

RAJASTHAN TECHNICAL UNIVERSITY, KOTA



SYLLABUS
OF EXAMINATION

B. TECH. (Textile Engineering)

Effective from session: 2008 - 2009

**THIRD SEMESTER
B. TECH. (Textile Engineering)**

MECHANISMS OF YARN MANUFACTURING – I

[3TE1]
[Common with 3TT1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
	<ul style="list-style-type: none"> System of expressing yarn linear density. Object of ginning Description and working of knife-roller, Mearthy and Saw gin Objects of mixing. Principles underlying the selection of cotton for mixing. Different methods of mixing
	<ul style="list-style-type: none"> Study of different blending methods, their advantages and disadvantages. Problems in blending of man-made fibre with cotton Objects of blow-room Various types of openers, their construction and working
	<ul style="list-style-type: none"> Lap forming mechanisms Objects and arrangements of calendar roller and their weighing Selection of machinery according to the type of cotton and their suitable combinations
	<ul style="list-style-type: none"> Nature of waste extracted in various openers and beaters Lap rejection causes of lap defects and their remedies. Processing parameters for working different varieties of cotton in blow room. Calculations pertaining to production of blow-room machinery under normal mill conditions.
	<ul style="list-style-type: none"> Blow room accessories e. g; Shirley analyzer, Lap meter, Varimeter, V-signal, moisture indicator . Introductory idea about cleaning efficiency and opening efficiency of blow room machinery Brief outline of setting the blow room line for man-made fibers Measurement of blow room performance . Lap quality parameters.

MECHANISMS OF FABRIC MANUFACTURING – I

[3TE2]

Class B. E. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> Warp winding machines – Rotoconer winding m/s, objects, passage of yarn Study of various mechanisms like tensioners, yarn clearers, yarn traverse drum, thread stop motion etc. Efficiency and production calculation of the m/c.
II	<ul style="list-style-type: none"> Pirn winding machine – high speed hacoba pirn winder, objects, passage of yarn Study of various mechanisms like tensioners & thread stop motion, traverse with traverse mechanism, diameter control mechanism, automatic doffing, etc. Production calculation of the m/c.
III	<ul style="list-style-type: none"> Beam warping machine- objects, passage through any high speed beam warping machine, production calculation.
IV	<ul style="list-style-type: none"> High speed sectional warping machine, passage, calculation of sections, traverse mechanism and its calculation, efficiency calculation
V	<ul style="list-style-type: none"> Slasher sizing machine - passage, sizing ingredients, 2 cylinder and multi-cylinder driers Factors affecting size take up, calculation of concentration ,size take up, and speed of machine Looming in process, accessories healds , reed, drop pins and its calculations. Manual drawing-in stand.

TEXTILE RAW MATERIALS**[3TE3]****[Common with TEXTILE FIBERS paper 3TC1, 3TT4]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none">• Definition and classification of textile fibers with reference to their utilization in textile industry• Introduction to impurities in natural fibers
II	<ul style="list-style-type: none">• Cultivation and retting practices,• Fiber morphology,• Physical and chemical properties of natural cellulosic fibers viz. cotton, jute, flex, rammie, hemp, sunn, coir.• Varieties of cotton
III	<ul style="list-style-type: none">• Varieties, sorting and grading of wool• Morphological structure of wool• Physical and chemical properties of wool fiber
IV	<ul style="list-style-type: none">• Varieties of silk• Rearing of silk worm, cocooning, silk reeling, throwing and weighting• Varieties of silk yarns and fabrics• Morphology, physical and chemical properties of silk fiber
V	<ul style="list-style-type: none">• Brief outline of manufacturing process and properties of regenerated fibers viz. viscose rayon, cellulose, triacetate, cupraammonium rayon, polynosics etc.• Brief manufacturing process and properties of important synthetic fibers viz. Polyester, Nylon, Acrylics etc.• Introduction to some newly developed fibers viz. Lycra, Spandex, Polybutylene, Terephthalate, Lyocell, Casein etc.

ENGINEERING MANUFACTURING PROCESSES**[3TE4]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Foundry: <ul style="list-style-type: none"> • Moulding Material Moulding Sands; • Properties and Methods testing. Core materials and core making. • Moulding Process: Green dry and loam sand moulding, various moulding processes - shell moulding, permanent moulding, carbon moulding.
II	Casting: <ul style="list-style-type: none"> • Die Casting, Centrifugal casting, Investment casting and continuous casting, Slush casting, casting defects and their smelting furnaces, rotary, H.electric, lifting and constructional features and operation of cupola, furnace, principal of casting design • Welding: Atomic hydrogen, ultrasonic, laser beam special welding processes e.g. TIG, MIG, friction and explosive welding
III	Powder metallurgy: <ul style="list-style-type: none"> • Powder manufacturing mechanical pulverization electrolytic process, chemical reduction, atomization properties of metal powder, compacting of powders, sintering • Application, advantage and disadvantage of powder metallurgy.
IV	Press tools: <ul style="list-style-type: none"> • Classification of processes and presses: shearing, bending, drawing and forming operation and dies. • Compound and progressive dies: calculation of bank size: high velocity forming of metals.
V	Machine Tools: <ul style="list-style-type: none"> • Constructional details and main operation lathes, • Capston and turret lathes: shaper and planner, drilling and boring machines. • Milling machine, indexing methods. • Grinding

APPLIED ELECTRONICS

[3TE5]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Basic Electronics: <ul style="list-style-type: none"> • Introduction, Solid Circuit Elements, Diode Application Bipolar Junction • Different Transistor, Contributions, Integrated Circuits – IC Technology • Non Inverting OP-Amps, OP-Amp Applications-Voltage Follower, Integrator, Differentiator
II	Digital Electronics: <ul style="list-style-type: none"> • Number System -Decimal, Binary, Octal & Hexadecimal Number System, • Conversion from One System to another, Binary Arithmetic, Signed Number ,Code-BCD, Excess -3, Gray, • Concept of Parity and Error Correction, Boolean algebra, Theorems, Boolean Function and standard canonical forms. • There Simplification and K-Map, Logic Gates- AND, OR, NOT, NAND, NOR and Ex-OR, universal gates.
III	Combinational Circuits: <ul style="list-style-type: none"> • Half & full Adder and Subtractor • Binary and BCD adder, their Design & Implementation • Multiplexer & Demultiplexer
IV	Sequential Circuits: <ul style="list-style-type: none"> • Definition, D, T, S-R, J-K, Master – slave configuration and IC Flip-flop, • Applications and design of Sequential circuits
V	Semiconductor Memory Devices: <ul style="list-style-type: none"> • Static And Dynamic RAM, ROM, PROM & EEPROM • There Working, Memory Organization & Operation

ELECTIVES

APPLIED STATISTICS

[3TE6.1]
[Common with 3TC6.1 & 3TT6.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none">• Curve fitting (least square method)• Fitting of straight line• Second degree parabola• Exponential and logarithmic curves
II	<ul style="list-style-type: none">• Correlation and regression• Partial and multiple correlation,• Multiple regression
III	<ul style="list-style-type: none">• Probability• Probability distributions• Binomial, Poisson• Normal distribution, application aspects of normal distribution ,• Hypergeometric distribution
IV	<ul style="list-style-type: none">• Estimation of parameters• Testing of hypothesis• t-test• F-test• Chi-square test
V	<ul style="list-style-type: none">• Quality control• Control charts (X, R & P), action & warning limits• Interpretation of control charts

NANO TECHNOLOGY

[3TE6.2]

[Common with 3TC6.2 & 3TT6.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Introduction and fundamental science behind Nano technology: <ul style="list-style-type: none"> • Definition, description about size and measures, electron, atoms and ions, molecules • Molecular recognition • Quantum mechanics and quantum ideas and some Nano challenges.
II	Measuring instruments of Nano structures: <ul style="list-style-type: none"> • Scanning probe instruments, spectroscopy, electrochemistry, electron microscopy • Tools to make Nano structures – lithography methods, scanning probe instruments • Nano scale crystal growth, polymerization • Nano bricks and building blocks
III	Points and places of interest: <ul style="list-style-type: none"> • Smart materials, sensors • Nano scale bio-structures • Optics, fabrication, modeling, electronics
IV	Applications: <ul style="list-style-type: none"> • Nano polymer, Nano tubes, Nano fibers • Nano catalyst and consumer goods
V	<ul style="list-style-type: none"> • Nano business • Nano ethics • Nano resource

PRACTICALS:

3TE7 SPG LAB I

hrs/week-3

Max marks-100

Practice in handling and operations of blow room. Study of constructional details of machinery: Various controls, change place etc. Practice in checking of the quality of lap. Calculation pertaining to blow-room. Sequence of machines in a modern blow room line settings of blow-room for processing cotton and man-made fibres. Maintenance schedules of blow room. Designs of a modern opener, beater.

3TE8 Weaving Lab- I

hrs/week-4

max. marks-100

1. various supply and delivery pkgs, rotoconer winding m/c, drive and production calculation,
2. various types of shuttles and pirns, hacobia pirn pirn winder-drive to various parts and study of various mechanisms, production calculation
3. suru slow speed sectional warping m/c-passage, drive, traverse, beaming mech.
4. sizing m/c –passage, speed and stretch calculation.
5. manual drawing in process, various types of reed, healds, and drop pins.

3TE9 FM&I LAB

hrs/week-4

Max marks-50

Principle of microscopy, microscopic identification of fibres, preparation and mounting of specimen for longitudinal view. Microscopy. Standard scheme of analysis of homogenous fibre and blends by physical and chemical methods Qualitative and Preparation of reagents used for chemical analysis

3TE10 Applied Mechanics Lab

hrs/week-2

Max marks-50

1. Verification resultant force using force polygon
2. Determination of friction coefficient of different materials
3. Fatigue test of given specimen
4. Engineering properties of materials and their definition
5. Tensile test of steel/cast iron
6. Study of torsion testing machine
7. Determine velocity of water by pitot tube
8. Verify Bernoulli's theorem
9. Determine flow rate of air by Venturimeter
10. Determine flow rate of air by nozzle meter

11. 3TE11 Applied Electronics LAB

hrs/week-2

Max marks-50

1. Study the Analog & digital Multi meter.
2. Function/Signal generators.
3. Study of Regulated D.C. power supplies (constant voltage and constant current operations).
4. Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous
5. To study OP-AMP as Current to voltage & voltage to current converter, comparator
6. op-Amp using (a) differentiator (b) Integrator
7. Study of various combinational circuits based on: AND/NAND logic blocks and OR/NOR Logic blocks.
8. Study of following combinational circuits: Multiplexer, Demultiplexer and Encoder, Verify truth tables of various logic functions.
9. BCD to binary conversion on digital IC trainer.
10. Study various Flip flops and construct Parallel in serial out register.
11. Testing of digital IC by automatic digital IC trainer.
12. Study and obtain the characteristics of Diac.

**FOURTH SEMESTER
B. TECH. (Textile Engineering)**

MECHANISMS OF YARN MANUFACTURING – II**[4TE1]**
[Common with 4TT1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Objects of carding • Introduction to roller & clearer card • Detailed study of revolving flat card • Constructional features and working details of liker- in, cylinder, doffer and flats.
II	<ul style="list-style-type: none"> • Elementary idea about Carding theories. • Flexible and metallic card clothing, stripping and grinding. • Processing parameters for different materials • Carding defects and their remedies
III	<ul style="list-style-type: none"> • Fiber neps, their assessment and control • Introductory information about modern developments in carding • Control of waste and cleaning in carding • Calculations pertaining to draft and production of the machines dealt with course
IV	<ul style="list-style-type: none"> • Objects of drawing. Working principle of draw frame including constructional details • Systems of drafting, weighing in draw frames • Mechanical and electrical stop-motions • Draft distribution: various types of drafting rollers and their construction
V	<ul style="list-style-type: none"> • Coiling systems: over coiling; under coiling and bicoiling • Concept of ideal draft and formation of drafting waves • Principles of roller setting • Introduction to modern developments in draw frames • Calculations pertaining to draft and production of the machine dealt with course

MECHANISMS OF FABRIC MANUFACTURING – II**[4TE2]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Classification of various fabrics • Weight of warp and weft in the fabric, design, draft and peg plan of plain, twill and satin weave.
II	<ul style="list-style-type: none"> • Classification of weaving machines • Various motions of plain power looms and its drive
III	<ul style="list-style-type: none"> • Tappet shedding for plain and twill weaves, • Dobby shedding - double lift knife and cam dobbie mechanism and its card cutting • Over and under pick motions
IV	<ul style="list-style-type: none"> • Conventional sley beat-up of power looms, 5 wheel and 7 wheel take up motion and its calculation
V	<ul style="list-style-type: none"> • Semi positive let-off mechanism and its setting • Loose and fast reed warp protector motion

FABRIC DESIGNING**[4TE3]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Classification of fabrics , definition and methods of construction of weave, draft , lifting plan and denting order . Weave repeat unit and its requirements. Heald and reed calculations, and types of drafts viz: straight, skip, pointed and sateen. • Plain weave • Derivatives and ornamentation.
II	<ul style="list-style-type: none"> • Twill weave , classification of twill weave • Derivatives of twill weave • Effect of twist on prominence of twill lines
III	<ul style="list-style-type: none"> • Sateen & satins, their extensions • Crepe weave • Diamond and diaper
IV	<ul style="list-style-type: none"> • Mock leno • Honey comb • Huck-a- back
V	<ul style="list-style-type: none"> • Cork screw • Bedford cords • Welt and pique fabrics

APPLIED MECHANICS

[4TE4]

[Common with 4TT6.1 & 4TC6.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Strength of materials <ul style="list-style-type: none"> • Behavior of common materials in tension & compression • Characteristic strain-stress curves of engineering materials • Hook's law • Elastic-limit working stress, ultimate stress, factor of safety • Poisson ratio • Elastic constants & their relationship
II	Shearing & Bending <ul style="list-style-type: none"> • Center of gravity, Moment of Inertia of area of symmetrical, un-symmetrical & built-up sections • Simple beams subjected to transverse loading • Shear force and bending moment diagram • Theory of bending • Normal stress due to bending
III	Torsion of shaft: <ul style="list-style-type: none"> • Torsional shear stresses in solid, hollow & stepped circular shafts • Angular deflection & power transmission capacity • Application to close coil helical spring
IV	Fluid Mechanics – I: <ul style="list-style-type: none"> • Basic definitions & fluid properties: definition of fluid, incompressible and compressible fluids • Mass density, specific weight, relative density, specific volume • Ideal fluid, viscosity, Newtonian & Non-Newtonian fluids • Kinematics & conservation of mass: flow classification, fluid velocity & acceleration • Continuity equation for one dimensional and three dimensional fluid flow
V	Fluid Mechanics – II: <ul style="list-style-type: none"> • Fluid momentum: momentum theorem, application of momentum equation • Bernoulli equation • Application of Bernoulli equation: orifice meter, venturi meter • Flow through pipe • Head losses due to sudden enlargement, contraction, entrance, exit, obstruction, bend and pipe fitting • Power transmission by fluid

MICROPROCESSOR APPLICATIONS IN TEXTILES

[4TE5]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Introduction To Microcomputer Systems: <ul style="list-style-type: none"> • Microprocessor, micro controller and microcomputer devices • Machine and assembly language • Bus concept
II	Architecture: <ul style="list-style-type: none"> • Comparative study of 8085-A, 8086 and 8088 (Pinout, internal architecture, timing diagrams) • Instruction format and addressing modes
III	Assembly Language and Programming in 8085: <ul style="list-style-type: none"> • Instruction set, program structure (sequential, conditional, iterative) • Macros and subroutines • Stack, counter and timing delay • Interrupt structure and its programming
IV	Devices and Interfacing: <ul style="list-style-type: none"> • System buses: STD and ISA Memory (static, dynamic & various PROM) , Architecture, characteristics and interfacing of the following devices. • DMA Controller 8257, Interrupt controller 8259A, USART 8251, PPI 8255, • Timer 8254 and keyboard display controller 8279. • Level converters MC 1488 and MC 1489, • Communication buses: Centronics, IEEE- 488, Current loop, RS 232 C , RS 422 A & RS 423 A
V	PLC: <ul style="list-style-type: none"> • Definition, comparison between relay logic control and PLC • Architecture of programmable controller • Inbuilt function of PLC • PLC applications in textile industry

ELECTIVES
NUMERICAL ANALYSIS

[4TE6.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Finite differences • Netwon's Interpolation formulae • Legrange's formula for unequal intervals
II	<ul style="list-style-type: none"> • Numerical differentiation & integration • Trapezoidal Rule • Simpson's rules • Weddel's rule
III	<ul style="list-style-type: none"> • Numerical solution of equations of one variable : Bisection method • Regula-Falsi method, Secant method • Newton-Raphson Method.
IV	<ul style="list-style-type: none"> • Numerical solution of systems of linear equation : Gauss-Sediel method • Jacobi method • Gauss elimination method.
V	<ul style="list-style-type: none"> • Numerical solution of differential equations : Euler's methods • Picard's method, Runga-Kutta method

INDUSTRIAL MANAGEMENT**[4TE6.2]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none">• Cotton Textile Industry of India- its importance, size, structure, problems and remedies• Location for Industries, factors influencing location, selection of sites• Trends of dispersal of industries in India
II	<ul style="list-style-type: none">• Industrial productivity- its importance and factors affecting productivity, productivity trends in Textile Industry• Industrial pricing export promotion• Wages of Industrial workers- methods of payment of wages including wage incentive plans
III	<ul style="list-style-type: none">• Industrial relation-problems of absenteeism and turn over• Grievance handling at plant level, collective bargaining• Collective agreement between the Mill Owners• Associations and workers participation in management
IV	<ul style="list-style-type: none">• An idea about labour and factory legislation• Factories act• Indian trade unions act• Payment of wages act• Trade dispute act• Workman compensation bonus act• Safety act• Industrial acts
V	<ul style="list-style-type: none">• Operation Management: General picture of industrial management• Types of organization• Distinction between line and staff Taylor's contribution to the theory and practices of management• Scientific management• Sales management• Personal management

PRACTICALS

4TE7 SPG LAB II

hrs/week-4

Max marks-100

Familiarity with carding machine, constructional details, change, effects of various machine parameters in production and quality of sliver. Checking the quality of sliver. Calculations pertaining to card. Card dropping and wastes and their analysis including cleaning efficiency. Practice in checking the quality of lap; and sliver, methods of rectifying defects there in. calculation pertaining to card gearing.

T. study different card room accessories. Speeds and setting of card for processing cotton and man-made fibres, maintenance schedule of card.

4TE8 WVG LAB II

hrs/week-4

Max marks-100

1. fabric analysis – identify warp and weft, weave, sett, crimp, fabric weight calculation.
2. passage of warp and weft on plain power loom, drive to loom,
3. plain tappet shedding,
4. picking motion- over pick motion, under pick motion,
5. loose and fast reed warp protector motion
6. take up motion - 5 wheel and seven wheel take up motions,
7. negative warp let-off mech

4TE10 Theory of machine lab.

hrs/week-2

Max marks-50

1. Velocity and acceleration of simple planar mechanisms used in textile machines
2. Study of different drives
3. Study of gear trains: simple, compound, reverted and epicyclic
4. Motion analysis and synthesis of cam-follower system
5. Study of spring testing machine
6. Study of vibration measurements

4TE11 Microprocessor application in textile lab.

hrs/week-2

Max marks-50

- 1) To study microprocessor trainer kit.
- 2) Program to perform addition of two 8-bit numbers & two 16-bit numbers.
- 3) Write a program in assembly level language which will find sum of ten numbers starting from memory location 20A0. Store the result as memory location 20B0 & 20B1.
- 4) Write a program in assembly level language which will find the greatest & smallest among three given numbers.
- 5) Write a program in assembly level language which will find product of two given 8-bit numbers.
- 6) Write a program in assembly level language which will search a numbers in array of 20 numbers & find its parity.
- 7) Write a program in assembly level language which will sort an array of ten numbers, starting from memory location 6000, in ascending & descending order. Store the result as memory location 6010.
- 8) Write a program in assembly level language to generate a Fibonacci series of 15 numbers. Also find out sum of this series.
- 9) Write a program in assembly level language for division of 8-bit by 8-bit number & 16-bit by 8-bit numbers.
- 10) a. Write a program in assembly level language which will convert BCD codes
ASCII codes.
b. Write a program in assembly level language which will convert BCD codes
Hexadecimal codes
- 11) Write a program in assembly level language for rolling display of message "INDIAN" on 8085 microprocessor kit.
- 12) Study the of PLC trainer kit .

FIFTH SEMESTER
B. TECH. (Textile Engineering)

Mechanisms of Yarn Manufacture-III

[5TE1]

[Common with 5TT1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Combing <ul style="list-style-type: none"> • Object of combing • Systems of lap preparation • Study of various lap preparation systems -sliver lap, ribbon lap and supper-lap machines . • Configuration of fibre feed and its effect on the quality of product, noil percentage and fractionation efficiency of comber
II	Comber <ul style="list-style-type: none"> • Types of combers • Detailed study of the old and modern comber • Timing and setting of comber for different classes of cotton • Control of comber waste
III	<ul style="list-style-type: none"> • Calculation pertaining to draft, production and noil percentage • Introduction to the recent developments in combing and simplex. Changes in design of comber and simplex
IV	Speed frame <ul style="list-style-type: none"> • Objects of speed frame • Conventional and modern roving processes • Mechanisms involved in drafting, twisting and winding • Basic principles of designing of essential mechanisms of simplex • Differential motions and their working principles • Building motions, their objects and types, working principle of English type builder motions • Drafting systems (Ordinary and high draft)
V	<ul style="list-style-type: none"> • Processing parameters for different materials. • Common defects in roving packages, their causes and remedies • Calculations pertaining to gearing, constants, drafts, tpi and production • Twist multiplier and roving twist • Introduction to the changes to be made on roving frame to run man-made fibers.

Mechanisms of Fabric Manufacture –III

[5TE2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Jacquard shedding <ul style="list-style-type: none"> • Classification of jacquards • Single Lift Single Cylinder, Double Lift Single Cylinder, Double Lift Double Cylinder • Shed forming element, drive & timing of above Machine
II	<ul style="list-style-type: none"> • Self twilling, pressure harness, cross border jacquard, card cutting operation for mechanical jacquard • Electrical jacquard • electronic jacquard • Warp stop motion & its setting
III	Terry weaving <ul style="list-style-type: none"> • Essential feature of terry weaving loom • Various principle of terry pile formation • Terry let- off-heading , fringing-motion • Modern development in terry structure
IV	<ul style="list-style-type: none"> • Automatic weft replacement device on loom • Pirn changing, Shuttle changing. • setting & timing of above mech.
V	<ul style="list-style-type: none"> • Basic concept of Unifil loom winder • Basic concept of Bobbine lodder • Introduction to shuttleless weaving machine, projectile, rapier with reference to picking

TEXTILE CHEMICAL PROCESSING – I

[5TE3]

[Common with 5TT3]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Pre treatments: Impurities in natural fibers. • Introduction to pre treatments viz. shearing, singeing, desizing, scouring, bleaching.
II	<ul style="list-style-type: none"> • Machines used in pre treatments viz. washing machine, kier, bleaching machine
III	<ul style="list-style-type: none"> • Introduction to mercerization & different types of mercerizing machines
IV	<ul style="list-style-type: none"> • Method of dyeing for natural & synthetic fibers by batch, semi-continuous and continuous process
V	<ul style="list-style-type: none"> • Dyeing Machines viz. Jigger, Jet dyeing, winch, HTHP beam dyeing, fiber dyeing.

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<p>MECHANISMS AND MACHINES</p> <ul style="list-style-type: none"> Introduction, Mechanism and machine, Rigid and Resistant body, Link, Kinematics pair, Types of motion, Degrees of Freedom (Mobility), Classification of Kinematics pairs, kinematics Chain, Linkage, Mechanisms, Kinematics Inversion, Inversions of Slider-Crank Chain, Double Slider-Crank Chain, Problems.
II	<p>BELTS, ROPES & CHAINS :</p> <ul style="list-style-type: none"> Introduction, Belt and Rope Drives, Open and Crossed Belt Drives, Velocity Ratio, Slip, Materials for Belts and Ropes, Law of Belting, Length of Belt, Ratio of Friction Driving Tensions, Power Transmitted, Centrifugal, Effect on Belts, Minimum power Transmitted by a Belt, Initial Tension, Creep, Chains, Chain length, Angular speed Ratio, Classification of Chains.
III	<p>GEARS & GEAR TRAINS:</p> <ul style="list-style-type: none"> Introduction, Classification of Gears, Gear terminology, Law of Gearing, Velocity of Sliding, Forms of teeth, Cycloidal Profile teeth, Involute profile teeth, Arc of contact, Number of pairs of teeth in contact, Interference in Involute gears, Minimum Number of teeth, Interference Between Rack and pinion, Undercutting, Comparison of Cycloidal and Involute Tooth Forms, Introduction to Helical, Spiral, Worm, Worm, Gear and Bevel Gears. Simple, compound and epi-cyclic trains. Study of epicyclic gear train used in speed frame, carding and comber.
IV	<p>CAMS:</p> <ul style="list-style-type: none"> Introduction, Types of Cams, Types of followers, Cam Terminology, Displacement Diagrams, Motions of the Follower, Graphical Construction of Cam profile.
V	<p>Balancing: Static & dynamic Balancing of rotary masses, balancing of rotating masses in one & different plane, balancing of reciprocating , masses.</p>

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<p>Introduction to textile testing</p> <ul style="list-style-type: none"> • Aim and scope <p>Sampling techniques</p> <ul style="list-style-type: none"> • General requirements, squaring, cut squaring and Zoning methods for sampling of raw material • Sampling techniques for yarn and fabrics for specific tests • Routine Sampling techniques used in the textile industry
II	<p>Hygrometry and moisture relations of textiles</p> <ul style="list-style-type: none"> • Terms and definitions • Relation between Relative Humidity. and regain of textile materials • Equilibrium regain, hysteresis • Measurement of regain principle and operation of equipment • Official regain and concept of current invoice weight
III	<p>Measurement of fibre physical characteristics</p> <ul style="list-style-type: none"> • Fibre length, fineness, maturity and foreign matter of cotton and other fibres • Principle, construction, operation and calibration of equipment in common use for measurement of above properties • Grading of different cottons • Nep testing of cotton
IV	<p>Fibre friction</p> <ul style="list-style-type: none"> • Theories and measurement of friction of single and fibre assemblies during drafting <p>Yarn numbering systems</p> <ul style="list-style-type: none"> • Numbering systems • Conversion methods • Measurement of yarn number <p>Measurement of yarn properties</p> <ul style="list-style-type: none"> • Twist in spun, continuous filament and ply yarns <p>Measurement of fabric properties</p> <ul style="list-style-type: none"> • Serviceability, wear and abrasion • Definitions, methods for measuring abrasion resistance and evaluation of results • Fabric creasing and crease recovery testing
V	<p>Methods of test for fabric dimensions and other physical properties</p> <ul style="list-style-type: none"> • Thickness • Weight • Crimp • Shrinkage • Air permeability • Wet ability • Shower-proofness • Water- proofness • Flame-resistance

ELECTIVES
FIBRE SCIENCE

[5TE6.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Polymers <ul style="list-style-type: none"> • Definition of polymer, Classification of polymers, Different kinds of polymer materials, Fibrous polymers and their Morphology. • Molecular weight of polymer molecule, different types of molecular weight averages, Polydispersity, Molecular weight measurement methods. • Concept of micro-structure of chain molecules, crystallinity, orientation
II	<ul style="list-style-type: none"> • Basic principle of fluid flow during fibre spinning • Introduction to Melt spinning, melt spinning line, design and engineering of equipments, melt spinning variables and conditions for continuous spinning.
III	<ul style="list-style-type: none"> • Introduction to solution spinning processes and process variables, preparation of the dope and process of dry spinning, preparation of the spinning solution and process of wet spinning, coagulation, development the structure and morphology during solution spinning. • Comparative study of spinning processes.
IV	Post extrusion processes <ul style="list-style-type: none"> • Introduction of spin finish, functions of spin finishes, properties of spin finishes, spin finish components, methods of spin finish application, spin finish for staple fibres, filaments, yarns and other processes. Analysis of spin finish formulations, effect of spin finish on dyeing, problems associated with the use of spin finish.
V	Drawing and setting process <ul style="list-style-type: none"> • Introduction to drawing, drawing machines, the drawing behaviour of thermoplastic fibres, influence of drawing on structure and properties of fibres, draw warping. • Introduction to heat setting, nature of set, heat setting behaviour of polyamide and polyester fibres, measurement of degree of set.

MATERIAL AND HUMAN RESOURCE MANAGEMENT

[5TE6.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Objectives of material management • Nature and scope of material management
II	<ul style="list-style-type: none"> • Inventory management, inventory control, ABC analysis • Store management • Stock verification • Store accounting
III	<ul style="list-style-type: none"> • Human resource development system • Human resource planning
IV	<ul style="list-style-type: none"> • Human resource development strategies • Man power planning • Concept and process of human resource planning
V	<ul style="list-style-type: none"> • Personnel management environment in India

OPTIMIZATION TECHNIQUES

[5TE6.3]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Linear Programming- Linear Programming problems and their Graphic Solution. Simplex Method – Duality – Post Optimality Analysis.
II	Transportation- Transportation and Transshipment Problems. Methods of solving transportation problems. Assignment- The assignment problem and methods of solution. Application of Assignment problem to solve Traveling salesman problems.
III	Inventory Technique – Economic order quantity models, Quantity discount model, multi-product model, inventory control model. Sequencing problems – Flow shop and Job shop problems, solution methods for solving various categories of sequencing problems.
IV	Queuing Theory – General structure of Queuing systems. Operating characteristics of Queuing systems, Analysis of M/M/1 model.
V	Project Management by CPM/PERT: Drawing of Network, Fulkerson’s rule, CPM technique, Floats and Slacks, crashing of Network, PERT technique. Simulation: process of Simulation, Monte Carlo simulation, Applications of Simulation.

5TE7 SPG LAB III

hrs/week-4

Max marks-100

Practice in handling, operations, setting and gauging draw frame. Lap former and comber. Study of constructional details of machines; various controls, change places, etc. Practice in checking the quality of comber lap, sliver and waste analysis; common faults and remedies. Calculations pertaining to gearing: speeds, constants, drafts and production etc.

Study features of modern drafting system in draw frame Cots mounting and buffing. Waste control at comber, maintenance schedules of draw-frame and comber

5TE8 WVG LAB III

hrs/week-4

Max.marks-100

1. high speed gamatex warping m/c, drive to various part, length measuring mech, traverse mech, thread stop motion, barke mech. doffing mech, calculation of production
2. semi positive let-off, its calculation, settings
3. high speed cam dobbie working principle, timing and setting.

5TE9 Textile Testing LAB I

hrs/week-4

Max marks-100

Measurement of fibre length and its distribution, fineness, maturity, moisture content and strength using conventional methods and instruments. Fibre diameter and its variability, Measurement of Hank of sliver roving, and count of yarn and their variability. Single yarn strength and elongation, lea strength measurement by conventional instruments. Twist of yarn. Crimp of fabric. Use of statistical techniques for evaluation of experimental results.

5TE10 Textile Chemistry LAB I

hrs/week - 4

Max marks-50

Pre-treatments such as desizing, scouring and bleaching. Dyeing of cotton, wool, silk and rayon fibres.

5TE11 Machine design lab.

hrs/week-4

Max marks-100

1. Selection of materials and IS coding
2. Selecting fit and assigning tolerations
3. Springs, Beams, and Shaft under static and fatigue loading
4. Introduction computer aided design software

5TE12 Discipline and extra Curricular activity

**SIXTH SEMESTER
B. TECH. (Textile Engineering)**

Mechanisms of Yarn Manufacture-IV

[6TE1]
[Common with 6TT1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<p>Objective of ring frame</p> <ul style="list-style-type: none"> • Principle and mechanism involved in drafting, twisting and winding • Ordinary and high draft systems <p>Yarn twist</p> <ul style="list-style-type: none"> • Terminology, twist levels • Concept of twist multiplier • Propagation of twist • Yarn contraction due to twisting
II	<p>Types of build</p> <ul style="list-style-type: none"> • Builder motions warp, filling and combined builds for common package sizes • Limitations to large package spinning • Types of rings and travelers and their common uses • Design of various essential mechanisms of ring spinning • Balloon control rings, living rings
III	<ul style="list-style-type: none"> • Systems of waste collection at ring frame and types of spinning wastes • Limitations in ring spinning and factors responsible for loss in efficiency • Introduction to the recent developments in ring spinning • Calculations pertaining to gearing, constants, drafts and production of ring frame • Concepts of average mill count and 20's conversion • Reason and remedies of end breaks on ring- frame • Changes to be done in ring frame to run man-made fibre
IV	<p>Objects of doubling</p> <ul style="list-style-type: none"> • System of doubling(dry and wet) • Study of ring doublers • Two for one twister • Reasons and remedies of end breaks in doubling frame • Calculations pertaining to gearing constants and production <p>Fancy yarns</p> <ul style="list-style-type: none"> • Objects and production of fancy yarns • Ply cable and core spun yarns • Sewing threads and tyre cords
V	<p>Objects of yarn reeling and doubling</p> <ul style="list-style-type: none"> • Types of reeling • construction and working of reel • Yarn bundling • Package defects, Yarn faults and their remedies

Mechanisms of Fabric Manufacture- IV

[6TE2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> Terry weaving mechanism. Loose reed dobby operated hackingson's motion, cam operated terry motion, terry let-off and take up motion and its calculations, Fast reed terry motion – variable swing to the sley, cloth control principle.
II	<ul style="list-style-type: none"> Automatic shuttle looms- cop change and shuttle change mechanism, their setting and timing.
III	<ul style="list-style-type: none"> Concept of unifil loom winder and bobbin loaders
IV	<ul style="list-style-type: none"> Shuttleless loom- Sulzer projectile picking mechanism. Picking cycle of projectile loom.
V	<ul style="list-style-type: none"> Rapier weaving, classification, Dewas and gabler system picking cycle, rapier head and rapier drive of each type.

TEXTILE TESTING -II

[6TT3]

[Common with 6TC5, 6TE5]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Mechanical behavior of textiles <ul style="list-style-type: none"> Terms and definitions, expressing the results, quantities and units Introduction to visco-elasticity, creep and relaxation phenomenon Mechanical conditioning and recovery properties of textile
II	Experimental methods <ul style="list-style-type: none"> Principle of CRL, CRT and CRE type Tensile testing machines- various Instruments Factors affecting the results of tensile experiments Evaluation and interpretation of tensile experiments Evaluation and interpretation of tensile test results Tension winding test for yarns
III	Fabric strength testing <ul style="list-style-type: none"> Tensile, tearing and bursting strength tests Principle and operation of equipment, fabric bending, shearing and draping properties: terminology, quantities and units, Experimental method
IV	Evenness testing of yarns <ul style="list-style-type: none"> Nature and cause of irregularities Principle and methods of evenness testing ,evaluation and interpretation
V	Yarn faults <ul style="list-style-type: none"> Classification Measurement Causes and their remedies

Machine Design

[6TE4]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Introduction: The design process, morphology of design, designing methods, concurrent engineering. <ul style="list-style-type: none"> • Design Analysis: Types of loads and stresses, theories of failure, fatigue failure - Soderberg and Goodman's methods.
II	Selection of Materials: Factors affecting material selection, ferrous and non-ferrous metals and alloys, plastics <ul style="list-style-type: none"> • Machine Components: Design of parts subjected to tension, compression, shear and bending - such as tie rods, push rods, levers etc. Design of shafts, keys, splines and couplings. Design of threaded fasteners. Design of power screws. Design of helical compression springs
III	<ul style="list-style-type: none"> • Design of joints and connections: Knuckle joint, riveted joint, welded connections.
IV	Mechanical power transmission system: Selection of V and flat belts and design of belt drives. Design of spur gears.
V	Cams: Types and design of eccentric and spiral cams. Manufacturing Considerations in Design: Limits, fits and tolerances, standardization, modular design, Introduction to product design.

TEXTILE CHEMICAL PROCESSING-II

**[6TE5]
[Common with 6TT4]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Introduction to textile finishing • Different chemical finishing agents and their behavior
II	<ul style="list-style-type: none"> • Finishing treatments by raising ,stiffening, calendering , heat-setting, anti-crease and flame proofing • Wool and silk finishing
III	<ul style="list-style-type: none"> • Finishing of polyester and their blends
IV	<ul style="list-style-type: none"> • Introduction to Textile printing • Printing paste ingredients • Paste preparation
V	<ul style="list-style-type: none"> • Introduction to different methods and styles of printing

ELECTIVES
KNITTING TECHNOLOGY

[6TE6.1]
 [Common with 6TC6.2, 6TE6.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Definition of Knitting • Knitted fabrics • General description of knitting machines (Flat and Circular and their classification) • Differences between woven and knitted fabric properties
II	<ul style="list-style-type: none"> • Type of different needles used in knitting process (Latch, Beard and Compound). • Knitting cycles • Classification of weft knitting machines • Basic weft knitted structures (Plain, Rib, Interlock, Purl). Their properties
III	<ul style="list-style-type: none"> • Circular machine used for plain knitted fabrics • Rib and Interlock double jersey • Purl knitting machine along with knitting cycle, design of cams
IV	<ul style="list-style-type: none"> • Classification of warp knitting machines • Description of Raschal and Tricot machines • Knitting cycle of these machines
V	<ul style="list-style-type: none"> • Knitting geometry • Knit, Tuck and Float Stitches, their formation in machine and applications • Derivatives and ornamentation of weft knitted fabrics • Knitted fabric faults, their causes and remedies

TECHNICAL TEXTILES

[6TE6.2]

[Common with 6TC6.1, 6TT6.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<p>Introduction</p> <ul style="list-style-type: none"> • Definition • Textile materials in technical applications <p>Fibers</p> <ul style="list-style-type: none"> • Natural and man-made fibres suitable for technical application and their relevant properties <p>Geotextile</p> <ul style="list-style-type: none"> • Fibers used for geotextile applications • Mechanics of reinforcement, filtration and drainage by geotextiles • Typical applications of woven and non-woven geotextiles
II	<p>Medical textiles</p> <ul style="list-style-type: none"> • Textiles in various medical applications • Textile materials used for medical applications • Application oriented designing of typical medical textiles (e.g. porous graft or trashed tube) • Materials used and design procedures for protecting wounds • Cardiovascular application, Sutures
III	<p>Filtrations</p> <ul style="list-style-type: none"> • Principles of wet and dry filtrations • Characteristic properties of fibres and fabrics in selective example of filtration <p>Ropes and Cordages</p> <ul style="list-style-type: none"> • Application oriented structure and production of ropes, cordages and twines
IV	<p>Protective Clothing</p> <ul style="list-style-type: none"> • Thermal protection • Ballistic protection • Protection against micro organisms, chemicals and pesticides • Protection from electromagnetic radiation and static hazards
V	<p>Automotive Textiles</p> <ul style="list-style-type: none"> • Fibres used for automotive applications – upholstery, carpeting, pre-formed parts, type, safety devices, filters and engine compartment items • Brief description for the manufacture and application of these devices or parts

PRODUCTION AND OPERATIONAL MANAGEMENT

[6TE6.3]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Production and Operations Management – Introduction history, Production system, functions of production planning and control, production and process planning, production control. • Patents & copyright: Introduction to patent laws; GATT, IPR, TRIPS .
II	<ul style="list-style-type: none"> • Routing, sequencing, loading, scheduling – master scheduling – short term scheduling – Johnson method.
III	<ul style="list-style-type: none"> • Demand forecasting – product life cycle, demand forecasting techniques: judgmental, Delphi, time series analysis, regression & correlation, exponential smoothing.
IV	<ul style="list-style-type: none"> • Inventory management – inventory costs, inventory management systems, inventory models-classical EOQ model, EOQ with price breaks, EOQ model for production runs, EOQ with shortage stock, ABC analysis.
V	<ul style="list-style-type: none"> • Network analysis – drawing of network, errors in network critical path, cost aspects in network, crashing, PERT analysis. • Japanese management techniques: total quality emphasis TQM waste reduction, value – added manufacturing, KANBAN, push v/s pull systems, flexible manufacturing

6TE7 SPG LAB IV

hrs/ week-4

Max marks-100

Practice in handling, operations, setting and gauging draw frame. Lap former and comber. Study of constructional details of machines; various controls, change places, etc. Practice in checking the quality of comber lap, sliver and waste analysis; common faults and remedies. Calculations pertaining to gearing: speeds, constants, drafts and production etc.

Study designs of a modern drafting systems at speed frame and ring frame. Design of spindle, ring and traveller, setting, speeds for processing man-made fibre as speed frame, ring frame. Maintenance schedule of speed frame, ring frame, doublers.

6TE8WVG LAB IV

hrs/week-4

Max.marks-100

1. drop box mech – eccle's drop box and Zang drop box mech, card preparation
2. jacquard mech, drive, setting and timing.
3. jacquard card cutting m/c and its sequence of design preparation.
4. mech warp stop motion and setting, timing diagram
5. electrical warp stop motion working and settings

6TE9Textile Testing Lab II

hrs/week-4

Max marks-100

Use of microscopes for testing of yarns for appearance, and diameter. Measurement of evenness by conventional and modern testing instruments. Classification of yarn faults, hairiness of yarn interpretation of results and construction of X& R Charts.

Fabric testing for dimensions, construction, weight, thickness, stiffness, crease, drape, busting, cover, shrinkage and air permeability.

Strength testing of fibre, yarn fabric using modern instruments.

Fabrics testing for load elongation, tensile, bursting and tearing strength , abrasion, flexural rigidity, crease recovery and draping qualities of fabrics.

6TE10 Textile Chemistry Lab II

hrs/week-4

Max marks-100

Pre-treatments such as desizing, scouring and bleaching. Dyeing of cotton, rayon, wool and synthetics fibres with different dyes, e.g. direct, reactive, vat, acid and disperse. Printing of cotton fabrics. Application of finishing agents such as starches, resins, etc.

6TE11 Discipline and extra Curricular activity

hrs/week-4

Max marks-100

**SEVENTH SEMESTER
B. TECH. (Textile Engineering**

Modern Spinning Machines**[7TE1]****Common with 7TT1]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Causes leading to the advent of unconventional systems of spinning • Classification of unconventional methods of yarn production
II	<ul style="list-style-type: none"> • Mechanism of yarn formation on rotor spinning • Effect of rotor machine variables and fibre properties on the properties of rotor spun yarns • Limitation of rotor spinning • Advances in rotor spinning
III	<ul style="list-style-type: none"> • Study of other open-end spinning systems • Friction spinning • Electrostatic spinning • Air-vortex spinning
IV	<ul style="list-style-type: none"> • Mechanism of yarn formation • Structure, properties and end uses of yarns spun on Air-jet spinning
V	<ul style="list-style-type: none"> • Principle of wrap spinning • Twist less spinning • Self-twist spinning • Compact spinning • Ring spinning • Structure, properties and end uses of these yarns • Potential and limitations of various spinning technologies

Modern Weaving Machines**[7TE2]**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 4	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Features of modern autoconers-with technical specification
II	<ul style="list-style-type: none"> • Development of high speed beam and sectional warping m/c with technical specifications. • Sizing m/c technical specification and developments.
III	<ul style="list-style-type: none"> • Technical specification of latest sulzer projectile loom and rapier loom, electronic tappets, dobby and jacquards. • Electronic let-off and continuous take-up.
IV	<ul style="list-style-type: none"> • Picking cycle of air jet loom and its development with technical specification of latest air jet loom. • Water jet looms , pump, nozzle and latest technical details of water jet loom.
V	<ul style="list-style-type: none"> • Concept of multiphase weaving with reference to M-8300 loom.

ENGINEERING OF TEXTILE STRUCTURE –I

[7TE3]

[Common with 7TC4, 7TT4]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Yarn geometry <ul style="list-style-type: none"> • Idealized yarn geometry • Relationship of yarn number and twist factor
II	Packing of fiber in yarn <ul style="list-style-type: none"> • Ideal packing, hexagonal close packing and to other forms • Packing factor and its measurement • Yarn diameter
III	Methods of measurement of twist contraction <ul style="list-style-type: none"> • limit of twist • Fiber migration • Mechanism of migration • Condition for migration to occur • Frequency of migration • Migration in blended yarns
IV	Translation of fibers properties into yarn properties <ul style="list-style-type: none"> • Extension of continuous filament yarn for small strains and large strains • Prediction of breakage
V	Mechanics of staple fibre yarns <ul style="list-style-type: none"> • The practical and experimental studies • Mechanics of staple fibre yarns • Hambureger model and later modifications • Spin ability of and torsional behavior of Fibres and yarns

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3 Practical : 2	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Computer Hardware And System Software Concepts: Fundamentals of computer Architecture & Organization of Computer. • Introduction to System Software and Loader & Linker, Compilers and Introduction to Operating System, Memory Management ,Process Management ,Scheduling & File Management ,Computer Networks and OSI Model.
II	<ul style="list-style-type: none"> • Programming Fundamentals: • Introduction of PF, Programming Methodology, Good Programming Style, Problem Solution Functions ,Recursive & Arrays & String, Shorting & Searching , File & Error Handling, Case Study .
III	<ul style="list-style-type: none"> • Relational Database Management Systems • Introduction of DBMS & Database Technology, ER Modeling & Notation & Case Study, Extended ER Features, Relational Database Design, Relationship, Normalization, Normal Forms, Renormalizations, Relational Algebra Operations, Views Case Study
IV	<ul style="list-style-type: none"> • Analysis of Algorithms: • Introduction & Code Tuning Techniques ,Analyzing Algorithm, Analysis Of Greedy Algorithm, Analysis Of Divide And Conquer Algorithm., Dynamic Programming Algorithm, Intractable Problems, Class P And NP Problem
V	<ul style="list-style-type: none"> • System Development Methodology: • Introduction Of Software Development, Software Development Life Cycle Methods, Software Analysis And Design Methods, Software Construction & Software Testing, Software Quality, case study

INDUSTRIAL ENGINEERING AND QUALITY MANAGEMENT

[7TE5]

[Common with 7TT5]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<p>Production Information</p> <ul style="list-style-type: none"> • Production Information of the entire unit • Product range and quantity • Production Information systems • Feeding and retrieval of data <p>Productivity Planning</p> <ul style="list-style-type: none"> • Production Capacity and the productivity obtained from each machine • Analysis of the data and planning of production
II	<p>Output of human resource</p> <ul style="list-style-type: none"> • analysis and strategy <p>Production Planning</p> <ul style="list-style-type: none"> • Study of market demand and supply analysis • Technology and product design for various textile products and forecasting future trends <p>Work study</p> <ul style="list-style-type: none"> • Method of Work study • Study and work measurement • Application of time study in a textile mill • Importance and use of snap study, TPM
III	<ul style="list-style-type: none"> • Production planning in spinning and weaving • Plans for various counts and yarns, production rates, waste, efficiency level of machine • Balancing of machines • Production rate, efficiency etc. for preparatory and weaving shed • Balancing of weaving machines • Preparation of weaving plan
IV	<p>Quality Management</p> <ul style="list-style-type: none"> • Concept of Total Quality • Quality Management systems as a means of achieving total quality. TQM • Linkage of Quality <p>Environment Management System</p> <ul style="list-style-type: none"> • Strategic concern for environment • Need for proper environment management systems and their economic implications • Environment management systems • Green products and strategies • Environment assessment • Environment protection
V	<p>Quality Management Systems</p> <ul style="list-style-type: none"> • ISO 9000 • Quality policy, data, records and traceability • Documenting the quality system, quality manual, quality audit, design and change control • ISO 9000 registration • ISO 14000

ELECTIVES
COMPLEX TEXTILES

[7TE6.1]
[Common with 7TT6.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> Gauge and leno structure with their mechanism Madras Muslin structures
II	<ul style="list-style-type: none"> Type of Carpets and classification, Hand knitted carpets, tufted Carpets, Knitted Carpets, Stitch Bonded Carpets, Electrostatic flocking Carpets
III	<ul style="list-style-type: none"> Some common fabrics like Lappets, Swivels, Ondule Fabrics, Tuck fabrics, woven pile fabrics produced by thermal shrinkage
IV	<ul style="list-style-type: none"> Industrial fabrics especially kind of canvases, Belts, Parachute Fabrics and umbrella cloth. Lycra Fabric
V	<ul style="list-style-type: none"> Narrow fabrics production methods and their calculation: Laces, bandage, ribbons and niwar. Introduction of non-woven fabrics, classification and uses

Advance Manufacturing Process

[7TE6.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Automation of manufacturing process : <ul style="list-style-type: none"> Automation, Evolution of automation, goal of automation, application of automation, hard automation & soft automation.
II	Numerical control: <ul style="list-style-type: none"> Introduction to N.C. Machine tools, N.C. Production systems, Machine control units. Tooling for N.C. machines, N.C. part programming.
III	Fundamental of CNC machines: <ul style="list-style-type: none"> CNC technology, function of CNC control in machine tools, classification of CNC system, contouring system, interpolators, open & closed loop in CNC system, CNC controllers, direct numerical control(DNC system)
IV	Constructional feature of CNC machines: <ul style="list-style-type: none"> Design consideration of CNC machines for improving machining accuracy, structural member, slide ways, slide linear bearing, ball screw, spindle drives feed drives, work & tool holding devices, automatic tool changer, tooling for CNC machines
V	Unconventional machining processes: <ul style="list-style-type: none"> ECM, EDM, AJM, USM, EBM, Nano Fabrication, Micro Machine.

7TE7 SPG LAB – V

hrs/week-4

Max marks-100

Spinning practical Familiarity with established processing parameters for production and carded combed, blended, folder and fancy yarns. Case studies pertaining to waste to waste analysis, estimation of the total productivity, actual efficiency levels and causes of loss of efficiency in different spinning preparatory departments, Viz. Blow-room, card, comber, draw-frame and simplex. Study of blow-room and card performance. Nep count in card web. Checking of comber waste. Assessment and control variability before yarn formation. Practice in handling and setting of the various spinning preparatory machines. Workload and measurement in spinning preparatory, Oiling and maintenance schedules. Idea of time and motion study.

Passage of material, speeds settings of two-for-one Twister machine. Study different types of Bearings.

7TE8 WVG LAB – V

hrs/week-4

Max marks-100

automatic cop change loom mech, timing diagram

1. automatic shuttle change mech. with timing
2. passage of warp and weft, revision of picking and receiving parts, picking mech of sulzer loom
3. drive to various parts of sulzer loom
4. various stop motions on sulzer loom
5. VSD color change mech

7TE 9 Information Technologies in Textile Lab

hrs/week-4

Max marks-100

Each of the experiment is designed for two labs. Classes. Experiment 1-4 can be carried in Turbo Analyst or any other Software Engineering Tools. Remaining Systems can be designed in C++/Java/Visual Basic.

1-2 Perform system modeling using Turbo-Analyst Tool for A Bookstore Management System. System handles user enquiry about available books and manages inventory, Billing for customers and recorder placement for books.

3-4 Perform System modeling using Turbo-Analyst Tool for Library Management System which handles issue and return of books, Imposes fine for late return of Books, and handles inquires about book availability.

5-6 Design of complete system for Books store Management mentioned in 1-2

7-8 Design complete system for Library Management System, which only deals with issue and return of books.

9-10 Design a system for electricity billing system.

11-12 Design a Bus Reservation System for making reservation in the Five 40 seated 2x2 buses for five different routes, Customers can opt for window seats and front seats.

7TE10 MILL TR. II

hrs/week-4

Max marks-100

Each student, individual or in association with some other students at the end of the Third B.E. course will observe and collect the general and technical information pertaining to machinery, raw materials used, yarns and fabrics produced by the textile mills, in which he/she/they are undertaking 4 weeks' practical training with the approval of the Principal, M.L.V.T.E.C.

Each student will have to submit a written/typed report duly approved and signed by the guide to the Head of the department.

hrs/week-4

7TE11

PROJECT PART - I

Max marks-100

Each Student individually, or in association with some other students will carry out mini project of an experimental and/ or theoretical nature in one of the main branches **Textile Technology** and present him finding is a systematic in the report form duly approved and signed by his supervisors/Guide (to be nominated by the Head of the Departments/Institutions). Each candidate would submit 3 typed copies of mini project report to the head of the department/institution at least 15 days before the commencement of first semester examination after viva-voce examinations. The original report and a carbon copy will be retained by the concerned department/institution and the supervisor respectively.

TE12 Discipline and extra Curricular activity

**EIGHTH SEMESTER
B. TECH. (Textile Engineering)**

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	Mechanics of Scutcher and Speed frame <ul style="list-style-type: none"> • Designing of cone drums for scutcher and speed frame • Roller weighting at different stages of spinning • Inertia of a carding machine • Epicyclic wheel trains used in textile machinery • Differential motion used in speed frames
II	Mechanics of Spinning Machine <ul style="list-style-type: none"> • The physics and theory of spinning balloons • Yarn tension in ring spinning • Power requirements for operating various motions and for machines as a whole, at various stages of spinning
III	Mechanics of winding <ul style="list-style-type: none"> • Winding rate, relationship between bobbin diameter and winding rate, relationship between bobbin diameter and spindle speed • Angle of wind and coil angle, Wind and traverse ratio • Drum-driven packages, develop the surface of cheeses • Gain in winding, linear gain, revolution gain • Cone-winding Tension in winding <ul style="list-style-type: none"> • Tension generators to control yarn tension • Yarn tension and its measurement
IV	Mechanics for Textile Machine <ul style="list-style-type: none"> • Warp tension and its measurement • Simple harmonic motion, displacement, velocity and acceleration • Determination of Tappet lift • Design of cam and tappet profile for textile machinery • Velocity of shuttle during acceleration and retardation, calculation for velocity of shuttle
V	Mechanics for Weaving Machine <ul style="list-style-type: none"> • An expression for sley eccentricity • Kinematics of sley I, e. displacement, velocity and acceleration of sley sword pin, Force, torque, power required to drive the sley • Kinematics of sedding i.e. an expression for shed opening at shuttle front • Power requirements for operation of various motions and for machine a whole, at various stages of weaving

Mill Organization, Costing and Economic[8TE2]
[Common with 8TT2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • General cost concepts • Classification of cost, cost elements, methods and techniques of costing. Direct / indirect, Fixed / Variable, Total cost. Inventory costing • System of costing: Job, order, batch, process, unit and operating cost
II	<ul style="list-style-type: none"> • Costing in Textile Industry: Cost structure, cost of raw material / labour / utilities • Cost control – standard costs, Variance analysis, determination of cost per kg of yarn, per meter of fabric, yarn realization, value loss, measures of cost reduction, selling price decision for yarn/fabric • Concepts of depreciation
III	<ul style="list-style-type: none"> • Labour allocation in different departments of a textile mill • Work-load standards for card tenters, speed frames and ring tenters, doffers, winders, weavers, in terms of tripartite agreements and Labour Laws
IV	<ul style="list-style-type: none"> • Economics of large package spinning and optimum package size. • Economics of Open-end Spun, Air-jet spun and Friction spun yarns.
V	<ul style="list-style-type: none"> • Economics of super-speed automatic warp and weft winding machines. • Economics of various labour saving mechanisms mounted on automatic looms like 'box loader' and 'unfil' systems. • Costing of shuttle-less weaving machine like Projectile, air-jet, water-jet, circular weaving machine

ENGINEERING OF TEXTILE STRUCTURES-II[8TE3]
[Common with 8TC3, 8TT3]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Elements of fabric geometry • Cloth setting theories • Fabric cover and fractional cover • Crimp balance equation • Fabric cover and fabric weight relationship
II	<ul style="list-style-type: none"> • Peirce's concept of fabric geometry • Flexible and elastic threads model • Graphical solutions • Latest modifications
III	<ul style="list-style-type: none"> • Translation of fiber and yarn properties into fabric properties, viz. tensile, tearing, abrasion, bending, shearing • Creasing & shearing
IV	<ul style="list-style-type: none"> • Introduction about FAST and KAWABATA Instrument
V	<ul style="list-style-type: none"> • Design of textile structure for certain functional and uses

Electives

ENTREPRENEURIAL VENTURE & TEXTILE HAZARDS

[8TE4.1]

[Common with 8TC4.3, 8TT4.1]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none"> • Introduction to entrepreneurial ventures • What is entrepreneurship • Who is entrepreneur
II	<ul style="list-style-type: none"> • Need scope and characteristics of entrepreneurship • Identification of opportunities
III	<ul style="list-style-type: none"> • The need scope and approaches entrepreneurship • Project formulation for different entrepreneurship
IV	<ul style="list-style-type: none"> • Cotton dust disease. of human-being in textile industry • Accidents , causes and safety measures for textile industry
V	<ul style="list-style-type: none"> • Pollution control : Measure to control air and noise pollution in spinning& weaving • Effluent treatment in process house

COMPUTER ADDED DESIGN & MANUFACTURING

[8TE4.2]

Class B. TECH. (Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	The design process Morphology of design: <ul style="list-style-type: none"> • Product cycle - Sequential and concurrent engineering - Role of computers - Computer Aided Engineering - Computer Aided
II	Design: <ul style="list-style-type: none"> • Design for Manufacturability – Computer Aided Manufacturing - Benefits of CAD. Creation of Graphic Primitives – <ul style="list-style-type: none"> • Graphical input techniques - Display transformation in 2-D and 3-D - Viewing
III	Management System:. <ul style="list-style-type: none"> • Hierarchical data structure. Network data structure - Relational data structure. Data Current trends in Manufacturing Engineering Group Technology – <ul style="list-style-type: none"> • Design for Manufacturing and Assembly - Process Planning Techniques - Total approach to product development - Concurrent Engineering – Rapid prototyping - Introduction to CAD / CAM software packages
IV	<ul style="list-style-type: none"> • Introduction to production planning and control: • Shop Floor Control Systems - Just in time approach, Emerging Challenges in CAD / CAM, Product Data Management, Product Modeling, Assembly and Tolerance Modeling
V	Flexible Manufacturing System: <ul style="list-style-type: none"> • Introduction to FMS. Sequencing & scheduling in FMS. Group technology. Production flow analysis.

SPINNING TECHNOLOGY**[[8TE4.3]
[Common with 8TT4.2]**

Class B. TECH. ((Textile Engineering)	Evaluation
Schedule per week Lectures : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Mid-term (20) & End-term (80)]

Units	Contents of the Subject
I	<ul style="list-style-type: none">• Measurement of performance of blow room: opening efficiency, cleaning efficiency, lap regularity and waste percentage
II	<ul style="list-style-type: none">• Assessment of performance of card• Study of hooks formation, their control, removal and effect of yarn quality
III	<ul style="list-style-type: none">• Improvement in technology of carding for increased production and improved quality of sliver, high speed carding: designs of carding machines for improved performances
IV	<ul style="list-style-type: none">• Recent developments in drawing, lap preparation, combing processes, speed frames• Types and basic principal of autolevellers
V	<ul style="list-style-type: none">• Irregularities of drafted material: random, quasi-periodic and periodic irregularities of addition of irregularities, effect of doubling on irregularity• Causes of irregularity: influence of raw material, process and machine variables on irregularity

8TE5 SPG LAB VI

hrs/week-4

Max marks-100

Collection and interpretation of data for process control and comparing the same with established norms. Waste analysis in ring and rotor spinning Locating and improving machines with substandard performance. Case studies pertaining to estimation of the total productivity, actual efficiency level, causes of loss of efficiency in ring, rotor and air-jet spinning. Study of the defects at various stages of spinning. Assessing process capability for count controls. Calculations pertaining to comparison of productive, average count etc. Practice in motion study, time study and work-load measurement in ring and rotor spinning departments, Oiling and maintenance schedules, Spare parts consumption and idea of the life of the various parts. Practice in handling and setting of the ring and rotor spinning. Assessment and control of variability in ring, rotor and air-jet yarns. Case studies pertaining to yarn costing. Conditions under which a worker is charged sheeted and suspended, To acquaint with labour laws. Passage of material, speeds, settings, maintenance, schedule of open end, airjet and Dref machines study different types of beets

8TE6 WVG LAB VI

hrs/week-4

Max marks-100

1. Staubli cam dobbie working and card preparation
2. air jet picking mechanism of Harish air jet loom
3. drive to various parts of air jet loom
4. various stop motion of air jet loom
5. let-off and take motion of Harish loom

8TE7 Computer programming lab

hrs/week-4

Max marks-100

8TE8 Computer aided Textile designing LAB

hrs/week-4

Max marks-100

Practice on dobbie & jacquard based weaving designs software's Preparation of draft, designs and peg plans for various types of designs. Practice on printing software, colour separation, screen preparation. Use of scanners.

8TE10 SEMINAR

hrs/week-4

Max marks-100

Each student will have to deliver a talk on the topic in the weekly period allotted to this subject, either pertaining to his project work or any topic assigned by Head of the Department. The performance of the speaker would be judged in the class by a board of examiners

hrs/week-4

8TE11 Discipline and extra Curricular activity

Max marks-100