

**SCHEME OF TEACHING AND EXAMINATION**

**B.TECH. SILK TECHNOLOGY**

**V SEMESTER**

Sl. No.	Sub. Code	Title	Teaching Dept.	Teaching Scheme Hours / Week		Examination			
				Theory	Practical	Duration	I.A. Max. Marks	Theory/ Practical	Total Marks
1	06AL51	Management and Entrepreneurship	Any dept.	04	--	03	25	100	125
2	06TX52	Woven Cloth Construction & Textile Design	Textile / Silk	04	--	03	25	100	125
3	06TX53	Yarn Manufacture-III	Textile / Silk	04	--	03	25	100	125
4	06TX54	Fabric Manufacture-III	Textile / Silk	04	--	03	25	100	125
5	06TX55	Chemical Processing of Textiles – I	Textile / Silk	04	--	03	25	100	125
6	06TXL56	Yarn Manufacture Lab.-III	Textile / Silk	--	03	03	25	50	75
7	06TXL57	Woven Cloth Construction and Textile Design Lab	Textile / Silk	--	03	03	25	50	75
8	06TXL58	Chemical Processing of Textiles Lab.-I	Textile / Silk	--	03	03	25	50	75
<b>TOTAL</b>				<b>20</b>	<b>09</b>	<b>24</b>	<b>200</b>	<b>650</b>	<b>850</b>

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**B.TECH. SILK TECHNOLOGY**

**VI SEMESTER**

Sl. No.	Sub. Code	Title	Teaching Dept.	Teaching Scheme Hours / Week		Examination			
				Theory	Practical	Duration	I.A. Max. Marks	Theory/ Practical	Total Marks
1	06TX61	Statistical Applications to Textiles	Textile / Silk	04	--	03	25	100	125
2	06TX62	Advanced Fabric Structure & Design	Textile / Silk	04	--	03	25	100	125
3	06TX63	Fashion Design & Garment Manufacture	Textile / Silk	04	--	03	25	100	125
4	06TX64	Chemical Processing of Textiles - II	Textile / Silk	04	--	03	25	100	125
5	06TX65x	<b>Elective-I (Group A)</b>	Textile / Silk	04	--	03	25	100	125
6	06TXL66	Advanced Fabric Structure & Design Lab	Textile / Silk	-	03	03	25	50	75
7	06TXL67	Fashion Design & Garment Manufacture Lab	Textile / Silk	--	03	03	25	50	75
8	06TXL68	Chemical Processing of Textiles Lab – II	Textile / Silk	--	03	03	25	50	75
<b>Total</b>				<b>20</b>	<b>09</b>	<b>24</b>	<b>200</b>	<b>650</b>	<b>850</b>

**Elective-I (Group A)**

06ST651 - Sericulture

06TX652 - Smart Textiles

06TX653 - Textile Mechanics & Calculations

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**B.TECH. SILK TECHNOLOGY**

**VII SEMISTER**

Sl. No.	Sub. Code	Title	Teaching Dept.	Teaching Scheme Hours / Week		Examination			
				Theory	Practical	Duration	I.A. Max. Marks	Theory/ Practical	Total Marks
1	06TX71	Apparel Marketing & Merchandising	Textile / Silk	04	--	03	25	100	125
2	06ST72	Silk Reeling Technology	Textile / Silk	04	--	03	25	100	125
3	06TX73	Knitting Technology	Textile / Silk	04	--	03	25	100	125
4	06TX74	Chemical Processing of Textiles – III	Textile / Silk	04	--	03	25	100	125
5	06TX75x	<b>Elective-II (Group B)</b>	Textile / Silk	04	--	03	25	100	125
6	06TX76x	<b>Elective-III (Group C)</b>	Textile / Silk	04	--	03	25	100	125
7	06STL77	Silk Reeling Technology Lab	Textile / Silk	--	03	03	25	50	75
8	06TXL78	Chemical Processing of Textiles Lab– III	Textile / Silk	--	03	03	25	50	75
<b>TOTAL</b>				<b>24</b>	<b>06</b>	<b>24</b>	<b>200</b>	<b>700</b>	<b>900</b>

**Elective-II (Group B)**

06TX751 - Non Mulberry Silk Technology  
 06TX752 - Total Quality Management  
 06TX753 - Fibre Reinforced Composites

**Elective-II (Group C)**

06TX761 - Yarn Manufacture - IV  
 06ST762 - Silk Fabric Manufacture  
 06TX763 - Erection and Maintenance of Textile Machinery

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**SCHEME OF TEACHING AND EXAMINATION**

**B.TECH. SILK TECHNOLOGY**

**VIII SEMISTER**

Sl. No.	Sub. Code	Title	Teaching Dept.	Teaching Scheme Hours / Week		Examination			
				Theory	Practical	Duration	I.A. Max. Marks	Theory/ Practical	Total Marks
1	06TX81	Industrial Management	Textile / Silk	04	--	03	25	100	125
2	06TX82	Technical Textiles	Textile / Silk	04	--	03	25	100	125
3	06TX83x	<b>Elective-IV (Group D)</b>	Textile / Silk	04	--	03	25	100	125
4	06TX84x	<b>Elective-V (Group E)</b>	Textile / Silk	04	--	03	25	100	125
5	06ST85	Project Work	Textile / Silk	--	06	03	100	100	200
6	06ST86	Seminar on Project	Textile / Silk	--	03	--	50	--	50
<b>Total</b>				<b>16</b>	<b>09</b>	<b>15</b>	<b>250</b>	<b>500</b>	<b>750</b>

**Elective-IV (Group D)**

06TX831 - Human Resource Management  
 06TX832 - Financial Management  
 06TX833 - Non Woven Technology

**Elective-V (Group E)**

06TX841 - Pollution Control in Textile Industry  
 06ST842 - Silk By-Product Technology.  
 06TX843 - Electronic Controls in Textile Machines

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## V SEMESTER

### MANAGEMENT AND ENTREPRENEURSHIP

Subject Code	: 06AL51	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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#### PART - A

#### MANAGEMENT

##### UNIT - 1

**MANAGEMENT:** Introduction – Meaning – nature and characteristics of Management, Scope and Functional areas of management – Management as a science, art of profession – Management & Administration – Roles of Management, Levels of Management, Development of Management Thought – early management approaches – Modern management approaches.

**7 Hours**

##### UNIT - 2

**PLANNING:** Nature, importance and purpose of planning process – Objectives – Types of plans (Meaning Only) – Decision making – Importance of planning – steps in planning & planning premises – Hierarchy of plans.

**6 Hours**

##### UNIT - 3

**ORGANIZING AND STAFFING:** Nature and purpose of organization – Principles of organization – Types of organization – Departmentation – Committees- Centralization Vs Decentralization of authority and responsibility – Span of control – MBO and MBE (Meaning Only) Nature and importance of staffing–Process of Selection & Recruitment (in brief).

**6 Hours**

##### UNIT - 4

**DIRECTING & CONTROLLING:** Meaning and nature of directing – Leadership styles, Motivation Theories, Communication – Meaning and importance – coordination, meaning and importance and Techniques of Co – Ordination. Meaning and steps in controlling – Essentials of a sound control system – Methods of establishing control (in brief).

**7 Hours**

#### PART - B

#### ENTREPRENEURSHIP

##### UNIT - 5

**ENTREPRENEUR:** Meaning of Entrepreneur; Evolution of the Concept, Functions of an Entrepreneur, Types of Entrepreneur, Intrapreneur - an

emerging Class. Concept of Entrepreneurship – Evolution of Entrepreneurship, Development of Entrepreneurship; Stages in entrepreneurial process; Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship – its Barriers.

**6 Hours**

#### **UNIT - 6**

**SMALL SCALE INDUSTRIES:** Definition; Characteristics; Need and rationale; Objectives; Scope; role of SSI in Economic Development. Advantages of SSI Steps to start and SSI – Government policy towards SSI; Different Policies of SSI; Government Support for SSI during 5 year plans. Impact of Liberalization, Privatization, Globalization on SSI Effect of WTO/GATT Supporting Agencies of Government for SSI, Meaning, Nature of support; Objectives; Functions; Types of Help; Ancillary Industry and Tiny Industry (Definition Only)

**7 Hours**

#### **UNIT - 7**

**INSTITUTIONAL SUPPORT:** Different Schemes; TECKSOK; KIADB; KSSIDC; KSIMC; DIC Single Window Agency; SISI; NSIC; SIDBI; KSFC.

**7 Hours**

#### **UNIT - 8**

**PREPARATION OF PROJECT:** Meaning of Project; Project Identification; Project Selection; Project Report; Need and Significance of Report; Contents; Formulation; Guidelines by Planning Commission for Project report; Network Analysis; Errors of Project Report; Project Appraisal. **Identification of business opportunities:** Market Feasibility Study; Technical Feasibility Study; Financial Feasibility Study & Social Feasibility Study.

**7 Hours**

#### **TEXT BOOKS:**

1. **Principles of Management** – P.C.Tripathi, P.N.Reddy – Tata McGraw Hill,
2. **Dynamics of Entrepreneurial Development & Management** – Vasant Desai – Himalaya Publishing House
3. **Entrepreneurship Development** – Poornima.M.Charantimath – Small Business Enterprises – Pearson Education – 2006 (2 & 4).

#### **REFERENCE BOOKS:**

1. **Management Fundamentals** – Concepts, Application, Skill Development – Robers Lusier – Thomson –
2. **Entrepreneurship Development** – S.S.Khanka – S.Chand & Co.
3. **Management** – Stephen Robbins – Pearson Education/PHI – 17<sup>th</sup> Edition, 2003.

## WOVEN CLOTH CONSTRUCTION AND TEXTILE DESIGN

Subject Code	: 06TX52	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

Classification of woven fabrics. Elements of woven fabric structure. Construction and analysis of thread interlacing diagrams and cross-Unital diagrams. Methods of weave representation. Conditions and requirements of various drawing in drafts (DID).

**6 Hours**

#### UNIT - 2

Characteristics of fundamental weaves and fabrics. Ornamentation of plain fabrics. Modification of plain weaves. Special Rib & Cord structures. Twill weaves and fabrics, Twist & twist interactions. Derivatives of twill weaves.

**7 Hours**

#### UNIT - 3

Diamond and diaper designs. Satin & Sateen weaves. Simple fancy weaves such as honeycomb, brighten honeycomb, Huck a back, sponge-weaves, Mock leno, crepe & corkscrew weaves.

**7 Hours**

#### UNIT - 4

Distorted tread effects. Combined weaves to construct longitudinal stripes, cross stripes, check effects. Bed ford cord weaves and fabrics.

**6 Hours**

### PART - B

#### UNIT - 5

BIS standards for the important commercial fabrics. Application of different design and their utility in textile fabrics. Colour and weave effects. Classification of colour and weave effects and their application in textile fabrics.

**6 Hours**

#### UNIT - 6

Various bases of textile design for figured arrangements. Light and pigment colour theory. Classification of colours. Attributes of colours.

**7 Hours**

## **UNIT - 7**

Modifications of colours. Color harmony and color contrast. Mixed colored effects with the aid of fibre mixtured yarns, twist yarn mixtures and combined colored threads in the fabrics.

**7 Hours**

## **UNIT - 8**

Application of special weaves and special yarns in special colour and weave effects. Brief study of history of textile design. Brief study of various historical designs with respect to their main features.

**6 Hours**

### **TEXT BOOKS:**

1. **Woven Cloth Construction** – ATC Robinson and Marks – Textile Institute Pub, Manchester, 1973
2. **Watson Design and Colour** – Z. J. Grosicki, Universal Pub Corp, 1988
3. **The Art of Colour and Design** – Matiland Graves, Mc Graw Hill Book Pub co. London, 1951

### **REFERENCE BOOKS:**

1. **Grammar of Textile Design** – H. Nisbet, D. B. Taraporewala and sons, 1985
2. **Elementary Textile Design and Structure** – John Reid, Edward Ormoldand Co., Pub 1931
3. **Design of Woven Fabrics** – Blinov, Shibabaw Balay – MIR Pub 1989
4. **Fundamentals of woven Structure** – Edward I Golec, ITT Pub Lowell Mass 1958
5. **Modern Textile Design and Production** – R. H. Wright – National Trade Press, London 1970
6. **Ornamental Design for Woven Fabrics** – C Stephenson and P. Suddards – Methegen and Co. Ltd 1951
7. **History of Textile Design** – V. A. Shenai – Sevak Pub Ltd, 1974.

## YARN MANUFACTURE – III

Subject Code	: 06TX53	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

Objects of ring spinning, study of different drafting systems and type of draft. Roller setting draft and its importance. Principles of twisting, factors affecting the twist calculation. Actual and practical TPI, Principal of winding and types of built.

**7 Hours**

#### UNIT - 2

Rings and Travelers. Different types of rings, selection of rings and manufacture of rings. Types of travelers, traveler numbering both in direct and indirect system. Manufacture of travelers. Functions of lappets and separators. Forces acting on traveler. Faulty packages of Ring frame and remedial measures.

**6 Hours**

#### UNIT - 3

Modern developments of Ring frame and salient features of the present day ring frame. Calculations of Ring frame such as production efficiency and count etc. Various quality control studies at Ring frame such as breakage study, idle spindle study, snap study and yarn parameter such as U%, CV%, Neps etc.

**7 Hours**

#### UNIT - 4

Doubling frame – objects of doubling and conditions to get balanced double yarn. Preparation of doubling, Types of doubling systems. Threading different types of doubling systems. Defects in doubling and remedies. Properties of cabled, voile and poplin yarn.

**6 Hours**

### PART - B

#### UNIT - 5

Detailed study of sewing threads such as manufacture properties and applications of sewing threads. Hosiery yarn and its application, Fancy yarns and its production.

**7 Hours**

## **UNIT - 6**

Open-end spinning – principle and objects of open-end spinning. Classification of open-end spinning. Comparison of open-end and ring spinning. Technique of rotor spinning and detailed study of rotor spinning such as initial drafting, transport zone, twisting and yarns formation.

**6 Hours**

## **UNIT - 7**

Types of opening rollers and rotors and their effect on the performance of OE machine. Calculations of OE machines and comparison of OE and Ring yarn. Modern developments in OE machine.

**7 Hours**

## **UNIT - 8**

Study of yarn numbering system both indirect and indirect system. Derivations of yarn diameters, quality studies of OE yarn.

**6 Hours**

## **TEXT BOOKS:**

1. **Manual of Cotton Spinning** – Vol V, Ed, AFW COULSON 1958, Textile Institute, Manchester
2. **Technology of short staple spinning** – W Klein – Vol III and IV, 1989, Textile Institute Pub. Manchester
3. **Spun Yarn Technology** – Oxtoby 1987, Butterworths, London
4. **Cotton Spinning Calculations** – T. K. Pattabhiraman – 1979, Soumaya Pub, Bombay
5. **Cotton Ring Frame** – G. R. Merrill – 1955, Pub G. R> Merrill, Lowell, Mass
6. **O. E. Spinning** – R. Rajgopalan – 1981, Textile Association of India, Delhi
7. **Spinning in 70s** – P.R. Lord – 1970, Merrow Pub. Co. Ltd. London

## **REFERENCE BOOKS:**

1. **Contemporary Textile Engineering** – F Happy, 1981, ACADEMIC press Inc.
2. **Hand book of Cotton Spinning** – William Taggart, 1979, Universal Pub. Corp.
3. **Essential facts of Practical Cotton Spinning** – T. K. Pattabhiraman, 1979, Soumaya Pub, Bombay. NCUTE Publications on spinning.



## FABRIC MANUFACTURE – III

Subject Code	: 06TX54	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

**DOBBY LOOMS**-Mechanical design and working principles of different types of dobbies such as negative, positive, cam, paper, rotary, cross border dobbies.

**7 Hours**

#### UNIT - 2

**LATTICE PEGGING METHODS**: cyclic diagram of operation of the dobbie mechanism. **JACQUARD**-Mechanical design and operating principles of single lift single cylinder. Double lift single cylinder. Double lift Double cylinder and cross border jacquard.

**6 Hours**

#### UNIT - 3

**METHODS TO INCREASE THE FIGURING CAPACITY**. Piano card cutting machine. Card punching. Card lacing, casting out in jacquard. London and Norwich harness mounting systems. Cyclogram of the jacquard shedding.

**7 Hours**

#### UNIT - 4

**DIFFERENT TYPES OF TIE-UPS**: Review of developments in jacquards. Introduction to Electronic Jacquard, Principle & working of Electronic Jacquar

**6 Hours**

### PART - B

#### UNIT - 5

**SHUTTLE-LESS WEAVING**: Study of special features of rapier, projectile, water-jet, Air-jet looms.

**6 Hours**

#### UNIT - 6

Study of above types of shuttle-less weaving machines with reference to: Types of weft supply creels, Types of weft tensioning devices, Weft feed system, Types of weft insertion systems.

**6 Hours**

## **UNIT - 7**

**DIFFERENT CARRIER BREAKING SYSTEM**, Consolidation of picking force in air jet picking systems. Weft mixing systems, Systems of weft beat up, Types of selvedges.

**7 Hours**

## **UNIT - 8**

**MODERN MULTIPHASE FABRIC FORMATION**, Circular looms, Multiphase flat looms, Tri-axial weaving machines.

**7 Hours**

### **TEXT BOOKS:**

1. **Principles of Weaving** – ATC Robinson, R. Marks – 1976, Textile Institute, Manchester, London
2. **Shuttleless Weaving Machine** – Oldrich Talavasek and Uladimin, Svary, Elsevlin – 1981 Scientific Pub. Co., New YORK
3. **Modern Weaving Theory and Practice** – ISHIDA
4. **Machines, Mechanisms & Management** – D.B.Ajgaonkar,

### **REFERENCE BOOKS:**

1. **Modern Preparation and weaving Machinery** – A Ormerod, 1983, Butterworths London.
2. **Cotton Weaving** – V. Gordev, P Volkov, L Blinov 1987. Mir PUB.
3. **Weaving Mechanism** – Vol I & II, Prof. N N. Banerjee 1982, Textile Book House, WEST BENGAL.
4. **NCUTE Course material** – Woven Cloth Production, IIT, New Delhi.

## CHEMICAL PROCESSING OF TEXTILES – I

Subject Code	: 06TX55	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

An overview of wet processing operations and sequences Chemicals and auxiliaries used for textile wet processing and their functions. Introduction to shearing and cropping. Objects of shearing and cropping.

**6 Hours**

#### UNIT - 2

Objects of singeing, methods of singeing by various singeing machines, precautions to be taken during singeing, latest developments in singeing  
Objects of desizing, methods of desizing, continuous desizing, desizing of cotton and other blends, latest developments in desizing

**7 Hours**

#### UNIT - 3

Objects of scouring, mechanism of scouring, methods of scouring, scouring of natural cellulose fabrics, degumming of silk, scouring of wool and jute, scouring of synthetic fibres, modifications required to scour knitted fabrics, latest developments in scouring.

**7 Hours**

#### UNIT - 4

Objects of Bleaching, mechanism of bleaching, methods of bleaching, bleaching of cellulose fibres, bleaching of natural protein fibres, bleaching of common manufactured fibres, bleaching of common fibre blends.

**6 Hours**

### PART - B

#### UNIT - 5

Latest developments in bleaching. Objects of optical whitening, optical whitening process for common fibres. Chemistry of optical whitening agents. Faults in scouring and bleaching and their remedies, quality control methods for testing scoured and bleached materials. Methods used for determination of degradation of cotton, during scouring and bleaching.

**6 Hours**

## **UNIT - 6**

Machines used for desizing, scouring and Bleaching. Batch processes, semi continuous processes and continuous processes. Objects of mercerization, history and developments of mercerization, physical and chemical changes in cotton due to mercerization, various factors affecting mercerization

**7 Hours**

## **UNIT - 7**

Methods of mercerization - yarns and fabrics, machines used for mercerization, slack mercerization.

**7 Hours**

## **UNIT - 8**

Hot mercerization, Faults in mercerization and their remedies, Test methods for mercerized materials. Latest developments in mercerization. Brief study on eco-friendly preparatory processes. Water and energy management in preparatory processes.

**6 Hours**

### **TEXT BOOKS:**

1. **Technology of Textile Processing** – V A Shenai – Vol. III, 1975, Sevak Publications
2. **Textile Chemistry** – R H Peters – Vol. I&II, , Elsewhere Publishing Co., New York.
3. **Technology of Bleaching and Dyeing of textile fibres** – Chakraborty – 1972, Coxtown publications
4. **Mercerization** – J T Marsh – 1979, B I Publications.
5. **Scouring and Beaching of Cotton** – J.T. Marsh, 1979, B I Publications.
6. **Dyeing and Chemical Technology of textile Fibres** – E.R.Trotman,

### **REFERENCE BOOKS:**

1. **Chemical Technology of Fibrous Materials** – MIR Publications, 1978.
2. **Textile Auxiliaries and Finishing Chemicals** – ATIRA Publications.
3. **Textile Chemistry** – R H Peters Vo. I, II and III, Elsewhere Publishing Co. New York.
4. **Modern techniques of textile Bleaching Dyeing, and Finishing** – SITRA Publication.
5. **Chemical Processing of Cotton** – J.R.Modi and A.R. Garde – Polyester Cotton Blends, , 1980, TAI Publications.
7. **Recent processes of Textile Bleaching, Dyeing and Finishing** – S B Srivastava – 1978, SBP Publications.

### YARN MANUFACTURE LAB- III

Subject Code	: 06TXL56	IA Marks	: 25
No. of Practical Hrs./ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Study of passage of material through Ring Frame and demonstration of its working and functions of each parts.
2. Calculation of spindle speed, front roller speed TPI through gearing diagram and also by changing the pulleys and concerned change wheels
3. Calculation of Twist constant through gearing and also TPI calculation for different TCP
4. Break Draft, Main Draft and Total draft calculation through gearing diagram.
5. Calculation of Draft constant and break draft constant, calculation of DCP for different counts of yarn
6. Study of building mechanism and different types of builds.
7. Working of Ring Frame and calculation of count of yarns for the roving fed by changing the wheels
8. Maintenance schedule of Ring Frame
9. Passage of material through Ring Doubler and demonstration of its working
10. Calculation of Spindle Speed, TPI through gearing on doubling frame
11. Calculation of twist constant, TPI & TPM for different TCP.
12. Demonstration and calculation on O.E. Spinning machine.
13. Practicing and piecing on Ring Frame and study of end breaks

## WOVEN CLOTH CONSTRUCTION AND TEXTILE DESIGN LAB

Subject Code	: 06TXL57	IA Marks	: 25
No. of Practical Hrs./ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Analysis of Plain wave fabrics
2. Analysis of Twill weave fabrics
3. Analysis of Honey comb weave fabrics
4. Analysis of Huck back weave fabrics
5. Analysis of Mock leno weave and other toweling fabrics
6. Analysis of Satin weave fabrics
7. Analysis of Sateen weave fabrics
8. Creation of stripes and checks effect on paper using suitable colours
9. Creation of floral design on paper by suitable colours
10. Creation of animation patterns and other designs on paper by suitable colours
11. Study of working of Dobby & Jacquards.
12. Creation of suitable designs on doobby looms
13. Creation of suitable designs on jacquard

## CHEMICAL PROCESSING OF TEXTILES LAB-I

Subject Code	: 06TXL58	IA Marks	: 25
No. of Practical Hrs/ Week	: 03	Exam Hours	: 03
Total no. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Desizing of cotton yarn/fabric using acid and enzymes
2. Scouring of cotton using alkali method
3. Degumming of silk using soap-soda and enzymatic methods.
4. Scouring of wool, jute fibres
5. Bleaching of cotton using Hydrogen Peroxide
6. Bleaching of PC blends
7. Bleaching of silk and woollen goods
8. Mercerization of cotton in taught and slack forms
9. Treatment of bleached goods with optical whiteners
10. Determination of scouring / bleaching efficiency using cuprammonium fluidity, methylene blue absorption etc.
11. Determination of efficiency of mercerized goods using BAN and strength measurements

## VI SEMESTER

### STATISTICAL APPLICATIONS TO TEXTILES

Subject Code	: 06TX61	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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#### PART - A

##### UNIT - 1

The concept of individual population and samples-Frequency distribution and its representation- Construction of frequency diagrams with applications.

**6 Hours**

##### UNIT - 2

Statistical measures and their practical applications. Measures of central tendency. Measures of dispersion.

**7 Hours**

##### UNIT - 3

Random sampling errors, relations between samples and populations, confidence interval.

**6 Hours**

##### UNIT - 4

The normal distribution- counts of proportions and counts of random events, binomial and Poisson distributions.

**7 Hours**

#### PART - B

##### UNIT - 5

Control charts, their uses and limitations in control of quality.

**7 Hours**

##### UNIT - 6

Test of significance. For means and dispersions, chi- square test.

**7 Hours**

##### UNIT - 7

Analysis of variance-One way & two way.

**6 Hours**

##### UNIT - 8

Correlation and Correlation co- efficient. Regression Analysis. Time series.

**6 Hours**



**TEXT BOOKS:**

1. **Textile Testing, J.E. Booth** – Buttersworth Pub, London, 1972
2. **Statistics For Textile Technologists** – L.H. C. Tippet, Textile Institute, Manchester 1973
3. **Handbook of Textile Testing and Quality control** – Hamby Grower – Willey Eastern Pvt Ltd Delhi 1969.
4. **Practical Statistics for Textile Industry** – Part-1 & 2, Gav-Leaf, Textile Institute, 1984

**REFERENCE BOOKS:**

1. **Industrial Statistics and Quality Control** – A. J. Duncan – D.B. Taraporewalla and Sons, 1970
2. **Statistical Method and their Applications** – BIS Publications

**ADVANCED FABRIC STRUCTURE & DESIGN**

Subject Code	: <b>06TX62</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A****UNIT - 1**

Wels & pique fabrics, figured pique Fabrics.

**6 Hours****UNIT - 2**

Extra warp and extra weft fabrics. Backed weaves and fabrics.

**6 Hours****UNIT - 3**

Double cloths- Classification, selection criteria for threads, weaves etc., self stitched double cloths & Interchangeable double cloths.

**7 Hours****UNIT - 4**

Center stitched double cloths. Principle of designing simple damask and brocades.

**7 Hours****PART - B****UNIT - 5**

Gauze and leno structures, principles of leno structure, basic sheds in leno structure, leno weaving with flat steel doupes with an eye, Russian cords design, simple net leno, Easing action shaker device.

**7 Hours**

## **UNIT - 6**

Weft pile fabrics- allover or plain velveteen, corded velveteen.

**6 Hours**

## **UNIT -7**

Terry pile structures- formation of pile, terry weaves, figured terry pile fabrics.

**7 Hours**

## **UNIT - 8**

Warp pile fabrics produced with the aid of wires and by face to face principle. Narrow fabrics. Uncommon woven structures- Lappet & Swivel fabrics.

**6 Hours**

### **TEXT BOOK:**

1. **Watsons Advanced Textile Design** – Z.J Grosicki – Universal Publishing Corporation, Bombay 1988

### **REFERENCE BOOK:**

1. **Grammar of Textile Design** – H. Nisbet – Tareporewala and Sons, 1985

## **FASHION DESIGN AND GARMENT MANUFACTURE**

Subject Code	: <b>06TX63</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### **PART - A**

#### **UNIT - 1**

Terms and definitions used in fashion and Garment Industries. The art and techniques of Body measurements and standard sizes and measurements prevalent in Garment industries. Psychological and sociological influences of dress, fashion design as applied to clothing and appearance. Texture column-trends, shapes, forms and design associated with clothing. Selection of fabrics for suitable end uses.

**7 Hours**

#### **UNIT - 2**

Principles and practices of pattern making, Grading, Computer applied pattern making and grading. Pattern making for men, women and children ware. Production operations- Initiation of pre-production operation, Marker planning,Markermaking,spreading,cutting,Numbering&bundling.

**6 Hours**

### **UNIT - 3**

Stitches seams & thread-classes of seams and stitches, seam appearance & performance.

Equipment assembly & pressing- Stages of technology advancement, purpose of operation of equipment, sewing machine fundamentals, work aids, pressing equipment.

**7 Hours**

### **UNIT - 4**

Fusing, Advantages of fusing, Requirements of fusing, Fusing process, Fusing Equipment And materials, Methods of fusing, Quality control in fusing. Fabric quality & performance –selection of piece goods, quality, aesthetics & performance of piece goods, evaluation of fabric quality.

**6 Hours**

## **PART - B**

### **UNIT - 5**

Sourcing of materials & production- Role of sourcing, make or buy decisions, sourcing materials, responsibilities of materials buyers, sourcing production. Inspection of fabrics under 4 point & 10 point systems.

**7 Hours**

### **UNIT - 6**

Production planning & management- Production planning, productivity, resource management. Apparel Engineering- Basic concepts, work flow, apparel production systems, production control, work study, ergonomics.

**6 Hours**

### **UNIT - 7**

Costs, Costing, Pricing & profit.- Cost & profits, stages of costing, methods of costing, determining product costs, pricing strategies.

**6 Hours**

### **UNIT - 8**

Support materials- Purpose of support materials, interlinings, linings, other support materials. Closures- Purposes of closures, zippers, button & button holes, snaps, hooks & loop tape, elastic. Trims- types & sources of trims, knit trims, embroidery, appliques, insert trims, lace, screen printing, heat transfer prints, labels. Garments Quality Control- Inspection of garments under different AQL standards like 2.5, 3.0 & 4.0. Introducing AATCC and ASTM standards for garments quality control, metal detecting in garments.

**7 Hours**

### **TEXT BOOKS:**

1. **The technology of Clothing Manufacture** – Carr H. & Latham B – 1988, Blackwell Scientific Publication, Oxford England

2. **Metric Pattern Cutting** – Aldrich W 1992, blackwell Scientific Publication, Oxford England
3. **Apparel Manufacturing** – Ruth E. Glock, Grace I. Kunz-, PHI Publication, UK

**REFERENCE BOOKS:**

1. **Pattern Cutting for Womens Outwear** – Gerry Cooklin – 1994, Blackwell Scientific Publications, Oxford England.
2. **The NIFT Book of Grading and sizing** – Vol I and II, Published by NIFT Campus, Near Gulmohor Park, New Delhi 110016
3. **Fashion Source Book** – Kathryn Mikelvey – 1996, Blackwell Scientific Publication, Oxford England
4. **Fusing Technology** – Cooklin G, 1990, The Textile Institute, Manchester, England

**CHEMICAL PROCESSING OF TEXTILES – II**

Subject Code	: 06TX64	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A**

**UNIT - 1**

Classification of dyes and principles of dyeing Chemicals and auxiliaries used for textile dyeing and their functions. Chemical constitution of dyes. Effect of fibre structure on dyeing behavior Theories of dyeing, action of electrolytes, effect of dye bath temperature, Effect of material to liquor ratio, Effect of dye bath pH, Mechanism of dyeing, various factors affecting dyeing, selection of dyes for specific end uses.

**7 Hours**

**UNIT - 2**

Evaluation of fastness properties of dyed materials. Properties, Selection and application of various dyes like direct dyes, basic dyes, acid dyes.

**6 Hours**

**UNIT - 3**

Sulphur dyes, Azoic dyes, Vat dyes, Sol-vat dyes, Mordant dyes, Reactive dyes.

**6 Hours**

**UNIT - 4**

Disperse dyes, Modified basic dyes on important natural and manufactured fibres. Various after treatments given to dyed goods. Introduction to natural dyes and their methods of application

**7 Hours**

## PART - B

### UNIT - 5

Preparatory process for garment dyeing, specialty chemicals and dyes used for garment dyeing. Different types of dyeing practices for various types of garments, precautions to be taken for effective dyeing of garments.

**6 Hours**

### UNIT - 6

Quality control in garment dyeing. Working principles of dyeing machinery for yarns, fabrics and garments. Latest developments in dyeing machinery

**7 Hours**

### UNIT - 7

Brief study on eco-friendly dyeing processes. Dyeing of blends and knitted fabrics

**7 Hours**

### UNIT - 8

Introduction to colour measurement and computer colour matching. Developments in dyes, chemicals & dyeing practices.

**6 Hours**

### TEXT BOOKS:

1. **Dyeing and Chemical Technology of textile Fibres** – E.R. Trotman,
2. **Technology of Textile Processing** – V A Shenai – Vo. III, 1975, Sevak Publications.
3. **Technology of Bleaching and Dyeing of textile fibres** – Chakrawarthy, 1972, Coxtown publications.
4. **Textile Chemistry Vo. I & II, R H Peters** – Elsewhere Publishing Co., New York
5. **Technology of Textile Processing Vo.II, Chemistry of Dyes and Principles of Dyeing** – V.A. Shenai – 1993, Sevak Publications.

### REFERENCE BOOKS:

1. **Textile Auxiliaries and Finishing Chemicals** – ATIRA Publications.
2. **Modern techniques of textile Bleaching** – Dyeing, and Finishing, SITRA Pub.
3. **Chemical Processing of Cotton** – Polyester Cotton Blends, J.R.Modi and A.R. garde, 1980, TAI Publications.
4. **Dyeing of Polyester Blends** – M L Gulrajani, 1980, TAI Publications.
5. **Principles and practice of Dyeing** – V A Shenai, 1993 Sevak Publications.

## ELECTIVE-1 (GROUP A)

### SERICULTURE

Subject Code	: 06ST651	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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#### PART - A

##### UNIT - 1

Introduction to sericulture and silk industry. Classification & varieties of mulberry & non mulberry silks. General Aspects of Mulberry - Botanical description.

**7 Hours**

##### UNIT - 2

Classification & Varieties, Anatomy & Embryology, Cytogenetics & breeding. Mulberry cultivation— Environmental conditions, propagation, moriculture, Irrigation, manuring, pruning, harvesting leaves.

**7 Hours**

##### UNIT - 3

Types of mulberry, diseases and pests of mulberry.

**6 Hours**

##### UNIT - 4

General principles of silk worms rearing. Environmental conditions for silk worm rearing. Various methods, precautions during rearing.

**6 Hours**

#### PART - B

##### UNIT - 5

Rearing equipment and their maintenance. Primary requisites for successful silkworm rearing.

**7 Hours**

##### UNIT - 6

Chawki rearing practices and recent developments in silk rearing. Silk worm seed production and activities in a Grainage house.

**6 Hours**

##### UNIT - 7

Diseases and pests of silkworms uzi-fly menace and its control.

**6 Hours**

## UNIT - 8

**COCOONS:** Different types of cocoons, physical and commercial characteristics-sorting of cocoons-cocoon testing-storage of cocoons. Status of sericulture and growth of silk industry in India and abroad.

**7 Hours**

### TEXT BOOKS:

1. **Handbook of Practical Sericulture** – S R Ullal and M. N Narasimhana
2. F.A.O Publication silk manual.
3. **Hand book of silk Technology** – T.N. Sonwalkar
4. **Mulberry silk Reeling Technology** – D.Mahadevappa, V.G. Malliyal,

### REFERENCE BOOK:

1. D.G. Shankar, Ravindra Bhandiwad, Oxford and IBH Publishing co. Pvt. Ltd.

## SMART TEXTILES

Subject Code	: 06TX652	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Introduction to Smart Textiles. An Overview on smart textiles.

**6 Hours**

### UNIT - 2

Electrically active polymer materials - applications of non-ionic polymer gel and elastomers for artificial muscles.

**7 Hours**

### UNIT - 3

Heat-storage and thermo-regulated textiles and clothing. Thermally sensitive materials.

**7 Hours**

### UNIT - 4

Cross – linked polyol fibrous substrates as multifunctional and multi-use intelligent materials

**6 Hours**

## PART - B

### UNIT - 5

Mechanical properties of fibre bragg gratings. Optical responses of FBG sensors under deformations.

**6 Hours**

### UNIT - 6

Smart textile composites integrated with optic sensors. Embroidery and smart textiles

**6 Hours**

### UNIT - 7

Adaptive and responsive textile structures (ARTS). Wearable technology for snow clothing.

**7 Hours**

### UNIT - 8

Bio-processing for smart textiles and clothing Tailor-made intelligent polymers for biomedical applications. Textile scaffolds in tissue engineering.

**7 Hours**

### TEXT BOOK:

1. **Smart Fibres, Fabrics and clothing** – Ed. Xiaoping woodhead publishing Ltd., England, 2001.

## TEXTILE MECHANICS AND CALCULATIONS

Subject Code	: 06TX653	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Equations of Motion- Motion in a circle- Transmission of motion by wheel gearing. V-Belt Drives - Comparison of flat and V-belts, Belt slippage, Effect of belt thickness, effect of initial tension on the belt. Effect of centrifugal force, horse power transmitted. Belt materials. Factors affecting the selection of V- belts, Joints in belting.

**7 Hours**

### UNIT - 2

Brief explanation of fast and loose Pulleys, guides, jockey or rider and grooved pulleys. Rope and Chain Drives: Driving by gears, determination of speed ratios in simple and compound gear train.

**6 Hours**



### **UNIT - 3**

Draft factor, rack and pinion and screw traversing mechanisms, determination of speed ratio in epicyclic gear train. Sun and Planet gears as transmission gear- application in spinning and weaving machinery. Stepped pulleys

**7 Hours**

### **UNIT - 4**

Construction of heart shaped 3- leaved and combined build cams for spinning machinery. Different between Tappets and cam construction for 1/1,2/1,1/2 and 1/3 weaves.

**6 Hours**

## **PART - B**

### **UNIT - 5**

Study of eccentricity and its effects, construction of displacement, velocity and acceleration diagrams.

**6 Hours**

### **UNIT - 6**

Brief study of clutches and brakes - Application in Textile machinery, kinetics and dynamics of shedding, picking beating - up, take up and let-off mechanism Derivation showing frictional force  $F$  is directly proportional to the distance of weight from the fulcrum in friction let off mechanisms.

**7 Hours**

### **UNIT - 7**

Essential weaving calculations like winding rate in double flanged bobbins, cheese, cone, precision winders. Production related to winding, warping, sizing, reed calculations. Problems related to loom production and efficiency.

**7 Hours**

### **UNIT - 8**

Yarn calculations, yarn count, systems, conversion from one count to other, within the system and between the system. Details about average count and resultant count. Cloth calculations, Calculation of fabric weight, average count, warp and weft calculations.

**6 Hours**

### **REFERENCE BOOKS:**

1. **Mechanics of Textile Machinery** – W .A. Hanton, Longmans – Green and Co., London, 1950.
2. **Textiles Mathematic** – J .E.Booth – Vol .1,2,3, f Butterworths Pub London., 1950. .
3. **Textile Mechanics** – K.Slater – Vol 1&2, , Textile Institute I Pub., 1979'
4. **Weaving Calculation** – Sen Gupta – D.B. Tarparwala & Sons., 1956

## ADVANCED FABRIC STRUCTURE & DESIGN LAB

Subject Code	: 06TXL66	IA Marks	: 25
No. of Practical Hrs/ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Analysis of dobby design fabrics.
2. Analysis of fancy woven design fabrics.
3. Analysis of jacquard design fabrics.
4. Analysis of printing design fabrics.
5. Generating of geometric, abstract, floral, animation and combined designs.
6. Application of paint brush and other related software in colour mixing.
7. Utilization in design software for creating textile designs intended for dobby.
8. Utilization in design software for creating textile designs intended for jacquard.
9. Utilization in design software for creating textile designs intended for printing.
10. Simulation of fabric appearance of woven designs by varying fabric set and yarn count.
11. Analysis of colour and weave fabrics and simulating the appearance using computer.
12. Scanning of fabric and simulating the appearance of the same.
13. Scanning of yarn and imitating the appearance of a yarn in woven fabric form.
14. Transformation of design to production particulars.

## **FASHION DESIGN & GARMENT MANUFACTURE LAB**

Subject Code	: <b>06TXL67</b>	IA Marks	: 25
No. of Practical Hrs/ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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Consideration of essential and desirable properties for selecting fabrics for garment with suitable examples. Review of old fashion and new fashions with supporting examples.

1. Method of inspecting fabrics for visual defects under different points.
2. Analysis of fusible interlinings and coated interlinings for their characteristics and applications.
3. Study of various buttons, labels and decorative materials for their characteristics and applications.
4. Study of different types of sewing machines
5. Analysis of sewing and embroidery threads and polyester bags
6. Practice of manual cutting method for different fabrics- for men, women and children
7. Practice of stitching methods - types of stitched seams, stitching of garments, different varieties like woven, knitted and silk fabrics
8. Fashion illustration & preparation of garments as per the design
9. Selecting of different garments & preparation of drafts and garments.
10. Development of garment components for Men's, Women's and Children's wear.
11. Computer aided marker preparation for Men's, Women's and Children's Wear.
12. Calculation of marker efficiency using manual and CAD method.
13. Grading of garment for Men's and Women's wear.
14. Digitization of garment components using readymade garment and grading the same.

## CHEMICAL PROCESSING OF TEXTILES LAB-II

Subject Code	: 06TXL68	IA Marks	: 25
No. of Practical Hrs./ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Dyeing of Cotton yarn / fabric using direct dyes
2. Dyeing of Cotton yarn / fabric using reactive dyes
3. Dyeing of Cotton yarn / fabric using Vat/ soluble vat dyes
4. Dyeing of Cotton yarn / fabric using Azoic colours
5. Dyeing of Cotton yarn / fabric using Sulphur dyes
6. Dyeing of silk with acid and basic dyes
7. Dyeing of silk with metal complex dyes
8. Dyeing of acrylic using basic dyes
9. Dyeing of polyester using disperse dyes with carrier, HTHP and Thermosol dyeing technique
10. Dyeing of garments with various classes of dyes
11. Dyeing of cotton, silk and wool using important natural dyes
12. Determination of K/S and matching of shades using spectrophotometer
13. Analysis of dyes, chemicals and auxiliaries
14. Measurement of washing / rubbing fastness of dyed goods

## VII SEMESTER

### APPAREL MARKETING AND MERCHANDIZING

Subject Code	: 06TX71	IA Marks	: 25
No. of Lecture Hrs/ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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#### PART - A

##### UNIT - 1

Organization of the Apparel Business- Nature of Apparel, Organization of the Apparel Industry- Business Concepts Applied to the Apparel Industry- International Issues- Cooperation in Manufacturing and Distribution.

**6 Hours**

##### UNIT - 2

Marketing Objectives and Strategies-Functional organization of an apparel firm, responsibilities of marketing division strategic plan, marketing objectives & strategies, Retail and Wholesale Strategies of Merchandise Distribution-Labeling and Licensing.

**7 Hours**

##### UNIT - 3

Merchandising strategies & process- Concepts apparel production lines, dimensions of product change, nature & timing of merchandising responsibilities, business & marketing plans, line planning, line development line presentation, sourcing.

**7 Hours**

##### UNIT - 4

Analysis of garment development- Role of garment analysis, process of garment analysis, professional perspectives on garment analysis.

**6 Hours**

#### PART - B

##### UNIT - 5

Product Standards and Specifications: Sources of Product and Quality Standards- Standards for Quality, Fit, and Performance- Use of Specifications- Writing Specifications for Apparel Manufacturing.

**7 Hours**

##### UNIT - 6

Apparel Design: Product Development and the Design Function- Role of Product Change in the Design Process- Post adoption Style. Development-Apparel Design Technology.

**6 Hours**

## UNIT - 7

Export Marketing: Outlook for export marketing, International agreement & agencies for promoting exports. Export import policy. Export assistance. Current pattern of India's foreign & world trade, Export barriers-tariff & non tariff, Export Assistance.

**7 Hours**

## UNIT - 8

Export marketing channels, physical distribution- transportation, packaging & marine insurance for exports. Management of risk & export financing, Quality control & pre-shipment inspection, documents for exports. An Introduction to retail marketing. Consumer behavior & retail operation. The retail marketing mix. Management of a retail brand. Application of IT in retail marketing.

**6 Hours**

### TEXT BOOKS:

1. **Apparel Manufacturing** – Ruth E. Glock, Grace I. Kunz-, PHI Publication, UK
2. **Export Marketing** – B.S.Rathore & J.S.Rathore – Himalaya Publishing house, Bombay, 1997

### REFERENCE BOOKS:

1. **The Technology of Clothing manufacture**-Herold Carr and Barbara Latham
2. **Individuality**-Mary Kefgan, Phylliss Touchies Specht
3. **Apparel Manufacturing and Sewn Product Analysis**-Ruth E Clock
4. **Quality Control in Apparel Industry**-By Pradip V. Mehta
5. **Fabulous fit** – Judith Rashand
6. **Marketing Management**-Phillip Kotler
7. **Retail marketing management** – David Gilbert

## SILK REELING TECHNOLOGY

Subject Code	: 06ST72	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Importance of cocoon quality, factors influencing quality of cocoon, Cocoon characteristics.

**6 Hours**

## **UNIT - 2**

Pretreatment of cocoons: Stifling of cocoons-Objects, various methods, merits and de-merits. Cocoon storage, cocoon mixing, deflossing & riddling, cocoon sorting.

**6 Hours**

## **UNIT - 3**

Cocoon cooking – Objects, various methods such as open pan, three-pan, conveyor cooking etc. - merits and demerits

**7 Hours**

## **UNIT - 4**

Silk Reeling - Systems of silk reeling, factors influencing silk reeling, Silk reeling machinery & processes.

**7 Hours**

## **PART - B**

## **UNIT - 5**

Charaka-cottage basins-multi end filatures, semi-automatic and automatic types. Re-reeling, Skein finishing & packing. Recent developments in reeling of silk.

**6 Hours**

## **UNIT - 6**

Silk Throwing – Objects – Winding, doubling, re-winding and twisting. Manufacture of yarns for use in ordinary, chiffon, crepe, Georgette fabrics - Recent developments in silk throwing machinery.

**6 Hours**

## **UNIT - 7**

Quality Control in Reeling: characteristics of water, treatment methods for water for reeling. Water quality in reeling clusters.

**7 Hours**

## **UNIT - 8**

Raw silk testing & grading – National & International methods of testing & grading of raw silk, shell ratio, assessment of renditta, reelability.

**7 Hours**

## **TEXT BOOKS:**

1. **Handbook of Practical Sericulture** – S R Ullal and M. N Narasimhana
2. F.A.O Publication silk manual.
3. **Hand book of silk Technology** – T.N. Sonwalkar
4. **Mulberry silk Reeling Technology** – D.Mahadevappa, V.G. Malliyal, D.G. Shankar, Ravindra Bhandiwad, Oxford and IBH Publishing co. Pvt. Ltd.

## KNITTING TECHNOLOGY

Subject Code	: 06TX73	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

Introduction to knitting. Evaluation of knitting technology, knitting industries position in India, general terms and principals of knitting technology. Knitting Elements, Elements of knitted loops structures. Comparison of warp and weft knitting

**6 Hours**

#### UNIT - 2

Weft Knitting- Weft knit structures & their characteristics. The four primary based structures – Introduction, Plain, Production of Single Jersey fabric on a circular latch needle machine, knitting head, knitting action cam system, sinker timing, rib fabric, needle timing, interlock, production of interlock fabric, example of interlock system, purl fabric.

**7 Hours**

#### UNIT - 3

Various types of weft knitting machines – Fabric machine & garment length machines, straight bar frames, flat machines circular machine. Stitches produced by varying the timing of the needle loop intermeshing.-Held loop, drop stitch, float stitch, float plating, and tuck stitch.

**7 Hours**

#### UNIT - 4

Ornamentation of weft knit structures. Colour stitch designs in weft knitting- Horizontal striping, intarsia, plating, individual stitch selection, weft knitted jacquard, accordion fabric, rib jacquard. Multiple cam track system, Pattern and selection devices, production of weft knitted fabrics

**6 Hours**

### PART - B

#### UNIT - 5

Aspects of knitting science- Knitted loop shape & loop length control, loop length warp, warp let-off, knitted fabric geometry, tightness factor, robbing back, needle bounce & high speed knitting. Knitted fabric properties, Star fish project and their implications, relaxation of weft knitted fabrics

**7 Hours**



## UNIT - 6

Different cams used, linear and non-linear cams and their advantages and disadvantages. Properties of hosiery yarns, advantages of positive feed motion. Different types of positive feed mechanism, development in weft knitting

**6 Hours**

## UNIT - 7

Warp Knitting-Basic warp knitting principle- Construction of warp knitted fabrics, warp beams, guide bar, guides, single needle bar structure, pattern mechanism, chain link.

**6 Hours**

## UNIT - 8

Tricot structures knitted with two full set guide bars- two bar tricot, lock knit, reverse lock knit sharkskin, queenscord, double atlas. Surface interest, relief and open work structures, laying in warp knitting. Multiguide bar machines and fabrics. Double needle bar warp knitting machines. Yarn counts, machine gauge, yarn quality for knitting, faults in knitting fabrics, causes and remedies

**6 Hours**

### TEXT BOOKS:

1. **Knitting Technology** – David J Spencer – Pergamon Press 1985, New York
2. **Knitting Technology** – Ajgaonkar – Universal Publishing Company, Bombay 1998
3. **Circular Knitting** – Mammel Schach

## CHEMICAL PROCESSING OF TEXTILES – III

Subject Code	: 06TX74	IA Marks	: 25
No. of Lecture Hrs. Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

Introduction to textile printing - An overview of the printing process. Selection of dyes/pigments/auxiliaries and textile substrate to suit the end use of the printed textile materials.

**6 Hours**

## **UNIT - 2**

The constituents and characteristic of printing paste. Brief study of different binders, thickeners, solvents, discharging agents and other ingredients of printing paste.

**6 Hours**

## **UNIT - 3**

Styles of printing – Direct, discharge, resist and special styles- chemical and mechanisms used for the above styles.

**7 Hours**

## **UNIT - 4**

Methods of printing – Printing by Hand block, Roller, hand screen, semi-automatic screen, flat bed and rotary screen printing methods. Developments in printing machinery.

**7 Hours**

## **PART - B**

## **UNIT - 5**

Transfer printing – Principle, mechanisms and continuous transfer printing – Transfer printing machinery. The print paste preparation and preservation. Printing of natural and synthetic fiber fabrics with various classes of dyes/pigments.

**6 Hours**

## **UNIT - 6**

Methods of print fixation – Drying, curing by dry heat, steam fixation etc. Finishing process an overview - objects and methods of finishing. Classification of various finishes – Various finishing chemicals used and their properties.

**7 Hours**

## **UNIT - 7**

Calendering and various calendering machines used. Sanforization – principle and the process. Resin and anti-crease finish on cotton and protein fibre fabrics. Water repellent finishes, fire retardant and fire proof finishes.

**7 Hours**

## **UNIT - 8**

Finishing of woollen materials, silk fabrics and blended products. Finishing of synthetic fibre fabrics - heat setting, de-lustering, anti-static, soil release, etc. Finishing of knitted fabrics. Fundamentals of computerized colour matching – K/S evaluation and principle of spectrophotometers.

**6 Hours**

**TEXT BOOKS:**

1. **Textile printing** – V.A.Shenai – Sevak publications, Mumbai
2. **Textile printing** – L.W.C. Miles – Butterwoths publications
3. **An Introduction to Textile Finishing** – J T Marsh – B Publications,1979

**REFERENCE BOOKS:**

1. **Rendering with Pen and Ink** – Thames and Hudson Publication
2. **Printed Textiles- A Guide To Creative Design Fundamentals** – Terry and Gentelle
3. NCUTE Publications on chemical Processing.

**ELECTIVE-II (Group B)****NON MULBERRY SILK TECHNOLOGY**

Subject Code	: <b>06TX751</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A****UNIT - 1**

Scope for non-mulberry silk in India, mulberry Vs. Non-mulberry. India's non-mulberry silk potential.

**6 Hours****UNIT - 2**

Food plants for non-mulberry silk for Tassar, Eri & Muga

**6 Hours****UNIT - 3**

Tassar Silk: Prerequisites for expansion Tassar Silk in India, varieties of Tassar silk, Morphology, anatomy, tassar cocoon production. Tassar silk reeling technology: reeling machines used, developments in reeling techniques.

**7 Hours****UNIT - 4**

Muga silk: scope Muga silk in Assam & other north east state, morphology, anatomy & rearing methods. Muga silk reeling & developments in silk reeling techniques.

**7 Hours**

## PART - B

### UNIT - 5

Eri silk: scope of Eri in tropical & sub tropical regions, morphology, anatomy & reeling techniques.

**6 Hours**

### UNIT - 6

Eri silk reeling & developments in silk reeling techniques.

**6 Hours**

### UNIT - 7

Spider silk: production of spider silk yarn, utilization in spider silk in technical textiles.

Diseases & pests for non mulberry silk-causes & remedies.

**7 Hours**

### UNIT - 8

Processing of non mulberry silks & blends-introduction to preparatory & dyeing of non mulberry silk.

**7 Hours**

### TEXT BOOKS:

1. **Handbook of Practical Sericulture** – S R Ullal and M. N Narasimhana
2. F.A.O Publication silk manual.
3. **Hand book of silk Technology** – T.N. Sonwalkar
4. **Mulberry silk Reeling Technology** – D.Mahadevappa, V.G. Halliyal, D.G. Shankar, Ravindra Bhandiwad – Oxford and IBH Publishing co. Pvt. Ltd.

## TOTAL QUALITY MANAGEMENT

Subject Code	: 06TX752	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Introduction TQM. Quality movement in Japan, US & India. Definition of quality. Small q & Big Q, Quality characteristics- weaves, Dimensions, determinants. Quality & profitability.

**6 Hours**

## **UNIT - 2**

Quality & management philosophies-Deming Philosophy- Chain reaction, 14 points for management, triangle theory of variance, deadly diseases & sins, Demings wheel. Juran Philosophy- 10 steps for quality improvement, quality trilogy, universal breakthrough sequence.Crosby Philosophy- Crosby's 6 C's, Absolutes of quality, Crosby's 14 points for quality, Crosby triangle. Comparison of 3 major quality philosophies

**7 Hours**

## **UNIT - 3**

Managing quality- traditional Vs Modern quality management, the quality planning, road map, the quality cycle. Cost of quality- Methods to reduce cost of quality, Sampling plans, O.C. curves

**6 Hours**

## **UNIT - 4**

Quality control - Objectives of quality control, Strategy & policy. Company wise quality control. Quality Assurance- Definition, concepts & objectives. Economic models for quality assurance. Statistical methodology in quality assurance. Process capability ratio, 6 sigma in quality assurance.

**7 Hours**

## **PART - B**

## **UNIT - 5**

Quality improvement, principles of total quality, Evolution of total quality control & principles.TQM- Basic concepts & overview. Necessity of TQM. Elements of TQM, benefits of TQM, TQM in services, ISO 9000 & ISO 14000 in quality management system.

**7 Hours**

## **UNIT - 6**

Focussing on customer- Importance of customer satisfaction, Kano's model of customers satisfaction, customers driven quality cycle, understanding customers needs & wants, customers retention.

**7 Hours**

## **UNIT - 7**

Leadership- Introduction, characteristics of quality leaders, role of TQM in leadership. Tools & Techniques of TQM, Just in time system-Concepts, objectives, overview, characteristics, benefits. Benchmarking- Introduction, process of bench marking, benefits, advantages & limitations

**6 Hours**

## **UNIT - 8**

Supply chain management- Objectives, process tools, supply chain management for manufacturing organization & service organization world

class manufacturing- becoming world class, relevance of TQM in world class manufacturing. World class supplier, world class customer, present global business conditions, world class companies in 21<sup>st</sup> century. Future of TQM.

**6 Hours**

**TEXT BOOKS:**

1. **Total Quality Management** – K. Shridhara Bhat – Himalaya Publishing House

**REFERENCE BOOKS:**

1. **Norms For Spinning, Weaving and Processing** – ATIRA Publication, Ahmedabad 1990
2. Handbooks manuals BIS ASTM ISO-9000
3. **Total Quality Management** – N.V.R. Naidu, K.M. Babu, G. Rajendra – New age international publishers

**FIBRE REINFORCED COMPOSITES**

Subject Code	: 06TX753	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A**

**UNIT - 1**

Introduction to composites. Basic nomenclatures – reinforcing phase, continuous phase, matrix, interface etc. Classification of composites with respect to fibre used, matrix used, limitations of engineering metals.

**7 Hours**

**UNIT - 2**

Study of mechanical & thermal properties various fibres Viz. Carbon, glass, silicon carbide, boron, kevlar, polyethylene, thiozole etc. used in the production of fibre reinforced composites.

**6 Hours**

**UNIT - 3**

Study of major natural fibres (coir, jute) which are used in the production of fibre reinforced composites. Classification of resins, thermoset, thermoplastic metal matrix. Their production properties, advantages, disadvantages (phenolic, epoxy, polyester, vinyl esters)

**7 Hours**

#### **UNIT - 4**

Composites manufacturing techniques-Introduction-Hand lay-up-spray-up-prepreg technology-centrifugal casting-filament winding.

**6 Hours**

### **PART - B**

#### **UNIT - 5**

Compression moulding-injection moulding-continuous manufacturing techniques. Study of mechanical and thermal properties of various composites viz. Glass boron carbon, aramid.

**6 Hours**

#### **UNIT - 6**

Study of various applications of composites mainly in the field like aerospace, medical, sports, ship building automobiles.

**7 Hours**

#### **UNIT - 7**

Brief outline on testing of composites.

**6 Hours**

#### **UNIT - 8**

Composite mechanics derivations of various equations related to composite structures viz. Axial modulus, transverse modulus, breaking strength of both continuous filament, reinforced and staple fibre reinforced composites, effect of volume of fibres on mechanical properties of fibre reinforced composites. Fatigue process in fibre reinforced composites.

**7 Hours**

#### **TEXT BOOKS:**

1. **Reinforced Material Technology** – N.J.Parratt:Fibr – Van Nostrand Reinhold Co, Inc 1972
2. **High Performance Fibre Composites** –J.H.Morely –Academic Press

#### **REFERENCE BOOKS:**

1. **DST-polymers and composites** – Recent trends – Proceedings of National Seminar1989, Oxford IBH Pub Co Pvt. Ltd.
2. **Composites Engineering hand books** – Ed. Mallik P.K., Marcell Dekker, N.Y., 1997.

**ELECTIVE-III (Group C)**  
**YARN MANUFACTURE - IV**

Subject Code	: 06TX761	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A**

**UNIT - 1**

Introduction to new spinning systems. Electrostatic and air-vortex spinning: Principle of yarn formation, problems associated with the production, specifications of the spinning machinery. Raw material requirement, advantages and range of yarn counts.

**7 Hours**

**UNIT - 2**

Friction spinning: Operating principle, kinds of friction spinning systems, technological interrelationships with respect to feed, opening, fibre transport, fibre collection, insertion of twist, yarn withdrawal and winding. Advantages and disadvantages, specialization of the processes.

**7 Hours**

**UNIT - 3**

Self twist and wrap spinning: Formation of a yarn, specifications of the spinning machines and technological interrelationships

**6 Hours**

**UNIT - 4**

Air-jet spinning: The false twist principle, operating principle of Air-jet spinning, raw material requirements, technical and economic interrelationships and machine specifications

**6 Hours**

**PART - B**

**UNIT - 5**

Study of SIRO spinning properties, variables affecting the properties and applications

**6 Hours**

**UNIT - 6**

Bobtex and twistless spinning, various methods, properties of yarn and application

**6 Hours**



## **UNIT - 7**

Core and cover spinning properties of yarn and application

**7 Hours**

## **UNIT - 8**

Comparison of the yarns produced by various spinning systems and their end uses. Techno-economic feasibility of modern methods of yarn production

**7 Hours**

### **TEXT BOOKS:**

1. **Spun yarn technology** – Oxtoby.Butter Worths
2. New spinning system, Short staple spinning series – W.Klein – Textile Inst., Vol.V

### **REFERENCE BOOKS:**

1. Spinning in the 70's – P.R.Lord.Mero,Walford,England,
2. Textile yarns – B.C.Goswamy, J.G.Martindale – Wiley Intersci,

## **SILK FABRIC MANUFACTURE**

Subject Code	: <b>06ST762</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### **PART - A**

#### **UNIT - 1**

Weaving: Preparation of warp and weft yarns. Different machinery employed in small scale and organized sector.

**7 Hours**

#### **UNIT - 2**

Silk weaving on hand loom and power looms. Speical features of Silk looms.

**7 Hours**

#### **UNIT - 3**

Production and preparation of light weight fabrics --- Plain, Crepe, Chiffon, and Georgette Fabrics.

**6 Hours**

#### **UNIT - 4**

Warp and Weft twist and its effect on Texture of Silk fabrics.

**6 Hours**

## PART - B

### UNIT - 5

Study of different Silk fabrics like soft silk fabrics, Mysore silks, Poochampalli, Kancheepuram Arani, Banaras, Molakalmuru, Ilkal and other silk fabrics produced in India.

**7 Hours**

### UNIT - 6

Preparation of Dupion dress materials and Furnishing fabrics. Design features of the above fabrics

**6 Hours**

### UNIT - 7

Production of silk fabrics --- Home textiles, Upholstery, Furnishing, dress materials using Unconventional Weaving Machines.

**6 Hours**

### UNIT - 8

Different effects in simple structured fabric –plain, twill, satin/sateen, crepe, seersucker etc., and variation in drawing-in-draft and reed in plan.

**7 Hours**

### TEXT BOOKS:

1. **Modern Yarn preparation** – Armerold
2. **Handbook Of Weaving** – Sabit Adanor
3. **Technical Handbooks** – CSB

### REFERENCE BOOKS:

1. **Principles of Weaving** – Robinson and Marks
2. **Woven Cloth Constructions** – Robinson and Marks

## ERECTION AND MAINTENANCE OF TEXTILE MACHINERY

Subject Code	: 06TX763	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Basic definitions related to mechanical design, vibration resistance, heat resistance, reliability, longevity, maintainability .Brief outline of engineering material.

**6 Hours**

## **UNIT - 2**

Different kinds of tools and the devices employed for erection and maintenance. Erection of machines, hoisting - equipment, over head cranes, machine installation conditions. Functions, prerequisite of maintenance and its classification.

**7 Hours**

## **UNIT - 3**

Function and classification of power transmission equipment and transmission members. Methods and kinds of repairs of textile equipment used in different departments.

**6 Hours**

## **UNIT - 4**

Cleaning and washing of parts. Various kinds of wears. Main factors influencing the wear of machine parts and methods increasing their wear resistance. Failure prediction of parts, units and mechanisms.

**7 Hours**

## **PART - B**

## **UNIT - 5**

Basic concepts of maintenance, Study of different maintenance programme, routine and preventive predictive remedial restorative maintenance.

**6 Hours**

## **UNIT - 6**

Maintenance of spinning, weaving, processing equipment as per the schedule.

**7 Hours**

## **UNIT - 7**

Function of prerequisite of lubricants, different lubricants used in the textile industry, method of lubrication.

**6 Hours**

## **UNIT - 8**

maintenance of ledgers spare parts etc. machinery maintenance audit and its advantages. House keeping, overhauling.

**7 Hours**

## **TEXT BOOKS:**

1. **Spinning Textile machinery maintenance** Pub – SITRA Coimbatore 1980
2. **Weaving Textile Machinery maintenance** Pub – BITRA, Bombay 1980
3. **Spinning, Weaving & processing machinery maintenance in textile mills** – B.B.Joshi, et al, , Textile & Allied industry research organization, Baroda, 1970

## **REFERENCE BOOK:**

1. **Repairs and maintenance** - Pub, MIR

## SILK REELING TECHNOLOGY LAB

Subject Code	: 06STL77	IA Marks	: 25
No. of Practical Hrs./ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Identification of defective cocoons.
2. Identification of different silk cocoons & sorting of cocoons
3. Measurement of renditta and denier.
4. Measurement of shell ratio.
5. Reeling of silk on silk reeling machine on charka, multi-end reeling machine.
6. Rewinding tests on silk winding machine.
7. Raw silk testing & grading
8. Twisting of silk on two for one twister.
9. Demonstration of cocoon stifling and reeling of silk automatic filature machine.
10. Testing of silk yams for its quality.

### CHEMICAL PROCESSING OF TEXTILES LAB-III

Subject Code	: 06TXL78	IA Marks	: 25
No. of Practical Hrs./ Week	: 03	Exam Hours	: 03
Total No. of Practical Hrs.	: 42	Exam Marks	: 50

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1. Preparation of colour charts by light, pigment, chromatic circle and Brewster's theory.
2. Preparation of printing paste using pigment colours
3. Printing practice using Hand blocks and screens with various classes of dyes
4. Preparation of screens for screen-printing.
5. Resist style ( batik) of printing on fabrics
6. Discharge style of printing on cotton, PET and silk
7. Tie and dye printing
8. Anti-crease finishing of cotton using formaldehyde and non-formaldehyde based chemicals
9. Softening of cotton and wool
10. Water proof finishing on cotton
11. Experiments on fastness properties of dyed and printed fabrics
12. Evaluation of dye uptake- K/S using spectrophotometer
13. Experiments on Finishing of garments.

**VIII SEMESTER**  
**INDUSTRIAL MANAGEMENT**

Subject Code	: 06TX81	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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**PART - A**

**UNIT - 1**

Principles and Functions of Management, Scientific Management. Organization: Concept, Importance, Structure, organization chart and types of organization.

**6 Hours**

**UNIT - 2**

Plant Location and Layout: Selection of Site for Textile Mills, Layout for machines in different Unit of a Textile Mill. Principles of plant layout, Plant maintenance.

**6 Hours**

**UNIT - 3**

Work Environment: Light requirement, air-conditioning, humidification and ventilation for a Textile Mill.

**7 Hours**

**UNIT - 4**

Work Study: Introduction, objectives, Procedure, Advantages and Components Motion Study - Concept, objectives and Techniques.

**7 Hours**

**PART - B**

**UNIT - 5**

Time Study - benefits, Limitations, procedure and work sampling Material Handling- Principles and Devices

**6 Hours**

**UNIT - 6**

Production, Planning and control: Introduction, objectives, Functions and Procedure, Product Planning, Product Development and Standardization.

**6 Hours**

**UNIT - 7**

Importance of Industrial Safety- Causes and consequences of accidents - Safety devices used in Textile Mill. Factory Act pertaining to Safety.

**7 Hours**

## UNIT-8

Nature and scope of Economics: Fundamental Concepts of Economics, Human wants, law of Supply and Demand. Economic Environment.

**7 Hours**

### TEXT BOOKS:

1. **Management of Textile Industry** – V.D. Dudeja – Pub., Textile Trade Press, Bombay 1981
2. **A Text book of Factory Organization** – Banga T.R. – Chaand Publications.
3. **Introduction to Work Study** – Universal Publishing Copr. – IIdia
4. **Macro and Macro Economics** – Dr. Samelson – ELS Publications.

### REFERENCE BOOKS:

1. **Management of Textile production** – Ormerod A, Butterwoths Pub. London 1980
2. **Business Management Theory and Practice** – Sinha I.C. and Magali V.N. – Verma , Publication, Delhi
3. **Personnel Management** – C.B. Mamoria – Himalaya Publishing House.

## TECHNICAL TEXTILES

Subject Code	: 06TX82	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Introduction to technical textiles. Requirements of fibres, yarns and fabrics for technical textiles. Classification of technical textiles. Study of properties of various fibres used for technical textiles. Agrotech: Textiles used for agriculture, Horticulture and animal husbandry

**6 Hours**

### UNIT - 2

Mobil Tech - Automotive textiles - Use of textiles in tires, top covers, upholstery, safety devices of automobiles. Requirements of fibres used for tires, various fibres used for tire cords, tire building, different types of tires, textiles used in Aerospace industry.

**6 Hours**

### **UNIT - 3**

Medical Textiles: Medical application of Textiles, requirements, classification, detailed study of application of textiles in implantable, non-implantable, extra corporal devices and health care hygienic products.

**7 Hours**

### **UNIT - 4**

Geo Textiles: Textiles for civil engineering - Road Railway, bridge, dam construction, functions of geo textiles. Fiber reinforced composites: Introduction, classification of composites, types of fibres, matrix used, applications of composites.

**7 Hours**

## **PART - B**

### **UNIT - 5**

Filter fibres: Introduction, types of filtration requirements, filtration mechanism, cleaning mechanism, Effect of yarns and fabric construction on filtration. Coated fabrics: Introduction, chemistry of coated textiles, coating techniques, fusible interlining.

**6 Hours**

### **UNIT - 6**

Heat and flame and chemical properties: Introduction to flammability, thermal behavior of fibres, fire retardant finishes, thermal resistant fibres. Chemical resistant fibres.

**7 Hours**

### **UNIT - 7**

Textiles in defense: Introduction, historical back ground, criteria for modern military textiles, textiles for environmental protection, Ballistic protective materials, water proof materials, application of textiles in camouflage. Application of Textiles in Packing, Power transmission, fish nets, sports, electrical industry.

**7 Hours**

### **UNIT - 8**

Smart textiles: Introduction, concept of smart textiles, various application of smart textiles. Introduction to nanotechnology in textiles. Application of Nan textiles in various field. Production and properties of nanofibres. Prospects of technical textiles in India.

**6 Hours**

### **TEXT BOOKS:**

1. **Hand book of Technical Textiles** – Ed. A.R.Horrocks – S.C, Anand. Wood Head Pub., England, 2000.



2. **Hand book of Industrial Textiles** – Ed S.Adanur – Technomic Pub., Lancaster-Basel, 1995.
3. **Smart Fibres, Fabrics, & Clothing** –Ed. Xiaoming Toa – Wood Head, England, 2001.
4. **Design of Textiles For Industrial; Applications** – ED P.W. Harrison –Pub Textile Institute 1977 Manchester

**REFERENCE BOOKS:**

1. **Handbook of Industrial Textiles** – E. R. Kaswell, Pub Willington, New York 1963
2. **Industrial Textiles** – P.K.Badami.
3. **International Seminar on Technical Textiles** – SASMIRA, 2000.

**ELECTIVE –IV (Group D)**

**HUMAN RESOURCE MANAGEMENT**

Subject Code	: <b>06TX831</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

**PART - A**

**UNIT - 1**

Human resource management, importance and impact on Textile Industry.

**6 Hours**

**UNIT - 2**

Understanding and Management of Human behavior at work, individual and group behavior, attitudes, motivation, communication and factors affecting behavioral changes to achieve higher production and profitability.

**10 Hours**

**UNIT - 3**

Importance of job analysis and job specifications.

**4 Hours**

**UNIT - 4**

Different types of evaluation, basis of promotion, demotion, transfers, methods of training personnel for higher performance and productivity. Advantages and disadvantages of line and group performance in garment Industries.

**8 Hours**

## PART - B

### UNIT - 5

Modern methods of recruitment, labour management relation, employ grievances and handling methods.

**6 Hours**

### UNIT - 6

Welfare measures and implementation.

**4 Hours**

### UNIT - 7

Latest amendments in Factories Act, wage and salary administration, incentive scheme. case studies on the above topic

**10 Hours**

### UNIT - 8

Analysis and suggestions. Problem solving and remedies.

**4 Hours**

### TEXT BOOKS:

1. **Personal Management** - Edvin B. Flippe
2. **Personal Management** - Subratha Ghosh.
3. **Personal Management** - Duck Torington.

### REFERENCE BOOK:

1. **Management of personnel in India** – N.N Chattargee.

## FINANCIAL MANAGEMENT

Subject Code	: 06TX832	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Finance function, goals of finance management, Financial planning, Major financial decision areas.

**6 Hours**

### UNIT - 2

Capital structure: measure of leverage, effects of lever- I, traditional approaches, MM theory of financial leverage and value of the forms. Designing of capital structure- EBIT- EPS analysis, risk-return trade-off.

**6 Hours**

### **UNIT - 3**

Investment decision: Method of capital budgeting- traditional and time adjusted methods, risk and un-certainty in capital ties, creditor-ship securities. Convertible and tradable warrant.

**7 Hours**

### **UNIT - 4**

Dividend policy: Factors affecting dividend policy relevance of the dividend policy- Walters model, Gordon's model- M.M. theory, types of dividend policies- Bonus shares - corporate dividend policy in practice.

**7 Hours**

## **PART - B**

### **UNIT - 5**

Market for corporate securities, trading procedures in stock exchange, financial services, leasing, mutual funds, SEBI and market regulation. Working capital management, receivables, inventories and cash management, Merger and take-overs.

**6 Hours**

### **UNIT - 6**

Objects of costing-elements of costs-types of overheads, Allocation of factory over heads by different methods- determination of selling price. Definition and objects of depreciation-break-even analysis.

**6 Hours**

### **UNIT - 7**

Definition and Advantages of Cost Accounting. Elements of cost. Introduction, classification, elements and allocation of Material cost. Labour cost and over head cost.

**7 Hours**

### **UNIT - 8**

Process cost calculation- introduction, special features of Textile processing and its cost calculation. Introduction to standard costing and Budgetary control. Statutory guidelines on the maintenance of cost records.

**7 Hours**

### **TEXT BOOKS:**

1. **Financial Management** - M.Y. Khan and Jain
2. **Financial Management and Policy** - James Varn Horny
3. **Financial Management** - Keown Scott

## NON WOVEN TECHNOLOGY

Subject Code	: 06TX833	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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### PART - A

#### UNIT - 1

Introduction to non-woven fabric, comparison with other fabric forming methods, Classification of non-woven (various approaches).

**6 Hours**

#### UNIT - 2

Fibres used in non-woven and their testing, Characteristic features and properties of non-woven fabrics, Identification of non-woven.

**6 Hours**

#### UNIT - 3

Manufacture of non-woven: Dry methods- various methods of web preparation (Opening, blending and cleaning machines used) technology used in production of parallel, cross-laid and random laid webs, web laying, and machines.

**7 Hours**

#### UNIT - 4

Wet methods: principles and raw materials, web laying, concept of drift deposition. Adhesive bonding: bonding agents and their application, bonding mechanisms, factors influencing the process, conditions for providing necessary adhesions, various method of adhesive bonding. Mechanical bonding: introduction to needle punching, passage of material through needle loom, pre-needling, specification of a needle, various constructional details of needles.

**7 Hours**

### PART - B

#### UNIT - 5

various types of needle arrangements, technical particular like needling density, web weight, depth of needle penetration and their relation, needling speed and its effects, fabric structure and properties, patterning major uses of needled fabrics. Research studies on needle punching.

**6 Hours**

#### UNIT - 6

Brief outline of thermal and cohesive methods of non-woven production, Details of spun bonding and spun lacing methods, Melt blown technology in

non-woven production. Finishing of non-woven: methods, dyeing and, printing, coating, lamination and special finishing techniques.

**6 Hours**

### **UNIT - 7**

Structure and property relation in non-woven: Structure of non woven, effect of fibre, web and processing parameters on the non- woven fabric properties, theory of mechanics of non-woven, testing of non-woven.

**7 Hours**

### **UNIT - 8**

Application of non-woven: A detailed study of application on non woven in medical field, home applications, shoes and leather industries" electrical industry, Applications as technical textile in automobiles etc.

**7 Hours**

### **TEXT BOOKS:**

1. **Non woven** – Radko croma – Textile Trade Press, Manchester, 1971.
2. **Non woven bonded fabrics** – J.Lunenscoloss – Et al, Ellis Hotwood, London, 1985.
3. **Needle Punching** – Purdy – The Textile Institute, Manchester, 1980.
4. **Research Study on Needle Punched Fabrics** - Subramanyam and Madhusudhanan – International Conference, 1.1. T Delhi, 1993.
5. **Needle punching** – Mrstina and Tejqi, Elsevier, New-York, 1990.
6. **International Seminar on Non** – Woven Book of Papers Published by BITRA, 1990.
7. **Non-Woven in 71** – John and Willey – Eastern publications, 1980.
8. **Non -Woven Materials and Recent Developments** - Gilies Noyes – Dara Corporation, New-Jersey, USA, 1979.
9. **MeltBlown Technique of Non Woven** – Sanjeev Malkan –1987.
10. **Non-Woven Manufacture** - Prof. N. N. Banerjee.
11. **Non-Woven Manufacture** – Encyclopedia of Textiles, Textile Institute, London.

## ELECTIVE-V (Group E)

### POLLUTION CONTROL IN TEXTILE INDUSTRY

Subject Code	: 06TX841	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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#### PART - A

##### UNIT - 1

Quality of Water, BIS standard for drinking water, factors affecting the quality of water and causes of other pollution and remedies.

**7 Hours**

##### UNIT - 2

Sewage- definition- characteristics of sewage, general methods of treatment of sewage, disposal of sewage.

**6 Hours**

##### UNIT - 3

Industrial effluents: The disposal of industrial effluents in to streams. Characteristics of textile mill effluents, disposal and effect on the receiving streams.

**7 Hours**

##### UNIT - 4

Noise pollution, causes of noise pollution, effects of noise pollution, remedial measures. Methods of noise control in textile mills.

**6 Hours**

#### PART - B

##### UNIT - 5

Brief discussion about different instruments used in analysis of effluents.

**7 Hours**

##### UNIT - 6

Pollution and its impact on ecology, environment and society.

**6 Hours**

##### UNIT - 7

Sources of pollution and its control. Various methods of industrial waste water treatment. Treatment of effluents received from textile wet processing industries.

**7 Hours**

## UNIT - 8

Role of filter fabrics in pollution control. Indian pollution acts, their role and effectiveness. Recent developments in pollution control in various processes in textile mills and manufacturing plants.

**6 Hours**

### TEXT BOOKS:

1. **Water Supply And Sewage** – Mc Graw Hill Publication
2. **Waste Water Treatment, International Publication** – M. N. Rao and A. K. Dutta
3. **Waste Water Engg Treatment Disposal Sewage** – Tata Mc Graw Hill Publication
4. **Pollution and its Control** – Chand Publication

### REFERENCE BOOKS:

1. **Efficient use of Fuel** – H. M. S. D. Publication London 1958
2. **Energy Resources** – Demand and Conservation with Special Reference to India, C. Kashjan

## SILK BY-PRODUCT TECHNOLOGY

Subject Code	: 06ST842	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Introduction to by-products of silk. Classification silk waste, economic importance.

**6 Hours**

### UNIT - 2

Sources & utilisation of silk waste – Silk worm pupae, basin refuge, cut & pierced cocoons, double cocoons, reelers & cocoors waste.

**6 Hours**

### UNIT - 3

Spun silk manufacturing-Preparatory processes in spun silk industry- degumming, rinsing, hydro-extraction drying.

**7 Hours**

### UNIT - 4

Spinning of silk yarn- spinning, cutting, carding, drawing, combing, roving, spinning, doubling, twisting, winding, gassing etc.

**7 Hours**

## PART - B

### UNIT - 5

Dupion silk: Introduction, reeling of dupion silk, end uses.

**6 Hours**

### UNIT - 6

Noil Yarn: extraction of waste & spinning of Noil yarn. Production of silk from Silk hard waste: technology & machinery used.

**6 Hours**

### UNIT - 7

Utilization of pupae- drying, oil extraction from pupae, utilization of pupae in other food products. Bi-products of mulberry- Utilisation of mulberry fruit in food industry.

**7 Hours**

### UNIT - 8

Marketing & entrepreneurship development in silk bi-product industry.

**7 Hours**

### TEXT BOOKS:

1. **Handbook of Practical Sericulture** – S. R. Ullal and M. N. Narasimhan
2. F.A.O Publication silk manual.
3. **Hand book of silk Technology** – T.N. Sonwalkar
4. **Mulberry silk Reeling Technology** – D.Mahadevappa, V.G. Malliyal, D.G. Shankar, Ravindra Bhandiwad – Oxford and IBH Publishing co. Pvt. Ltd.

## ELECTRONIC CONTROLS IN TEXTILE MACHINES

Subject Code	: <b>06TX843</b>	IA Marks	: 25
No. of Lecture Hrs./ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hrs.	: 52	Exam Marks	: 100

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## PART - A

### UNIT - 1

Basics of electronics: Introduction, general concepts, Kirchoff's current laws, Kirchoff's voltage law, Thevenin's theorem, Norton's theorem

**6 Hours**

### UNIT - 2

Analog electronics, Ideal diodes, rectifiers, half wave rectifiers, wave shaping circuits, ideal amplifiers, ideal operational amplifiers, inverting amplifiers,



field effect transistors, Mosfet Biasing circuit, Thyristors digital electronics, logic gates and operation, logic gate memory and digital processing resistors.

**7 Hours**

### **UNIT - 3**

Automatic textile control system, feed forward control system, combined loop control system, electronic system for textile testing, modern evenness tester.

**7 Hours**

### **UNIT - 4**

Electronic inspection boards, modern airiness tester, working principle of strain gauge transducers, on line quality monitoring in ring frame, optical sensors for textile machines, textile quality control through digital imaging. Nep control at card.

**6 Hours**

## **PART - B**

### **UNIT - 5**

AC / DC drives in textile machine, Basic principles of induction motor operations, induction motor drive, load commutated inverted drives, motor used in various textile processes.

**7 Hours**

### **UNIT - 6**

Micro controller application in textile industry: Introduction to micro controller signal, conditioning and data converters.

**6 Hours**

### **UNIT - 7**

Building blocks of textile automation, voltage follower, instrumentation amplifier, data converters, digital to analog converters, analog to digital converters, bridge rectifier fed drive.

**7 Hours**

### **UNIT - 8**

Microprocessor base controller for DC motor drives, AC regulator, Synchronous motor speed drive. Maintenance methods of electronic system in textile mills.

**6 Hours**

### **TEXT BOOKS:**

1. **Electronic controls in textile machines-** NCUTE training material, IIT, New Delhi

## PROJECT WORK

Subject Code	:	<b>06 ST85</b>	IA Marks	:	100
			Exam Hours	:	03
			Exam Marks	:	100

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The Students in a group will be assigned as experimental, design, a case study or an analytical problem to be carried out under the supervision of a guide. Students should be encouraged to take up experimental and industry oriented project work. The Project has to be assigned at the beginning of the Seventh semester. The Project Group should complete preliminary literature survey and plan of project at the end of Seventh Semester. The Project work should be carried out and completed in Eighth Semester.

## SEMINAR ON PROJECT

Subject Code	:	<b>06ST86</b>	IA Marks	:	50
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The Students are required to give the comprehensive presentation in the forms of seminar on the Project work carried out in the VIII semester. The Seminar should be evaluated as Internal Assessment.

