1. Course Title :- Textile Factory Planning & Organization
2. Course Code :-TT-501
3. Semester :-5th
4. Rationale of the subject/ Courses:

Effective Planning and organizing is the key to the success for any textile mill. First of all supervisor should know the various areas where planning and organizing is needed. These different areas are – side selection. Plant layout, material handling facilities, spinning and weaving plans, requirement of man power, power and illumination, temperature and humidity requirements in different sections of textile mills industrial safety etc. and then what kind of planning and organizing activities are needed? This subject aims towards providing the students the knowledge and skills in textile mill planning and organizing i.e. this subject aims to provide the answers to the questions of what is to be planned and organized and how that should be planned and realized. Besides the basic planning, an attempt is also made for introducing the elements of continues improvement in textile mill by energy conservation, and modernization renovation and replacement of machines based on techno economic studies. This subject aims at providing the comprehensive approach towards the textile mill planning and organizing for strategic to operational level, and thereby aims to develop the students not only for the supervisor level but also for the effective manager level responsibilities.

5. Teaching Scheme (in hours):

Lecture	Tutorial	Practical	Total
45 (Including 3 class test & Tutorials)	03	---	45

6. Examination Scheme:

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	33	-	-	-	-

7. Course Outcomes:

The Students will be able to:

- Explain about the factors and principle of Management in planning for a textile Enterprise.
- State the concept of economy in spinning, weaving and processing unit of Textile.
- Identify the preliminary considerations before setting up an organization.
- Explain different factors which are to be observed before selection of a site for an Enterprise.
- Identify the type of building required and proper roof, wall and floor structure.

8. Detailed Course Content :

Chapter No	Chapter Title	Content	Duration (in hours)
1	FACTORY PLANNING	1.1. Factors to be considered in planning for a textile enterprise. 1.2. Concept of economic units-weaving, dyeing, printing as small cottage unit. 1.3. Selection of site factors that influence detection of site, location pattern for Indian textile industries. 1.4. Choice of building type, shape and structure of buildings, trendin building construction for textile made in India. 1.5. Selection of machinery lay-out , machinery balancing. 1.6. Lighting-- importance of correct lighting for textile processing and testing, natural and artificial light, abstract of light. 1.7. Ventilation-- system of ventilation, standard of ventilation. 1.8. Humidification and conditioning, effects of humidity on textile processing and testing, necessity of humidification and air conditioning, system of humidification and air conditioning, control and measurement of humidity, abstract of humidification. 1.9. Fire prevention- measure of prevention and controlling fire. 1.10. Safety precaution- objects and measure adopted. 1.11. Material handling- objects and equipments in general and of textile industry in particular. 1.12. Plant maintenance—objects, methods in use their scope and limitations.	31
2	SPINNING ORGANISATION	2.1. Organisation of different counts and different system of proportion and spinning. 2.2. Scheme of hank, draft, twist. Setting, speed of machinery necessary for production of certain quality and quantity of yarn. 2.3. Calculation of average count and its efficiency.	07
3	WEAVING ORGANISATION	3.1. Organisation of preparation and weaving machinery for different sort, quality and materials. 3.2. WEAVING shed efficiency.	02
4	PROCESSING ORGANISATION	4.1. Organisation for lot dyeing of yarn and piece goods and printing of cloths selection of Equipment, dyes and auxiliaries.	02

9. Distribution of Marks :

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type (Compulsory)	Short Questions	Descriptive Questions	
1	FACTORY PLANNING	03	04	13	20

2	SPINNING ORGANISATION	02	03	11	16
3	WEAVING ORGANISATION	02	04	10	16
4	PROCESSING ORGANISATION	03	04	11	18
		10	15	45	70

10. TABLE OF SPECIFICATIONS FOR THEORY:- ANNEXURE-I

Sr No.	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1	Factory Planning	31	73.8%	04	03	08	05
2	Spinning Organisation	07	16.6%	02	03	07	04
3	Weaving Organisation	02	4.7%	02	03	06	05
4	Processing Organisation	02	4.7%	03	03	07	05
		42	100%	11	12	28	19

11. DETAILED TABLE OF SPECIFICATIONS FOR THEORY

Sr. No	**Topic**	Objective type				Short Answer Type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Factory Planning		3		3			4		4		5		8	13
2	Spinning Organisation		2		2			3		3		6		5	11
3	Weaving Organisation		2		2			4		4		5	5		10
4	Processing Organisation		3		3		4			4		5		6	11
					10					15					45

K=Knowledge C=Comprehension A=Application HA=Higher Than Application.

12. Books list :-

1. Textile Mill pLanning And Organisation. By D.S. Verma.
2. Management of Textile Industries by Dr. V.D. Dudeja.

13. **ILO (Intended Learning Outcome):-**

The students will be able to:

1.Acquire knowledge on the principle of management, role of managers.

a) State the utility of Scientific Management in a running industry.

b) Describe the function of management.

c) Relate the structure of management.

2. Access the economic activity of spinning and weaving unit.

a) Identify the economic concepts to run an Industry.

b) Look after the necessity of knowledge of economics before running an industry.

c) Identify the economic activity for each unit to a profitable industry.

3.Explain the parameters before setting up an industry.

a) Describe different preventive measures for selection of a site.

b) Relate the different factors involved before setting up an industry.

c) Identify the strategy of setting up an industry.

4. Illustrate the system of material handling.

a) Access the utility of material handling equipments in Industry.

b) Describe the advantages of material handling equipments in Industry.

c) Identify the name of modern material handling equipments.

5.Explain the type of building required.

a) Illustrate on proper structure of roof, wall and floor of an Industry.

b) Identify the advantages and disadvantages of old and new type of industrial building.

6.Explain the humidification process in the textile department.

a) Get ideas on the structure of hygrometer and humidifier.

b) Describe the effect and value of humidity in textile industry.

c) Identify the process of humidification in the textile department.

7. Access the importance of corrective, preventive and operational maintenance in the textile industry.

a)Explain the schedule maintenance required in the spinning and weaving Department.

b)Differentiate the preventive and corrective maintenance in the textile department.

c)Explain , how to plan the technical datas in spinning, weaving and processing unit.

8. Explain the process of lay-out of machinery in the textile Department.

a) Identify the importance of proper lay-out of the machinery in the department for smooth running.

b)Explain the proper spacing kept between machinery for smoothly moving in the department.

c) Detect the ideas of space requirement for installation of machines in proper manner.

9. Explain the importance of lighting arrangement in the textile department.

a) Access the intensity of lighting in the department to avoid injury to the human health.

b) State the quality of light required in the department for smooth running.

10.Recognize the safety rules in the industry.

a) Concentrate about the safety rules maintained during duty hours.

b) Detect the safety construction required to avoid fire and accident hazard.

1.Course title : TEXTILE WET PROCESSING-III

2.Course code : TT-502

3.Semester : 5th semester.

4.Rationale of the course : This part of the Textile processing explains various machineries used in textile industry, testing method of textile materials, fundamentals underlying the finishing of textile goods, which will develop basic understanding and skill of the students.

5. Course Outcome

After completion of the course, the students will be able to:-

- List out the important factors in selecting materials for construction of dyeing machines. Understand the working of different machines used for textile fibre in different forms such as yarn, fabric, piece goods and in package.
- Explain the object of testing methods like light fastness, washing fastness etc. of dyed materials
- Explain computerize colour matching system.
- Explain the object of finishing, differentiate temporary, semi-permanent and permanent finish, the purpose of synthetic resin finishes- antishrink and anticrese and their application, the object of mercerization and organdi finishes and their application along with machinery involved.
- Explain the sanforrizing treatment of cotton goods, heat setting of synthetic materials, the significance of water, rot, mildew, moth and flame proofing, their application and chemicals used & their functions. Working principle of textile finishing machines like mangle, starching, drying, stentering and calendaring.
- Calculate the cost involved for dyed and printed goods.

6 .Teaching scheme (in hours)

Lecture	Tutorial	Practical	Total
45 (including 3 class test)	8	30	83

7. Examination Scheme :

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	33	-	-	-	-

8. Detailed Course Content :

Chapter No	Chapter Title	Content	Hours
Unit-I	STUDY OF TEXTILE MACHINERIES	i)Consideration of some important factors in selecting materials for construction of dyeing machines. ii)Study of different machines used for Dyeing. Fibre Dyeing Machine. Yarn Dyeing.(Hank Dyeing Machine. Cone Dyeing Machine, Cheese Dyeing machine.	12

		Beaker Dyeing Machine) Fabric Dyeing.(Jiggar Dyeing Machine, Jet Dyeing Machine, Winch Dyeing Machine, Padding Mangle)	
Unit-II	TESTING OF DYED MATERIALS.	i)Testing of fastness properties of different dyestuff to various agencies such as washing, perspiration, light, rubbing and sublimation fastness. ii) Study of Computerized Color Matching System	5
UNIT-III	IDENTIFICATION OF DYES	ii)Identification of different classes of dyes in substance and in dyed materials.	5
UNIT-IV	SHADE MATCHING	i)Concept of shade matching.	3
UNIT-V	FINISHING OF TEXTILE MATERIALS.	i)Aim and objective of Finishing. ii) Temporary, semi permanent and permanent Finish. iii)Different finishing processes.(Synthetic resin finishes- Anti shrink, Anti crease and Organdi finishes, iv)Sanforizing treatment of cotton goods, v)Heat setting of synthetic materials. vi)Water proofing, water repellent, rot, mildew, moth & flame proofing finishes. vii)Study of machinery used in finishing of textile materials, like mangle, stretching, drying, stentering and clandering machines. viii) Finishing of Knitted goods. ix)Silicon finish, Shiffon Finish and Creping. x) Wash & Wear and durable finish	16
UNIT-VI	COSTING CALCULATION OF FINISHED TEXTILE AND SCHEME PREPARATION	i)Calculations relating to the costing of dyed and printed cotton goods. ii)Preparation of Scheme for small scale textile Industry.	4

9. Distribution of Marks :

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type	Sort Questions	Descriptive Questions	
Unit I	Study Of Textile Machineries	1+1+1+1	3	13	20
Unit II	Testing Of Dyed Materials.	1+1	2	6	10
Unit III	Identification Of Dyes	1	2	7	10
Unit IV	Shade Matching	1+1	3		5
Unit V	Finishing Of Textile Materials.	1+1+1+1	3	13	20

Unit VI	Costing Calculation Of Finished Textile Product And Scheme Preparation	1+1	3		5
		15	15	40	70

10. **TABLE OF SPECIFICATIONS FOR THEORY**

Sr. No	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1.	Study Of Textile Machineries	11	26	11	9		
2.	Testing Of Dyed Materials.	5	12	2	5	3	
3.	Identification Of Dyes	5	12	3	3	4	
4.	Shade Matching	3	7	5			
5.	Finishing Of Textile Materials.	14	33	11	9		
6.	Costing Calculation Of Finished Textile Product And Scheme Preparation	4	10		2	3	
Total		Σ b	100				

K = Knowledge C = Comprehension A = Application
HA = Higher Than Application (Analysis, Synthesis, Evaluation)

11. DETAILED TABLE OF SPECIFICATIONS FOR THEORY

Sr. No	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Study Of Textile Machineries	2	2		4	3				3	6	7			
2	Testing Of Dyed Materials.		2		2	2				2		3	3		
3	Identification Of Dyes	1			1	2				2		3	4		
4	Shade Matching	2			2	3				3					
5	Finishing Of Textile Materials.	2	2		4	3				3	6	7			
6	Costing Calculation Of Finished Textile Product And Scheme Preparation		2		2			3		3					

K = Knowledge C = Comprehension A = Application
HA = Higher Than Application T = Total

12. Intended Learning Outcome

S.L No	Course outcome	Intended Learning Outcome
1	List out the important factors in selecting materials for construction of dyeing	Student will able to, List out the some important factors in selecting materials for construction of dyeing machines.

	machines. Understand the working of different machines used for textile fibre	Enlist the materials used for construction of dyeing machines, their source & composition. List out the advantage & disadvantages of different materials. Understand the working principle of loose stock (fibre) dyeing machine, identity different parts of machine & their functions. Enlist the different machines used for yarn dyeing. Understand the working principle of cabinet hank dyeing machine, & the function of its parts; describe working principle of high temperate high pressure yarn (in package) dyeing machine and identification of parts of the machine & their function, its advantages over cabinet hank dyeing. Enlist the different machines used for fabric dyeing like winch dyeing, jigger dyeing, HTHP dyeing, jet dyeing. Viii) Illustrate with diagrams the working principle dyeing machine like which, jigger, HTHP beam dyeing, Jet dyeing &thesmosol dyeing, the functions of various parts of the machines, advantages of HTHP machine & jet dyeing our winch & jigger dyeing machine.
2	Understand the object of testing methods like light fastness, washing fastness etc. of dyed materials	Understand the significance of testing fastness properties. Explain the test to assess the fastness properties to washing, Explain the test to assess the fastness properties to light Explain the test to assess the fastness properties to perspiration. Explain the test to assess the fastness properties to Rubbing. Explain the test to assess the fastness properties to ironing Explain the test to assess the fastness properties to bleaching.
3	Understand about computerizes colour matching system.	Use computer for colour matching. Able to find out shade variation by using computer.
	Understand the object of finishing, differentiate temporary, semi-permanent	Understand the significance of finishing. Differentiate temporary, semi- permanent and permanent finishes with examples.

	and permanent finish, the purpose of synthetic resin finishes- antishrink and anticrese and their application, the object of mercerization and organdi finishes and their application along with machinery involved.	Explain the application of resin finishes-antishrink and anticrease finish. iv) Know about buckrum& wash & wear finishes. Understand the purpose of mercerization & its effect on cotton fibre. Illustrate the working principle of chainless mercerization machine.Explain organdi finishes and its application on fabric
4	Understand the sanforrizing treatment of cotton goods, heat setting of synthetic materials, the significance of water, rot, mildew, moth and flame proofing, their application and chemicals used & their functions. Working principle of textile finishing machines like mangle, starching, drying, stentering and calendaring.	Understand the signification of sanforizing treatment & heat setting of synthetic material. Describe the working principle of sanforizing machine. Identification of various parts of the machine and their function. Understand the importance of finishes like water proof & water repellent finish, the chemicals involved for the treatment & its application on fabric, Examples of waterproof &water repellent finishes. Explain rot, mildew & moth proofing, the application on fabric & the chemicals used. Know the object of flame proofing, the application process on fabric and the chemicals used & their function. Illustrate with diagrams the working principals of Textile Finishing machine like.
5	Calculate the cost involved for dyed and printed goods.	Calculate the cost involved in dyeing/ printing on the basis of dyes/ pigments, assistants & auxiliaries Utilized and overhead expenses.

13. Suggested Implementation Strategies :

The syllabus can be completed by regular classes, special classes using audio –visual aids, tutorial classes and providing writing materials. Practical classes in the laboratory helps students to understand the subject.

14. Suggested learning Resource :

i) Technology of Dyeing by V A Shenai.
ii) Technology of Printing by V A Shenai.
iii) A Glimpse on the chemical technology of Textile Fibre by R R Chakravertty.
iv) Dyeing and Chemical Technology of textile fibre by E R Trotman.
v) Chemistry of dyes and principle of dyeing by V A Shenai.
vi) Textile Finishing by G Nalankilti.
vii) Chemical processing of cotton polyester blend by ATA.

1.Course title : TEXTILE WET PROCESSING-III (PRACTICAL)
2.Course code : TT-502(P)
3.Semester : 5th Semester
4 Objectives : At the end of the program the student will be able to Dye the Synthetic textile materials and also printing of fabric.

5. Teaching and Examination Scheme :

Lecture	Tutorial	Practical	Total
45(including 3 class test)	8	45	98

6. Examination scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	17

7. Detailed Course Content:

Instructions		Examination		Total
Hours/week	Hours/Semester	Internal assessment	Practical examination	
2	45	25	25	50

7. **Detailed Course Content :**

Chapter No	Chapter Title	Name of the Topic	Hours
Unit-I	TESTING OF DYED MATERIALS.	i)Testing of washing fastness of Dyed Textile materials. ii) Testing of Light fastness of Dyed Textile materials. iii) Testing of Rubbing fastness of Dyed Textile materials. iv) Testing of Sublimation fastness of Dyed Textile materials.	12
Unit-II	IDENTIFICATION OF DYES.	i)Identification of unknown dye powder. ii) Identification of dye present in dyed Textile materials.(Yarn and Fabric.)	12
Unit-III.	SHADE MATCHING	i)Matching of shade of one color. ii) Matching of shade of two color.	11

UNIT-IV	FINISHING OF TEXTILE MATERIALS.	i)Application of whitening agent on white cotton fabric. ii)Application of softening Agent. iii)Application of weighting agent.	10

8. Distribution of Marks:

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type	Short Questions	Descriptive Questions	
Unit I	Testing Of Dyed Materials.				8
Unit II	Identification Of Dyes.				7
Unit III	Shade Matching				5
Unit IV	Viva.				5
Total					25

1 Course Title : COMPUTER AIDED TEXTILE DESIGN
2 Course Code : TT-503
3 Semester : 5th
4 Objectives : Main purpose of this subject is What is Computer Graphics, how to use a computer Graphics. Uses of CorelDraw, Making Sketch & Drawing in Corel Draw, Restore of Photograph in Photoshop, Colour Matching, Creating Pattern etc. Woven Design etc.

5. Teaching Scheme (in hours):-

Lecture	Tutorial	Practical	Total
--	--	90	90

6. Examination Scheme:

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
--	--	--	--	50	50	100	33

7. Detailed Course Content:

Chapter No	Chapter Title	Content	Hours
Unit-I	Introduction to computer graphics	Definition, uses of computer - CorelDraw - Photoshop - Design development through above packages as well as through Paint	 10 15 5
Unit-II	Computer Aided Woven Design	- Introduction to software for textile woven Design with windows platform.	25
Unit-III	Use of Computer for Colour Matching.	- Use of Computer for Colour Matching.	10
Unit-IV	Computer in Garment Industry	- Software for pattern making, grading and sorting.	15
Unit-V	Computer in Textile Testing.	- Computer in Textile Testing.	10

Books :

1. CorelDraw X7: The Ofiicial Guide, By- Gray David Bouton, Pub: McGraw Hill Education, 11 Edition

2. Photoshop CC for Dummies, By- Peter Baver

1**. Course Title** **:-Garment Manufacturing &Knitting**

2. Course Code **:- TT-504**

3. Semester **:- 5th**

4. Rationale of the subject/Courses:-The fabrics are to be produced to serve certain end uses. These end uses determine the properties and the quality of the fabric that it should posses. The quality of the fabric depends on its' 'functional' and 'aesthetic' properties. These in turn are governed by raw material selection (fibre), yarn used, fabric construction, structure and texture, and ornamentation of fabric. Some of the end uses emphasis only on the functional aspects and others on both functional and aesthetic aspects. It brings in, the importance of this subject of the fabric structure, design, and colour. In this subject the students are taught about the advanced methods of fabric design and structure and their production on the looms. They are also taught the methods of ornamenting the fabric with attractive figures during weaving process. The fabrics can also be embellished with the colour prints in chemical processing. There the students are taught about the use of colours and methods of developing the attractive figures, which can be used to decorate the fabrics.

Knitting Technology is the important are of textile industry. Knitted fabrics due to its stretchable and favorable properties are in good demand and it is expected to rise day by day. Knitted fabrics find uses for under garments, sports uniforms, summer and winter dresses, etc. to a large extent. This sector is now diversifying into synthetics, domestics fabric, carpets, technical and geo textiles. Similarly, since last few years young generation has been attracted to readymade garments due to quality, cost and readiness of availability. As such, large opportunities for the textile technologist particularly diploma pass –out exist in this field. Already many diploma pass outs are finding employment in this area. Therefore, the main object is to equip the students with all the relevant technical knowledge for manufacturing of knitted fabrics, articles garments and the maintenance aspects of the machines used. This subject will help the students to start their small scale industrial units which will help them for self employment.

Course Outcome: After completion of this course student will be able to-

CO1: Have a complete overview of the various aspects involved in Garment manufacturing right from fabric to finished garments, throw light on the various departments involved in the garment manufacturing process with a detailed understanding of machines and equipments used in each department such as Cutting, Sewing, Quality control, Finishing and so on.

CO2: Understand the need and importance for standardization of body measurements into size groups for bulk manufacturing, basic knowledge of sewing mechanisms and types of machines and seams used for the same. Prepare the basic patterns for garments and understand their need and purpose in bulk manufacturing.

CO3: Realize the importance of Quality in the Garmenting process and how it plays a pivotal role in controlling and commanding the market price, as well as arrive at manufacturing targets to achieve higher levels of efficiency by arriving at a conclusive man-machine ratio.

CO4: Have a complete overview of Introduction to Knitting process. Warp & weft knitting, Reasons for growth of knitting. Indian knitting industry, Comparison of Woven & Knitted fabrics. Classification of weft knitting machine, Definition of Basic terms in weft knitting: Closed loop, face loop, needle loop, sinker loop, course, wale.

CO5 : Understand elements in Knitting, Types of needle and its Comparison, Knitting action of different needles, Sinker and its function, Cylinder, Gauge, pitch, Cams, Feeder/ Stripper, Fabric spreader

CO6: Understand Production Calculation, Grams per square meter calculation, Tightness factor, Stitch length calculation, Weight per linear meter calculation

5. Teaching Scheme (in hours):-

Lecture	Tutorial	Practical	Total
40	5	45	90

6. Examination Scheme:

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	**100**	33	-	-	-	-

7. Detailed Course Content:

Chapter No	Chapter Title	Content	Duration (in hours)
GARMENT MANUFACTURING			
1	Introduction to the Garment Industry	Structure and sectors of clothing industry. Flow Process of Garment Manufacturing.	4hrs
2	Pattern Making	Body measurements and their importance. Pattern making, Pattern making tools Principles for pattern drafting. Basics of Pattern grading. Garment pattern- Lay Planning, drawing and reproduction of the marker. Requirements of marker planning.	4 hrs
3	Designing, Layout, Spreading & Cutting	CAD, Product Sampling & development Spreading, techniques involved Cutting, Tools & Equipment, Laying Methods of cutting. Sorting, Bundling & Preparatory	4 hrs
4	Sewing and Machines	Basic parts of Sewing machine, types of sewing machines The properties & types of seam,: superimposed, lapped, bound, ornamental stitches. Stitch type & SPI Sewing machine needles.	4hrs

		Requirement & Types of sewing machine work aids. Preparatory & Assembly line	
5	Quality Control	Importance of Quality & Quality standards Checking a garment for its finishing & Quality Care labelling symbols.	4hrs
6	Finishing	Pressing & Equipment used. Packaging & Warehouse activities.	2hrs
KNITTING			
1	Overview of Knitting Process.	1.1. Introduction to Knitting process. 1.2. Introduction to warp & weft knitting. 1.3. Reasons for growth of knitting. 1.4. Indian knitting industry. 1.5.Comparison of Woven & Knitted fabrics. 1.6.Classification of weft knitting machine.	2hrs
2	Weft Knitting.	2.1 Definition of Basic terms in weft knitting: Closed loop, face loop, needle loop, sinker loop, course, wale. 2.2. Function elements in Knitting • Types of needle and its Comparison • Knitting action of different needles • Sinker and its function • Cylinder, Gauge, pitch • Cams • Feeder/ Stripper • Fabric spreader	3hrs
3	Weft Knitting Machines	3.0. Passage of yarn through Single Jersey machine 3.2. Single jersey machine- Structure, loop diagram, Needle arrangement, knitting action, machine construction. 3.3. Rib Knitting machine Structure, loop diagram, knitting elements knitting action. 3.4. Interlock machine-loop diagram, Structure, needle arrangement, trick arrangement, knitting action. 3.5. Purl machine-loop diagram, structure, knitting action. 3.6. Characteristics of single jersey, rib, interlock, purl fabrics	3hrs

4	Weft Knitted Fabrics	4.0. Principle stitches in weft knitting-knit, tuck, miss. 4.1. Notations in weft knitting	2 hrs
5	Knitting Calculations	Production Calculation 5.1. Grams per square meter calculation 5.2. Tightness factor 5.3 Stitch length calculation 5.4. Weight per linear meter calculation	3hrs
6	Warp Knitting	Introduction of Warp knitting 6.1. Loop Structure 6.2. Comparison of Warp & Weft Knitting 6.3. Basic Warp knitting terms-overlap, under lap, open & closed lap 6.4. Application of Warp knit fabrics 6.5. Classification of warp knitting.	2hrs
7	Warp Knitting Machine	7.0. Comparison of tricot and Rachel Machine 7.1. Elements of Tricot knitting machine 7.2.Knitting circles of Tricot machine 7.3. Notation for warp knit Structures	3hrs
8	Quality aspects of Knitting	9.0. Basic properties of yarn used for knitting 9.1. Defects and their remedies in knitted fabrics 9.2. Quality test for weft knit fabrics	2hrs

8.a Distribution of Marks (Garment Manufacturing):

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type (Compulsory)	Short Questions	Descriptive Questions	
1	Introduction to the Garment Industry	2	-	-	2
2	Pattern Making	1	3	4	8
3	Designing, Layout, Spreading & Cutting	1	3	4	8
4	Sewing and Machines	-	4	5	9
5	Quality control	2		3	5
6	Finishing	1	2		3
		7	12	16	35

8.b Distribution of Marks (Knitting) :

Chapter No	Chapter Title	Type of Question			Total Marks
		Objective Type (Compulsory)	Short Questions	Descriptive Questions	
1	Overview of Knitting Process.	1	1	6	8
2	Weft Knitting.	1	3	--	4

3	Weft Knitting Machines	1	3	--	4
4	Weft Knitted Fabrics	1	3		4
5	Knitting Calculations	--	4	--	4
6	Warp Knitting	2	2	--	4
7	Warp Knitting Machine	--	--	3	3
8	Quality aspects of Knitting	1	3	--	4
		7	19	9	35

9. Suggested implementation Strategies: Blackboard, Audio Visuals, Practical demo's

10.a Suggested learning Resource: Garment Manufacturing Book List

Sl.No.	Title	Author/Publisher
1	The Technology of Clothing Manufacture	Harold Carr & Barbara Lathan
2	Sewing Lingerie	Singer
3	Garment Technology for Fashion Designer	Gerry Cooklin
4	Clothing for moderns	Erain Mabel

10.b Suggested learning Resource: Knitting Book List

Sl. No.	Author	Title	Publisher
1	David Spencer	Knitting Technology	Woodhead Publishing India Pvt Ltd
2	S Raz	Warp Knitting Production	VerlagMeliand Textile Berichte, Heidelberg
3	A. Reisfeld	Warp Knit Engineering	National Knittedoutwear Association, Newyork
4	D.F. Paling	Warp Knitting Technology	Cloumbine Press, London
5	Dr. N. Anbhumani	Knitting- fundamentals, Machine, Structure & Developments	New Age International (P) Ltd.
6	SadhanCh Ray	Fundamentals and advances in Knitting Technology	Woodhead Publishing India Pvt Ltd

11. TABLE OF SPECIFICATIONS FOR THEORY Annexure-I

Sr. No.	Topic (a)	Time allotted in hours(b)	Percentage Weightage (c)	K	C	A	HA
1.	Introduction to the Garment Industry	4	9.5	2	-	-	-
2.	Pattern Making	4	9.5	-	4	4	-
3.	Designing, Layout, Spreading & Cutting	4	9.5	4	4	-	-
4	Sewing and Machines	4	9.5	-	5	4	-
5.	Quality control	4	9.5	2	3	-	-
6.	Finishing	2	4.75	1	2	-	-
7.	Overview of Knitting Process.	2	4.75	2	6	-	-
8.	Weft Knitting.	3	7.14	3	-	1	-
9.	Weft Knitting Machines	3	7.14	3	-	1	-
10.	Weft Knitted Fabrics	2	4.75	3	-	1	-
11.	Knitting Calculations	3	7.1	-	-	-	4

12.	Warp Knitting	2	4.75	2	-	2	-
13.	Warp Knitting Machine	3	7.1	-	3	-	-
14.	Quality aspects of Knitting	2	4.75	3	-	1	-
	TOTAL	**42**	**100**	**25**	**27**	**14**	**4**

K = Knowledge C = Comprehension A = Application

HA = Higher than Application(Analysis, Synthesis, Evaluation)

1. COURSE TITLE :- GARMENT MANUFACTURING & KNITTING (PRACTICAL)
2. COURSE CODE :- TT-504(P)
3. SEMESTER :- 5TH

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	17

GARMENT MANUFACTURE

1.0 Body measurement 2
2.0 Basic pattern set 5
- Basic Bodice
- Basic Skirt
- Basic Sleeve

3.0 Dart Manipulation 5
4.0 Garment analysis 15

KNITTING

5.0 Study of different knitting stitches 3
6.0 Study of different needles, sinkers, cams etc. 3
7.0 Study of different creels 3
8.0 Study of stop motion, yarn guides, spreader 5
Take -up and winding mechanism
9.0 Study of different loops. 3

1. Course Title : Textile Testing-II
2. Course Code : TT-505
3. Semester : Vth
4. Rationale : 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 yarns, fabrics 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.

The main objectives of this course are :

- To know the properties and their importance the yarn.
- To understand the principles and the method of testing the yarn to determine the properties.
- To know the quality characteristics of the fabric required for different and uses.
- To study the principles and the methods of testing the fabric to determine their quality characteristics.
- To study the statistical standards involved in controlling the quality of the textile products during their manufacture.

5. Course Outcomes:

At the end of the course, students should be able to:

CO-1 Determine the yarn count from yarn and cloth by using different instruments.
CO-2 Describe the effect of twist on yarn, fabric quality and their measuring systems.
CO-3 Generalize and compare the various yarn strength testing instruments.
CO-4 Identify the various types of yarn variation and the terminologies used in expressing yarn evenness.
CO-5 Explain the various fabrics handle properties and the techniques / methods of measuring fabric properties.
CO-6 Infer about the sample preparation, quality control and various ISI standards.

6. Teaching Scheme (In hours)

Lecture	Tutorial	Practical	Total
45 (including 3 hrs class test)	6	45	90

7. Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	33	25	25	50	17

8. Detailed Course Content:

Chapter No.	Chapter Title	Content	Duration (In Hrs.) (L+ T)
1	YARN NUMBER	1.1 Principles involved in determination yarn number 1.2 Determination of yarn number from yarn and cloth 1.3 Use of the following instrument for determination of yarn number: Knowledge balance, Quadrant balance, Beesly balance.	5 (+1)
2	YARN TWIST	2.1.Effect of twist on the quality of yarn and fabrics. 2.2.Optimum twist and its essentiality 2.3.Determination of twist of single and ply yarn : Single yarn twist tester, Double yarn twist tester, Automatic Twist tester.	5 (+1)
3	YARN STRENGTH TESTING	3.1 Principle of different method tensile strength Test 3.2 Effect of C.R.I. and C.R.L. on strength test 3.3 Study of the following yarn strength testing instruments: Lea tester, Single thread tester, Ballistic tester 3.4 Principle of the working of scotts I.P. tester. 3.5 Comparative study of various yarn strength testing instruments	9(8+1)
4	YARN EVENNESS	4.1. Meaning of the term random variation, periodic variation, short, medium and long term variation. 4.2. Index of irregularly in evenness determination 4.3. Measurement of yarn evenness by the following methods 4.4. Black board test 4.5. Fielden walker test 4.6. Uster Evenness Tester	6 (5+1)
5	FABRIC TESTING	5.1.Determination of the following related to fabric testing • Thickness • Weight • Crimp • Stiffness 5.2.Measurement of tear, tensile, bursting, rubbing and abrasion, properties of fabric 5.3. Air and water permeability test	8 (7+1)
6	FABRIC HANDLE	6.1.Determination of crease resistance and crease recovery properties.	6 (5+1)

	PROPERTIES	6.2. Study of handle, drape and Cover factor of fabrics.	
7	SAMPLING AND QUALITY CONTROL IN TEXTILE	7.1. Sample preparation technique of fibre, yarn and fabric. 7.2. Purpose of Quality control. 7.3. Routine testing and quality control 7.4. Introduction to I.S.I., BS, ASTM, AATTC standards	3

L= Lecture, T= Tutorial

9. Distribution of Marks

Chapter No.	Chapter Title	Type of question			Total Marks
		Objective Type (Compulsory)	Short Question	Descriptive Question	
1	Yarn Number	2	2	4	8
2	Yarn Twist	2	2	4	8
3	Yarn Strength	5	5	5	15
4	Yarn Evenness	4	2	4	10
5	Fabric Testing	3	6	5	14
6	Fabric Handle Properties	2	4	4	10
7	Sampling and Quality Control	3	2	0	5
Total		21	23	26	70

10. Table of Specifications-1

Sr. No	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE					GT
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T	
1	Yarn Number	1	1		2	2				2			4		4	8
2	Yarn Twist	1	1		2		2			2	4				4	8
3	Yarn Strength	3	1	1	5	3			2	5	5				5	15
4	Yarn Evenness	2	1	1	4		2			2		4			4	10
5	Fabric Testing	2	1		3	2	2		2	6	5				5	14
6	Fabric Handle Properties	1	1		2	2			2	4	4				4	10
7	Sampling and Quality Control	2	0	1	3			2		2					0	5
TOTAL		12	6	3	21	9	6	2	6	23	18	4	4	0	26	70

10. Table of Specifications-2

Sr. No	Topic	Time allotted in hours	Percentage Weightage	K	C	A	HA	Total
1	Yarn Number	9	21	3	1	4	0	8
2	Yarn Twist	10	24	5	3	0	0	8
3	Yarn Strength	10	24	11	1	1	2	15
4	Yarn Evenness	9	22	2	7	1	0	10
5	Fabric Testing	4	9	9	3	0	2	14
6	Fabric Handle Properties	9	22	7	1	0	2	10
7	Sampling and Quality Control	4	9	2	0	3	0	5
	Total =	42	100	39	16	9	6	70

11. Suggested learning Resources:

- Indian Textile Journal
- Asian Textile Journal
- Textile Trends
- Textile Technical
- Visit related Industry.

12. Book List :

Sr. No.	Author	Title	Publication
1.	Angappan	Physical Testing (Vol I & II)	Textile Testing, Coimbatore
2.	J. E. Booth	Principles of Textile Testing	
3.	Kothari	Testing and Quality Management	IAFL, New Delhi
4.	B. P. Saville	Physical Testing of Textiles	--

13. **COURSE PLAN**

SN	Course outcome	Intended Learning Outcome
1.	Determine the yarn count from yarn and cloth by using different instruments.	ILO-01 give brief introduction about the basics of yarn numbering system. ILO-02 describe about the direct and indirect principle of yarn numbering. ILO-03 state the formula used for calculating yarn number. ILO-04 describe the methods and equipment used for finding out yarn count from yarn ILO-05 explain the working of instrument used for finding out yarn count from a piece of fabric.. ILO-06 advantages and disadvantages of various yarn counts

		measuring system
2	Describe the effect of twist on yarn, fabric quality and their measuring systems.	ILO-01define twist and its types. ILO-02explain the effect of twist on yarn/fabric quality. ILO-03define balanced, optimum twist and its essentiality. ILO-04explain the working of single and double yarn twist measuring system.
3	Generalize and compare the various yarn strength testing instruments.	ILO-01define the various terminology used in measuring yarn strength. ILO-02explain the various yarn strength measuring principles i.e CRL, CRE& CRT. ILO-03describe the working of : single yarn strength, lea strength, Scott IP tester and ballistic tester. ILO-04comparative study of different yarn strength tester.
4	Identify the various types of yarn variation and the terminologies used in expressing yarn evenness.	ILO-01state the terminologies used for expressing yarn evenness. ILO-02define index of irregularity in evenness measurement. ILO-03explain the working of black board test and fielden walker test. ILO-04 describe the working of Uster evenness tester.
5	Explain the various fabric handle properties and the techniques / methods of measuring fabric properties.	ILO-01 describe the following terms: fabric thickness, weight, crimp, tear, bursting, abrasion, crease resistance, crease recovery, handle, drape. ILO-02describe the procedures of fabric thickness, weight and crimp measuring system. ILO-03describe the working of fabric tear, tensile, bursting and abrasion tester. ILO-04explain the working of air and water permeability instrument. ILO-05describe the measuring techniques of fabric crease resistance and crease recovery properties.
6	Infer about the quality control and various testing standards.	ILO-01illustrate the various terminology related to routine testing and quality control. ILO-02 explain the techniques used for picking up the sample from fibre, yarn and fabric. ILO-03 explain about the various testing standards used in textile testing.

1. Course Title : TEXTILE TESTING-II (PRACTICAL)
1. Course Code :TT-505
2. Semester : V (Fifth)
4. Rationale
5. Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	17	50

6. Detailed Practical List:

a. Determination of yarn count by using:
- Knowles Balance
- Quadrant balance
- Beasley balance

b. Determination yarn strength by using:
- single thread strength tester (Pendulum type)
- lea tester
- electronic strength tester
- instron

c. Determination single and double yarn twist by using:
- Single yarn strength tester.
- Double yarn strength tester

d. Determination yarn evenness by using:
- Visual examination (black board tester)
- Electronic evenness tester

e. Determination fabric strength by using:
- Pendulum type strength tester
- Tear strength tester
- Bursting tester
- Abrasion tester

f. Determination of fabric GSM by calculation and quadrant balance.

7. Suggested learning Resources:
- Indian Textile Journal
- Asian Textile Journal
- Textile Trends
- Textile Technical
- Visit related Industry.

1. **COURSE TITLE : TECHNICAL TEXTILES (OPTIONAL)**
2. **COURSE CODE : TT-506**
3. **SEMESTER : 5TH**
4. Rationale **:**The textiles are to be produced for different end uses. These end uses decide properties of textile materials. Major applications of textiles are related to clothing need of mankind. Hence in these applications, aesthetic properties of textiles are important. Apart from apparels, textiles are also used for other end uses from very long time. Since majority of these applications are related with Industry. Hence, these textiles were called as Industrial Textiles.
In recent past, enormous developments have taken place in the field of Science and Technology, which have opened new areas of applications for textiles. As all these applications require specific end use oriented products. Hence functional properties of textiles have become important. Stringent controls are therefore necessary right from raw material selection to production of final product. Hence term Technical Textiles have been applied for them. In the final semester students are introduced to this special and challenging field of Textile Applications.

5. Course Outcomes:

At the end of the course, students should be able to:

CO-1 Extrapolate the technical textiles.
CO-2 Describe the different class of technical textiles.
CO-3 Illustrate the construction of laminated and coated non-woven fabrics.
CO-4 Explain the fabric construction and different use of textiles in filter media.
CO-5 Paraphrase the application of automotive and protective clothing in defence. and other allied areas.
CO-6 Illustrate the applications of Geo-Textiles.

6. Teaching Scheme (In hours)

Lecture	Tutorial	Practical	Total
45 (including 3 hrs class test& 7 hrs Tutorial)	7	45	90

7. Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	33	-	-	-	-

8. Detailed Course Content:

Chapter No.	**Chapter Title**	**Content**	**Duration (In Hrs.) (L + T)**
1	Introduction to Technical Textiles	• Introduction, definition, and scope of Technical Textiles. • History, present status and future of Technical Textiles • Classification of Technical Textiles on end use • Areas of application of Technical Textiles.	6 (5+1)
2	Coating and	• Introduction, chemistry of coated fabrics	8 (7+1)

	Laminated Textiles	• Fibers and fabrics used in coating ,polymers and additives used in coating • Material for coating, substrate for coating. • Coating technique, Fusible interlinings. • Physical properties of coated fabrics, • Laminating, applications of Coated and Laminated fabrics	
3	Filtration Applications.	• Introduction, principles of filtration, filtration spectrum • Dust filtration, fabric construction. • Solid-liquid separation, yarn types, fabric construction, • Finishing treatments.	5 (4+1)
4	Medical Textiles	• Introduction, classification of Medical Textiles. • Characteristics of materials used for medical uses. • Implantable & non-implantable medical textiles, extracorporeal medical textiles, Health care / hygiene products. • Innovations in medical textile.	6 (5+1)
5	Automotive Textile	• Introduction • Areas of application in automobile Textile. • Fibres and fabrics used in automobile Textiles like upholstery seat coverings, carpets, seat belts, airbags, tyre cords.	5 (4+1)
6	Textiles in Protective and Defence	• Introduction, criteria for modern military materials. • Applications of textile in defence areas such as environmental protection, thermal insulation, ballistic protection, biological and chemical warfare protection, camouflage concealment & deception, flame retardant. • Intelligent textiles – use of wearable electronics.	6 (5+1)
7	Geotextiles	• Introduction and types of Geo-Textiles. • Terminology used in Geotextilein civil engineering: Geocells, Geocomposites, Geogrid, Geomembrane and Geosynthetic. • Functions of geotextiles in civil engineering: Filtration, Drainage, Reinforcement, Separation etc. • Determination of properties of geotextiles.	6 (5+1)

L= Lecture, T= Tutorial

9. Distribution of Marks

Chapter No.	Chapter Title	Type of question			Total Marks
		Objective Type (Compulsory)	Short Question	Descriptive Question	
1	Introduction to Technical Textiles	4	2	4	10
2	Coating and Laminated Textiles	4	4	5	13
3	Filtration Applications.	3	2	4	9
4	Medical Textiles	4	2	4	10
5	Automotive Textile	3	0	5	8
6	Textiles in Protective and Defence	3	2	5	10
7	Geotextiles	4	2	4	10
Total		25	14	31	70

10. Table of Specification-1

Sr.	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE					GT
No		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T	
1	Intro.to Tech Textiles	3	1	0	4	0	2	0	0	2	4	0	0	0	4	10
2	Coating and Laminated Textiles	3	1	0	4	2	0	2	0	4	5	0	0	0	5	13
3	Filtration Appl	3	0	0	3	2	0	0	0	2	4	0	0	0	4	9
4	Medical Textile	3	1	0	4	2	0	0	0	2	0	4	0	0	4	10
5	Automative Textile	2	1	0	3	0	0	0	0	0	0	5	0	0	5	8
6	Protective and Defence	2	1	0	3	0	2	0	0	2	5	0	0	0	5	10
7	Geotextile	3	1	0	4	0	2	0	0	2	4	0	0	0	4	10
Total=		19	6	0	25	6	6	2	0	14	22	9	0	0	31	70

Table of Specification-2

Sr.	Topic	Time allotted in hours	Percentage Weightage	K	C	A	HA	Total
No	(a)	(b)	(c)					
1	Intro.to Tech Textiles	6	14	7	3	0	0	10
2	Coating and Laminated Textiles	8	19	10	1	2	0	13
3	Filtration Appl	5	12	9	0	0	0	9
4	Medical Textile	6	14	5	5	0	0	10
5	Automative Textile	5	12	2	6	0	0	8

6	Protective and Defence	6	14	7	3	0	0	10
7	Geotextile	6	14	7	3	0	0	10
	Total =	42	100	47	21	2	0	70

11. Suggested Implementation Strategies: Blackboard, Projector, field visit.

12. Suggested learning Resources:

- Indian Textile Journal
- Asian Textile Journal
- Textile Trends
- Textile Technical
- Visit related Industry.

13. Book List :

Sr. No.	Author	Title	Publication
1.	Sabit Adanur	Wellington Seas', Handbook of Industrial Textiles	The Textile Institute, Manchester, England
2.	A.R.Harrocks S.C.Anand	Handbook of Technical Textiles	Wood head Publications Ltd. England.
3.	Edited by J.W.S.Hearle	High Performance Fibre.	Wood head Publications Ltd. Cambridge England
4.	Pof. P. A. Khatwani, Mr.S.S.Yardi	NCUTE Programme on Technical Textiles	NCUTE (Set up by Ministry of Textiles, Govt. of India)
5.	Walter Fung and Mike Hard castle	Textiles In Automotive Engineering	Woodhead Publishing Limited
6.	Dept. Of Civil & Textile , IIT, Delhi	Geotextile	Indian Institute of Technology, Delhi

1. COURSE TITLE : TECHNICAL TEXTILES (PRACTICAL)
2. COURSE CODE : TT-506
3. SEMESTER : 5TH (FIFTH)
4. Examination Scheme :

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	17

5. Detail Practical List:

1. Analysis the following fabrics 25
   - Conveyer belt fabric
   - Tarpaulin fabric
   - Shoe fabric
   - Blankets
   - Interior decorative fabrics
   - Geotextile fabric
   - Medical Textile Fabric
2. Air permeability of filter & parachute fabric 5
3. Water permeability of filter, tarpaulin, shoe fabric 9
4. Bending length of 6
   - Shoe fabric
   - Tarpaulin fabric

-----x-----

1. COURSE TITLE : MODERN SPINNING & TEXTURISING (OPTIONAL)
2. COURSE CODE : TT-507
3. SEMESTER : VTH
4. Rationale : In previous semesters study up to ring spinning process is covered. In continuation study of post spinning process is covered in Modern Spinning & Texturizing. The processes included are doubling, unconventional spinning methods, processing of manmade fibres & blends on cotton spinning system and texturizing. For specialty yarns doubling process is used. During first and second year the student study the conventional machines. The conventional machines have limitations with respect to quality and production capacity. In the present era of globalization and the age of competition there is a clear indication of shift from sellers' market to consumers' market. This will further have an impact to reduce the cost of production and distribution as well as to inculcate high standards of quality. So it is imperative to use advanced machines / equipment. These machines should be capable of giving very high production and high quality products in the areas of spinning and weaving.

The cotton yarn produced on cotton system and un-conventional spinning system there are some limitations on yarn properties with respect to yarn quality and production capacity. As compared to cotton fiber the quality is good and the cost of synthetic raw material is very less. After synthetic material blending with cotton and processing on cotton spinning system the quality can be improved and the cost of can reduced.

To change the structure and characteristics of a synthetic filament the texturising process is necessary, that can be used in weaving which will improve the quality of fabric and reduce the cost.

Course Outcomes:

At the end of the course, students should be able to:

CO-1 Paraphrase the doubling process in ring doubler and TFO.
CO-2 Describe the different ways and means of producing fancy yarn.
CO-3 Tabulate and explain the new spinning systems w.r.t. rotor, friction and air jet spinning.
CO-4 Enlist the different modifications required in cotton spinning system to spin MMF and blended yarns.
CO-5 Expound the texturizing process.
CO-6 Analyse and calculate the cost of yarn.

5. Teaching Scheme (in hours)

Lecture	Tutorial	Practical	Total
45(Including 3hrs class test& 5hours tutorial	-	45	90

6.Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
70	30	100	33	25	25	50	17

7. Detail Contents

Chapter No.	Chapter Title	Content	Duration (L+T)
1	Yarn Doubling	1.1Objects of yarn doubling 1.2Effect of direction and amount of twist in doubling on properties of doubled yarns 1.3Construction and working of modern doubler - two for one twister (TFO) 1.4Calculation of twist, twist contraction, resultant count of double yarns and spindle speed, production calculation of TFO & Ring doubler. 1.5 Study of special yarns such as viole yarns, sewing threads, Hosiery yarns etc. 1.6Introduction to Fancy yarn, 1.7Study of different types of Fancy yarns and their characteristics, 1.8Study of any one modern fancy doubler.	9+1hours
2	Un Conventional Spinning Systems	2.1Limitations of ring spinning 2.2Principle of open end spinning and it's comparison with ring spinning 2.3Various steps involved in open end spinning process. 2.4Principle of operation (Passage of material through O.E. (rotor machine). 2.5Raw material requirement and preparation of sliver. 2.6Study of opening unit, construction and working of opening roller. 2.7Yarn formation in rotor, back doubling, twist insertion. 2.8Effect of rotor groove, diameter, rotor speed on yarn properties. 2.9Yarn with drawl and winding, 2.10Modern developments in O.E. (rotor) spinning.	14+1hours

		2.11Study of yarn properties and applications of O.E. yarns, 2.12Calculation of twist and production of O.E. Rotor machine. 2.13 Friction spinning: Study of operating principle, material feed, 2.14Opening of material, fibre transport and collection, twist insertion and yarn formation. 2.15 Study of DREF II & III machine. 2.16 Twist spinning (Siro spinning): Description of the process and yarn properties. 2.17Rubbing (Self twist spinning): Study of yarn formation and yarn properties. 2.18Study of REPCO spinning. Wrap spinning: Operating principle, Parafil system. 2.19Air jet spinning: principle of yarn formation, raw material requirement, yarn characteristics. 2.2Twist less spinning: Bobtex process. Compact spinning system: principle of working, Study of different methods and properties of yarns produced by compact spinning.	
3	Spinning of Manmade fibres & blends on Cotton spinning system	3.1Objectives of blending, 3.2Indices of blending (only definitions of: degree of mixing and index of blend irregularity) 3.3Tinting, selection of blend constituents, blending at blow room and draw frame, difference between them. 3.4Processing of P/C & P/V blends on cotton spinning machines and changes to be made at blow room, carding, drawing, fly frame, ring frame. 3.5Common blended yarn faults. Effect of relative humidity and Temperature on blend spinning at different departments.	5+1hours
4	Texturising	4.1Objects of texturing 4.2Difference between spun yarns and filament yarns.	9+1 hours

		4.3Advantages of textured yarns, 4.4Classification of textured yarns stretch, modified stretch and bulk yarns. 4.5Classification of texturing methods. 4.6False twist texturing, factors influencing properties of false twist, textured yarn, Texturing variables factors, i.e. material variables, machine variables, and process variables. 4.7Study of Draw texturing process, comparison between pin spindle and friction disc 4.8Study of Air jet texturing process. Effect of processing parameters on properties of yarns. 4.9Brief description of other texturing methods as; Gear crimping, Stuffer box, Edge crimping, Knit- de- knit crimping. 4.10Study of texturised yarn defects and causes. 4.11End uses of textured yarns	
5	YARN COSTING	5.1Analysis of yarn costing 5.2Calculations relating to costing of yarn.	3+1hours
		Total =	45hours including 3class tests

8. Distribution of Marks

Chapter No.	Chapter Title	Type of question			Total Marks
		Objective Type (Compulsory)	Short Question	Descriptive Question	
I	Yarn Doubling	3	2	7	12
II	Unconventional Spinning Systems	4	5	11	20
III	Spinning Of Manmade Fibres & Blends On Cotton Spinning System	4	4	6	14
IV	Texturising	4	4	8	14
V	Yarn Costing	0	0	10	10
	TOTAL	15	15	40	70

SN	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE					GT
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T	
1	Yarn Doubling	4	1	0	5	0	2	0	0	2	5	0	0	0	5	12
2	Un-Conventional Spinning Systems	3	2	0	5	2	0	2	0	4	5	0	0	0	5	14
3	Spinning Of Manmade Fibres & Blends On Cotton Spinning System	4	3	0	7	2	4	0	0	4	6	0	0	0	6	17
4	Texturising	3	1	1	5	2	3	0	0	5	0	4	0	0	4	14
5	Yarn Costing	2	1	0	3	0	0	0	0	0	0	0	10	0	10	13
Total=		16	8	1	25	6	6	2	0	15	14	4	10	0	30	70

9. Learning Resources:

Book List:

S.No	Author	Title	Publishers
1. 2.	T. K. Pattabhiram A. R. Garde (Editor)	Essential Facts in Cotton Spinning Spinning Tablet Series (9nos)	Somaiya Publication The Textile association, India.
3.	A. E. De Barr, H.Catling	The Principles and Theory Of Ring Spinning. Vol. 5	The Textile Institute Manchester Melschwe
4.	Ed. By K. Ganesh, A. R. Garde.	Cotton Spinning.	The Textile association, India
5.	R.Chattopadhyay, R. Rengasamy J	Spinning- Drawing, Combing and Roving.	NCUTE, IIT Delhi
6.	K. R. Salhotra, R. Alagirusamy, R. Chattopadhyay	Ring Spinning, Doubling and Twisting	NCUTE, IIT Delhi
7.	R. Chattopadhyay	Advances in Technology of Yarn Production	NCUTE, IIT Delhi
8.	W.klein	Practical Guide to combing &Drawing	The Textile Institute Manchester
9.	W.S.Tagart	Cotton Spinning vol-2	Macmillian & Company ltd.
10.	A. R.Khare.	Cotton Spinning	The Textile Institute Manchester

1. COURSE TITLE :MODERN SPINNING & TEXTURISING (PRACTICAL)
2.COURSE CODE : TT-507
3. SEMESTER : VTH
4. Examination Scheme

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	17

List of Practical's

1. Identify the different parts of the ring doubling frame that are on the path of the material and draw the flow of fibres through the ring doubling frame.
2. Identify the different parts of the TFO that are on the path of the material and draw the flow of fibres through the TFO.
3. Identify the different parts of the twisting system, the gearing of different rollers and calculate the twist as well as the twist constant. Draw the gearing of the twisting system. (RD/F)
4. Draw a complete gearing diagram of the m/c indicating the different change places as well as the implication of these change places. (RD/F)
5. Identify the different parts of the twisting system, the gearing of different rollers and calculate the twist as well as the twist constant. Draw the gearing of the twisting system. TFO
6. Identify the different parts of the m/c involved in building the bobbin and draw a diagram. TFO
7. Draw a complete gearing diagram of the m/c indicating the different change places as well as the implication of these change places. TFO
8. Practise yarn production in R/F and TFO

1.COURSE TITLE : PROFESSINAL PRACTICE III (PRACTICAL)
2.COURSE CODE : TT-508
3.SEMESTER : 5TH
4.Examination Scheme :

Theory				Practical			
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Practical	Practical Assessment	Total Marks	Pass Marks
-	-	-	-	25	25	50	17

Rational :

To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through Industrial visits, expert lectures, seminars on technical topics and group discussion.

Aim

Student will be able to:

- Acquire information from different sources
- Prepare notes for given topic
- Present given topic in a seminar
- Interact with peers to share thoughts
- Prepare a report on industrial visit, expert lecture

ACTIVITIES

1. INDUSTRIAL VISITS 12

Structured industrial visits be arranged and report of the same shall be submitted by the individual student, to form a part of the term work.

- Visit to a local entrepreneur where hosiery goods are manufactured & study of knitting machines.
- Study of garbage disposal system for pollution free environment under municipality corporation.
- Visit to garment manufacturing unit within - outside Assam.

2. LECTURES BY PROFESSIONAL / INDUSTRIAL EXPERT LECTURES TO BE ORGANIZED FROM ANY TWO OF THE FOLLOWING AREAS: 10

- Awareness on how interviews are conducted by organizations and how to appear.
- Use of boilers in cotton textile mill.
- Study of electrical control panel in textile industries.

3. INFORMATION SEARCH: 10

Information search can be done through manufacturer's catalogue, websites, magazines, books etc. and submit a report **any one** topic.

Following topics are suggested:

- Study of different lubricants used for various textile machineries.
- Study of machineries erection process of textile industries.
- Study of labour tackling management to avoid & strike and maintain production.
- Study of new development of textile machines.
- Study of different standards used for textile testing and make a list of testing standards for different test of fibre, yarn fabric etc.

4. SEMINAR: 13

Seminar topic shall be related to the subjects of fourth semester. Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time - 10 minutes)
Mini Project / Activities: (any one)

a) To study the flow chart of machineries for different updated product in textile field.
b) Study of humidification plant of textile industries and its merit & demerits.
c) Study of safety rules observe in the industries.
d) Role of maintenance to reach the target production.

***