 MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI TEACHING AND EXAMINATION SCHEME																	
COURSE NAME : D]		IA IN TEXTILE MANUFACTURES															
COURSE CODE : TX																	
DURATION OF COURSE : 6 SEMESTER										WITH EFFECT FROM 2012- 13							
SEMESTER : THIRD										DURATION : 16 WEEKS							
PATTERN : FULL TIME - SEMESTER										SCHEME : G							
SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (17300)
				TH	TU	PR	PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)			
								Max	Min	Max	Min	Max	Min	Max	Min		
1	Yarn Manufacturing-II	YMA	17344	4	--	2	3	100	40	50#	20	--	--	25@	10	50	
2	Fabric Manufacturing-II	FMA	17345	4	--	2	3	100	40	--	--	25#	10	25@	10		
3	Textile Testing-II	TTE	17346	3	--	2	3	100	40	50#	20	--	--	25@	10		
4	Textile Chemistry-I	TCH	17347	3	--	2	3	100	40	--	--	--	--	25@	10		
5	Fabric Structure-I	KTE	17348	3	--	2	3	100	40	--	--	--	--	25@	10		
6	Elements of Electrical Engineering & Mechanics	EEE	17015	--	--	2	--	--	--	--	--	--	--	50@	20		
7	Professional Practices-I	PPT	17030	--	--	3	--	--	--	--	--	--	--	50@	20		
TOTAL				17	--	15	--	500	--	100	--	25	--	225	--	50	
Student Contact Hours Per Week: 32 Hrs. THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH. Total Marks: 900 @ Internal Assessment, # External Assessment, #* Online Examination, Ø - Common for TC, No Theory Examination.																	
Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Termwork, SW- Sessional Work.																	
<ul style="list-style-type: none"> ➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subject are to be converted out of 100 marks as sessional work (SW). ➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms. ➤ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code. 																	

Course Name : Diploma in Textile Manufactures

Course Code : TX

Semester : Third

Subject Title : Yarn Manufacture - II

Subject Code : 17344

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
04	--	02	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 100 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

During first two semesters two textile subjects namely Elements of Textile Technology and Yarn Manufacturer. I have been covered. Yarn Forming I covered Blow Room a preparatory process of spinning.

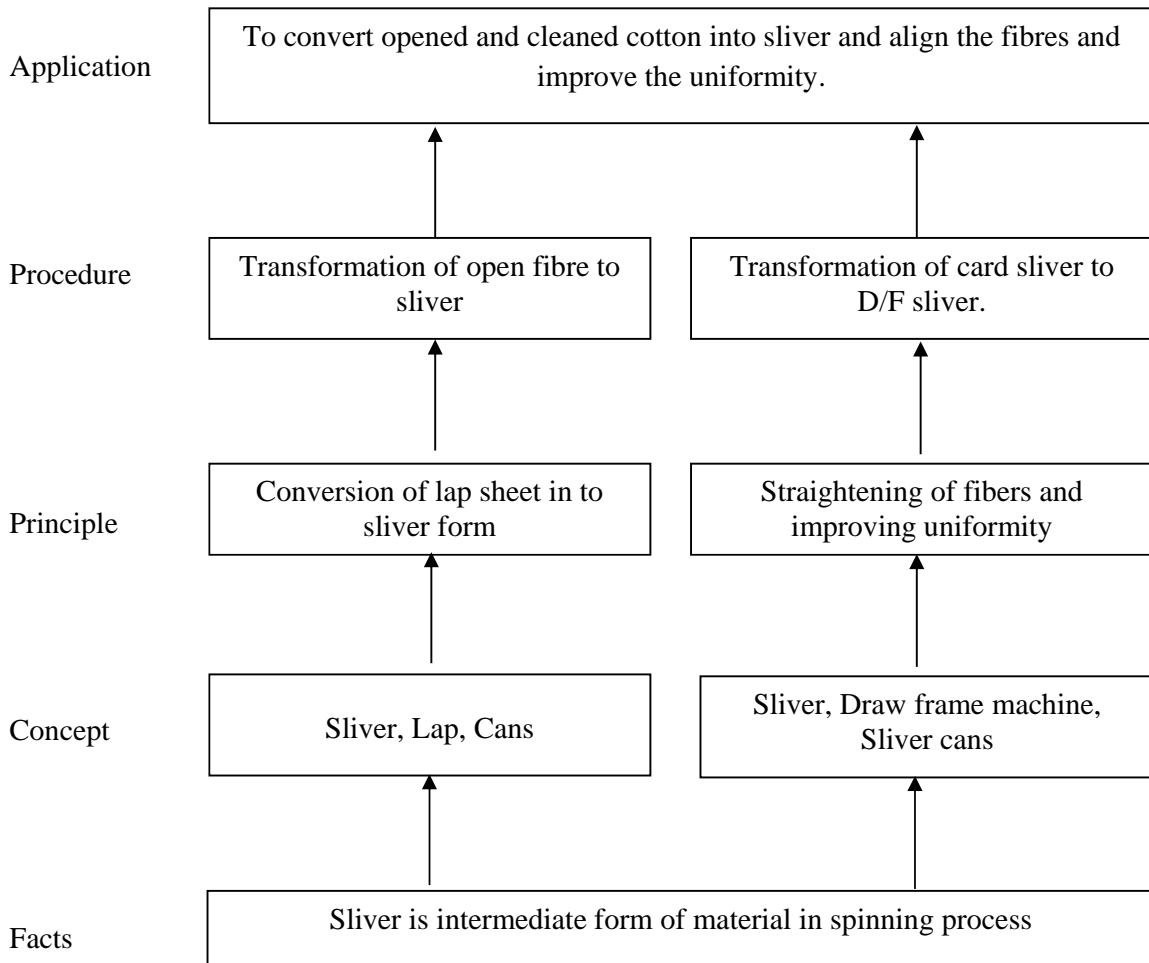
Yarn Manufacture-II is a continuation of detailed study of spinning processes. This subject covers Carding and Draw frame processes. It covers the study of principles and description of these processes and functions of all machines and their parts with related information and skills.

General Objectives:

The students will be able to:

- i) Understand carding process.
- ii) Draw the sketch and gearing of carding machine.
- iii) Calculate production of carding machine.
- iv) Understand Drawing process.
- v) Draw and sketch gearing of Drawing Machine.
- vi) Calculate the production of Drawing Machine.
- vii) Describe the working of auto leveler.

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
<p>1. STUDY OF CARDING PROCESS: Specific Object : 1. Identify concept of individualization of fibers 2. Describe effect of setting and process parameters on quality of sliver produced. 3. State the importance of wire sharpness. 4. Identify the defects in carding process.</p> <p>The tasks of card: ----- 20 Marks</p> <ul style="list-style-type: none"> • Operating principle • The operating regions of card—requirement of feed material, Basic concept of Chute feed, flock feed. • Taker - in feeding arrangement—conventional system, unidirectional feed. • The main cylinder, the grid, • The zone of taker-in, working of taker-in, transfer of fibers to the main cylinder, elimination of impurities • Auxiliary carding devices (carding aids), need for such assemblies, Additional carding segments, Purpose and effect of carding segments. <p>Flats, Doffing, Detaching, Card Clothing ----- 20 Marks</p> <ul style="list-style-type: none"> • Flats, function of flats, movement of flats, cleaning positions in the region of flats. • Doffing - the doffer, doffing operation. • The detaching operation, crushing rollers, coiling into cans, • The drive, Gearing diagram of carding machine and change places • Card clothing - choice of clothing, Metallic clothing <p>Auto Leveling, Maintenance, Defects ----- 20 Marks</p> <ul style="list-style-type: none"> • Auto leveling equipment, classification, Principle of short term medium term and long-term autoleveller. • Measuring devices: The active pneumatic system, the mechanical principle. • Maintenance: stripping the card clothing, polishing, grinding, full width grinder, horsefall grinder. • Setting of parts, Dust extractors on high performance cards, waste disposal. • Modern developments in Carding (Zone wise) • Defects in Carding their causes and remedies. • Calculations regarding speeds, drafts, hank, production of the machine. 	40	60

<p>Study of draw frame process: Specific objectives:</p> <ol style="list-style-type: none"> 1. Describe the concept of parallelization and blending of fibers. 2. State the effect of setting and process parameters on quality of sliver produced. 3. Identify the importance of drafting parameters. 4. Identify the defect in drawing process. <p>Draw Frame:</p> <ul style="list-style-type: none"> • Objectives of the draw frame, • Operating principle, passage of material through Draw frame machine • Feeding devices-creel-sliver feed <p>Drafting Arrangement: ----- 16 Marks</p> <ul style="list-style-type: none"> • Drafting arrangement: requirements, influence of draft, factors dependent upon the drafting arrangement. • Elements of drafting arrangement: Bottom rollers, Top rollers, maintenance of top rollers, Top roller pressure • Study of modern drafting Systems viz. 4/3 roller drafting system, • Suction system of drafting arrangement <p>Coiling: ----- 12 marks</p> <ul style="list-style-type: none"> • Coiling—delivery, condensing, sliver coiling, Can changers. • Monitoring and auto levelling system - open loop, close loop, combined loop. • Integrated monitoring system, sliver data. <p>Modern Development: ----- 12 Marks</p> <ul style="list-style-type: none"> • Modern developments in Draw frame. • Defects, their causes and remedies. <p>Calculations regarding hank, draft and production</p>	24	40
Total	64	100

Practical:

Skill to be developed

Intellectual Skills

- Calculate the speeds of various parts in Carding.
- Calculate the production of Carding.
- Select various settings of Carding.
- Select speed of various parts and setting for particular mixing.
- Calculate the speeds of various parts in Drawing.
- Calculate the production of Drawing.
- Select proper setting for particular mixing.

Motor Skills:

- Draw gearing diagram of Carding machine
- Draw sketches of Carding machine.
- Measure the speed of Carding by using tacho meter.
- Follow standard setting procedure for Card setting.
- Draw gearing diagram of Draw Frame.
- Draw sketches of Draw Frame.
- Measure the speed of drawing by using tacho meter.
- Follow standard setting procedure for Draw frame setting.

List of Practicals:

- 1) Study of passage of material through high production Carding machine.
- 2) Study of gearing diagram and calculation of hank, speed, draft and production of Carding machine.
- 3) Setting of Carding machine (feed side).
 - i) Cylinder to taker-in
 - ii) Taker-in to taker-in under casing.
 - iii) Mote knife to taker-in
 - iv) Feed plate to taker-in
 - v) Cylinder to cylinder under casing
- 4) Setting of Carding machine (delivery side).
 - i) Cylinder to doffer
 - ii) Doffer to doffer comb.
 - iii) Cylinder to flat
- 5) Study of passage and features of Modern high production Card.
- 6) Study of stripping, polishing and grinding of Carding machine.
- 7) Study of passage of material through high speed Draw frame machine.
- 8) Study of gearing diagram and calculation of hank, speed, draft and production of high speed Draw frame machine.
- 9) Study of roller setting of Draw frame machine.
- 10) Study of auto-leveller at Draw frame.

Learning Resources:**Books:**

Sr. No.	Author	Title	Publication
1.	W. Klein	Technology of Short Staple Spinning Vol. I	The Textile Institute, Manchester.
2.	W. Klein	The Practical Guide To Combing and Drawing Vol. 3	The Textile Institute, Manchester.
3	W. S. Taggart.	Cotton Spinning Vol. II	Macmillan and Co. Ltd.
4	T. K. Pattabhiram	Essential Element of Practical Cotton Spinning.	Somaiya Publication Pvt. Ltd. Mumbai.
5	T. K. Pattabhiram	Essential Facts in Cotton Spinning.	Somaiya Publication Pvt. Ltd. Mumbai.
6	A. R. Garde (Editor)	Spinning Tablet Series (9 numbers)	The Textile Association, India.
7	Ed. By K. Ganesh, A. R. Garde	Cotton Spinning.	The Textile Association, India.
8	R. Chattopadhyay, R. Rengasamy	Spinning- Drawing, Combing and Roving.	NCUTE, IIT Delhi
9	R. Chattopadhyay	Advances in Technology of Yarn Production.	NCUTE, IIT Delhi
10	K. R. Salhotra	Spinning of Manmades and Blends on Cotton System	The Textile Association, India.
11.	H V S Murthy	Introduction to Textile Fibres	The Textile Association, India.
12	Foster	Principles of Roller Drafting	--

Course Name : Diploma in Textile Manufactures

Course Code : TX

Semester : Third

Subject Title : Fabric Manufacturing-II

Subject Code : 17345

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
04	--	02	03	100	--	25#	25@	150

NOTE:

- **Two tests of 25 mark each, to be conducted as per the schedule given by MSBTE.**
- **Total of test marks for all theory subjects are to be converted out of 50 and to be entered in mark-sheet under the head Sessional Work (SW).**

Rationale:

In the second semester, Fabrics Forming-I dealt with yarn preparation in weft winding and weaving of simple fabric on non-automatic loom. In this semester, this subject deals with warping process, which is the first step in warp preparation. Further, processes of warp preparation, i.e. sizing and drawing-in will be dealt with in the next semester.

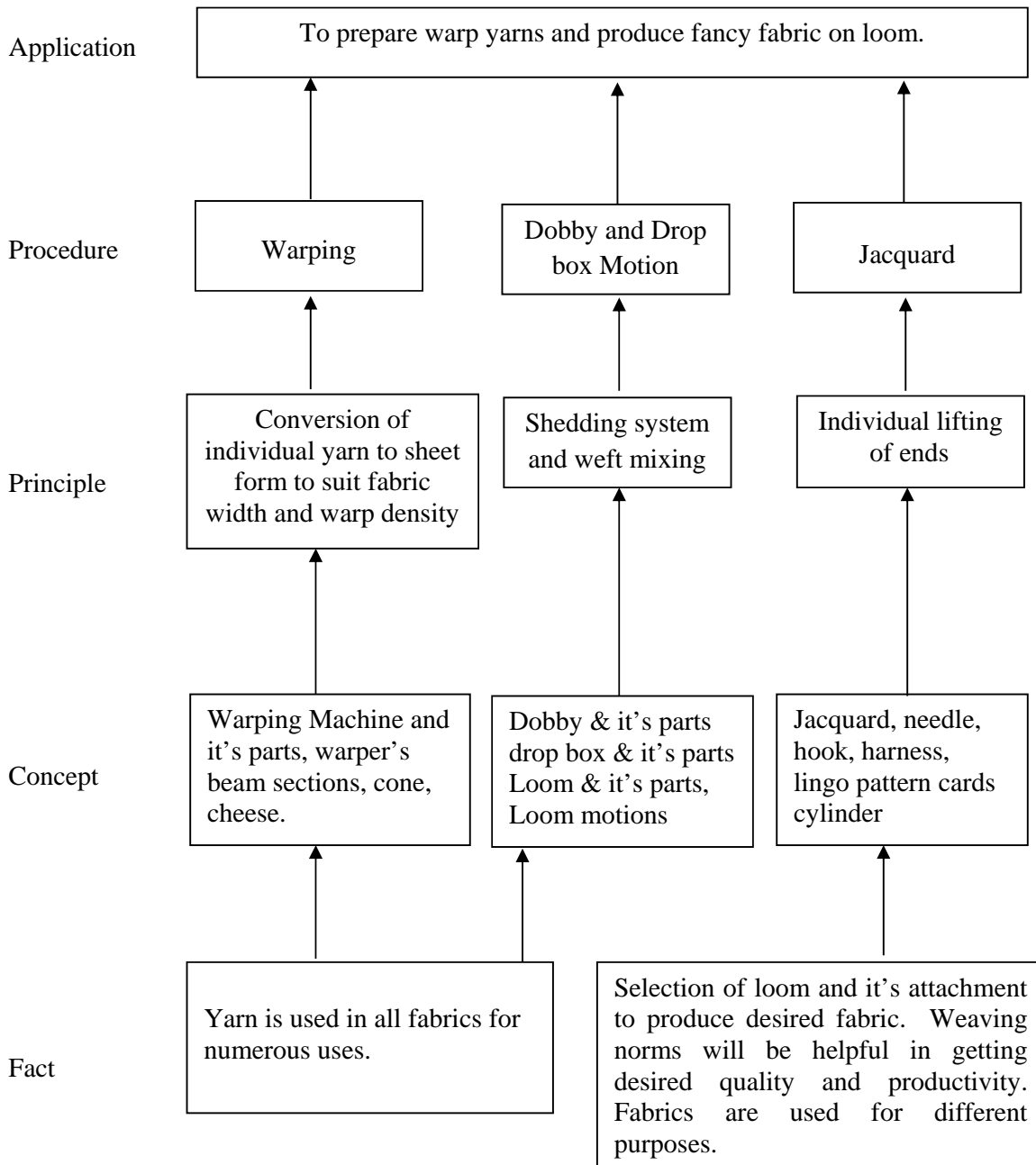
One of the important features of weaving process is that various attractive designs can be produced in the fabric during weaving by employing yarns of different colours, materials, characteristics and combining different orders of interlacements in a skillful manner. For this purpose, various mechanisms like dobby, drop-box and jacquard are attached to the loom. Therefore, this subject intends to impart knowledge and skills in the area of fancy weaving process. Also study of these mechanisms will be helpful while studying the subject Fabric Structure and Designing in the next semester.

Objectives:

The student will be able to

- Identify Warping process requirements
- Understand Warping process
- Identify mechanisms required for fancy weaving
- Use dobby, drop-box and jacquard mechanisms for fancy weaving.

Learning Structure



Contents: Theory

Chapter	Topic and Contents	Hours	Marks
01	<p>Warping: Specific Objectives - The Student will be able to</p> <ul style="list-style-type: none"> • understand objects of Warping • identify various parts and their functions • compare Beam and Sectional Warping • understand the procedure of leasing and beaming • select the machine for desired production • estimate the time required for desired production • calculate no. of Beams required for desired warp density <p>Content: 14 Marks</p> <p>1.1 Direct Warping (Beam Warping):- Objects, passage of warp, construction and working of spindle driven warping machines, different types of creels used, their merits and demerits, different types of tension devices, pre-tensioner, pneumatic tensioner, central control of tension.</p> <p>1.2 Head Stock details, spindle and drum drive, braking arrangements, expanding comb, manual and automatic doffing, system to give pressure on beam, stop motions on Beam Warping machine, it's working, types, significance and effect on beam quality.</p> <p>1.3 Indirect Warping:- (Sectional Warping) – object, passage of warp, through machine, preparation of sections, construction of warping drum, lease rod, section reed, traverse motion, section warping, leasing, beaming and creeling for colour patterns, description of colour master for creeling.</p> <p>1.4 Study of automations in creels and creeling.</p> <p>1.5 Modern Warping machines : Salient features</p> <p>Sub Topic - Warping calculations 06 Marks</p> <ol style="list-style-type: none"> 1. Production and efficiency of Direct Warping machine. 2. Efficiency of Sectional Warping machine. 3. Calculation and no. of beams in a set for beam warping and no. of sections and section width for Sectional Warping. 	14	20

02	<p>Dobby Shedding: Specific Objectives – The Student will be able to</p> <ul style="list-style-type: none"> • Identify different types of sheds. • Select the dobbie for desired design. • Set the timing of the dobbie. • Reproduce the required design. • Compare different dobbies. • Understand working of new dobbie. <p>Content Sub Topic - 1: Conventional Dobbies 16 Marks</p> <p>2.1.1 Types of sheds (a) Open shed (b) Semi-open shed, (c) Bottom closed shed, (d) Centre closed shed, their formation, merit and demerits.</p> <p>2.1.2 Types of Dobbys, study of construction and working of double lift, single jack (Keighley Dobby) and double-lift, double jack (Climax Dobby).</p> <p>2.1.3 Setting of Climax Dobby, method of pegging for right and left hand dobbie.</p> <p>2.1.4 Heald reversing motion on looms with Dobby.</p> <p>2.1.5 Cross-border Dobby - necessity, construction and working of two cylinder and three cylinder cross-border dobbie, cylinder selection mechanism.</p> <p>Sub Topic – 2 : Modern Dobbies 14 Marks</p> <p>2.2.1 Cam Dobby – construction and working of negative cam dobbie, advantages.</p> <p>2.2.2 Paper pattern Dobby – construction and working of paper pattern Dobby, heald selection on paper dobbie. Comparison between conventional Dobby and Cam Dobby, Paper Dobby.</p> <p>2.2.3 Positive dobbie – Construction and working of double lift positive dobbie, advantages.</p> <p>2.2.4 Rotary Dobby – Function and working of modulator and reading in mechanism, working of mechanical and electronic rotary dobbie, features and advantages of Rotary Dobby.</p>	18	30
03	<p>Multiple Box Motions Specific Objectives – The Student will be able to</p> <ul style="list-style-type: none"> • Understand the multiple box motions. • Set the timing of box motion. • Reproduce the required pattern. <p>Content –</p> <p>3.1 Object and types of Drop Box motions</p> <p>3.2 Construction and working of multiple box motions such as Cow-burn and Peck and Eccle’s drop box motion, timing and settings, different types of safety devices.</p> <p>3.3 Different types of cards used for drop box motion, card saving device, preparation of card chain with and without card saving.</p> <p>3.4 Pick and Pick, Pick at will mechanism, weft mixing with drop boxes.</p>	14	20

04	<p>Jacquard Shedding – Specific Objectives – The Student will be able to –</p> <ul style="list-style-type: none"> • Identify different types of jacquards. • Select jacquard for desired design • Reproduce the required design • Compare different types of jacquard • Understand working of new jacquard. <p>Content –</p> <p>4.1 Introduction to ornamentation of fabrics, various effects produced in the woven fabric.</p> <p>4.2 Introduction to jacquard shedding – object, types of Jacquards, study of construction and working of Single Lift Single Jacquard, principle parts of jacquard, study of figuring, capacity of jacquard.</p> <p>4.3 Study of construction and working of Single Lift Double cylinder, double lift Single cylinder and Double Lift Double cylinder jacquards, features, advantages and limitations of these jacquards.</p> <p>4.4 Cross-border Jacquards – object, construction and working of cross border Jacquard.</p> <p>4.5 Open shed jacquard – construction and working of open shed Jacquard, advantages.</p> <p>4.6 Jacquard mounting, Harness building and Harness ties.</p> <p>4.7 Methods of transferring design on graph paper from sketch and from fabric, selection of point paper counts for it.</p> <p>4.8 Method of card punching, card lacing, casting out.</p> <p>4.9 Electronic Jacquards – Features of electronic jacquards, its advantages over mechanical jacquard, construction and working of electronic jacquards.</p>	18	30
	Total		

Practices – Fabric Manufacturing - II

Skills to be developed:-

Intellectual Skills

- Select the warping machine or warping process
- Calculate production and efficiency of warping machine
- Select doobby, drop box and jacquard for producing fancy design.
- Analyze the fabric sample.

Motor Skills

- Draw sketches of Warping, Dobby, Drop Box and Jacquard.
- Set the Dobby and Drop Box mechanisms.
- Operate the fancy design power loom.

List of Practices:

1. Mill visit to study Beam Warping Machine.
 Passage of material, study of creel and head stock details, functions of various parts, calculations of speeds and productivity.
2. Mill visit to study Sectional warping Machine.
 Passage of material, study of creel and head stock details, functions of various parts, calculations of speeds and productivity.

3. Study, dismantling and refitting of Climax Dobby.
4. Settings and timings of Climax Dobby
5. Preparation of lattice chain for R.H. and L.H. dobbie and weaving the design on the loom.
6. Study, dismantling and refitting of Drop Box.
7. Timing and settings of drop box, Preparation of card chain for Drop Box.
8. Study of paper cam dobbie: Construction and working, function of various parts, driving arrangement, heald selection mechanism.
9. Study of single Lift cylinder jacquard: Construction and working, function of various parts, driving arrangement, heald selection mechanism.
10. Study of Double Lift Double Cylinder Jacquard: Construction and working, functions of various parts.
11. Operation of Piano Card Cutting Machine, card punching and card lacing.
12. Sample preparation on CAD package with printouts.
13. Demonstration of Rotary dobbie and Electronic jacquard (if available).

Note :- Practicals on Dobby and Drop-box are to be included in the practical Exam. of IVth Semester.

Learning Resources

Books

Sr. No.	Author	Title	Publisher
1	M.K. Talukdar	Winding, Warping	--
2	R. Sengupta	Yarn Preparation Vol. I & II	Popular Publications, Mumbai
3	N.N. Banerjee	Weaving Mechanism Vol. I & II	Textile Book House, 29, Krishnath Road, Behrampore (W.B.)
4	K.T. Aswani	Fancy Weaving Motions	Mahajans Publishers, Ahmedabad
5	Hasmukhbai	Fabric Forming	SSM Institute of Textile Technology, Tamilnadu
6	M.K. Talukdar, P.K. Shriramulu D.B. Ajgaonkar	Weaving Machines, Mechanisms, Management.	Mahajan Publishers Pvt.Ltd., Ahmedabad
7	T.W. Fox	Mechanism of Weaving	Universal Publications, Mumbai
8	R. Sengupta	Weaving Calculations	D.B. Taraporevasla Sons & Co. D.N. road, Mumbai
9	M.C. Paliwal P.D. Kimothi	Process Control in Weaving	ATIRA, Ahmedabad

1. P.A. Khatwani, J.R. Ajmeri, Developments in Warping JTA Jan-Feb 2003
2. M.V. Korenne – Modern Dobbies, ITJ, Dec. (1997).

Course Name : Diploma in Textile Manufactures

Course Code : TX

Semester : Third

Subject Title : Textile Testing-II

Subject Code : 17346

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
03	--	02	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Different fibers are used in textile manufacturing, such as Cotton, Silk, Synthetic etc. These raw materials are used individually or mixed in different proportions to form a yarn of desired quality. The raw materials are to be tested for numerous characteristics like fiber length, fineness, strength, maturity etc. Intermediate products like sliver, roving etc. are also required to be tested for controlling the process, for optimizing the process parameters or for developing existing process. To ensure the quality of final product like yarn, fabric or garment, testing is imperative. This subject will equip students with the concepts, principles and methods of testing of various textile fiber and yarns, which is helpful in selection of raw materials, process control, process optimization and quality assurance.

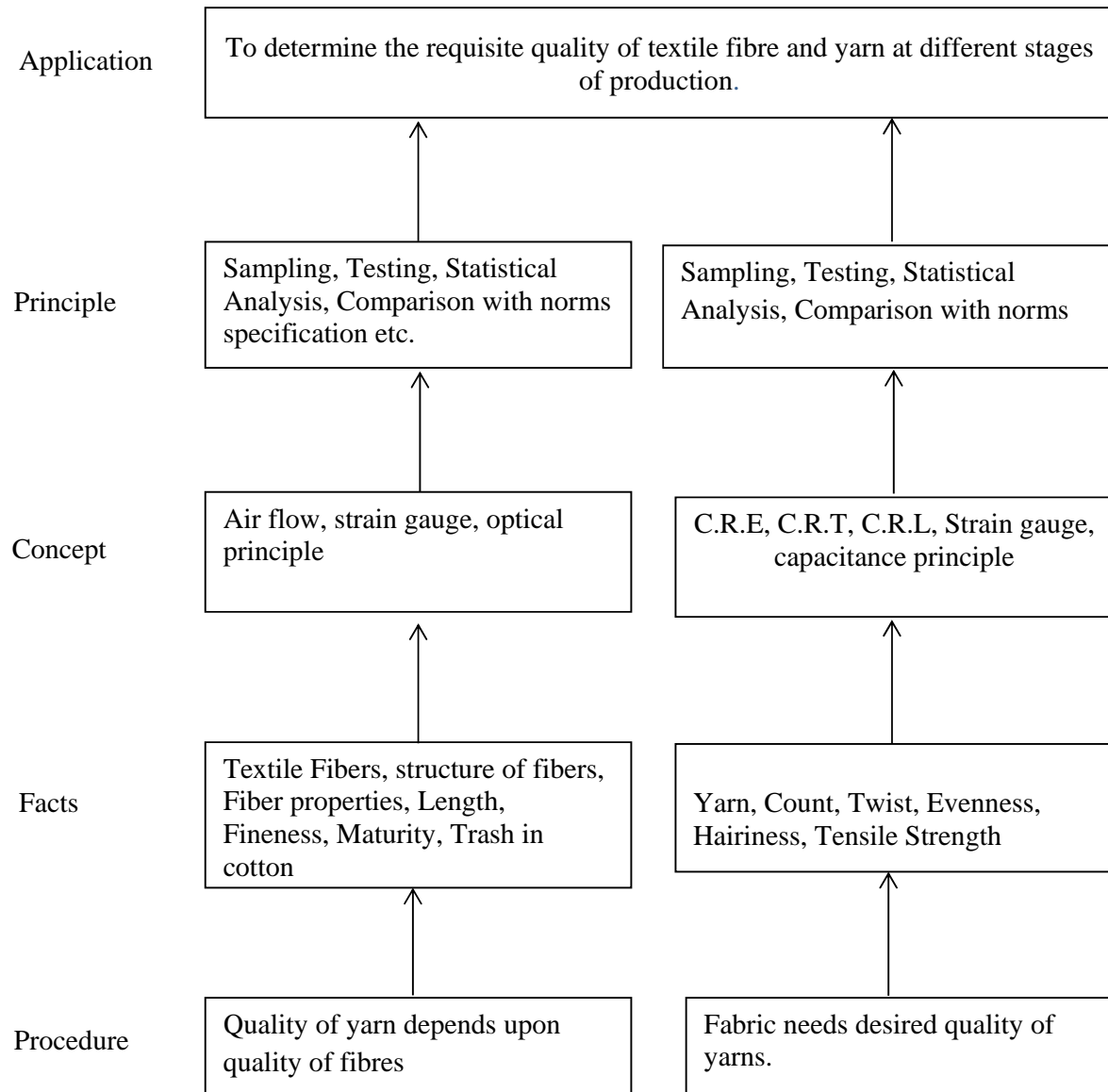
Since textile is a continuous process, variations in product quality are likely to occur. Results obtained from number of observations are to be analyzed, interpreted and used for best outcomes. Therefore, students are equipped with the methods to analyze the testing results statistically.

General Objectives:

Student will be able to:

1. Understand yarn numbering system.
2. Measure twist in twisted yarn.
3. List yarn tensile strength testing methods.
4. Define various terms used in yarn evenness testing.

Learning Structure:



Detail Content:

Chapter	Topic	Hours	Marks
1	<p>Yarn Numbering Systems: Specific Objectives</p> <ul style="list-style-type: none"> ➤ Select yarn count measuring system. <p>1.1 Concept, Direct and indirect yarn numbering system</p> <ol style="list-style-type: none"> i. Definition : British, Metric, Worsted, Woollen (Yorkshire), Tex, Denier Count/Linear Density of plied yarn ii. Numerical examples on Yarn Numbering system, Conversion Formulae. iii. Measurement of Yarn Count: <ul style="list-style-type: none"> • Package form- Wrap reel & Weight measurement (ASTM D-1907-89) • Yarn in fabric form- Cut a particular length of yarn removed from fabric and Weight measurement (IS-3442-98). iv. Relation between yarn count and diameter. 	08	22
2	<p>Yarn Twist Specific Objectives</p> <ul style="list-style-type: none"> ➤ Describe the process testing of yarn twist. ➤ List different methods of twist measurement. ➤ Interpretation of effects of twist on fabric properties. <ol style="list-style-type: none"> i. Concept, Definition of Twist, Twist directions, Amount of twist, Twist multiplier, Twist factor ii. Twist and yarn strength relationship, Effects of twist on fabric properties. iii. Methods to measure twist in a single yarn: <ol style="list-style-type: none"> a. Straightened fiber method (ASTM D-1422-92) b. Twist contraction method (ASTM D-1422-92) c. Twist to break method. iv. Twist measurement in double yarn: Take up twist tester. 	08	18
3	<p>Yarn Evenness Specific Objectives</p> <ul style="list-style-type: none"> ➤ Know causes and effects of evenness. ➤ Use appropriate method of testing of evenness. <ol style="list-style-type: none"> i. Concept, Classification of variations in weight per unit Length. Random and periodic variation. ii. Causes of unevenness iii. Terms & Definitions : U%, C.V.%, Limit irregularity, Index of irregularity, addition of irregularity, reduction in irregularity iv. Measurement of Unevenness <ol style="list-style-type: none"> a. Cutting & weighing method b. Visual Examination (ASTM D-2259-90) c. Capacitance principle, Electronic Capacitance Tester.(BS-2085-1973) v. Effects of irregularity. 	14	24

4	Yarn Hairiness Specific Objectives <ul style="list-style-type: none"> ➤ Interpret causes and effects of Hairiness. ➤ Use method of testing Hairiness. i. Concept of Yarn Hairiness. ii. Causes and effects of Hairiness iii. Yarn Hairiness testing: Microscopic method, Photoelectric method 	02	10
5	Tensile Strength Testing: Specific Objectives <ul style="list-style-type: none"> ➤ Describe the process of tensile strength testing of fiber and yarn ➤ Use appropriate method of testing of tensile strength testing of fiber and yarn. i. Terms and Definitions : Load ,Tenacity, Breaking length, Elongation, Breaking extension, Breaking Strength ii. Load Elongation Curve, Stress Strain Curve, Initial Young's modulus, Work of rupture, Work factor, iii. Elastic recovery, Instantaneous & time dependant effects. iv. Factors affecting tensile properties of textiles v. Constant Rate of Extension (CRE), Constant Rate of Loading (CRL), Constant Rate of Traverse (CRT) vi. Pendulum Lever principle, Strain Gauge Principle vii. Study of Fiber Strength tester : Stelometer, Instron viii. Study of Yarn Strength tester: Tensile Strength Tester, Single yarn strength tester (IS-1670-1970), Lea Strength Tester (IS-1671-1677, ASTM –D1578-88), Count Strength Product (LCSP/RKM), Ballistic or impact strength tester. 	16	26
Total		48	100

Skills to be developed

1) Intellectual skills:

1. Proper selection of measuring instruments depending upon the data and precision required.
2. Analyze properties of matter & their use for the selection of material.
3. To interpret the results from observations and calculations.
4. To use these results for corrective actions in mechanical and wet processing.

2) Motor Skills:

1. Proper handling of instruments.
2. Measuring physical dimensions of yarn and fabric accurately.
3. To observe the phenomenon and to list the observations in proper tabular form.
4. To adopt proper procedure while performing the experiment.

List of Practical:**Determination of:**

1. Determination of Linear density of spun yarns
2. Determination of Denier of Man-made yarn.
3. Determination of Twist in single yarn
4. Determination of Twist in doubled yarn
5. Estimation of Yarn Hairiness by Projection Microscope method.
6. Measurement of Yarn Evenness by Evenness Tester.
7. Grading of yarn by ASTM Yarn appearance method
8. Estimation of hank and hank C.V. % of sliver and roving sample.
9. Determination of tenacity of single yarn
10. Determination of Lea strength and CSP of given yarn sample
11. Determination of Ballistic strength of yarn
12. Determination of Bundle strength of cotton fibers.

References:

Sr. No.	Author	Title	Publisher
1	W.E. Morton & J.W. Hearle	Physical Properties of Textile Fibres	
2	--	Hand book of Textile Testing	Bureau of Indian Standards
3	John Skinkle	Textile Testing, Physical, Chemical & Microscopic	--
4	J. E. Booth	Principles of Textile Testing	-
5	Kothari	Testing and Quality Management	IAFL, New Delhi
6	Hamby & Grover	Hand book of Textile Testing & Quality Control	--
7	B. P. Saville	Physical Testing of Textiles	--
8	--	Methods of Tests, Fibre, Yarn & Fabric	CIRCOT, Mumbai
9	R. B. Beevers	Experiments in fibre physics	--
10	Angappan	Textile Testing	SS Textile Inst, Coimbatore
11	--	Quality Control	NCUTE

Websites:

- 1) www.scribd.com
- 2) www.fibre2fashion.com

Course Name : Diploma in Textile Manufactures

Course Code : TX

Semester : Third

Subject Title : Textile Chemistry-I

Subject Code : 17347

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

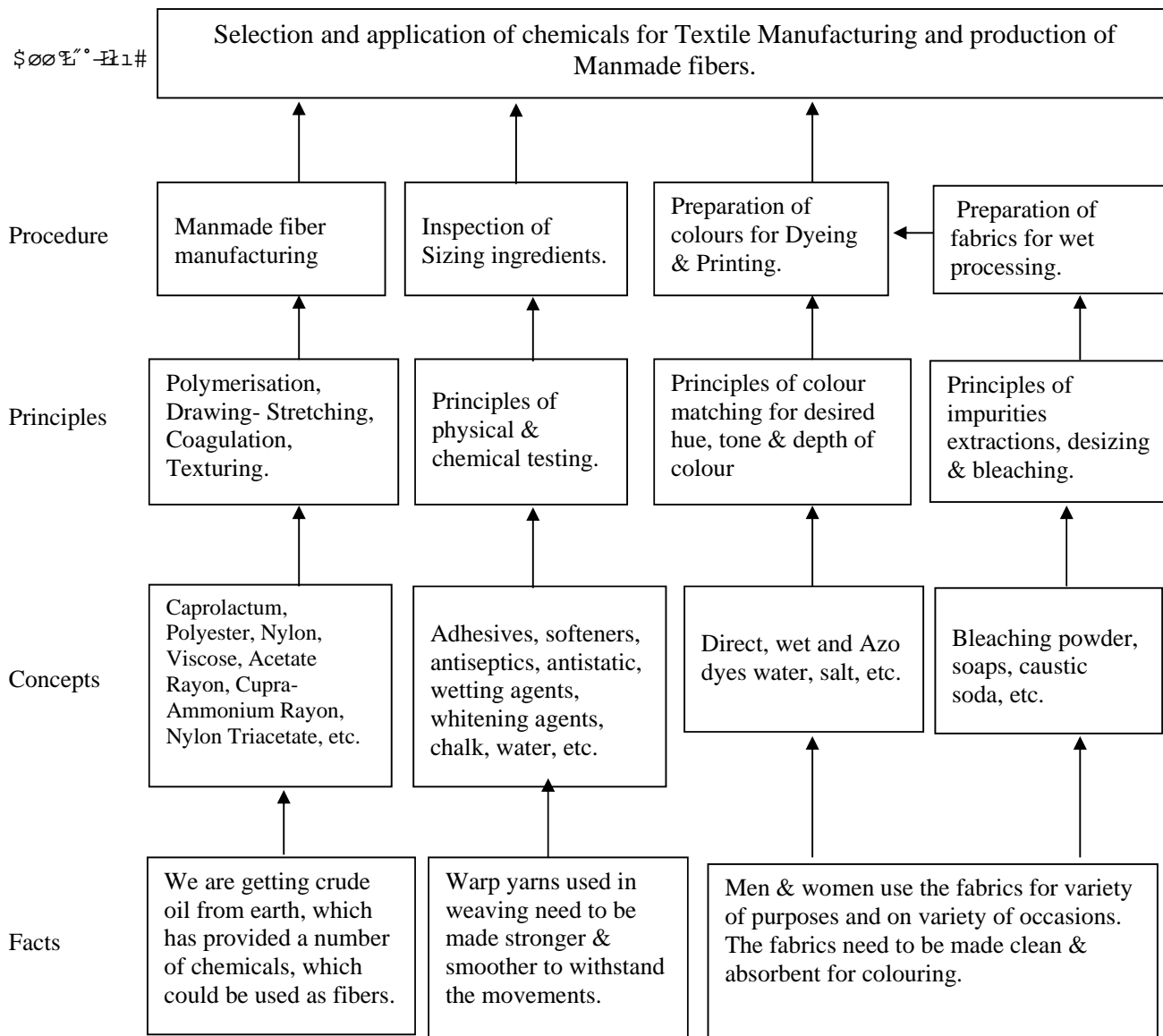
As has been described in Basic science- Chemistry, in the first semester that people prefer different colours in fabrics and like change in colour and prints. In garments, tapestry, bed sheets etc. Continuous change in life and such expectations make this subject of textile chemistry all the more interesting and challenging. While working in various capacities in textile industry, it is very essential to acquire the necessary knowledge and skills in using the chemicals, which are used for

- Improving the strength, abrasion resistance and smoothness of the warp yarns to impart weavability during sizing process
- Removing fats and impurities from cotton yarns and fabrics for making them color absorbent
- Washing of fabrics

General Objectives: The students will be able to:

1. Classify the fibers
2. Establish relationship between physical and chemical properties of fibers
3. Draw the diagram of Wet Spinning, Melt Spinning and Dry Spinning methods
4. Explain the properties of sizing ingredients
5. Understand the continuous Bleaching process.

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
1. Natural and Regenerated Fibers Specific Objectives: 1. List the type of fibers 2. Draw morphological structure of fibres. 1.1 Classification of Fibres, Physical and Chemical properties of Cotton, Wool, Jute and Silk. 1.2 Method of manufacturing, physical and chemical properties and uses of man-made fibres: Regenerated fibres such as Viscose rayon, Acetate Rayon.	08	20
2. Synthetic Fibers Specific Objectives 1. Identify the fibre based on manufacturing process. 2. Able to list the physical chemical properties of fibres. Method of Manufacturing, chemical and physical properties and uses of Synthetic Fibres: Polyester, Nylon-6, Nylon 66, Polypropylene, Polyethylene. And Polyacrylonitrile etc.	08	20
3. Sizing Specific Objectives 1. Understand the function of size ingredients. 2. List the physical, chemical properties of size ingredients. 3.1 Object of Sizing, Sizing ingredients and their function. 3.2 Chemistry of sizing ingredients. 3.3 Physical and chemical properties of adhesives, softener, antiseptic, and antistatic agents. 3.4 Keeping and congealing properties of starch, study of viscosity of adhesives 3.5 Testing of adhesives, softener. 3.6 Testing of softener – SAP value, Iodine value, and acid value. Size formulations for different fibers.	16	30
4. Pre treatments Specific Objectives 1. Understand outline of pretreatment process. 2. Understand batch wise and continuous process. 4.1 Shearing, Singeing, De-Sizing, Scouring, Bleaching, (batch and continuous process) 4.2 Study of Bleaching of cellulosic and synthetic materials	16	30
Total	48	100

Practicals:**Skills to be developed****Intellectual Skills**

1. Analyze the sizing ingredients
2. Interpret the results

Motor Skills

1. Measure the quantities accurately
2. Handle the apparatus carefully
3. Observe the chemical reactions

List of Practical

- 1) Identification of Textile fibres: Physical and Chemical
- 2) Testing of starches.
- 3) Testing of wetting agents
- 4) Viscosity testing of different adhesive/softeners
- 5) Testing of other sizing ingredients
- 6) Sap value of softeners
- 7) De-sizing of grey cotton fabrics
- 8) Scouring of cotton
- 9) Bleaching of cotton by different bleaching agents (any two)
- 10) Bleaching of Synthetic Fibre/yarn

References:**Books:**

Sr. No	Author	Title
1	Dr. V. A. Shenai	Textile fibres
2	D. B. Ajgaonkar	Sizing
3	V. A. Shenai	Bleaching
4	V. A. Shenai	Dyeing
5	V. A. Shenai	Printing
6	J. T. Marsh	An introduction to finishing
7	V. A. Shenai	Finishing
8	E. R. Trotman	Bleaching

Course Name : Diploma in Textile Manufactures

Course Code : TX

Semester : Third

Subject Title : Fabric Structure-I

Subject Code : 17348

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

The quality of woven fabric depends on its functional and aesthetic properties. These in turn are governed by raw material selection, yarns used, fabric construction, structure and texture, and ornamentation of fabric. Some of the end uses emphasize only on the functional aspects and others on functional and aesthetic aspects. In this context fabric structure is of immense importance.

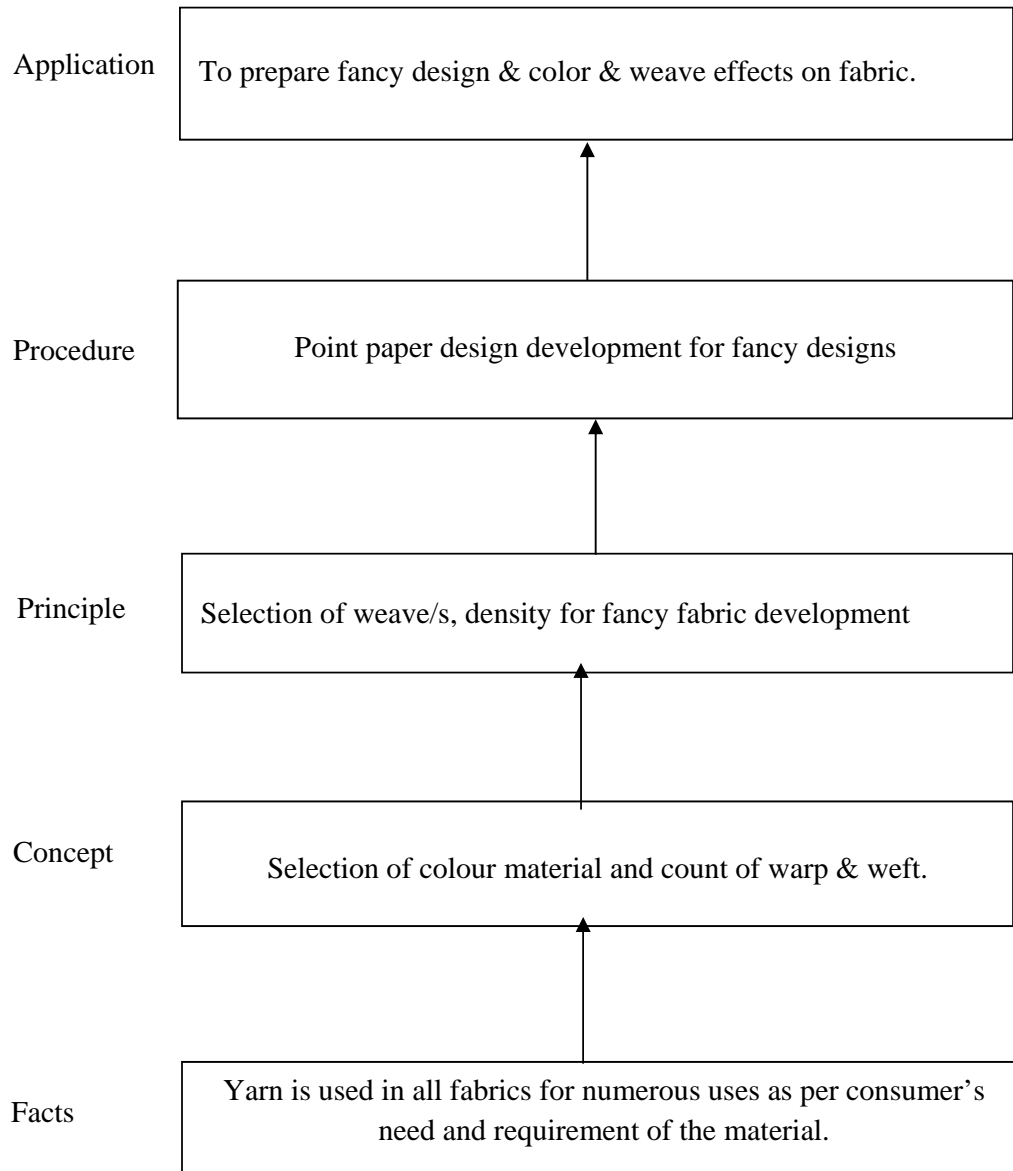
In this subject the basics of fabric structure with reference to weave, raw materials, feel, weight and appearance are covered. Also various types of drafts, denting order and lifting plans to develop different woven designs are included development of fancy fabric structure and color and weave effects to serve consumers in view of competitive global market is stressed in detail.

Objectives:

The students will be able to:-

- Understand the concept of weave, draft, denting order and lifting plan.
- Understand the fundamentals of fabric structure.
- Develop the elementary fabric structure on point paper.
- Mark different fancy structures and color & weave effects on point paper.

Learning Structure:



Contents: Theory

Chapter	Name of Topic	Hours	Marks
01	Fundamentals of Fabric Structure 1.1 Concept of warp & weft with attributes 1.2 Basic operation in woven fabric production 1.3 Concept of interlacement of warp & weft 1.4 Method of fabric representation on point paper 1.5 Concept & definition of weave/design, weave repeat, draft, denting order & lifting plan. 1.6 Fabric quality parameters-Material of warp & weft, warp count weft count ,EPI & PPI, warp cover factor, weft cover factor, fabric cover factor, weight in grammes/sq.mtr 1.7 Type of drafts – Straight draft, Skip draft, pointed draft 1.8 sateen draft, transposed ,curved & combine drafts. 1.9 Relation between design, draft & lifting plan. 1.10Heald calculations & change in denting order requirements	08	16
02	Construction of plain – Woven fabrics with derivatives & standard plain woven fabrics. I. Construction of plain – woven fabrics 2.1 Design ,draft, lifting plan & denting order 2.2 Characteristic feature of plain woven fabric 2.3 Interlacing Diagram of Plain weave 2.4 Cross – sectional views of plain weave 2.5. Rib & cord effects produced in plain weave II. Derivatives of plain weaves 2.6 Warp Rib weaves 2.7 Weft Rib weaves 2.8 Hopsack, Mat or Basket weaves III. Standard plain woven fabric 2.9 Poplin, Voile, Cambric, Chiffon, Dhoti	08	16
03	Construction of twill – woven fabrics with derivatives & standard twill woven fabrics. I. Basic Twills 3.1 Characteristic feature of twill woven fabric 3.2 Classification of basic twills. 3.3 Balanced twill-Design, draft, denting order & lifting plan 3.4 Unbalanced twill- Warp faced twill- Design, draft, denting order & lifting plan with cross section. 3.5 Unbalanced twill – Weft faced twill- Design, draft, denting order & lifting plan with cross section. 3.6 Relative firmness of twill weave II. Weaves Constructed on Twill Bases Design, draft, denting order & lifting plan of following twills 3.7 Pointed twill 3.8 Waved twill 3.9 Broken twill 3.10 Herring bone 3.11 Transposed or Re arranged twill 3.12 Curved twill 3.13 Elongated twill 3.14 Combinations of twill weaves	08	16

	III. Standard Twill Woven Fabrics 3.15 Denim, drill etc.		
04	Construction of Satin/Sateen – woven fabrics with derivatives. 4.1 Characteristic feature of satin & sateen woven fabrics 4.2 Concept of move number for development of satin structure. 4.3 Development of regular satin weave 4.4 Draft, denting order & lifting plan of regular satin. 4.5 Concept of change in move number for development of irregular satin weave. 4.6 Development of irregular satin weave	04	10
05	Simple Colour & Weave effect 5.1 Concept of weave & colour in combination 5.2 Classifications of colour & weave effect 5.3 Representation of colour & weave effect on design paper. 5.4 Examples of simple colour & weave effect a) Continuous line effect b) Hound's tooth patterns c) Bird's eye & spot effects d) Hairlines e) Step patterns f) All over effects	06	12
06	Fancy Fabric Structures. Study of design, draft, denting order & lifting plan, loom equipment required to manufacture following fabric structure with characteristic features 6.1 Crepe weaves developments a) Constructions of crepe weaves upon sateen bases. b) Combination of floating weave upon plain threads c) Crepe weaves produced by reversing method. 6.2 Development of Huck-a-Back structures. a) Huck-a-back structures b) Huck-a-back structure on ten picks. c) Reversible Huck-a-Back structure d) Huck-a-back structure on eighteen picks. 6.3 Development of Honey-comb structures. a) Ordinary Honey-comb structures. b) Honey-comb structure having equal warp & weft floats c) Large Honey-comb structures. d) Brighton Honey-comb structures. 6.4 Development of Mock- Leno Structure a) Concept, development of perforated fabrics. b) Simple Mock- Leno Structure development on 6x6 c) Mock- Leno Structure on 8x8,10x10. d) Concept of missing dents and application of special denting order for development of Mock- Leno fabrics. 6.5 Development of Distorted Thread Effects. a) Distorted warp Thread Effects. b) Distorted weft Thread Effects.	14	30
Total		48	100

LIST OF PRACTICALS**Fabric analysis of following fabrics**

1. Plain woven fabric
2. Warp Rib fabric
3. Weft Rib Fabric
4. Mat Fabric
5. Twill Fabric
6. Satin Fabric
7. Sateen Fabric
8. Colour & Weave Effect Fabrics
9. Crepe fabric
10. Honey – comb fabric
11. Mock – Leno Fabric
12. Combination of Twills

Learning Resources:**Books:**

Sr. No.	Author	Title	Edition	Year of Publication	Address of Publisher
1	Watson	Textile Design & Colour	7 th	1988	Universal Publishing Corporation Mumbai
2	Doris Gorner	Woven Structure & Design – Part I	3 rd	1990	WIRA Technology Group Ltd. U.K.
3	A.F. Barker & E Midgley	Analysis of Woven Fabrics	1 st	1979	Abhishek Publication, Chandigarh

Course Name : Diploma in Textile Manufactures
Course Code : TX / TC
Semester : Second Semester for TC and Third Semester for TX
Subject Title : Elements of Electrical Engineering and Mechanics
Subject Code : 17015

Teaching & Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
--	--	02	--	--	--	--	50@	50

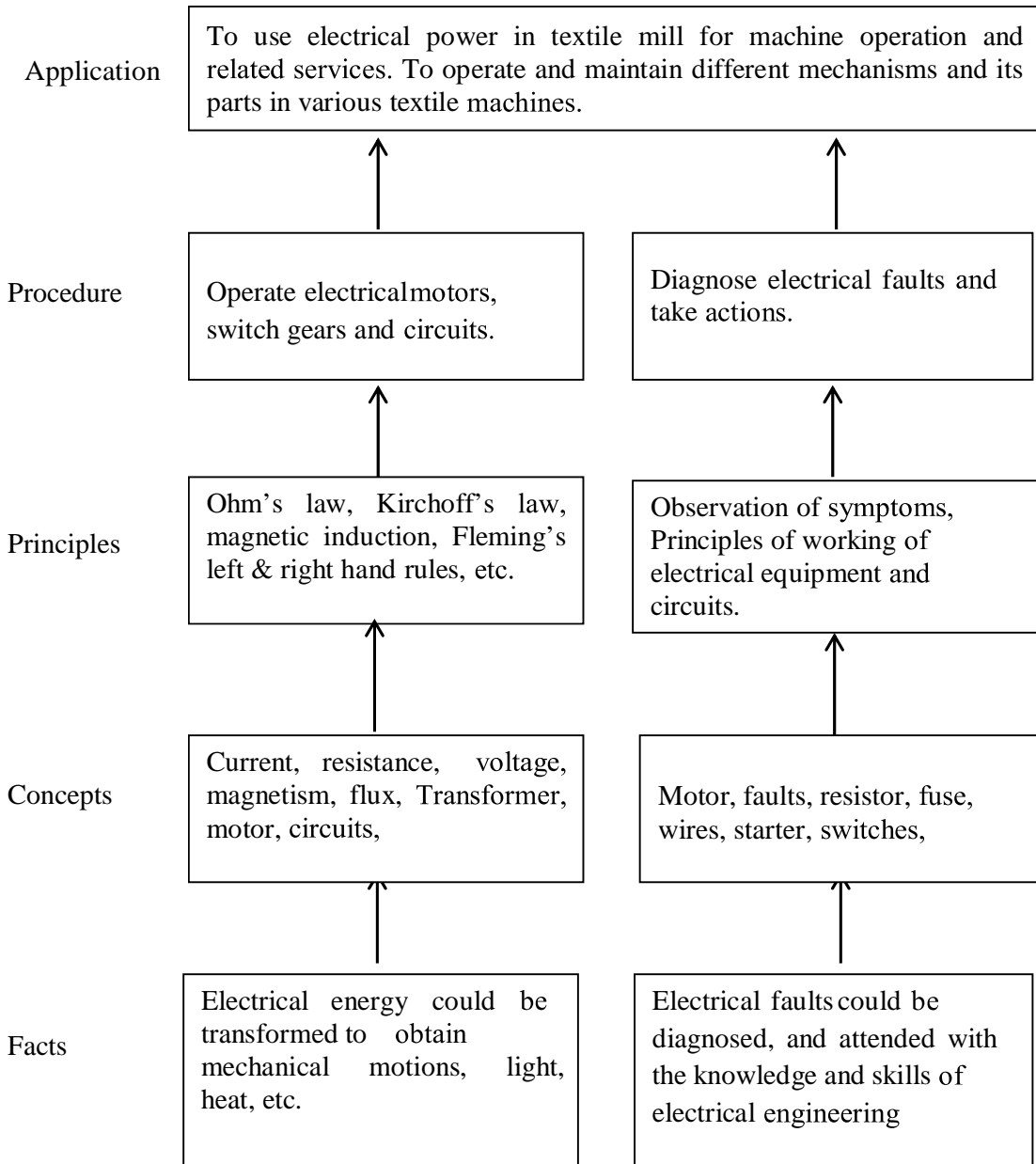
Rationale:

The prime responsibility of a textile technician working on shop floor is to ensure smooth and continuous functioning of all machines and equipments for satisfactory production and quality. This requires maintenance of the machines in good condition and to ensure that the functioning of all mechanisms in a particular machine is in order. Basic concept of force, work, energy, power are essential for this work which will help a diploma holder to achieve quality production.

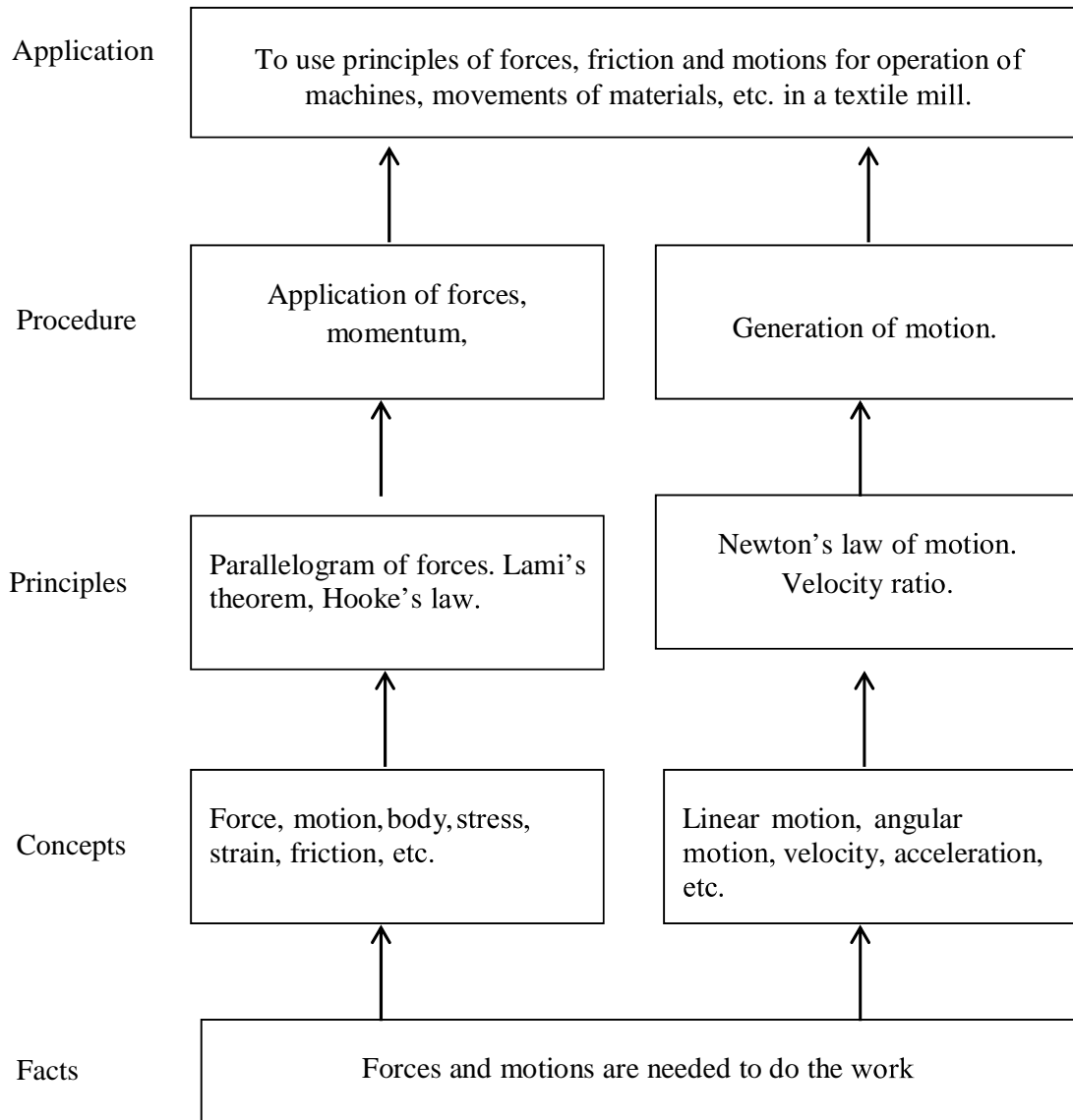
Secondly, the electrical power is one of the most essential inputs of any textile mill. The textile machinery and other services like, air conditioning, ventilation, water supply, lighting, etc. are powered by electrical energy. It is also evident that lot of care is needed in use of electrical power due to cost and safety. This requires the knowledge of basic electrical engineering concepts such as voltage, current, power etc. Further, technician should know about the different types of motors, their working, billing of electrical energy, and the safety measures while working with electrical equipments. This subject intends to impart the knowledge and skills of these aspects in the first part of the subject.

The knowledge about mechanics and materials is included in part of two.

Learning Structure for Elements of Electrical Engineering:



Learning Structure for Elements of Mechanics:



Practical:**ELEMENTS OF ELECTRICAL ENGINEERING:** Skills to be developed:**Intellectual Skills:**

1. To understand use of Ohm's law and Kirchhoff's law.
2. To determine Power factor in R, L circuit.
3. To understand working of electrical and magnetic circuits and induced current.
4. To understand A.C.
5. To understand principle of Transformer.
6. To understand induction motors and its construction and operation, speed control.
7. To understand faults in motors to solve simple problems.
8. To understand tariff and other related terms.

Motor Skills:

1. To measure current voltage, its direction.
2. Three phase wiring circuit in textiles.

List of Practical:

1. Verification of Ohm's law and Kirchhoff's law.
2. Determination of Power Factor of R-L Series circuit.
3. Performance of single phase Transformer by direct loading.
4. Draw single line diagram of three-phase wiring for any section/department of a textile mill comprising of motors.
5. Study of operation of DOL and star-delta starter.
6. Performance of three phase induction motor by direct loading.

ELEMENTS OF MECHANICS:

Skills to be developed:

Intellectual skills:

Determine law of machine, frictional efforts, efficiency of machine

Motor Skills:

Apply load on the machine and measure the corresponding effort required to determine the relation between load and effort and determine velocity ratio

List of Practical:

1. Verification of law of polygon of forces.
2. Find out velocity ratio, mechanical advantage and efficiency of wheel and differential axle.
3. Find out velocity ratio, mechanical advantage and efficiency of worm and worm wheel arrangement.
4. Find out velocity ratio, mechanical advantage and efficiency of single purchase crab and double purchase crab.
5. Find out velocity ratio, mechanical advantage and efficiency of screw jack.
6. Determine coefficient of friction between different surfaces like metal, wood, glass etc.
7. Study of different type of drives & their Applications in textile machines.

Learning Resources:**Books:**

Sr. No.	Author	Title
1	B. L. Theraja	Electrical Technology Vol. I to IV
2	Timothy Maloney	Electrical Circuits
3	Edward Hughes	Electrical Technology
4	U.A. Bakshi	Elements of Electrical Engineering
5	Hanton	Textile Mechanics
6	J. E. Booth	Textile Mathematics
7	Khurmi	Theory of Machines
8	Slator	Textile Mechanic Vol I & II

Course Name : Diploma in Textile Manufacture / Diploma in Textile Technology

Course Code : TX/TC

Semester : Third

Subject Title : Professional Practices-I

Subject Code : 17030

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
--	--	03	--	--	--	--	50@	50

Rationale:

Most of the diploma holders join industries for jobs. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Serial No.	Activities
1	<p>Industrial Visits Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work. TWO industrial visits may be arranged in the following areas / industries :</p> <ul style="list-style-type: none"> i) Spinning Mill ii) Weaving mill iii) Composite Mill iv) Garment Manufacturing unit v) Processing unit
2	<p>Lectures by Professional / Industrial Expert be organized from ANY THREE of the following areas:</p> <ul style="list-style-type: none"> i) Use of Technical Textiles ii) Modern Spinning machines iii) Modern Weaving unit(Shuttle less weaving) iv) Selection of electric motors. v) Computer Aided Designing vi) Industrial hygiene. vii) Composite Materials from Textile viii) Safety Engineering and Waste elimination in Textile industry
3	<p>Individual Assignments:</p> <p>1. Any two from the list suggested</p> <ul style="list-style-type: none"> a) Latest development in Blow room b) Latest development in Carding c) Latest development in Draw frame d) Latest development in Speed frame e) Latest development in Weaving machines f) Selection of fabric for a Garment g) List the various properties and applications of following Fibers - Cotton Polyester OR, Viscose etc. for Non Woven Applications <p>2. Conduct ANY ONE of the following activities through active participation of students and write report</p> <ul style="list-style-type: none"> i) Rally for energy conservation / tree plantation. ii) Survey for local social problems such as mal nutrition, unemployment, cleanliness, illiteracy etc. iii) Conduct aptitude , general knowledge test , IQ test iv) Arrange any one training in the following areas : <ul style="list-style-type: none"> a) Yoga. B) Use of fire fighting equipment and First aid b) Maintenance of Domestic appliances.