

**Scheme of Teaching and Examination for
IV Semester DIPLOMA in TEXTILE ENGINEERING/TEXTILE TECHNOLOGY
THEORY**

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME			EXAMINATION SCHEME				
			Periods per Week	Periods in one Session	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1	Textile Fibres	28401	4	50	3	20	80	100	26	36
2	Yarn Preparation & Weaving Calculation-I	28402	4	50	3	20	80	100	26	36
3	Fabric Manufacture-I	28403	4	50	3	20	80	100	26	36
4	Fabric Structure & Design-I	28404	4	60	3	20	80	100	26	36
5	Textile Chemistry-I	28405	4	50	3	20	80	100	26	36
Total :-			20					500		

PRACTICAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME			EXAMINATION SCHEME				
			Periods per Week	Periods in one Session	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6	Fabric Manufacture Lab.-I	28406	6	60	3	10	40	50	16	21
7	Textile Chemistry-Lab I	28407	6	60	3	10	40	50	16	21
8	Cloth Analysis & Designing Practice-I	28408	6	60	3	10	40	50	16	21
Total :-			18					150		

SESSIONAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME			
			Periods per Week	Periods in One Session	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
9	Fabric Manufacture-I	28409	-	-	20	30	50	25
10	Textile Chemistry & Cloth Analysis & DP- I	28410	-	-	20	30	50	25
Total :-			04				100	

Total Periods per Week	42	Total Marks	750
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TEXTILE FIBRES

Subject Code 28401	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	-	-	Internal Exam.	:	20

S.No.	Topics	Periods
01.	Introduction of Textile	(02)
02.	Properties of Textile Fibres	(04)
03.	Natural Fibres	(20)
04.	Man – made Fibres	(18)
05.	Identification and Application of Textile Fibres	(06)

CONTENTS:

TOPIC: 01- INTRODUCTION OF TEXTILE:

		[02]
01.01	Textile, textile technology, textile engineering, texture and importance of textile	
01.02	Textile fibres and filament (definition with examples).	
01.03	Classification of textile fibres according to source of occurrence.	

TOPIC: 02 -PROPERTIES OF TEXTILE

		[04]
02.01	Fiber morphology, the macro and micro structure of a textile fibre and filament, microscopic appearance.	
02.02	Important Physical Properties of Textile Fibres :- staple length, strength, elasticity, uniformity, cohesiveness or spinnability, softness and fineness, resiliency, flexibility, pliability, plasticity, luster, absorbency, density and specific gravity, colour, abrasion resistance etc.	
02.03	Thermal Properties, chemical properties, Biological properties, Electrical properties and others.	

TOPIC: 03- NATURAL FIBRES:

		[20]
03.01	Cotton Fibres	
03.01.01	Introduction	
003.01.02	Growth, cultivation and production of cotton fibres, grading and growing countries, commercial classification or varieties of cotton (Sea- Island. Egyptian. Brazilian. American and Indian cotton etc.).	
03.01.03	Microscopic Appearance and chemical composition of cotton.	
03.01.04	Physical Properties: Convolutions, length tensile strength, flexibility, elasticity, luster, moisture absorption colour, density, elongation, modulus etc.	
03.01.05	Chemical Properties: Action of acid, alkalies, organic solvent & water.	
03.01.06	Thermal Properties. Biological Properties (mildew, insect, rots etc.)	
03.01.07	Uses of Cotton fibres.	
03.02	Wool Fibres	
03.02.01	Introduction	
03.02.02	Growing of wool, grading of wool (fine, medium, long, crossbreed. mixed).	
03.02.03	Types of wool (Merino, British, Cross- breed, carpet).	
03.02.04	Microscopic structure and appearance, chemical composition.	
03.02.05	Physical Properties: Length. Fineness, Strength, Elasticity, Resilience, Moisture absorption, Dimensional Stability, Crimp, Specific Gravity, Colour, Capillarity and Porosity, Luster.	
03.02.06	Thermal properties and Electrical properties.	
03.02.07	Chemical Properties: Action of Acids, Alkalies, Effect of bleaches etc. Influence of mildew, moth and bacteria.	
03.02.08	Felting of wool.	
03.02.09	Brief idea of conversion of wool fibers into woollens and worsted yarns.	
03.02.10	Uses.	
03.03	Silk	
03.03.01	Introduction	
03.03.02	Types of silk (Mulberry, Tassar, Eri and Muga silk).	
03.03.03	Production of silk.	
03.03.03.01	Sericulture	
03.03.03.02	Reeling of silk	
03.03.03.03	Throwing of silk	
03.03.03.04	Wild silk, spun silk, Degumming of silk, chemical composition of silk.	

- 03.03.03.05 Physical Properties of silk, Length and denier, tensile strength and tenacity, density and specific gravity, elasticity, luster, resilience, moisture regain absorbency, colour, dimensional stability, electric properties.
- 03.03.03.06 Chemical Properties: Action of heat, sunlight, water, acids, alkalis, chloride salts, organic solvent, bleaches, dyeing properties.
- 03.03.03.07 Microscopic appearance, uses of silk.
- 03.04 Jute Fiber**
- 03.04.01 Introduction.
- 03.04.02 Growth and cultivation: Harvesting, Retting and stripping of jute fibers.
- 03.04.03 Properties and Uses of jute fibers.

TOPIC:04 -MAN – MADE FIBERS

[18]

- 04.01 Viscose Rayon: Introduction, properties and uses of viscose rayon.
- 04.02 Polynosic Rayon: Introduction, properties and uses of polynosic rayon.
- 04.03 Cuprammonium Rayon: Introduction, chemical constitution, manufacture with flow sheet, properties and uses of cuprammonium rayon.
- 04.04 Acetate Rayon: Rayon: Introduction, manufacture with flow sheet, properties and uses of acetate rayon.
- 04.05 Synthetic Fibers**
- 04.05.01 Polyamide fibers (Nylon): Introduction, properties and uses of polyamide fibers (nylon 6 & nylon 66)
- 04.05.02 Polyester fibers: Introduction, properties and uses of polyester fibers.
- 04.05.02.01 Introduction
- 04.05.02.02 Manufacture with flow sheet.
- 04.05.02.03 Physical Properties (name & definition only).
- 04.05.03 Acrylic fibers: Introduction, properties and uses of acrylic fibers

TOPIC: 05- IDENTIFICATION AND APPLICATION OF TEXTILE FIBRES:

[06]

- 05.01 Identification of textile fibers.
- 05.01.01 Non-Technical: Test: Feeling test, burning test, staining test.
- 05.01.02 Technical Test: Microscope test, Density measurement, Chemical test.
- 05.02 Application of Fibers and Textiles: Apparel textiles, bedding and home textiles, interior textile and technical textiles.
- 05.02.01 Technical textiles: Mobile textiles, Geo textiles, Construction textiles, Industrial textiles, Medical textiles, Safety textiles

Book Recommended:

- | | | |
|-----|--|-------------------|
| 01. | Textiles Fibers. | -Dr. V.A.. Shenai |
| 02. | Textiles Fibers. | -Mathew |
| 03. | Introduction to Textiles Fibers. | -Murthy |
| 04. | Man-Made fibers. | -R.W. Moncrieff |
| 05. | Textiles Fibers. | -ATA |
| 06. | Textiles Science. | -Gohl |
| 07. | A Textiles Book of Fiber Science and Techonology | -S.P. Mishra |
| 08. | Textiles Fibers to Fabric | - Carbman |
| 09. | Fabric Care | -D'Souza |
| 10. | Essential of Textiles | -Joseph |
| 11. | Textile Fibres and Their Use | -Hess |

YARN PREPARATION & WEAVING CALCULATION - I

Subject Code 28402	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks : 100		
	L	T	P/S	Annual Exam. : 80		
	04	-	-	Internal Exam. : 20		

Rational:-

Yarn preparation and weaving calculation is one of the main activities for diploma holder technician in Textile Engineering. He is required to handle the yarn preparatory machines, tools and equipments and also supervise the yarn preparatory processes. He is also required to calculation regarding weaving .He must be well versed with the subject of yarn preparation and weaving calculation.

The subject is introduced to develop the understanding of yarn preparatory processes and weaving Calculation. It will help in discharge of his duties in analyse the same and take an appropriate discision as and when the job demands.

Objectives :-

- After Completion of the courses, student will be able to
- Define the terminologies related with yarn preparatory machines and process like winding and pirn winding
 - Explain the principle and working of the machine
 - Sketch the machine parts and label them
 - Understand the process of production and their related problem
 - Calculate count of yarn in direct, indirect and universal system and its conversion
 - Calculate Resultant and Arrange count, Heald calculation

<u>Sl. No.</u>	<u>Topic</u>	<u>periods</u>
01	Introduction	[05]
02	Warp winding	[20]
03	Weft winding	[12]
04	yarn count calculations	[13]
		50

CONTENTS:-

Topic: 01 Introduction

[05]

- 01.01 A brief consideration of the principle, purpose , requirements of preparatory process involved in converting important natural , regenerated, synthetic and blended yarns in to appropriate packages

Topic: 02 Warp winding

[20]

- 02.01 Machine design, main working members and operating principle of non-automatic winding machines – upright spindle winding machine, Drum winding machine.
- 02.02 Merits and demerits of upright spindle winding machine.
- 02.03 Machine design, main working members and operating principles of high speed winding and super speed winding, automatic cone and cheese winding.
- 02.04 High speed winding – Schlathorst high speed cheese winding, Roto corner high speed cone winding , Auto corner high speed cone winding, Precision cone and cheese winding, Schweiter High speed winding machine.
- 02.05 Merits and demerits of high speed and super speed winding.
- 02.06 Automatic cone and cheese winding – Barber Coloman automatic spooler winder
- 02.07 Advantages and disadvantages of Barber Coloman spooler winder.
- 02.08 Winding process parameter , characteristics of Various winding packages
- 02.09 Faults and elimination of defects, waste in winding ,
- 02.10 Structure of various knots and splicers.

Topic: 03 weft winding

[12]

- 03.01 Introduction to weft yarn preparation for weaving
- 03.02 Ordinary pirn winding machine, merits and demerits of ordinary pirn winding machine.
- 03.03 High speed pirn winding – Schweiter high speed pirn winding machine Hocoba high speed pirn winding machine.
- 03.04 Super speed pirn winding.
- 03.05 Automatic and fully automatic pirn winding – Schweiter Automatic pirn winding machine.
- 03.06 Characteristics of various packages, Technological parameter of weft winding.
- 03.07 Study of different types pirns, shuttles and their Characteristics, possible faults in weft yarn winding

Topic: 04 yarn count Calculations

[13]

- 04.01 Concept of different yarn numbering system – Direct Indirect and universal system with examples
- 04.02 Conversion from one system to another system in indirect system and direct system
- 04.03 Conversion from indirect system to direct system and vice – versa.
- 04.04 Folded yarns and resultant counts, Averages counts.
- 04.05 Costing of folded yarns
- 04.06 Heald counts.

Book Recommended:

- | | | | |
|-----|------------------------------------|---|----------------------|
| 01. | Yarn Preparation. Volume-1 | - | R. Sen Gupta |
| 02. | Weaving Calculation | - | R. Sen Gupta |
| 03. | Yarn Winding | - | P.K. Banerjee |
| 04. | Winding | - | BTRA |
| 05. | Yarn Preparation. Volume I&II | - | J.T. Marsh |
| 06. | Modern Weaving Calculations. Vol-I | - | Singh |
| 07. | TFO- Technology and Techniques | - | Shree Nivasan Murthy |

FABRIC MANUFACTURE-I

Subject Code 28403	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	-	-	Internal Exam.	:	20

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01.	Motion of Weaving	(02)
02.	Loam	(06)
03.	Shedding Mechanism	(05)
04.	Tappet Shedding Mechanism	(08)
05.	Picking Mechanism	(10)
06.	Beat up Mechanism	(03)
07.	Take Up Motion	(06)
08.	Let-Off Motion	(04)
09.	Weft Fork Motion	(03)
10.	Warp Protecting Motion	(03)
	Total:	(50)

CONTENTS:

TOPIC: 01- MOTION OF WEAVING:

[02]

- 01.01 Principle and definition of fabric manufacture.
- 01.02 Motions in weaving: Primary motions, Secondary motions and Tertiary motions.

TOPIC: 02- LOAM:

[06]

- 02.01 Introduction
- 02.02 Types of Loom
- 02.03 Handloom – Brief idea of handloom.
- 02.04 Power loom - Details study of plain tappet looms.
- 02.05 Various parts of loom and its functions.

TOPIC: 03- SHEDDING MECHANISMS:

[05]

- 03.01 Definition, Types of shed.
- 03.02 Shedding mechanisms and its kinds.
 - 03.02.01 Tappet Shedding mechanism
 - 03.02.02 Dobby Shedding mechanism
 - 03.02.03 Jacquard shedding mechanism
- 03.03 The scope of tappet, dobbie and jacquard shedding

TOPIC: 04- TAPPET SHEDDING MECHANISMS:

[08]

- 04.01 Tappets, cam and Difference between cam and tappets.
- 04.02 Types of tappet shedding: Negative and positive tappet shedding.
- 04.03 Various types of tappet shedding: Inside Outside tappet shedding.
- 04.04 Condition of good shedding
- 04.05 Early shedding and late shedding

TOPIC: 05- PICKING MECHANISM:

[10]

- 05.01 Introduction, Methods of picking mechanism.
- 05.02 Types of picking mechanism: cone – over pick mechanism, cone – under pick mechanism and other conventional picking mechanism, Comparison between under pick and over pick.
- 05.03 Shuttle and its types, defects in shuttle and shuttle cop.
- 05.04 Defects in negative picking.
- 05.05 Essential feature to a good pick.
- 05.06 Early and late picking.
- 05.07 Study of the following: picker, picking band, buffer, check strap, swell spring, shuttle guard, shuttle flying, shuttle trapping.

TOPIC: 06- BEAT UP MECHANISM:

[03]

- 06.01 Introduction, Construction and Mechanism
- 06.02 Eccentricity of sley motion and its effect on loom working.
- 06.03 Factors affecting the sley, motion.

TOPIC: 07-TAKE UP MOTION: [06]

- 07.01 Introduction, Classification of take up motion: Negative and positive take up motion.
- 07.02 Five wheel and seven wheel take - up motion.
- 07.03 Dividend of loom, calculated dividend and practical dividend, Calculated regarding dividend.
- 07.04 Changing the number of picks/ inch.

TOPIC: 08- LET- OFF MOTION: [04]

- 08.01 Objects
- 08.02 Types of let- off motion: Negative and positive let- off motion.
- 08.03 Types of negative let –off motion: Frictional let-off motion, Chain, lever and weight let-off motion, Advantages and disadvantages of chain, lever and weight let-off motion.
- 08.04 Conditions to good let – off motion.

TOPIC: 09- WEFT FORK MOTION: [03]

- 09.01 Objects and principles
- 09.02 Types of Weft fork motion: Side Weft fork motion and centre weft fork motion.
- 09.03 Relative advantages and disadvantages between a side weft fork and centre weft fork motion.

TOPIC: 10- WARP PROTECTING MOTION: [03]

- 10.01 Introduction
- 10.02 Types of Warp Protecting motion: Loose Reed, Fast reed and Electromagnetic Warp Protecting motion.
- 10.03 Loom knocking off or banging off; Defects of Knocking off.

Book Recommended:

- | | | | |
|-----|---|---|--------------------|
| 01. | Weaving Mechanism. Vol. I & II. | - | N.N. Banerjee |
| 02. | The Mechanism of weaving | - | Fox |
| 03. | Principles of weaving | - | Robinson and Marks |
| 04. | Cotton Weaving and Designing | - | J.B. Taylor |
| 05. | Cotton Yarn Weaving | - | A.T.A. |
| 06. | Tappet and Dobby Looms | - | T. Robberts |
| 07. | Weaving, Machines, Mechanisms, Management | - | Talukdar |
| 08. | Weaving Technology | - | Kulkarni |

FABRIC STRUCTURE AND DESIGN-I

Subject Code 28404	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	-	-	Internal Exam.	:	20

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01.	Elements of Woven Design	(07)
02.	Construction of Elementary	(06)
03.	Development of Weaves from Elementary Bases	(14)
04.	Diamond and Diaper Designs	(05)
05.	Simple Fancy Weaves	(14)
06.	Yarn Diameter and Cover Factor	(05)
07.	Colour and Its Applications	(09)
		(60)

CONTENTS:

TOPIC: 01- ELEMENTS OF WOVEN DESIGN:

[07]

01.01	General Principle of fabric structure and design	
01.02	Classification of woven fabrics	
01.03	Methods of fabric representation	
01.04	Use of the design	
01.05	Repeat of the design	
01.06	Drawing-in denting, draft, lifting plan, design	
01.07	System of drafting	
01.08	Construction of brafts and lifting plans	
01.08.01	Methods of indicating drafts and lifting plans	
01.08.01.01	By ruling lines	
01.08.01.02	By design papers	
01.08.01.03	By numbering	
01.08.02	Relations between weaves	
01.08.03	Construction of drafts and lifting plan from given designs	
01.08.04	Construction of drafts and lifting plan from given designs	
01.08.05	Construction of designs from given drafts and lifting plans	

TOPIC: 02- CONSTRUCTION OF ELEMENTARY WEAVES:

[06]

02.01	Study of plain weaves	
02.02	Classification of plain weave	
02.03	Simple twill weaves and its construction	
02.04	Sateen and satin weaves	
02.04.01	Regular sateens and satins	
02.04.02	Irregular sateens and satins	

TOPIC: 03- DEVELOPMENT OF WEAVES FROM ELEMENTARY BASES:

[14]

03.01	Plain weave derivatives	
03.01.01	Warp rib weaves	
03.01.02	Weft rib weaves	
03.01.03	Hopsack, mat or basket weaves	
03.01.04	Mock rib effects	
03.02	Weaves constructed on basket weaves	
03.02.01	Zig-zag twills	01
03.02.02	Herringbone twills	01
03.02.03	Broken twills	01
03.02.04	Elongated twills	01
03.02.05	Combined twills	01
03.02.06	Fancy twills (large diagonals, shaded twills, diagonals on sateen bases, figured twills)	02

03.03	Angle of twills	01
03.04	Weaves constructed on satin of sateen bases	02
03.04.01	Simple developments	01
03.04.02	Extension of sateen weaves	
<u>TOPIC: 04 - DIAMOND AND DIAPER DESIGNS:</u>		[05]
04.01	Construction of diamond designs	02
04.02	Construction of diaper designs	
04.03	Elongated and Flattened diamonds and diapers	
<u>TOPIC: 05- SIMPLE FANCY WEAVES:</u>		[14]
05.01	Principles of designing honey comb weave	
05.02	Types of honey comb weaves	
05.02.01	Ordinary honey comb weaves	
05.02.02	Brighton honey comb weaves	
05.03	Huckaback weaves	02
05.04	Mock Leno Weaves	
05.05	Simple spot designs	
05.06	Crepe weaves	
05.07	Moss crepes	
05.08	Fancy rib and cord weaves	
05.09	Bedford cords	
05.09.01	Wadded bedford cords	
05.09.02	Crepon bedford cords	
05.09.03	Bedford cords, arranged with alternate picks	
05.09.04	Twill- faced Bedford cords	
05.10	Welts and piques	
05.10.01	Ordinary welt structures	
05.10.02	Weft wadded wefts	
05.10.03	Fast-back wefts	
05.10.04	Pique, piques weaves with wadded ends	
05.10.05	Waved piques	
05.11	Stripe and check weave combinations	
<u>TOPIC: 06- YARN DIAMETERS AND COVERFACTOR:</u>		[05]
06.01	Diameter of yarn and their calculations regarding their in fabric	01
06.02	Brief idea of structure of cover factor of simple fabrics	02
06.03	Quality particulars of different fabrics of the above weave.	02
<u>TOPIC: 07- COLOUR AND ITS APPLICATION:</u>		[09]
07.01	Light and colour phenomena	
07.01.01	Physical basis of colour	
07.01.02	Emission and absorption of light	
07.01.03	Colour vision and light theory of colour	
07.01.04	Primary, secondary and tertiary colours	
07.01.05	Complementary colour	
07.01.06	Chrou measurement	
07.01.07	Colour measurement	
07.01.08	Pigment theory of colour	
07.01.09	Modification of colours	
07.02	Colours in combination	
07.02.01	Colour contrast	
07.02.02	Contrast of hue	
07.02.03	Contrast of tone	
07.02.04	Colour harmony	
07.03	Colour Mixing: The rainbow, additive colour mixing, subtractive colour mixing.	01
07.04	Colour specification and colour specifying systems	
07.04.01	The Munsell system	
07.04.01.01	Munsell value	
07.04.01.02	Munsell hue	

- 07.04.01.03 Munsell chroma
- 07.04.01.04 Munsell colour charts
- 07.04.02 The CIE system
- 07.05 Application of colour-
Mixed colour effects, fibre mixtures, twist yarn mixtures, combinations of differently coloured threads, colour stripes and checks, simple regular patterns, simple irregular patterns, compound orders of colouring etc.

02

Book Recommended:

- 01. Watson's Textile Design and Colour - Z. Grosicki
- 02. Cloth Construction - Robinson and Marks
- 03. Grammar of Textile Design - Nisbet
- 04. Structure Fabric Design - Kilbbee
- 05. Textile Colour Mixing - Paterson

TEXTILE CHEMISTRY-I

Subject Code 28405	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	-	-	Internal Exam.	:	20

Rational:-

Textile chemistry is one of the main activities for a diploma holder technician in textile Engineering. He is required to apply different types of dyes on different types of textile fibre, printing and wet processing. He must be well versed with the subject of textile chemistry.

Objective

- After completion of the course student will be able to
- Define the terminologies related with textile chemistry
 - Explain the principle and working of the dyeing and printing processes
 - Methods of application of dyes.
 - Understand wet processing like singeing, Desizings, Scouring, Bleaching. Mercerization and their related problem.

<u>Sr.No</u>	<u>Topic</u>	<u>Periods</u>
01	Singeing	03
02	Desizing	05
03	Scouring	05
04	Bleaching	06
05	Mercerization	06
06	Dyeing	13
07	Printing	12
		50

CONTENTS:-

Topic 01 Singeing **[03]**

- 01.01 Objects of Singeing
 01.02 Methods of singeing by various singeing machines - Plate singeing, Roller singeing, Gas singeing.
 01.03 Merits and demerits of these above singeing machines

Topic 02 Desizing **[05]**

- 02.01 Objects of Desizing
 02.02 Methods of desizing - Hydrolytic and oxidative
 02.02.01 Description and working of Hydrolytic desizing method - Rot steep, Acid steep, Enzymatic desizing, continuous desizing method.
 02.02.02 Description and working of oxidative desizing method - chlorine desizing, chlorite desizing, Bromite desizing, Continuous desizing.

Topic 03 Scouring **[05]**

- 03.01 Objects of Scouring
 03.02 Scouring operation - Saponification, Emulsification Detergent action, Prolonged boiling
 03.03 Machines used for batch wise and continuous Scouring - Jigger and Winch machine
 03.04 Kier – old type kier, vertical kier, Horizontal kier
 03.05 Comparison of horizontal and vertical kier
 03.06 Steam injector kier
 03.07 Scouring and bleaching agents for cotton, wool silk.

Topic 04 Bleaching **[06]**

- 04.01 Objects of bleaching
 04.02 Bleaching of cotton
 04.03 Bleaching process- Bleaching powder, Sodium hypochlorite, Hydrogen peroxide, sodium chlorite.
 04.04 Advantages and disadvantages of above processes
 04.05 Bleaching of Wool
 04.06 Wool Carbonisation
 04.07 Bleaching of silk – sodium peroxides method, H₂O₂ method
 04.08 Optical whitening agents.
 04.09 Application of Hydrogen peroxides- one or two bath method , mixed bleaching , continuous method, Du pont process
 04.10 Machines used for continuous bleaching
 04.11 Developments in bleaching
 04.12 Souring, Antichlorination

- 04.13 Different types of bleaching agents and optimum conditions for various operators.
- 04.14 Methods used for determination of degradation of cotton during scouring and bleaching
- 04.15 Faults in bleaching and their prevention

Topic 05 Mercerization

[06]

- 05.01 History and developments of mercerization
- 05.02 Factors determining the efficiency of mercerization
- 05.03 Physical and chemical changes in cotton due to mercerization
- 05.04 Methods and machines used for mercerization chain cloth mercerizing machines, chainless cloth mercerizing machine , chainless padless mercerizing machine
- 05.05 Hank Mercerization and Hot mercerization
- 05.06 Evaluation of different chemicals, solvents used in wet processing and their importance.

Topic 06 Dyeing

[13]

- 06.01 Historical developments of dyes and their applications
- 06.02 Classification of dyes to mode of application
- 06.03 Theory of dyeing
- 06.04 Introduction to physical and chemical principles involved in dyeing
- 06.05 Factors affecting dyeing
- 06.06 Properties, selection and application of various dyes like – Direct, Basic, Acid, Sulphur dyes used on cotton, wool silk.
- 06.07 Various after treatment given to sulphur dyed goods

Topic 07 Printing

[12]

- 07.01 Historical developments of decorating textiles especially by printing, the scope of printed textiles.
- 07.02 The printing process on overview
- 07.03 Difference between dyeing and printing
- 07.04 Methods of printing-
 - 07.04.01 Block printing - Preparation and use of blocks
 - 07.04.02 Screen printing - Principle and working of screen printing
 - 07.04.03 Roller printing- Principle and working of Roller printing
- 07.05 Vertical Duplex screen printing
- 07.06 Rotary Screen printing
- 07.07 Transfer printing and foam printing

Books Recommended

- | | | |
|---|---|---|
| 1. A glimpse on chemical Technology of textile fibres | - | R.R Chakraworty |
| 2. Chemical technology of fibrous materials | - | Sadov MIR Publications. |
| 3. Textile chemistry Vol I and II | - | R.H. peters, Elsewhere Publishing Co, New York. |
| 4. Dyeing and chemical Technology of Textile fibres | - | ER Trotman |
| 5. Scouring and bleaching of Cotton | - | J.T.Marsh, B.I Publications |
| 6. Mercerization | - | J.T. marsh, B I Publications. |
| 7. Technology of textile processing Vol III | - | V.A. Shenai, Sevak Publications |
| 8. Textile chemistry vol I, II and III | - | R.H peters Elsewhere publishing Co, New York. |
| 9. Modern Techniques of textile Bleaching, Dyeing and finishing | - | SITRA Pub. |
| 10. Textile printing | - | Miller , L.W.C. Butter worths Publications |
| 11. Printing Textiles | - | A guide to creative design Fundamentals terry and genteelly |

FABRIC MANUFACTURE Lab-I

Subject Code 28406	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
	-	-	06	Internal Exam.	:	10

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01.	Winding	(06)
02.	Pirn Winding	(06)
03.	Warping, Sizing, Beaming, & Looming.	(06)
04.	Warp and Weft Preparation: Hand Process	(06)
05.	Primary Motions	(12)
06.	Secondary Motions	(09)
07.	Tertiary Motions	(06)
08.	Looms	(09)
	Total:	(60)

CONTENTS:

TOPIC: 01 – WINDING:

01.01	Study the working of winding machine, sketching the line and gearing diagram of the winding machine.	[06]
01.02	Practice of winding on them.	
01.03	Calculation of speed and Production of winding m/c.	

TOPIC: 02- PIRN WINDING:

02.01	Study the working of Pirn winding machine machines, Sketching the line and gearing diagram of these machine.	[06]
02.02	Practice of Prin Winding on them.	03
02.03	Calculation of speed and production of Prin Winding m/c/	03

TOPIC: 03- WARPING, SIZING, BEAMING & LOOMING:

03.01	Study the Working of Warping, Sizing, Beaming and Looming machines, sketching the line and gearing diagram of these machines.	[06]
03.02	Practice of Warping, sizing, Beaming and Looming on them,	03
03.03	Calculation of speed and Production of the above m/cs.	

TOPIC: 04-WARP& WEFT PREPARATION: HAND PROCESS:

04.01	Study the Yarn Preparation for Handloom	[06]
04.02	Practice of the various yarn preparation process on yarn preparatory m/cs for handloom.	06

TOPIC: 05- PRIMARY MOTIONS:

05.01	Detailed study of primary motions	[12]
05.01.01	Shedding	
05.01.02	Picking	
05.01.03	Beat Up	
05.02	Dismantling and resetting of the parts of the above motions.	
05.03	Sketching the above motion parts.	

TOPIC: 06- SECONDARY MOTIONS:

06.01	Detailed study of secondary motions	[09]
06.01.01	Take Up Motion (5 wheels and 7 wheels)	
06.01.02	Let Off Motion	
06.02	Dismantling and resetting of the parts of the motions.	
06.03	Sketching the above motion parts.	

TOPIC: 07- TERTIARY MOTIONS:

07.01	Detailed study of the tertiary motions	[06]
07.01.01	Weft Fork Motion	03
07.01.02	Warp Protecting Motion (Loose reed & fast reed)	03
07.02	Dismantling and resetting of the above motions.	
07.03	Sketching the above motion parts.	

TOPIC: 08- LOOMS:

08.01	Study the handloom and practice of weaving on them.	[09]
08.02	Study the handloom and practice of weaving on them.	

TEXTILE CHEMISTRY Lab. - I

Subject Code 28407	Practical			No of Period in one session :60		
	No. of Periods Per Week			Full Marks		
	L	T	P/S	Annual Exam.	:	40
	-	-	06	Internal Exam.	:	10

Rational:-

Diploma holder technician in Textile Engineering is very frequently required to dye the fabric, Scouring and bleaching of fabrics and printing of fabrics.

The Course is introduced to develop the skill to dye the cellulosic material with Direct, Acid, Basic, sulphur, scouring and bleaching of cotton, silk, wool, Printing of natural fibre for better understanding of the subject.

Objectives:-

- Able to develop skill to
- Scouring and Bleaching of cotton, silk, wool
- Dyeing of cotton with Direct dyes.
- Dyeing of Cotton, wool, silk, with basic dyes
- Dyeing of wool, silk, with Acid dyes
- Dyeing of Cotton with sulphur dyes
- Printing of fabric

<u>Sr No</u>	<u>Topic</u>	<u>Periods</u>
01	Scouring	06
02	Bleaching	06
03	Dyeing	33
04	Printing	<u>15</u>
		60

Contents

Topic 01 Scouring

01.01 Experimental Scouring of cotton, Wool, silk and other important textile fibres, yarns and fabrics.

[06]

Topic 02 Bleaching

01.02 Experimental Bleaching of cotton, Wool, silk and other important textile fibres, yarns and fabrics.

[06]

Topic 03 Dyeing

- 03.01 Familiarizing and sketching of various tools and machines used in wet processing.
- 03.02 Evaluation of inorganic and other substances used in textile processing like soda ash, bleaching powder, hydrogen peroxides, sodium sulphate, hydrosulphate,
- 03.03 Dyeing of three shades with direct dyes on cotton (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.04 Dyeing of three shades with basic dyes on cotton (0.5%, 1%, 1.3%, 1.5 %)
- 03.05 Dyeing of three shade with basic dyes on silk, wool, (0.5%, 1.2%, 1.5%, 1.8 %)
- 03.06 Dyeing of three shade with acid dyes on wool, silk (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.07 Dyeing of three shade with sulphur dyes on cotton (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.08 After treatment given to direct colour and sulphur colour dyed goods.
- 03.09 To study the effect of fine, temperature, concert ration of chemicals during dyeing .

[33]

Topic 04 Printing

- 04.01 Practice of block printing on paper and fabrics (cotton, silk)
- 04.02 Preparation of designs for printing systems.
- 04.03 Printing paste preparation
- 04.04 Study the Roller printing machines and practice of them on fabric (cotton, silk)
- 04.05 Study the screen printing constituents - screen table, screen, exposing unit, washing tray.

[15]

CLOTH ANALYSIS & DESIGNING PRACTICE-I

Subject Code 28408	Practical			No of Period in one session :60		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
	-	-	06	Internal Exam.	:	10

Rational:-

Diploma holder technician in Textile Engineering is very frequently require to analyses the sample for the purpose of reproduction.

The course is introduced to develop the skill to analyse the sample, representation of weave in point paper and its design and peg plan, preparation of colour chart, preparation of common design and free hand sketching for better understanding of the subject.

Objectives:-

- Able to develop skill to
- Analyse the test sample
- Representation of weave in point paper and find out draft, denting and its lifting plan for weaving.
- Preparation of colour chart, common and saree border design
- Free hand sketching.

<u>Sr.No.</u>	<u>Topic</u>	<u>periods</u>
01	Cloth Analyses	45
02	Design and colour	15
		60

CONTENTS:-

Topic: 01 Cloth Analysis

[45]

- 01.01 Discussion on the method of analysis, representation of weave on point paper, thread interacting diagrams, cross section diagrams, drawing – in, drafts and peg plans.
- 01.02 Discussion on the Analysis and fabric manufacturing data. Study of the method of analysis.
- 01.03 Studying the characteristics of various plain weave fabrics. Dissecting and finding various data of the given plain weave fabrics.
- 01.04 Analysis of matt weave fabrics for their characteristics and various data
- 01.05 Analysis of twill weave fabrics for their characteristics.
- 01.06 Analysis of Honey comb and Brighton Honey comb weaves fabrics for their characteristics.
- 01.07 Analysis of Mockleno and Huckaback weave fabrics
- 01.08 Analysis of crepe like effect fabrics
- 01.09 Analysis of woven crepe effect fabrics.
- 01.10 Analysis of combination of weaves fabrics.
- 01.11 Analysis of Decorative natural silk fabrics.
- 01.12 Analysis of Decorative Artificial silk weave fabrics
- 01.13 Analysis of Decorative polyester fabrics.
- 01.14 Analysis of satin and sateen weave fabrics.
- 01.15 Analysis of Bed ford cord fabrics.
- 01.16 Analysis of Pique fabrics.

Topic 02 Design and color

[15]

- 02.01 Preparation of colour charts showing primary, secondary, and tertiary colour
- 02.02 Preparation of mixed colour effect
- 02.03 Practice of colour harmony and contrast
- 02.04 Preparation of small border design
- 02.05 Free hand sketching
- 02.06 Preparation of design for jacquard

FABRIC MANUFACTURE Lab.-I

Subject Code 28409	Sessional			No of Period in one session :-		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	-	-	-	Internal Exam.	:	20

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01.	Winding	(06)
02.	Pirn Winding	(06)
03.	Warping, Sizing, Beaming, & Looming.	(06)
04.	Warp and Weft Preparation: Hand Process	(06)
05.	Primary Motions	(12)
06.	Secondary Motions	(09)
07.	Tertiary Motions	(06)
08.	Looms	(09)
	Total:	(60)

CONTENTS:

TOPIC: 01 – WINDING:

- | | | |
|-------|--|-------------|
| | | [06] |
| 01.01 | Study the working of winding machine, sketching the line and gearing diagram of the winding machine. | |
| 01.02 | Practice of winding on them. | |
| 01.03 | Calculation of speed and Production of winding m/c. | |

TOPIC: 02- PIRN WINDING:

- | | | |
|-------|--|-------------|
| | | [06] |
| 02.01 | Study the working of Pirn winding machine machines, Sketching the line and gearing diagram of these machine. | 03 |
| 02.02 | Practice of Prin Winding on them. | 03 |
| 02.03 | Calculation of speed and production of Prin Winding m/c/ | |

TOPIC: 03- WARPING, SIZING, BEAMING & LOOMING:

- | | | |
|-------|---|-------------|
| | | [06] |
| 03.01 | Study the Working of Warping, Sizing, Beaming and Looming machines, sketching the line and gearing diagram of these machines. | |
| 03.02 | Practice of Warping, sizing, Beaming and Looming on them, | 03 |
| 03.03 | Calculation of speed and Production of the above m/cs. | |

TOPIC: 04-WARP & WEFT PREPARATION: HAND PROCESS:

- | | | |
|-------|---|-------------|
| | | [06] |
| 04.01 | Study the Yarn Preparation for Handloom | 06 |
| 04.02 | Practice of the various yarn preparation process on yarn preparatory m/cs for handloom. | |

TOPIC: 05- PRIMARY MOTIONS:

- | | | |
|----------|--|-------------|
| | | [12] |
| 05.01 | Detailed study of primary motions | |
| 05.01.01 | Shedding | |
| 05.01.02 | Picking | |
| 05.01.03 | Beat Up | |
| 05.02 | Dismantling and resetting of the parts of the above motions. | |
| 05.03 | Sketching the above motion parts. | |

TOPIC: 06- SECONDARY MOTIONS:

- | | | |
|----------|--|-------------|
| | | [09] |
| 06.01 | Detailed study of secondary motions | |
| 06.01.01 | Take Up Motion (5 wheels and 7 wheels) | |
| 06.01.02 | Let Off Motion | |
| 06.02 | Dismantling and resetting of the parts of the motions. | |
| 06.03 | Sketching the above motion parts. | |

TOPIC: 07- TERTIARY MOTIONS:

- | | | |
|----------|---|-------------|
| | | [06] |
| 07.01 | Detailed study of the tertiary motions | |
| 07.01.01 | Weft Fork Motion | 03 |
| 07.01.02 | Warp Protecting Motion (Loose reed & fast reed) | 03 |
| 07.02 | Dismantling and resetting of the above motions. | |
| 07.03 | Sketching the above motion parts. | |

TOPIC: 08- LOOMS:

- | | | |
|-------|---|-------------|
| | | [09] |
| 08.01 | Study the handloom and practice of weaving on them. | |
| 08.02 | Study the handloom and practice of weaving on them. | |

TEXTILE CHEMISTRY & CLOTH ANALYSIS & DP-I

Subject Code 28410	Sessional			No of Period in one session :-		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	-	-	-	Internal Exam.	:	20

Textile Chemistry

Rational:-

Diploma holder technician in Textile Engineering is very frequently required to dye the fabric, Scouring and bleaching of fabrics and printing of fabrics.

The Course is introduced to develop the skill to dye the cellulosic material with Direct, Acid, Basic, sulphur, scouring and bleaching of cotton, silk, wool, Printing of natural fibre for better understanding of the subject.

Objectives:-

- Able to develop skill to
- Scouring and Bleaching of cotton, silk, wool
- Dyeing of cotton with Direct dyes.
- Dyeing of Cotton, wool, silk, with basic dyes
- Dyeing of wool, silk, with Acid dyes
- Dyeing of Cotton with sulphur dyes
- Printing of fabric

<u>Sr No</u>	<u>Topic</u>	<u>Periods</u>
01	Scouring	06
02	Bleaching	06
03	Dyeing	33
04	Printing	<u>15</u>
		60

Contents

Topic 01 Scouring

[06]

01.03 Experimental Scouring of cotton, Wool, silk and other important textile fibres, yarns and fabrics.

Topic 02 Bleaching

[06]

01.04 Experimental Bleaching of cotton, Wool, silk and other important textile fibres, yarns and fabrics.

Topic 03 Dyeing

[33]

- 03.08 Familiarizing and sketching of various tools and machines used in wet processing.
- 03.09 Evaluation of inorganic and other substances used in textile processing like soda ash, bleaching powder, hydrogen peroxides, sodium sulphate, hydrosulphate,
- 03.10 Dyeing of three shades with direct dyes on cotton (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.11 Dyeing of three shades with basic dyes on cotton (0.5%, 1%, 1.3%, 1.5 %)
- 03.12 Dyeing of three shade with basic dyes on silk, wool, (0.5%, 1.2%, 1.5%, 1.8 %)
- 03.13 Dyeing of three shade with acid dyes on wool, silk (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.14 Dyeing of three shade with sulphur dyes on cotton (0.5%, 0.8%, 1.2%, 1.5 %)
- 03.08 After treatment given to direct colour and sulphur colour dyed goods.
- 03.09 To study the effect of fine, temperature, concentration of chemicals during dyeing .

Topic 04 Printing

[15]

- 04.06 Practice of block printing on paper and fabrics (cotton, silk)
- 04.07 Preparation of designs for printing systems.
- 04.08 Printing paste preparation
- 04.09 Study the Roller printing machines and practice of them on fabric (cotton, silk)
- 04.10 Study the screen printing constituents - screen table, screen, exposing unit, washing tray.

Cloth Analysis & DP-I

Rational:-

Diploma holder technician in Textile Engineering is very frequently require to analyses the sample for the purpose of reproduction.

The course is introduced to develop the skill to analyse the sample, representation of weave in point paper and its design and peg plan, preparation of colour chart, preparation of common design and free hand sketching for better understanding of the subject.

Objectives:-

- Able to develop skill to
- Analyse the test sample
- Representation of weave in point paper and find out draft, denting and its lifting plan for weaving.
- Preparation of colour chart, common and saree border design
- Free hand sketching.

<u>Sr.No.</u>	<u>Topic</u>	<u>periods</u>
01	Cloth Analyses	45
02	Design and colour	<u>15</u> 60

CONTENTS:-

Topic: 01 Cloth Analysis

[45]

- 01.17 Discussion on the method of analysis, representation of weave on point paper, thread interacting diagrams, cross section diagrams, drawing – in, drafts and peg plans.
- 01.18 Discussion on the Analysis and fabric manufacturing data. Study of the method of analysis.
- 01.19 Studying the characteristics of various plain weave fabrics. Dissecting and finding various data of the given plain weave fabrics.
- 01.20 Analysis of matt weave fabrics for their characteristics and various data
- 01.21 Analysis of twill weave fabrics for their characteristics.
- 01.22 Analysis of Honey comb and Brighton Honey comb weaves fabrics for their characteristics.
- 01.23 Analysis of Mockleno and Huckaback weave fabrics
- 01.24 Analysis of crepe like effect fabrics
- 01.25 Analysis of woven crepe effect fabrics.
- 01.26 Analysis of combination of weaves fabrics.
- 01.27 Analysis of Decorative natural silk fabrics.
- 01.28 Analysis of Decorative Artificial silk weave fabrics
- 01.29 Analysis of Decorative polyester fabrics.
- 01.30 Analysis of satin and sateen weave fabrics.
- 01.31 Analysis of Bed ford cord fabrics.
- 01.32 Analysis of Pique fabrics.

Topic 02 Design and color

[15]

- 02.07 Preparation of colour charts showing primary, secondary, and tertiary colour
- 02.08 Preparation of mixed colour effect
- 02.09 Practice of colour harmony and contrast
- 02.10 Preparation of small border design
- 02.11 Free hand sketching
- 02.12 Preparation of design for jacquard