way classification only).

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Unit III

Elementary theory of testing of hypothesis, Statistical Hypothesis, Null Hypothesis, Errors of first and second kind, Critical Region, level of Significance. Chi-square test of goodness of fit Test of significance based on T, F and Z distribution.

Unit IV

General idea of sampling method, random sample, sampling size, sample size for different distribution, differences between average and variances

Unit V

Statistical quality control chart, control limits, X, R, P, Pn chart etc., analysis by defects, number of defects (C chart), introduction to TQM and ISO 9000

References:

- 1. Gupta, Kapoor: Fundamental of Mathematical Statistics
- 2. Booth J.E.: Textile Testing.
- 3. SITRA : Application of statistics in textile.
- 4. Grover B. & Hanby D. S.: Textile testing and Quality Control. Grant Eugene; Statistical Quality control; TMH

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SUBJECT CODE			TE	ACH	ING &	EVALU	ATION	I SC	HE	МE	
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	CATEGORY	CATEGORY SUBJECT NAME	END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDI
BTTX401	DCS	YARN MANUFACTURING - II	60	20	20	30	20	3	1	2	5

Name of Program: B.TECH (Textile Engineering)

 $\label{eq:Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit;$

***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 explain the concept of drafting and how the different process parameters influence the drafting process and the different type of drafting systems, necessary settings, technical parameters, monitoring and auto-leveling systems and modern developments in draw-frames.
- 2. To illustrate the objectives of combing operation, working and constructional features of a modern rectilinear comber, necessary settings, technical parameters and calculations related to production, noil % etc.
- 3. To describe the constructional features, principle of operation and objectives of a modern speed-frame and explain it's necessity in the context of ring-spinning system.

Course Outcomes (COs)

Student will be able:

- 1. To comprehend the principles of operation of any type of drafting systems/draw-frames and thereby effectively alter or modify the process parameters, so as to meet the desired level of outcome.
- 2. To examine the characteristics of a lap suitable for the combing operation and accordingly modify the different settings of the lap former machine so as to achieve the desired objectives.
- 3. To interpret the operations of different types of combing machines and calculate their performance level for the production of superior quality combed yarn in terms of cost and productivity.
- 4. To infer the necessity of the roving-frame in the context of ring-spinning system and effectively operate the different types/models of roving-frames so as to produce the desired quality of roving.

Course Contents:

Unit I

Draw frame: Objectives of drawing, constructional details of draw frame, concept of perfect drawing, different drafting systems, monitoring and auto leveling of irregularities.

Unit II

Draw frame blending, recent developments, performance assessment, idea of setting,



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speed and other technical parameters. Calculations related to draft, production etc. Defects and remedies, supervisory check points.

Unit III

Combing: Lap preparation, Lap former, setting, speed and recent developments, production calculations, Methods of Lap preparations and its importance.

Unit IV

Objectives of combing, construction and principle of working, function of different motions, combing cycles, different types of combers, different setting points and speeds. Calculation related to production, noil %, draft etc. Recent developments, assessment of comber performance, control of waste, Defects and remedies, supervisory check points.

Unit V

Speed frame: Objectives of speed frame, construction and principle of working, details of speed frames. Drafting, twisting winding and building mechanism, Speed and setting points, latest developments, Different types of flyers and suspended type of speed frame. Calculation related to speed, draft, production, performance assessment, defects and remedies, supervisory check points.

List of Practical (Expand it if needed):

- 1. To study of Drawframe, Comber and Speed frame, constructional details, setting and gauging, controls and change places, Calculations of speeds, drafts, production
- 2. To study the general features of a draw frame, Draw the drafting arrangement of the draw frame.
- 3. Draw the gearing diagram of draw frame and calculate break draft, main draft, total draft, draft constants, creel draft.
- 4. Study the machine, material and man safety devices in draw frame.
- 5. To study the general features of a speed frame. Draw the drafting arrangement of the speed frame.
- 6. Draw the gearing diagram of speed frame and calculate break draft, main draft, total draft, draft constants, creel draft.
- 7. To study the building mechanism of a speed frame.
- 8. To study the twisting mechanism and to calculate the twist constants and spindle speed based on the gearing diagram.
- 9. Study the machine, material and man safety devices in speed frame.

References:

- 1. Manual of Cotton Spinning Vol. 3-Text. Institute.
- 2. Klein; The Textile Institute Short Staple Spinning Series.
- 3. Taggart; Cotton Spinning Calculations.
- 4. Venkatasubramani; Spun Yarn Tech. Vol. 3.
- 5. Khare AR; Elements of Carding & Drawing.
- 6. Khare AR; Elements of Combing.
- 7. Cotton Combing Gilbert Merrill
- 8. Cotton Drawing and Roving Gilbert Merrill
- 9. Drawing, Combing and Roving Z.S. Szaloki
- 10. Electronics Controls for Textile Machines Hiren Joshi, Gouri Joshi, NCUTE Pub.2002
- 11. Cotton Spinning Taggart

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Name of Program: B.TECH (Textile Engineering)

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SUBJECT CODE			ТН	EOR	Y	PRACT	TICAL				
	CATEGORY	SUBJECT NAME	END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDITS
BTTX402	DCS	FABRIC MANUFACTURING - II	60	20	20	30	20	3	1	2	5

 $\label{eq:Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit;$

***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 of the working principles of primary and secondary motions of the loom.
- 2. To explain the working of Dobby and Jacquard Shedding Mechanisms.

Course Outcomes (COs)

Student will be able:

- 1. To identify the working principles of primary and secondary motions of the loom and can manufacture fabrics as per the required quality and specifications.
- 2. To demonstrate the knowledge of Shedding mechanism and can prepare fabric of desired weave design.

Course Contents:

Unit I

Principles of weaving. Primary, Secondary an Auxiliary motions. Shedding – its various types and devices, positive and negative shedding, Negative tappet shedding mechanism, shedding tappets, heald reversing motions, early and late shedding, shed troughing and heald staggering.

Unit II

Picking classification, mechanism of Over and Under pick motions, picking tappets, shuttle speed, shuttle checking devices, causes of shuttle flying and shuttle trap. Beat-up sley movement, sley eccentricity and its effect, factors affecting sley movement, double beat-up, Timing diagram of primary motions.

Unit III

Classification of take-up motion, 5 and 7 wheel take-up motion, Negative let-off motion and its related calculations, Causes of pick spacing variation. Temples-types and uses.

Unit IV

Dobby shedding scope and uses, negative and positive dobbies, working Principles of Keighley, staubli, Cross-border dobbies, modern electronics dobbies; Preparation of pattern lattices and methods for preparation of punch cards in modern dobbies.



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Unit V

Jacquard shedding, coarse pitch, working principle of single cylinder single lift and double cylinder double lift jacquards. Various types of harness tie-ups and their uses, londontie and Norwich tie. Casting out of harness, figuring capacity of jacquard. Fine pitch jacquard, working principle, Vincenzi jacquard and Vardol jacquards, Modern electronic jacquards.

List of Practical (Expand it if needed):

- 1. Detailed study of primary motions of a plain loom
- 2. Detailed study of secondary motions of a plain loom
- 3. Detailed study of temples used on the loom.
- 4. Detailed study of Dobby shedding mechanism
- 5. Detailed study of Jacquard shedding mechanism

References:

- 1. Weaving Vol. II Bannerjee NN
- 2. Fancy Weaving Aswani K T
- 3. Principle of Weaving Marks & Robinson
- 4. Woven Fabric Production II, NCUTE,1st Ed Dobby, Jacquar; NCUTE Publication (2002)
- 5. Weaving Machines, Mechanisms and Management Talukdar MK et al.
- 6. Textile Mathematics Vol.III Booth J E
- 7. Fox; Mechanism of Weaving;
- 8. BTRA Silver Jubilee Monograph Series BTRA; Loom Shed
- 9. Fabric Forming Hasmukharai B
- 10. Electronic Controls for Textile Machines, Joshi Hiren, Gauri, NCUTE Pub.(2003)
- 11. Weaving Tech. & Operations Allan Ormerod, Walter S. Sondheln

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Name of Program: B.TECH (Textile Engineering)

		8	TEACHING & EVALUATION SCHEME								
SUBJECT CODE		CATEGORY SUBJECT NAME	THEORY			PRACI				S	
	CATEGORY		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDIT
BTTX403	DCS	FABRIC STRUCTURE - I	60	20	20	30	20	3	1	2	5

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 understand and design basic fabric structures (like plain, twill and satin structures as per specifications.
- 2. To identify and differentiate different derivatives of basic weaves and their effect in fabric.

Course Outcomes (COs)

Student will be able:

- 1. To develop new woven fabric design
- 2. To make honeycomb, welt structures.
- 3. To solve technical problems related to basic fabric structures on the loom.
- 4. To provide suitable draft and peg plan for a given weave for making design

Course Contents:

Unit I

Fabric classification, Weave notation and weave repeat, Introduction to design, drafting and peg-plan systems and their relationship, Plain weave and its derivatives e.g. warp rib, weft rib and hopsack/ matt.

Unit II

Twill weave its different types and derivatives e.g., pointed, curved, broken, elongated, transposed, fancy and cork-screw, Satin and sateen weave regular and rregular.

Unit III

Diamond, Honeycomb ordinary honeycomb and brighton honeycomb, Mockleno, Huckaback, crepe weave, different types of bed ford cord, welt and pique.

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Unit IV

Twill angle and yarn twist angle, Effect of yarn twist direction on the prominency of twill lines in the fabric, Reed and heald count systems and related calculations.

Unit V

Color and weave effects stripes and checks.

List of Practical (Expand it if needed):

- 1. To study the design, draft and peg-plan of Plain weave
- 2. To study the design, draft and peg-plan of Satin and sateen weave
- 3. To study the design, draft and peg-plan of honeycomb
- 4. To study the design, draft and peg-plan of Brighton honeycomb
- 5. To study the design, draft and peg-plan of bed ford cord
- 6. To study the design, draft and peg-plan of welt and pique
- 7. To study the design, draft and peg-plan of twill
- 8. To study the colour and weave effects for strip weave
- 9. To study the colour and weave effects for check weave
- 10. To study the reed and heald count systems and related calculations

References:

- 1. Watsons' Textile Design & Color. Grosicki
- 2. Grammar of Textile Design Nisbet
- 3. Structural Fabric Design Klibbe
- 4. Textile Weaving & Design Murphy W S
- 5. Mary Humphries Fabric Glossary.



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Name of Program: B.TECH (Textile Engineering)

SUBJECT CODE		TEACHING & EVALUATION SCHEMI								ME	
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	CATEGORY	SUBJECT NAME	END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDIT
BTTX404	DCS	FIBER SCIENCE - II	60	20	20	0	0	3	1	0	4

 $\label{eq:Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit;$

***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 impart knowledge about the principle and manufacturing process of high performance fibres.
- 2. To understand accurately the optical, Electrical and Thermal properties of different synthetic fibres.

Course Outcomes (COs)

Student will be able:

- 1. To identify and evaluate the properties of synthetic fibres accurately.
- 2. To explain the correct manufacturing process of various synthetic fibres.
- 3. To solve technical problems related to fibres behavior on the machine.
- 4. To explain optical and thermal behavior of the fibres.
- 5. To develop the new fibres.

Course Contents:

Unit I

New Fibres Glass, Carbon, Aramid, Spandex, Spectra, Nano fibres and Teflon etc. Basic concept of bi-component, hollow and tri-lobal fibres, High speed extrusion, Tow conversion process.

Unit II

Texturing - Importance, basic principle, heat setting, false twisting, process variables, development of false twist texturising machine. Textured yarns like stuffer box, crimping, edge crimping, knit-de-knit, gear crimping etc. properties of such yarn. Principle of air bulking and properties of air-jet textured yarn. Chemical texturising, production of POY, MOY, FDY and DTY yarn

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Unit III

Optical properties - refraction, absorption, dichroism, reflection and luster. Birefringence and orientation, specific index of birefringence and its measurement.

Unit IV

Electrical properties – dielectric properties, electrical resistance of fibres and its measurement, static electricity, measurement and explanation of static phenomena. Frictional properties - nature of friction and application to fibres, static and dynamic friction of yarn on ceramics, metals

Unit V

Thermal properties thermal parameters, structural changes in fibres on heating, concept of heat setting and its usefulness, factors affecting the heat setting behavior of textile materials, first and second order transition.

References:

- 1. Vaidya; Production of Synthetic Fibres.
- 2. Shennai VA; Technology of Textile Processing Vol.I, Textile Fibres.
- 3. Gupta, Kothari; Progress in TST Vol.II Textile Fibres Developments & Innovations
- 4. Murthy HVS; Introduction to Textile Fibre
- 5. Moncrieff Man Made Fibres.
- 6. Akira Nakamura; Fibre Science & Technology (Translated from Japanese).
- 7. Mishra SP; A Text Book of Fiber Science & Technology.
- 8. Tatsuya Hongu, Glyn O. Philips; New Fibers 2nd Edition.

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SUBJECT CODE				TEACH	HING &	EVALUA	ATION S	SCHE	EME		
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	CATEGORY	SUBJECT NAME	END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	Т	Р	CREDIT
BTTX405	DCS	YARN AND FABRIC STUDIES	0	0	0	0	50	0	0	2	1

Name of Program: B.TECH (Textile Engineering)

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 of various types of yarn.
- 2. To give exposure to the various types of woven, knitted and non-woven fabric

Course Outcomes (COs):

Student will be able:

- 1. To identify and analyse the various types of yarn and fabric
- 2. To solve the various ambiguities among the various types of fabric
- 3. To distinguish the requirement for the various types of yarn and fabrics

List of Practical (Expand it if needed):

- 1. To collect and study of various types of single yarns
- 2. To collect and study of various types of double yarns
- 3. To collect and study of various types of synthetic yarns
- 4. To collect and study of various types of fancy yarns
- 5. To collect and study of various types of woven fabrics
- 6. To collect and study of various types of knitted fabrics
- 7. To collect and study of various types of non-woven fabrics
- 8. To collect and study of various types of packages
- 9. To collect and study of various types of Industrial fabrics

Note: Students will study various types of yarns and fabrics during one day mill Visit and also study various aspects about the same in the departmen workshops/labs as assign by the concern faculties.

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