

<b>S.Y.B.TEXT. (FT) SEMESTER-I</b>											
SR. NO.	COMMITTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
3.1	TT/MMTT/TPE/TC/FT	ADVANCED COMPUTER PROGRAMMING	3	---	---	2	100	25	---	50	175
3.2	TT/MMTT/TPE/TC/FT	TEXTILE MATHEMATICS-III	3	---	---	---	100	---	---	---	100
3.3	FT	FABRIC STRUCTURE & DESIGN	4	---	---	2	100	50	---	---	150
3.4	FT	BASICS OF APPARAL PRODUCTION PROCESSES	4	---	---	---	100	---	---	---	100
3.5	FT	YARN MANUFACTURE	4	---	---	2	100	25	---	---	125
3.6	FT	FABRIC MANUFACTURE	4	---	---	2	100	50	---	---	150
			<b>22</b>	---	---	<b>8</b>	<b>600</b>	<b>150</b>	---	<b>50</b>	<b>800</b>
L =LECTURES T =TUTORIALS DR=DRAWING PR=PRACTICALS			TP=THEORY PAPER TW=TERM WORK OE=ORAL EXAMINATION PE=PRACTICAL EXAMINATION								

<b>S.Y.B.TEXT. (FT) SEMESTER-II</b>											
SR. NO.	COMMITTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
4.1	FT	YARNS & FABRICS FOR FASHION APPLICATIONS	4	---	---	2	100	---	---	50	150
4.2	TT/MMTT/TPE/TC/FT	TEXTILE MATHEMATICS-IV	3	---	---	---	100	---	---	---	100
4.3	FT	CHEMICAL PROCESSING OF TEXTILES	3	---	---	2	100	25	---	---	125
4.4	FT	PATTERN MAKING & GARMENT CONSTRUCTION-I	3	---	---	2	100	25	---	50	175
4.5	FT	TESTING OF TEXTILES & APPARELS	3	---	---	2	100	25	---	50	175
4.6	FT	FASHION ILLUSTRATION	2	---	---	2	100	25	---	---	125
4.7	TT/MMTT/FT	TEXTILE DESIGN & COLOUR	---	---	2	---	---	50	---	---	50
			<b>18</b>	---	<b>2</b>	<b>10</b>	<b>600</b>	<b>150</b>	---	<b>150</b>	<b>900</b>
L =LECTURES T =TUTORIALS DR=DRAWING PR=PRACTICALS			TP=THEORY PAPER TW=TERM WORK OE=ORAL EXAMINATION PE=PRACTICAL EXAMINATION								

**SECOND YEAR B. TEXT. – SEMESTER – I****3.1 ADVANCED COMPUTER PROGRAMMING (TT/MMTT/TPE/TC/FT)**

Lectures	:	3 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Practical Exam	:	50 Marks
Term Work	:	25 Marks
Subject Total	:	175 Marks

**1. Networking Concepts:**

Introduction to network, use of computer networks, Network Topologies, Network types - LAN, MAN, WAN, Network hardware Components - cables, connectors, NIC, Hub, Switch etc. Network Operating system, Client / Server Architecture, Internet and its applications. Switching and routing in network, The X.25 network & supporting protocols, TCP/IP

**2. Database Management**

Introduction to database, Records, Relational database management systems, structural query languages (SQL), SQL table creation integrity constraints, insertion of records, select statement, alter command, drop table partitioned table, SQL operator, transaction processing, where clause, like operator, between operator, order by clause, group by clause, having clause, SQL function , commands - Select, Insert, update, delete, joins - inner join, outer join, equijoin.

**3. Analysis of Information System:**

Types of information, information processing for store- overview, overview of design of an information system, role & attribute system analyst, tool for system analyst

**4. Visual Basic Fundamentals:**

Introduction, projects in visual basic, project explorer, setting project. Options, Visual Basic code - understanding procedures, subroutines, Functions, comments, code window & its features, controlling program flow, conditional branching, loops.

### **5. Visual Basic Data Types:**

Data types in visual basic, - byte, integer, long, single, double, currency, Boolean, data, string, object, variant, declaring variables, variable scope & life time, data conversion, arrays, constants, user defined data types.

### **6. Designing User Interface:**

Forms, form properties, form events, loading, unloading, showing & hiding Forms controls in visual Basic - label, buttons, text box, list, dropdown Selection list, checkbox, option button, timer control, setting tab order, Menus in visual basic. Message box, input box, common dialog. Data report.

### **7. Programming Database Access:**

Introduction, Record set object - definition, properties, methods & events, Records, working with record set in code, visual basic data control, Introduction to ADO.

### **8. Introduction To .Net**

Need of vb.net, .Net framework, features of and architectures of vb. net, introduction to visual studio, .Net IDE interface and event driven programming. Creating application building projects using simple components running VB.NET application.

### **9. Introduction of ERP**

Evolution of ERP, growth of ERP, Need for system interaction and interface, early ERP packages, various models of ERP, advantages of ERP, Overview of enterprise, integrated management, business modeling ERP for small business, business process for ERP module design, opportunities and problems in ERP selection and implementation, hardware Environment.

### **List of Experiments:-**

1. Study of basic concept of computer network.
2. Study of network System with commands from Novell Network.
3. Creating databases, tables using Ms-access.
4. Creating & manipulating Database using Oracle.

5. Working with SQL Commands like Select, Insert, Update, Delete, etc.
6. Creating simple form in Visual Basic.
7. Writing applications in Visual Basic using multiple forms, various controls (like radio button, list etc.) and database application using data control for Finding mean, SD, CV% of yarn strength testing machine  
Finding twist & its SD, mean & CV%  
To calculate production of winding m/c, warping m/c, sizing m/c, looms, (Weaving Machine.), blow room, card, speed frame, ring frame etc (Spinning Machine).
8. Finding % exhaustion of dye bath.
9. Application program using VB ADODC- 2 Programs
10. Application program using VB.Net- 2 Programs

**Reference Book:-**

1. Computer Network - by Andrew Tanenbaum
2. Database System - by Korth
3. Black Book VB 6.0 - by Holzner
4. Analysis & Design of information System- by Rajaraman

**SECOND YEAR B. TEXT. – SEMESTER – I**

**3.2 TEXTILE MATHEMATICS-III (TT/MMTT/TPE/TC/FT)**

Lectures	:	3 Hours / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

- 1) Differential equations of first order & first degree:**  
Method of solving Exact, Non exact, Linear and Non-linear differential equations.  
Numerical solution of o.d. equations by Euler,s method and Runge Kutta method of fourth order. (6)
- 2) Applications of ordinary differential equations:**  
Applications for solving simple electrical circuit problems and mechanical problems (4)
- 3) Linear differential equations of n<sup>th</sup> order with constant coefficients:-**  
Methods of finding Solution of L.D. equations in the form  $y = C.F. + P.I$   
Cauchy,s homogeneous linear differential equations with constant coefficients and there solution. (7)
- 4) Applications L. D. equations of n<sup>th</sup> order with constant coefficients:**  
Applications for solving simple electrical circuit problems and mechanical problems (4)
- 5) Testing of hypothesis:-**  
Introduction, Hypothesis, Statistic, Critical Region, Errors in testing, Level of Significance. (2)
- 6) Large sample tests:-**  
Test for population mean, equality of population means population proportion & equality of population proportions. (4)

**7) Small sample tests:-**

Test for population mean, equality of population means, population variance, equality of population variance. Test for goodness of fit and independence of attributes. Test for significance of population correlation coefficient.

(7)

**8) Estimation:-**

Point Estimation, types, unbiased estimators of population mean and variance. Interval Estimation, Confidence Interval for population mean based on normal and 't' and  $X^2$  distributions,

(3)

**9) Statistical quality Control:-**

Process Control: Control\_charts, X-chart, R-chart, C-chart, np-chart, P-chart. Lot Control: AQL, LTPD, AOQ, AOQL, O.C. Curve, Single and Double sampling plans.

(4)

**Reference Books:-**

1. A Text Book of Applied Mathematics: by J.N. & P.N. Watarikar.
2. Higher Engineering Mathematics by B. S. Grewal.
3. A Text Book on Engineering Mathematics by Bali, Saxena & Iyengar.
4. Mathematical Statistics by J.Fruend.
5. Applied Statistics & Probability of Engineers by Montgomeri & Runger
6. Probability & Statistics for Engineers by Johnson.

**SECOND YEAR B. TEXT. – SEMESTER – I**

**3.3 FABRIC STRUCTURE AND DESIGN (FT)**

Lectures	:	4 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Subject Total	:	150 Marks

- 1) Bedford cords: plain faced - twill faced. Wadded - modifications. Welt piques: wadded piques - Loose back and fast back welts and piques, waved pique. Simple spot designs, Spot figuring - arrangement of figuring for dobby and jacquard.
- 2) Color theory: light and pigment theory - modification of color - color combination - application of colors - color and weave effects. Stripe & check weave combination.
- 3) Extra warp and extra weft figuring. Extra warp and extra weft figuring with two colors.
- 4) Backed Fabrics: Warp and Weft back, wadded backed fabric.
- 5) Warp pile produced by - terry weaves, Face to face weaving, wire insertion methods, carpet structure. Weft pile: plain back - twill back velveteen, corduroy, Weft plush, Length, density and fastness of pile.
- 6) Double cloth: Object, Classification: - self stitched - face to back - back to face - Combination face to back and back to face stitched double cloth. Wadded double cloth - weft and warp Wadded double cloth - Center Warp & Weft Stitched double cloth. Interchanging double cloths, multilayer fabrics, open to double & triple width & tubular fabrics.
- 7) Gauze & Leno: Principles, basic sheds, leno with flat steel doups And slotted doups, point draft or counter leno, simultaneous top & bottom douping, application of slotted doups, easing and shaker motion concept, working and construction.
- 8) Fabric engineering: fabric classification as per structure pierces formula for yarn diameter, cloth cover, cloth geometry of plain & twill fabrics, practical application of cloth geometry and cover factor.

9) Construction and development of jacquard design.

Elements of jacquard shedding-double lift jacquard with single and double cylinder working, jacquard sizes, harness ties ,card cutting and card lacing, harness and design calculation ,casting out ,size of repeat ,count of design paper. Development of jacquard design -construction of square paper designs, process of drafting a sketch design, drafting designs from woven fabrics,

10) Application of CAD in developing fabric structure and design.

**List of Experiments:**

- 1) Fabric analysis: Bedford cords pique.
- 2) Fabric analysis: Extra warp and extra weft
- 3) Fabric analysis: color and weave effects. Stripe & check weave.
- 4) Fabric analysis: Warp and weft back
- 5) Fabric analysis: Pile fabrics
- 6) Fabric analysis: double cloth
- 7) Fabric analysis: Leno fabric.
- 8) Sample weaving of Bedford cloth
- 9) Sample weaving of extra weft
- 10) Sample weaving of double cloth
- 11) Sample weaving of terry pile fabric
- 12) Sample weaving of stripe & check fabric.

**Reference Books:-**

1. Grosicki Z., "Watson's Textile Design & Color: Elementary weaves & Figure", Blackwell Science, Commerce place.
2. Grosicki Z., "Advanced Textile Design & Colour:", Blackwell Science, Commerce place.
3. H.Nisbet, "Grammar of textile Design", Tarporevala sons & Co. Pvt. Ltd.,
4. W.S. Murphy, "Textile weaving & Design", Abhishek Publications.
5. Marks & robinson, " woven cloth construction"
6. J.E. Booth," Textile mathematics- vol-I & II"

**SECOND YEAR B. TEXT. – SEMESTER – I**

**3.4 BASICS OF APPARAL PRODUCTION PROCESSES (FT)**

Lectures	:	4 Hours / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

1. Introduction to clothing industry, classification as per the size, labour etc. fabric inspection and grading system used in the industry.
2. Cutting: Importance of cutting, requirements of cutting, production processes in cutting room, planning, spreading, cutting, preparation for sewing.
3. Fusing: purpose of fusing, the process of fusing, requirement of fusing as per fabric, fusing machinery for garment parts, methods of fusing and quality control in fusing.
4. Sewing: Classification of stitches & seams, seam defects and stitching defects, feed systems, sewing threads, sewing needles, machinery and equipments.
5. Pressing & finishing: object, classifications, means, components, machinery and equipments, garment finishing and inspection, Quality Standards of some giant retailers, TUV, SGS and ASTM testing standards.
6. Production technology: Manual systems, make through systems, straight line systems, modular production systems, unit production systems, quick response systems
7. Ware housing: Handling equipments, storage equipments, packing equipments.
8. Application of CAD/CAM in garment manufacturing

**Reference Books:-**

- 1) Garment technology for fashion designers by Gerry Cooklin.
- 2) Introduction to clothing manufacturing by Gerry Cooklin.
- 3) Clothing construction and wardrobe planning by Dora S. Lewin, Mabel Goode Bowers, Manetta Knttunen- The Macmillan Co New York
- 4) Garment technology by Dr. V. Subramanian – winter school booklets 1990
- 5) BIS publications 1989.
- 6) The Technology of clothing manufacture, Carr & Latham, Blackwell Publications, 2000.

**SECOND YEAR B. TEXT. – SEMESTER – I****3.5 YARN MANUFACTURE (FT)**

Lectures	:	4 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Term Work	:	25 Marks
Subject Total	:	125 Marks

- 1) **Cotton Ginning:** - Introduction, Objects of ginning. Cotton cultivation. Cotton picking methods. Study of various types of gins. Pre and post ginning equipments. Factors influencing ginning performance. Influence of ginning on fibre, yarn and fabric quality. Pressing and bailing of cotton, Characteristics of bales of various countries Grading of cotton
- 2) **Blowroom:** Types and composition of trash in cotton, their origin and their effect on processing performance & yarn quality. Objects of mixing and blowroom Elements of blow room machines. Machines used for opening & cleaning Chute feed system, calculation of production, waste.
- 3) **Carding:** Objects, basic actions in carding, constructional details, calculation of production, draft and waste.
- 4) **Drawing:** Objects, Concepts of drafting & doubling, principles of roller drafting systems. Drafting roller setting. Calculations of drafts & production.
- 5) **Combing:** Objects, Characteristics of good lap, Machines sequences used for comber preparatory, Type of combing. Study of principles & operation. Constructional details Calculation of drafts, production & noils.
- 6) **Speed Frame:** Objects, principles of working of speed frame, drafting, twisting & winding, constructional details, driving arrangement, calculation of draft, twist & production.
- 7) **Ring Frame:** Objects, description of machine, drafting, twisting & winding, brief study of spindles, ring & travelers, driving arrangements, calculation of draft, twist & production.

**List of Experiments:-**

- 1) Study of passage of material through blow room machines - bale openers, mild opener,
- 2) Study of passage of material through blow room machines intensive opener, cute Feed system.
- 3) Driving arrangement & calculation of Carding machine.
- 4) Driving arrangement & calculation of Draw Frame
- 5) Driving arrangement & calculation of Sliver lap machine.
- 6) Driving arrangement & calculation of Ribbon lap machine.
- 7) Driving arrangement & calculation of Comber machine.
- 8) Driving arrangement & calculation of Speed frame.
- 9) Driving arrangement & calculation of Ring frame.
- 10) Spinning of carded yarn
- 11) Spinning of combed yarn. Comparison with carded yarn.
- 12) Mill visit.

**Reference Books:-**

1. 'The Technology of Short Staple Spinning' by W.Klein. The Textile Institute Publication - Short Staple Spinning Series Vo1.1.
2. 'A Practical Guide to Opening and Carding' by W. Klein. The Textile Institute Publication - Short Staple Spinning Series Vo1.2.
3. 'The Characteristics of Raw Cotton' by E. Lord. The Textile Institute Publication Manual of Cotton Spinning Vol.II, Part-I.
4. 'Opening Cleaning and Picking' by Dr.Zoltan S. Szaloki, Institute of Textile Technology, Virginia.
5. 'Cotton Opening and Picking' by G.R. Merrill.
6. 'Blowroom' by BTRA, Sliver Jubilee Monograph series.
7. 'Cotton Ginning' Textile Progress, The Textile Institute Publication.
8. CIRCOT Annual Issue on Cotton Varieties.
9. The technology of short staple spinning - The Textile Institute publication short staple spinning series Vol-I - W. Klein.
10. The practical guide to opening & Carding. The Textile Institute publication short staple spinning series Vol-II - W. Klein.
11. The Practical guide to combing & drafting The Textile Institute publication

short staple spinning series Vol-III - W. Klein.

12. Carding by F. Charanlay. The Textile Institute publication Manual of cotton spinning series Vol-III.
13. Drawing, Combing and Roving by Zoltan. S. Szalola The Institute of Textile Technology Virginia.
14. Cotton Drawing & Roving by GR. Merrill.
15. Elements of cotton spinning calculations by Dr. HV.S. Murthy.
16. A Practical guide to Ring Spinning by Vol.-IV by W.Klein, The Textile Institute, Manual of Textile Technology - Short Staple Spinning Series.
17. Carding, draw frame by Prof. A. R. Khare.
18. Ring frame & doubling by Prof. A. R. Khare.

**SECOND YEAR B. TEXT. – SEMESTER – I**

**3.6 FABRIC MANUFACTURE (FT)**

Lectures	:	4 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Subject Total	:	150 Marks

**1) Winding:**

Constructional details and features of modern winding machines.

**2) Warping:**

Classification, Working of beam and sectional warping machine, Calculations for production and efficiency, Features of modern warping machines.

**3) Sizing-**

Need, size ingredients, Passage of warp through the sizing machine, Calculations for production & efficiency, Features of modern sizing machine.

**4)** Basic concepts and working principles of Dobby looms, Drop box Looms, Jacquard looms - dobby pegging and Card cutting.

**5) Automatic weaving**

Limitations of ordinary looms, Importance of shuttle and cop changing loom, Working and objects of various motions for the same, autoloom fabric defects, causes and remedies.

**6) Non-Woven fabrics** - Types- different methods of production of non woven - needle punched, chemical & thermal bonded - application of non woven fabrics.

**7) Shuttleless Weaving:-**

- 1) Classification of shuttleless weaving machines.
- 2) Projectile weaving machine -Projectile picking motion , picking phases, torsion rod details, Projectile preparation for picking, selvedge motion, Receiving unit , Selvedge weaves, specifications of projectiles & grippers for various applications, Sley drive, Multi colour weft insertion, Fabric defects & remedies.

- 3) Principle of rapier weft insertion through various mechanisms such as single rapier, double rapier, rigid and flexible, biphasic & twin rapiers. Rapier heads, weft transfer system rapier drive, Positive and negative rapiers, Sley Reed drive, selvage formation, Multicolour feeding mechanism, Field of application & commercial viability.
- 4) Study of secondary and auxiliary motions of shuttleless technology

**List of Experiments:-**

- 1) To study the working of modern automatic winding machine.
- 2) To study & operate the sectional warping machines to make the beam.
- 3) To study the working of various dobby looms.
- 4) To study the working of jacquard loom.
- 5) To study the working of drop box loom.
- 6) To study the working of cop and shuttle changing automatic loom.
- 7) General study of projectile machine.
- 8) General study of flexible & rigid Rapier machine. 9) Study of fabric inspection system.
- 9) Visit to auto loom and jacquard unit.
- 10) Visit to projectile unit.
- 11) Visit to Rapier unit.

**Reference Books:-**

1. Principles of Weaving By Marks A.T.C. & Robinson.
2. Weaving machines, Materials & methods By Prof. M.K. Talukdar Prof. D.B. Ajgaonkar and Sriramulu.
3. Modern Preparation & weaving Machines by A. Ormerod.
4. Weaving mechanism by N. N. Bannerjee.
5. Sizing by Prof. D. B. Ajgaonkar, Dr. M. K. Talukdar & V.R. Wadekar
6. Warp Sizing by Paul V. Seydel.
7. Warping and Sizing - BTRA Silver Jubilee Monograph series.
8. Winding & Warping by Dr. M. K. Talukdar.
9. Non-wovens by N. N. Bannerjee.
10. Manual of non Wovens by Dr. Radko Kriva.
11. Non Woven Bonded Fabric by Lunenscholoss

**SECOND YEAR B. TEXT. – SEMESTER – II****4.2 TEXTILE MATHEMATICS-IV (TT/MMTT/TPE/TC/FT)**

Lectures	:	3 Hours / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

**1. Laplace Transforms: -**

Definition, transforms of standard functions, transforms of derivatives, and integrals. Inverse Laplace transforms by partial fraction and convolution method. (6)

**2. Applications of Laplace Transforms for solving L.D. equations:-**

Method of solving L. D. equations with initial conditions (Boundary Values) with the help of Laplace Transforms. (3)

**3. Vector differentiation:-**

Differentiation of vector valued function of scalar 't', gradient, divergence, curl, directional derivative. Solenoidal and irrotational vector fields. (5)

**4. Fourier Series:-**

Definition, Euler,s formulae, Conditions for fourier expansions. Full range fourier series and half range expansions and their examples. (6)

**5. Analysis of Multivariate Data:-**

Multiple and Partial correlation coefficients. Plane of regressions. (4)

**6. Analysis of Variances:-**

Introduction, One-way Classification, Two-way Classification with and without repetition. (5)

**7. Design of Experiments:-**

Introduction, Basic principles, Basic Designs (CRD, RBD & LSD). (7)

**8. Factorial Experiments:-**

Introduction & types,  $2^n$  factorial experiments,  $2^2$  &  $2^3$  factorial experiments. (4)

**Reference Books:-**

1. A Text Book of Applied Mathematics : by J.N. & P.N. Wattikar.
2. Higher Engineering Mathematics : by B.S. Grewal.
3. A Text Book on Engineering Mathematics :by Bali, Saxena & Iyengar.
4. Mathematical Statistics : by J.Fruend.
5. Applied Statistics & Probability of Engineers : by Montgomeri & Runger
6. Probability & Statistics for Engineers : by Johnson.
7. Design and Analysis of Experiments : by Montgomeri.
8. A Text Book of Engineering Mechanics : by R.S. Kurmi.

**SECOND YEAR B. TEXT. – SEMESTER – II**

**4.7 TEXTILE DESIGN AND COLOUR (TT/MMTT/FT)**

Drawing	:	2 Hours / Week
Practical Exam	:	50 Marks
Subject Total	:	50 Marks

**List of Experiments:-**

1. Units developments for textile design.
2. Colour modification chart.
3. Colour theory chart.
4. Textile design development with the help of designing principles.
5. Composition of all over textile design by following bases – (Any two assignments)
  - a. Sq. or Rectangle base
  - b. Drop base – half drop, full drop, 1/3 or 2/3 drop
  - c. Diamond base.
  - d. Ogee base
  - e. Satin base.
6. Development of point paper design for dobby weaving (Any two).
  - a. Extra warp b. Extra weft c. Backed cloth d. Double cloth
7. Development of point paper design for jacquard.
8. Basics of computer aided designing software for dobby.
9. Use of dobby software for designing (Designing different colour patterns, motifs for dobby weaving).
11. Basics of computer aided designing software for jacquard.
12. Use of jacquard software for designing.
13. Designing different motifs, colour pattern for jacquard weaving.

**Reference Books:**

1. Willian Watson “Textile design and colour”: Elementary weaves and figured fabrics.
2. N. Gokarneshan “Fabric structure and design”.
3. Doris Goerner “Woven Structures and Design “

**SECOND YEAR B. TEXT. – SEMESTER – II****4.1 YARNS AND FABRICS FOR FASHION APPLICATIONS (FT)**

Lectures	:	4 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Practical Exam	:	50 Marks
Subject Total	:	150 Marks

**1. Fancy yarns**

Concept of blend spinning. Properties & application of blended yarns. Introduction to various types of fancy yarns - Siub yarn, multi twist multi count yarn, Crep yarn, multi component fancy yarn, Rotor and Ring frame slub yarn, Blended Fancy yarns, SIRO, Bobtex etc.

Manufacturing techniques, end uses, yarn properties & structure of fancy yarns.

**2. Hosiery Yarns**

Requirement of hosiery yarn. Raw material for hosiery yarn, Process sequence & Process parameters to make hosiery yarn from Cotton, Polyester, viscose & their blends. Properties and end use applications of hosiery yarns.

**3. Elastane Yarns**

Introduction to elastane textile material like polyurethane, production of core / cover lycra yarns on ring spinning & air covering machine. Necessary modification on machine, process parameters, production, yarn properties & end uses.

**4. Embroidery Yarn:**

Introduction of thread construction, Raw material used, Characteristics of embroidery yarn, Thread production methods, Types of thread package

**5. Sewing Threads**

Introduction of Thread construction, Characteristics of sewing threads, Thread productional methods, Types of thread package, Thread storage & degradation.

**6. Principle of Air jet weft insertion.**

Constructional details of single nozzle, confusor, multinozzle air jet weaving machines. Study of- Relay nozzle weaving machines, Profile reed, Reed beat up,

Take up - let *off* motions, Auxiliary motions, Field of application & commercial viability.

7. Water jet weft insertion system, nozzle, picking, water consumption, water requirement, and field of application.

8. Principle of multiphase weaving, passage of yarn, ripple shed or wavy shed formation, Beatup, carrier drive, take up, field of application, study of sulzer M 8300 multiphase weaving machines.

9. Circular weaving principle, passage of yarn, fabric production, speeds, classification and field of application. Types of yarns used and their specifications.

10. Triaxial Weaving: Principles of weaving, shed formation, heddles, beat up, take up of fabric, properties and applications of triaxial fabrics, yarns used and their specifications, field of applications.

11. Techno economical rating of different shuttleless technologies.

12. Weaving of different material on shuttleless weaving like polyester, silk, Acrylic, polypropylene, Nylon and Blends. Sample weaving concept from hand loom to Suzuki sample loom.

13. Fabric inspection and its importance

**List of Experiments: -**

1. Manufacturing of Hosiery yarn and warp yarn on the ring spinning machine.
2. Manufacturing of elastic core cover yarn on ring frame and manufacturing of air covered fancy yarn on air covering machine.
3. Manufacturing of dye package by using precision winding machine.
4. Manufacturing of fancy yarns on hallow spindle winder by changing machine parameters.
5. Manufacturing slub yarn, multi count yarn & multi twist yarn for garment application.
6. Manufacturing of fancy yarn using SIRO spinning.
7. Mill visit to the fancy yarn manufacturing unit.
8. General study of air-jet machine.

9. Weaving on air jet loom by changing parameters.
10. Sample warping & weaving for blend yarns.
11. Fabric inspection procedures.
12. Style change on shuttle less looms.
13. Visit to circular weaving unit.
14. Visit to air jet weaving unit.

**Reference Books:-**

1. 'Sewing Threads' Textile progress vol.30 no.3/4, by J.O. Ukponmwan, The Textile Inst. Publisher.
2. 'Modern Yarns for Modern Fabrics Seminar' Conference proceedings. By TTI, The Textile Inst. Publisher.
3. Yarns & Fabric Classification Main Items in wool and blends, Italtex Editor.
4. Textile guide synthesis to create yarns & fabrics, Italtex Editor.
5. Fancy yarns by Wood head publications.
6. Modern Preparation & Weaving by A. Ormerod.
7. Principles of weaving by Marks & Robinson.
8. Weaving machines & methods by Dr. Talukdar, Prof. D.B. Ajgaonkar.
9. Shuttleless weaving by Svaty.
10. Modern Methods of Weaving by Duxbury
11. Shuttleless Weaving by J.J. Vincent.
12. Shuttleless weaving NCUTE programme by IIT Delhi.
13. Brochures and machine pamphlets of various machine manufacturers

**SECOND YEAR B. TEXT. – SEMESTER – II**

**4.3 CHEMICAL PROCESSING OF TEXTILES (FT)**

Lectures	:	3 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Term Work	:	25 Marks
Subject Total	:	125 Marks

**1. SIZING:**

Objects of sizing, Sizing ingredients & their functions, Types of Sizing, Size paste formulations for cotton (20<sup>s</sup>, 40<sup>s</sup>, 60s, 100s), P/C, P/V yarn

**2. INTRODUCTION TO TEXTILE WET PROCESSING:**

Importance of pretreatments, various pretreatment sequences for yarn, woven, Knits, synthetics & their blends, Importance of grey inspection, Point system, Types of stitches, Inspection machines for woven and knit goods

**3. MECHANICAL PREPARATORY PROCESSES:**

- Objects of shearing and cropping, working principle of shearing and cropping
- Object of singeing, various types of singeing machines for yarn, woven and knitted fabrics

**4. CHEMICAL PREPARATORY PROCESSES:**

**A. DESIZING**

- Objects of desizing, Chemistry of desizing, Various hydrolytic and oxydative methods of desizing, Evaluation of efficiency of desizing - Tegawa system

**B. SCOURING**

- Objects of scouring, various processes occurring during scouring, solvent assisted scouring, Batch wise, Semi- Continuous & continuous methods of scouring, Concept of Bio-scouring.

### **C. BLEACHING**

- Objects of bleaching, Chemistry of bleaching agents like Hydrogen Peroxide, Bleaching of Cotton, Polyester, Wool Silk, Nylon, Acrylic & its blended woven fabrics, bleaching of coloured woven goods. Evaluation of bleaching efficiency

### **D. MERCERIZATION**

- Object of mercerization, Changes brought about by Mercerization, Mercerization machines used for yarn, woven and knit fabrics, Concept of hot mercerization and liquid ammonia treatment.

### **5. DYEING**

- Elements of Dyeing, Principles of dyeing, Classification of dyes based on application methods, concepts of exhaustion, expression, percentage shade and affinity
- Dyeing of cellulosic fibres with direct, vat, reactive and sulphur dyes. Dyeing of Polyester & its blends like polyester/cotton, polyester/viscose, polyester/wool. Dyeing of silk, wool, acrylic, & nylon
- Evaluation of fastness properties like Wash Fastness, Rubbing Fastness, Light Fastness and Perspiration fastness
- Package dyeing machine, Jigger, winch machine, Padding mangle, Soft airflow jet dyeing

#### **List of Experiments:-**

1. Desizing of 100% cotton fabric.
2. Scouring of 100% cotton fabric.
3. Bleaching of 100% cotton fabric by using Hydrogen Peroxide.
4. Dyeing of cotton with direct dyes
5. Dyeing of cotton with I<sub>N</sub> class of vat dyes.
6. Dyeing of cotton with HE reactive dyes by exhaust method.
7. Dyeing of cotton with HE reactive dyes by pad –steam method.
8. Dyeing of cotton with sulphur dyes.
9. Dyeing of 100% polyester with disperse dyes by HTHP method.
10. Dyeing of 100% polyester with disperse dyes by thermosol method.

11. Dyeing of Polyester/cotton blended fabric by exhaust method.
12. Dyeing of 100% wool
13. Dyeing of 100% silk
14. Visit to process house.

**Reference Books:-**

1. Sizing by Prof.D.B. Ajgaonkar, M.K. Talukdar & V.R. Wadekar.
2. Textile Wet Processing, by Nodal Centre for Up gradation of Textile Education
3. Chemical technology of fibrous materials by F. Sadov.
4. Chemical Processing of Polyester/Cellulosic blends by R.M.Mittal & S.S. Trivedi.
5. Chemical processing of synthetic & blends by K.V. Datye & A.A. Vaidya.
6. Mercerizing by J.T. Marsh.
7. Textile Finishing by Heywood
8. Introduction to Textile bleaching by J.T. Marsh.
9. Bleaching, Dyeing & Chemical Technology of textile fibres by S.R. Trotman.
10. Technology of Bleaching by V.A. Shenai.
11. Dyeing of Polyester & Its Blends by M.L. Gulrajani.
12. Dyeing of Chemical Technology Of Textile Fibres by E.R. Trotman.
13. Technology of Dyeing by V.A. Shenai.
14. Chemistry and technology of fabric preparation and finishing by Dr. C. Tomasino, NCSU, USA.

**SECOND YEAR B. TEXT. – SEMESTER – II**

**4.4 PATTERN MAKING AND GARMENT CONSTRUCTION-I (FT)**

Lectures	:	3 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Practical Exam	:	50 Marks
Term Work	:	25 Marks
Subject Total	:	175 Marks

**1) BASIC PATTERN MAKING:**

Function of Pattern Making Tools, Pattern Making Terms, Model form and measurements, Measurement Taking – Size chart and Measuring of Sizes.

**2) DRAFTING OF BASIC PATTERN SET:**

Basic dress foundation, front and back bodice block, front and back skirt and sleeve, testing of fitting of basic blocks & correction.

**3) DART MANIPULATION:**

Introduction to darts, Techniques of dart manipulation, Pivotal method & Slash & Spread method, Dart terminology, Creating styles through dart manipulation.

**4) DESIGNING WITH DARTS:**

Introduction, Tuck darts, pleats, flares, gathers, fullness, Dart clusters & dart equivalents, multiple darts. Importance of drill hole marks in the darts.

**5) DRAFTING OF SLEEVE & COLLAR:**

**SLEEVES:** Introduction, Cap sleeves, Puff Sleeve, Leg-o-mutton Sleeve, Cowl Sleeves, Wedding Sleeves, Sleeve Cuffs.

**COLLARS:** Introduction, Straight collar, Peter Pan collar, Mandarin collar, collar with stand, shawl collar, sailor collar.

## **6) DRAFTING OF YOKES & PLACKETS:**

**YOKES:** Yokes for bodice, gathers, yokes design variations, gathers, flanges, pleat tucks & pin tucks.

**PLACKETS:** Pointed placket with facing-in-one, wing collar placket, slit opening with placket.

## **7) POCKETS:**

Pocket classification, outside pockets, seam pocket, jeans pocket, accordion pockets, stylized outside pockets, pocket with hidden side seam.

## **8) Introduction and construction techniques of garment closures:**

Application of zippers-fly, kissing lap, button & button holes, hooks, and eye snaps. Velcro, eyelets, cords. Cuffs – Contoured cuffs, Roll-up Cuffs.

### **List of Experiments:-**

1. - Taking measurements directly from body
  - Locating land marks and taking anthropometrics measurements
  - Taking measurements from the garments
2. Practice on use of:
  - L-scales and grading scales
  - French curve – for armhole, necklines etc.
  - Practice on use of other equipment
3. Drafting of:
  - Basic block
  - Sleeve
4. Dart Manipulation
  - i. Relocation of darts
  - ii. Designing with darts
5. Developing patterns for Children's wear
  - i. Skirt Block
  - ii. Rompers
6. Developing patterns and samples for darts & pleats:
  - i. Graduated & Radiating darts
  - ii. Box, knife & sunburst pleats

7. Developing Patterns and sample for collars:
  - i. Stand Collar
  - ii. Peter Pan Collar
8. Developing patterns and samples for plackets:
  - i. Sleeve plackets
  - ii. Front Plackets
9. Developing patterns and samples for pockets:
  - i. Welt Pocket
  - ii. Patch Pocket
10. Developing patterns and samples for sleeves:
  - i. Puff Sleeve
  - ii. Raglan Sleeve
11. Preparing samples for Necklines
  - i. Bias facing,
  - ii. Bias Binding & Fitted facing.
12. Visit to garment industry for preparation of industrial patterns.

**Reference Books:-**

1. Gerry Cooklin "Introduction to Clothing Manufacture", Blackwell Scientific Publications SP
2. Gerry Cooklin "Master Patterns & Grading for Women's Outsize", Blackwell Scientific Publications (1995) ISBN: 0 – 632- 03915 – 9.
3. Gerry Cooklin "Master Patterns & Grading for Men's Outsize", Blackwell Scientific Publications 1992.
4. Gillian Holman - Pattern Cutting Made Easy, Blackwell Scientific Publications 1997. ISBN: 0- 7134 – 8093- 9.
5. Natalie Bray "More Dress Pattern Designing" Blackwell Scientific Publications 1986 ISBN: 0- 632-01883- 6.
6. Cooklin Gerry, "Garment Technology for Fashion Designers", Blackwell Science Ltd., 1997.
7. Claire Shaeffer, "Sewing for apparel Industry", Prentice Hall, 2000.
8. Leila Aitken, "Step by step dress making course", BBC Books, 1992.

**SECOND YEAR B. TEXT. – SEMESTER – II**

**4.5 TESTING OF TEXTILES AND APPARELS (FT)**

Lectures	:	3 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Practical Exam	:	50 Marks
Term Work	:	25 Marks
Subject Total	:	175 Marks

**I) Objectives Of Testing**

**II) Classification of fabric Properties, Sampling of Fabrics**

**III) Dimensional characteristics**

Length, Width & Thickness and their measurement, Importance of thickness.

**IV) Threads/Unit length**

EPI and PPI, Thread count, Fabric weight - Weight per unit length, Weight per unit area, Warp & Weft crimp, Effect of crimp on the fabric properties, Measurement of crimp, fractional cover factor, Cloth cover factor

**V) Fabric Strength**

Terminology and definitions related to tensile testing.

Tensile strength testing – Ravelled strip method, cut strip method, Grab method, Comparison between strip test & grab test, Tear strength testing – Measurement of tear strength - Elemendorf tearing strength tester, Impact principle-Ballistic test, Bursting strength test.

**VI) Fabric Abrasion resistance & Handle of fabric**

Serviceability, wear, abrasion, testing of abrasion resistance, assessment of abrasion damage, BFT abrasion testing machine, Martindale abrasion tester.

**VII) Pilling of fabrics**

Definition, mechanism of pilling, factors responsible for pilling, Effects of pilling, Remedies, ICI Pill Box Tester.

**VIII) Fabric Stiffness, Handle & Drape**

Concept- Handle,Drape. Measurement of drape-Drapeometer, Measurement of Stiffness - Cantilever test (Shirley stiffness tester), Heart-loop test.

**IX) Crease resistance & crease recovery**

Definitions: Crease,Wrinkle. Measurement of crease recovery - Recovery angle, TBL method.

**X) Air permeability**

Definitions - Air permeability, Air resistance, Air porosity, Shirley air permeability tester,

**XI) Water proofing & water repellency**

Water permeability and Water repellency, Basic concepts of Wetting and water repellency, Methods of measuring water repellency in fabrics - Wetting time test, spray test, Drop penetration test, Hydrostatic head test.

**XII) Fabric Hand**

Concept - fabric hand, Objective & subjective evaluation of textiles, Measurement of fabric hand- KAWABATA & FAST techniques.

**XIII) Luster**

Concept of luster, Subjective aspects of luster, measurement of luster, Effect of fabric construction on luster.

**XIV) Apparel Testing**

Introduction, Strength properties of Apparel Fabrics – Fabric strength, Seam Strength, Resistance to Yarn Slippage, Fabric Stretch Properties, Dimensional Stability in Apparel, Durable Press Evaluation, Needle cutting/Yarn Severance, Sewability of Fabrics, Soil/Stain Release Testing, Snagging, Colorfastness to – Washing, Dry Cleaning, Light, Crocking, Perspiration, Frosting, Heat, Burnt Gas fumes, Ozone Testing of Fusible interlinings, Testing of Zippers, Testing of Elastic Waistband.

**list of experiments:-**

1. Determination of Fabric Tensile strength and Elongation
2. Determination of crimp in Yarn.
3. Determination of Abrasion Resistance.
4. Determination of Fabric bursting strength
5. Determination of fabric washing fastness.
6. Determination of Shrinkage of knitted and woven fabrics.
7. Determination of color fastness to rubbing - Crock meter
8. Analyzing of Woven and knitted fabric EPI, PPI, Wales and courses per inch, loop length, GSM,
9. Determination of fabric stiffness and crease recovery angle.
10. Determination of fabric Drape
11. Seam strength testing
12. Dimensional Stability

**Reference Books:-**

1. J.E.Booth- "Principles of Textile Testing", CBS Publishers & Distributors, 1996.
2. Sundaram V, "Hand book of Textile Testing", CTRL Publication, Bombay.
3. Textile Testing Vol.I & II by Anagappan & Gopalkrishnan
4. An Introduction to Quality Control for Apparel Industry , Pradip Mehta
5. Managing Quality in the Apparel Industry, Pradip Mehta & Satish Bhardwaj
6. Quality control and testing by V.K.Kothari.

**SECOND YEAR B. TEXT. – SEMESTER – II**

**4.6 FASHION ILLUSTRATION (FT)**

Lectures	:	2 Hours / Week
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks
Term Work	:	25 Marks
Subject Total	:	125 Marks

**1. Figure Proportions**

Real Figure versus fashion figure, Understanding basic proportions of 8 head theory and 10 Head Theory, Figure mapping with geometrical shapes, Fleshing out, Freehand quick sketching, Profile figure, Three-quarter turned figure, lay figure.

**2. Basic Figure Forms**

Full front head, profile head, three-quarter turned head, Diamond technique, Hairstyles, Facial features: eyes, nose, mouth and ears. Drawing legs, Legs in motion, Foreshortening legs, Drawing feet, Drawing Arms, Foreshortening arms, Rotating arms and legs, Drawing hands.

**3. Turning Reality to Fashion Fantasy**

Drawing from photographs, Gesture components, balance line, movement and balance, importance of center front, angles. Matching poses to garments, wide silhouettes, attitude in poses, attitude contradictions, illustrator versus designer, stylization

**4. Drawing Men**

Proportions of male figure, male versus female figure, drawing male figures, Drawing head, legs, arms and hands, hairstyle, comparing male and female gestures, Gesture sketching.

**5. Drawing Children**

Children's age groups, Infants, Toddlers, Child, Tween, Head, Hairstyles, Arms and Hands, Legs and Feet, styling kids.

## **6. Rendering Techniques**

Art kit used for rendering, Rendering skin flesh tone, Patterns, Print, shading, Rendering materials like denim, chiffon, satin, taffeta, gouache, gauze, net, velvet, knits, fur, silk, wool, etc. rendering black garments, rendering hairs, Rendering accessories like hats, shoes, scarves, bags, belts, gloves, sunglasses, etc.

## **7. Drawing Flats**

Ways to layout flats, sketching flats freehand, proportions for flats, flats and specs, flats for men, flats for children, sketching techniques for flats, croquis mixed with flats.

## **8. Layout**

Composition for layout, figures and accessories, space and shapes in layout, grouping figures, layout choices.

### **List of Experiments:-**

1. Study of human body proportions and drawing of 8 head figure.
2. Drawing of 10 head fashion figure.
3. Drawing of side view and 3/4<sup>th</sup> turned view of fashion figure.
4. Enlargement and reduction of basic figures.
5. Drawing fashion figures from photographs.
6. Dressing fashion figures.
7. Drawing of male figure.
8. Drawing of children figure.
9. Study of fabric and garment rendering.
10. Study of rendering accessories.
11. Study of drawing flats.
12. Study of composition for layout.

### **Reference Books:-**

1. Fashion Sketchbook by Bina Abling
2. Figure Drawing for Fashion Figure by Elisabetta Drudi
3. Fabric Texture and Patterns by Elisabetta Drudi

4. Illustrating Fashion by Kathryn McKelvey
5. Fashion Drawing: The basic principles by Anne Allen and Julian Seaman
6. Illustrating Fashion: Concept to Creation by Steven Stipelman
7. Fashion Artist: Drawing Techniques to Portfolio Presentation by Sandra Burke
8. Fashion Design Drawing and Presentation by Patrick John
9. Fashion Design Illustration (Women) by Patrick John
10. Fashion Design Illustration (Men) by Patrick John
11. Fashion Design Illustration (Children) by Patrick John