

SYLLABUS FOR FULL TIME

**DIPLOMA
IN
TEXTILE TECHNOLOGY (SANDWICH)
(2007 – 2008 BATCH ONWARDS)**

**DIRECTORATE OF TECHNICAL EDUCATION
CHENNAI – 600 025, TAMIL NADU**

NEW SYLLABUS FOR FULL-TIME
DIPLOMA IN TEXTILE COURSES
(FROM 2007 – 2008 BATCH ONWARDS)

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DIPLOMA IN TEXTILE TECHNOLOGY (SAND WICH)

Course objectives:

The three and half year full time Diploma course in Textile Technology has the primary objective of creating technical manpower to meet the needs of the Indian textile manufacturing industries. In the present scenario, the textile industry in India is facing severe competition in the national and international markets. The textile products manufactured in the Indian textile industry have to meet the quality requirements and cost competitiveness in the Indian as well as global textile markets. Keeping this in view, the curriculum is framed to impart the theoretical and practical knowledge in various textile manufacturing processes such as Spinning, Weaving, Knitting, Dyeing, Garment making and Finishing with the latest sophisticated machineries. The subjects imparting basic knowledge on Textile raw materials, Testing, basics of engineering, Textile management are included in the curriculum. Since the advent of computers and its applications has revolutionized the textile industry at present, basic practical on computer applications and Textile CAD are also incorporated in the curriculum. Knowledge on latest technologies emerging in the Textile industry is imparted through the various elective subjects in the curriculum.

The students, after successful completion of the course will be able to work as,

1. Supervisor in spinning mills
2. Supervisor in weaving units
3. Supervisor in wet processing units
4. Supervisor in garment making units.
5. Quality control assistant in Q.C laboratories of textile industry and
6. Start a weaving unit of his/her own.
7. Start a knitting unit of his/her own
8. Start a garment making unit of his/her own.
9. Work as technical assistant in government organizations such as Textile committee, Central Silk board , Jute board, Department of industries and commerce as factory inspectors.
10. Technical assistant, fabric co-ordinators, Merchandisers in garment manufacturing organizations.
11. Work as garment designers in Ordinance Clothing Factories
12. Fabric Co-ordinators, Fabric Managers and Merchandisers in Garment Industries.

DIPLOMA IN TEXTILE TECHNOLOGY (SANDWICH)
SEMESTER SYSTEM
(Implemented from 2007-2008)
K - SCHEME
REGULATIONS

1. Description of the Course:

The course for the Diploma in Textile Technology (Sandwich) shall extend over a period of three and a half academic years, consisting of 7 semesters and the First Year is common to all Engineering Branches.

Each Semester will have 16 weeks duration of study.

The Curriculum for all the 7 Semesters of Diploma in Textile Technology (Sandwich) have been revised and revised curriculum is to be implemented for the candidates admitted from 2007 - 2008 onwards.

The salient features of this revised curriculum under 'K' Scheme are:

- ❖ Removal of obsolete portions
- ❖ Addition of topics covering of new technology, new industrial practices to cope up with the modern trends in Textiles and services.
- ❖ Inclusion of Professional Ethics.
- ❖ Creation of consciousness about Environment Management.
- ❖ Preparing the students to tackle emergency situations due to various disasters.
- ❖ Adoption of Industrial Safety Practices.
- ❖ Offering electives to suit the local needs of industries.
- ❖ Laying more stress on Communication English.
- ❖ Training in soft skills.
- ❖ Enhancement of Computer Skills.
- ❖ Enhanced Practical skills to supplement the theory learnt.
- ❖ Introduction of Continuous Internal Assessment.
- ❖ Conduct of periodical Tests and Assignments and uniformity in assigning sessional marks.
- ❖ Listing of Equipment, Instruments / Manuals along with the Practical Experiments.
- ❖ Revised Question Paper pattern to test the in-depth knowledge of students.

2. Eligibility for the Award of Diploma

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3 1/2 academic years in an Institution when joined in First Year and two and a half years if joined under Lateral scheme in the second year, affiliated to the State Board of Technical Education and Training, Tamil Nadu and has passed the prescribed examination.

3. Subject of study and curriculum outline

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical. The curriculum outline for III, IV, V, VI and VII Semester is given in. Annexure-I

4. Examinations

Board Examination in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester.

The sessional marks in all the subjects will be awarded on the basis of continuous internal assessment earned during the semester concerned. For each subject 25 marks are allotted for sessional marks and 75 marks are allotted for Board Examination.

5. Continuous Internal Evaluation

Theory

It has been decided to introduce Continuous Internal Assessment marks for a total of 25 marks, which are to be distributed as follows:

Attendance:

5 Marks

(Award of marks for attendance will be as per the range given below)

80%	-	83%	} 1 Mark 2 Marks 3 Marks 4 Marks 5 Marks
84%	-	87%	
88%	-	91%	
92%	-	95%	
96%	-	100%	

Test:

3 Tests each of 2 hours duration for a total of 30 marks is to be conducted out of which the best two will be taken and the marks to be reduced to 10.

TEST	UNITS	WHEN TO CONDUCT	MARKS
Test - I	Unit - I	End of 4 th Week	30
Test - II	Unit - II & III	End of 10 th Week	30
Test - III	Unit - IV	End of 14 th Week	30

Question Paper Pattern for Periodical Test:

5 Questions x 1 Mark	...	05 Marks
5 Questions x 2 Marks	...	10 Marks
3 Questions x 5 Marks	...	15 Marks

		30 Marks

Model Examination covering all 5 units for 75 marks and 3 hours duration.

Assignment:**10 Marks**

For each subject three Assignments are to be given each for 20 marks and the average marks scored should be reduced for 10 marks.

All Test papers and assignment note books after getting the signature from the students must be kept in the safe custody in the Department for verification and audit. It should be preserved for a Semester for Academic Audit.

Practical:

The internal assessment mark calculation for Practical subjects is given as follows:

a) Attendance	:	05 Marks - evaluation pattern same as Theory
b) Procedure / observation and tabulation/ other related practical work	:	10 Marks
c) Result	:	05 Marks
d) Record writing	:	05 Marks

TOTAL		25 Marks

The Record for every completed exercise should be submitted in the subsequent Practical classes and marks should be awarded for 20 for each exercise as per the above allocation. At the end of the Semester, the average marks of all the exercises should be calculated for 20 marks and the marks awarded for attendance is added to arrive at the internal mark for practical.

All the mark entries for assignment, test and attendance should be entered in the personal log book of the staff handling the subject. This is applicable to both theory and practical subjects.

6. **Communication Skill Practical**

The Communication Skill Practical with more emphasis is being introduced in IV Semester for Circuit Branches and in V Semester for other branches for Textiles.

Much stress is given on:

- ❖ Reading Skill
- ❖ Listening Skill
- ❖ Writing Skill
- ❖ Pronunciation
- ❖ Interview Technique
- ❖ Writing Resumes

Internal Assessment Mark

25 Marks

Board Examination Mark Allocation

Allocation of Marks

Communication Practicals ... 45 Marks

Written Test in Professional Ethics for 1 hour

Professional Ethics 15x2 ... 30 Marks

Selection of 15 Questions (15x2 Marks) should be only from the Question Bank given by the External with out any choice.

7. **Project Work**

The students of all the Diploma Programmes have to do a Project work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamilnadu. In order to encourage students to do worth while and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. The selection of Project work should be taken up in V Semester of study. The First Project review should be done in 14th week of study in V Semester. The Second Project Review should be done in the 8th week of study in the VI Semester.

a) Internal Assessment mark for Project Work & Viva Voce:

Project Review I	(V Semester)	05 Marks
Project Review II	(VI Semester)	05 Marks
Project Review III	(VI Semester)	10 Marks
Attendance		05 Marks
	Total	25 Marks

b) Project Work & Viva Voce Board Examination

The Allocation of Mark:

Viva Voce	15 Marks
Project Report	10 Marks
Demonstration	15 Marks
Applicability of the Project	05 Marks
Total	45 Marks

Written Test in 3 topics for 1 hour:

Entrepreneurship	5 questions x 2 marks	10 Marks
Environment Management	5 questions x 2 marks	10 Marks
Disaster Management	5 questions x 2 marks	10 Marks
	Total	30 Marks

Selection of Questions from Question Bank by the External Examiner, no choice need be given to the candidates.

8. INDUSTRIAL TRAINING :

Each student has to undergo industrial Training in Textile Industries for a period of 6 month during VII Semester

ALLOTMENT OF MARKS:

TIME: 3 HRS.

MAX.MARKS: 100

Industrial Review I(3 rd Month)	- 10
Industrial Review II(5 th Month)	- 10
Attendance	<u>- 05</u>
	<u>25</u>

Board Examination

Report writing	- 45
Viva Voce	<u>- 30</u>
	<u>75</u>

9. Scheme of Examinations

The Scheme of examination for subjects in the III, IV, V, VI and VII Semester are given in Annexure - II.

10. Criteria for Pass

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed courses of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, Tamil Nadu and pass all the subjects prescribed in the syllabus.
2. A candidate shall be declared to have passed the examination in a subject if he/she secures not less than 40% in theory, drawing subjects and 50% in practical subject out of the total prescribed maximum marks including both the sessional and the Board Examination marks put together, subject to the condition that he/she has to secure at least a minimum of 30 marks out of 75 marks in the Board's Theory/Drawing and a minimum of 35 marks out of 75 marks in the Practical Examinations.

11. Classification of successful candidates

Classification of candidates who pass out the final examination from April 2010 onwards (joined in first year in 2007-2008) will be done as specified below:

FIRST CLASS WITH HONOURS

A candidate will be declared to have passed in First Class with Honours if he/she secures not less than 75% of the aggregate marks in all semesters put together, except I and II semester and passes all the above semesters in the first appearance itself and complete all papers including that of I & II semester within the stipulated period of study 3 / 3 ½ / 4 years (Full time /Sandwich / Part time) without any break in study.

FIRST CLASS

A candidates will be declared to have passed in First Class if he/she secures not less than 60% of the aggregate marks in all semesters put together except I & II Semesters and completes all papers including that of the I&II semester within the stipulated period of study 3 / 3 ½ /4 years (Full Time /Sandwich / Part Time) without any break in study.

SECOND CLASS

All other successful candidates will be declared to have passed in second class. The above mentioned classification is applicable for the sandwich / Part time students who pass out final examination from October 2010 / April 2011 onwards (both joined in first year in 2007-2008)

12. Duration of a Period in the Class Time Table

The duration of each period of teaching in a day is 1 hour and the total period of instruction hours excluding interval and lunch break in a day should be uniformly maintained as 7 hours corresponding to 7 periods of instruction (Theory & Practical).

ANNEXURE-I
DIPLOMA IN TEXTILE TECHNOLOGY

Course code: 2060

K Scheme

CURRICULUM OUTLINE

I SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
1001	Communication English-I	3	1	-	4
1002	Mathematics	5	2	-	7
1003	Engineering Physics-I	3	-	-	3
1004	Engineering Chemistry-I	3	-	-	3
2005	Engineering Graphics	-	6	-	6
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical	-	-	2	2
2008	Computer Application	-	-	4	4
2009	Workshop Practice	-	-	4	4
	TOTAL	14	9	12	35

II SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
2001	Communication English-II	3	1	-	4
2002	Applied Mathematics	5	2	-	7
2003	Engineering Physics-II	3	-	-	3
2004	Engineering Chemistry-II	3	-	-	3
2005	Engineering Graphics	-	6	-	6
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical	-	-	2	2
2008	Computer Application	-	-	4	4
2009	Workshop Practice	-	-	4	4
	TOTAL	14	9	12	35

I & II Semester Duration: 16 Weeks (of study)

- Physical Education for atleast 3 hours/week shall be made compulsory for all students in the evening after the general working hours of the Institution.

DIPLOMA IN TEXTILE TECHNOLOGY

Course code: 1060

K Scheme

SCHEME OF EXAMINATION

I SEMESTER

S.No	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam
		Internal assessment Mark	Board Exam. Marks	Total Marks		
1001	Communication English-I	25	75	100	40	3
1002	Mathematics	25	75	100	40	3
1003	Engineering Physics-I	25	75	100	40	3
1004	Engineering Chemistry-I	25	75	100	40	3
2005	Engineering Graphics	-	-	-	-	-
2006	Physics Practical	-	-	-	-	-
2007	Chemistry Practical	-	-	-	-	-
2008	Computer Application	-	-	-	-	-
2009	Workshop Practice	-	-	-	-	-
	TOTAL	100	300	400		

II SEMESTER

S.No	SUBJECT	Examination Marks			Minimum marks for pass	Duration of Exams
		Internal assessment Mark	Board Exam Mark	Total Marks		
2001	Communication English-II	25	75	100	40	3
2002	Applied Mathematics	25	75	100	40	3
2003	Engineering Physics-II	25	75	100	40	3
2004	Engineering Chemistry-II	25	75	100	40	3
2005	Engineering Graphics	25	75	100	40	3
2006	Physics Practical	25	75	100	50	3
2007	Chemistry Practical	25	75	100	50	3
2008	Computer Application	25	75	100	50	3
2009	Workshop Practice	25	75	100	50	3
	TOTAL	225	675	900		

ANNEXURE II

DIPLOMA IN TEXTILE TECHNOLOGY
SYLLABUS FROM THE ACADEMIC YEAR 2007-2008

Course code: 2060

K Scheme

III SEMESTER

S.No	Subject code	Subject
1	TT3.1	Fibre Science &Technology
2	TT3.2	Basics of Engineering
3	TT3.3	Yarn manufacture-1
4	TT3.4	Fabric Manufacture-1
5	TT3.5	Yarn manufacture – I Practical
6	TT3.6	Fabric Manufacture-1 Practical

IV SEMESTER

S.No	Subject code	Subject
1	TT4.1	Textile wet processing
2	TT4.2	Yarn manufacture – II
3	TT4.3	Fabric Manufacture – II
4	TT4.4	Textile wet processing Practical
5	TT4.5	Yarn manufacture – II Practical
6	TT4.6	Fabric Manufacture – II Practical

4 WEEKS INDUSTRIAL TRAINING DURING VACATION

V SEMESTER

S.No	Subject code	Subject
1	TT5.1	Textile Testing
2	TT5.2	Garment technology
3	TT5.3.1	Elective-I Advanced textile manufacturing
	TT5.3.2	Statistical quality control in textiles
4	TT.5.4	Textile Testing Practical
5	TT5.5	Garment technology Practical
6	TT5.6	Communication skill Practical

2 WEEKS INDUSTRIAL TRAINING DURING VACATION

VI SEMESTER

S.No	Subject code	Subject
1	TT6.1	Textile Management
2	TT6.2	Fabric structure
3	TT.6.3.1	Elective: II Maintenance of textile machineries
	TT.6.3.2	Textile Marketing and Merchandising
4	TT6.4	Textile CAD practical
5	TT6.5	Fabric structure practical
6	TT.6.6	Project Work, Entrepreneurship, Environment & Disaster management

VII SEMESTER:

S.No	Subject code	Subject
1	TT 7.1	Industrial training and viva voce

**DIPLOMA IN TEXTILE TECHNOLOGY
CURRICULUM OUTLINE**

Course code: 2060

K Scheme

III SEMESTER:

Subject No.	Subject	Periods per week		
		Theory	Practical	Total
TT3.1	Fibre Science & Technology	6	-	6
TT3.2	Basics of Engineering	6	-	6
TT3.3	Yarn manufacture-1	5	-	5
TT3.4	Fabric Manufacture-1	-	6	6
TT3.5	Yarn manufacture – I Practical	-	6	6
TT3.6	Fabric Manufacture-1 Practical	-	6	6
Total		17	18	35

IV SEMESTER:

Subject No.	Subject	Periods per week		
		Theory	Practical	Total
TT4.1	Textile wet processing	6	-	6
TT.4.2	Yarn manufacture – II	6	-	6
TT.4.3	Fabric Manufacturing – II	5	-	5
TT4.4	Textile wet processing Practical	-	6	6
TT4.5	Yarn manufacture – II Practical	-	6	6
TT4.6	Fabric Manufacturing – II Practical	-	6	6
Total		17	18	35

V SEMESTER:

Subject No.	Subject	Periods per week		
		Theory	Practical	Total
TT5.1	Textile Testing	6	-	6
TT5.2	Garment technology	6	-	6
	Elective			
TT5.3.1	Advanced textile manufacturing	5	-	5
TT5.3.2	Statistical quality control in textiles			
TT.5.4	Textile Testing Practical	-	6	6
TT5.5	Garment technology Practical	-	6	6
TT5.6	Communication skill Practical	-	6	6
Total		17	18	35

VI SEMESTER:

Subject No.	Subject	Periods per week		
		Theory	Practical	Total
TT6.1	Textile Management	6	-	6
TT6.2	Fabric structure	6	-	6
	Elective: II			
TT.6.3.1	Maintenance of textile machineries	5	-	5
TT.6.3.2	Textile Marketing and Merchandising			
TT6.4	Textile CAD practical	-	6	6
TT6.5	Fabric structure practical	-	6	6
TT.6.6	Project Work, Entrepreneurship, Environment & Disaster management	-	6	6
Total		17	18	35

DIPLOMA IN TEXTILE TECHNOLOGY

SCHEME OF EXAMINATION

Course code: 2060

K Scheme

III SEMESTER:

Subject code No.	Subject	Examination Marks			Minimum Marks For Pass	Duration of Examination (Hours)
		Internal Assessment Mark	Board Exam. Marks	Total Marks		
TT3.1	Fibre Science & Technology	25	75	100	40	3
TT3.2	Basics of Engineering	25	75	100	40	3
TT3.3	Yarn manufacture-1	25	75	100	40	3
TT3.4	Fabric Manufacture-1	25	75	100	40	3
TT3.5	Yarn manufacture – I Practical	25	75	100	50	3
TT3.6	Fabric Manufacture-1 Practical	25	75	100	50	3

IV SEMESTER:

Subject code No.	Subject	Examination Marks			Minimum Marks For Pass	Duration of Examination (Hours)
		Internal assessment Mark	Board Exam. Marks	Total Marks		
TT4.1	Textile wet processing	25	75	100	40	3
TT.4.2	Yarn manufacture – II	25	75	100	40	3
TT.4.3	Fabric Manufacturing – II	25	75	100	40	3
TT4.4	Textile wet processing Practical	25	75	100	50	3
TT4.5	Yarn manufacture – II Practical	25	75	100	50	3
TT4.6	Fabric Manufacturing – II Practical	25	75	100	50	3

V SEMESTER:

Subject No.	Subject	Examination Marks			Minimum Marks For Pass	Duration of Examination (Hours)
		Internal assessment Mark	Board Exam. Marks	Total Marks		
TT5.1	Textile Testing	25	75	100	40	3
TT5.2	Garment technology	25	75	100	40	3
TT5.3.1	Elective Advanced textile manufacturing	25	75	100	40	3
TT5.3.2	Statistical quality control in textiles					
TT.5.4	Textile Testing Practical	25	75	100	50	3
TT5.5	Garment technology Practical	25	75	100	50	3
TT5.6	Communication skill Practical	25	75	100	50	3

VI SEMESTER:

Subject No.	Subject	Examination Marks			Minimum Marks For Pass	Duration of Examination (Hours)
		Internal assessment Mark	Board Exam. Marks	Total Marks		
TT6.1	Textile Management	25	75	100	40	3
TT6.2	Fabric structure	25	75	100	40	3
TT.6.3.1	Elective: II Maintenance of textile machineries	25	75	100	40	3
TT.6.3.2	Textile Marketing and Merchandising					
TT6.4	Textile CAD practical	25	75	100	50	3
TT6.5	Fabric structure practical	25	75	100	50	3
TT.6.6	Project Work, Entrepreneurship, Environment & Disaster management	25	75	100	50	3

VII SEMESTER:

Subject No.	Subject	Examination Marks			Minimum Marks For Pass	Duration of Examination (Hours)
		Internal assessment Mark	Board Exam. Marks	Total Marks		
TT 7.1	Industrial training and viva voce	25	75	100	40	3

EQUIVALENT SUBJECTS FOR I AND II SEMESTERS SUBJECTS

‘J’ SCHEME TO ‘K’ SCHEME FROM APRIL, 2007-2008

I and II Semesters

S.No.	EXISTING SCHEME OF SUBJECTS IN J - SCHEME	EQUIVALENT SUBJECTS IN THE PROPOSED K – SCHEME
	Subjects	Subjects
1	English	2001- Communication English-II
2	Basics Of Computer Science	No Equivalent subject
3	Mathematics-I	1002- Mathematics (I semester)
4	Mathematics-II	2002-Applied Mathematics (II Semester)
5	Applied Physics	2003-Engineering Physics-II (II Sem)
6	Applied Chemistry	2004-Engineering Chemistry-II (II Sem)
7	Technical Drawing	2005-Engineering Graphics
8	Applied Physics Practical	2006-Physics Practical
9	Applied Chemistry Practical	2007-Chemistry Practical
10	Workshop	2008-Workshop Practice
11	English Communication Practical	IV / V Sem. English Communication Practical

III Semester	
TT31. Technology of Textile Materials	TT31. Fibre Science & Technology
TT32. Technology of Yarn Manufacture – I	TT33. Yarn Manufacture – I
TT33. Technology of Fabric Manufacture – I	TT34 . Fabric Manufacture – I
TT34. Computer Applications Practical	-----
TT35. Technology of Yarn Manufacture - I Practical	T 35.Yarn Manufacture – I practical
TT36. Technology of Fabric Manufacture - I Practical	TT36. Fabric Manufacture - I Practical
IV Semester	
TT41. Textile Plant Engineering	TT32. Basics of Engineering
TT42. Textile Chemical Processing	TT41. Textile Wet Processing
TT43. Technology of Yarn Manufacture –II	TT42. Yarn Manufacture –II
TT44. Fabric Analysis Practical	TT65.Fabric Structure Practical
TT45. Textile Chemical Processing Practical	TT44. Textile Wet Processing Practical
TT46. Technology of Yarn Manufacture – II Practical	TT45. Yarn Manufacture II Practical
V Semester	
TT51. Textile Testing & Quality Assurance	TT51. Textile Testing
TT52. Technology of Fabric Manufacture – II	TT43.Fabric Manufacture – II
TT53A Knitting and Apparel Technology TT53B Technical Textiles TT53C Statistical Quality Control in Textile Industry	TT52. Garment Technology ----- TT53 ii) Statistical Quality Control in Textile
TT54. Textile Testing and Quality Assurance Practical	TT54. Textile Testing practical
TT55. Technology of Fabric Manufacture – II Practical	TT46. Fabric manufacture-II Practical
TT56. Knitting and Apparel Manufacturing Practical	-----
VI Semester	
TT61. Textile Mill Management & Entrepreneurship	TT61. Textile Mill Management
TT62. Advanced Textile Manufacture	TT53 i. Advanced Textile Manufacture
Elective-II : (Any one from the following four subjects) TT63A Maintenance of Textile Machineries TT63C Textile Machinery Control Systems TT63D Textile Marketing and Merchandise TT63B	TT63 i Maintenance of Textile Machineries ----- TT63 ii Textile Marketing and merchandising
TT64. Advanced Textile Manufacture Practical	-----
TT65. Textile CAD Practical	TT6.5 Textile CAD practical
TT66. Project Work & Inplant Training	-----

VII SEMESTER

TT 7.1 Industrial training and viva voce

TT 7.1 Industrial training and viva voce

III SEMESTER

TT 3.1 FIBRE SCIENCE AND TECHNOLOGY

Total Number of hours / week : 6

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- To know about the various classifications of textile fibres their origin and chemical nature, properties etc.
- To know about the chemical composition their reaction & methods and uses.

Unit-2

- To know about the cotton, fibre cultivation, Indian & hybrid varieties and its uses.
- To know about the Flax fibre and Jute fibre, cultivation and extraction and their uses.

Unit-3

- To know about Wool fibre, their origin, wool producing countries, sequence process for yarn manufacture uses etc.
- To know about silk producing countries, life cycle and several process to use silk fabric and uses.

Unit-4

- To study about different techniques of spinning – manufacture of viscose rayon and polynosic rayon etc.
- To know about Tencel rayon and HT rayon.

Unit-5

- To know about the manufacture of Nylon 6, Nylon 66 polyester and Acrylic fibre, and their properties & uses.
- To know briefly about the Glass fibre, bamboo, casein, carbon, Nomex and Kevlar and Lycra fibres.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Fibre Science And Technology	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	INTRODUCTION	15
II	VEGETABLE FIBRES	16
III	ANIMAL FIBRES	18
IV	REGENERATED FIBRES	18
V	SYNTHETIC FIBRES	17
Revision, Test		12
Total		96

I. INTRODUCTION:

Definition of Textile Fibre. Classification of Textile Fibres based on origin and chemical nature. Properties required for an ideal textile fibre. Identification of Textile Fibres - Microscopic test, burning test, Solubility test. Definition of monomer, polymer, repeat unit, polymerization - Degree of polymerization, staple fibre, filament yarn, mono filament, multifilament, spun yarn, double yarn. Types of polymerization - Addition and condensation polymerization.

II. VEGETABLE FIBRES:

Cotton:

Cotton producing countries. Cultivation and harvesting Varieties of commercial cottons Indian hybrid cottons with their characteristics Physical and chemical structures of cotton fibre Physical and chemical properties Uses.

Flax:

Flax producing countries Extraction of fibre. Physical and chemical properties. Uses.

Jute:

Jute producing countries –Extraction of fibre – Physical and chemical properties. Uses.

III. ANIMAL FIBRES:

Wool:

Wool producing countries .Classification of wool with respect to fleece and breeds .Scouring of raw wool to produce clean wool .Physical and chemical structure .Physical and chemical properties Comparison of woollen and worsted .Virgin and remanufactured wool .Uses.

Silk:

Silk producing countries. Types of silk - Wild and cultivated. Sericulture - Life cycle of silk worm - Reeling, throwing and doubling. .Degumming of silk. .Physical and chemical properties –Uses.

IV. REGENERATED FIBRES:

Types of spinning of man made fibres - Wet, dry and melt. Drawing and its importance.

Viscose Rayon:

Manufacturing of viscose rayon filament and staple fibre. Properties. Uses.

Polynosic rayon:

Manufacturing of Polynosic rayon filament and staple fibre. Properties. Uses.

HT Rayon:

Modification of viscose process for the manufacture of HT Rayons. Properties. Uses.

Tencel Rayon:

Brief study

V. SYNTHETIC FIBRES:

Nylon and Polyester manufacturers in India.

Nylon - 66:

Manufacture of Nylon 66 - Polymerization, Spinning & Drawing
Properties and uses.

Nylon - 6 :

Manufacture of Nylon 6 - Polymerization, Spinning and Drawing –
Properties and uses.

Polyester : Manufacture of Polyester - Polymerization, Spinning and Drawing –
Properties and uses.

Acrylic Fibre:

Manufacture of acrylic fibre - Polymerization, Spinning and Drawing –
Properties and uses.

Uses of other significant fibres - Glass, Asbestos, Casein, Carbon, Nomex, Kevlar,
Polyurethane

Text Book

1. Fibre Science by R. Gopalakrishnan and T. Murugan
2. Fibre Science (Tamil) by R. Gopalakrishnan and A. Edwin Sunder

REFERENCE BOOKS:

S.No	Title	AUTHOR	PUBLISHERS
1	Textile fibres	V.A. Shenai	2 nd Revised edition, 1997. Vol. I in the series, "Technology of Textile Processing". Sevak publications, Bombay
2	Manmade fibres	P.W. Moncrieff	6 th edition 1975, Newnes –
3	Textile Science	E.P.C. Gohle and L.D. Vilensty	1 st Indian edition 1987 CBS Publishers and Distributors Delhi, India
4	Fibre Science and Technology	S.P. Mishra	New age International (p) Ltd Daryaganj, New Delhi-110002

III SEMESTER

TT 3.2 BASICS OF ENGINEERING

Total Number of hours / week : 6

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

UNIT-1

1. To have knowledge of fuel, steam, pumps,
2. To have knowledge of air compressor, air conditioning and bearings.

UNIT-2

3. To know about lubrication, clutches, brakes,
4. To have knowledge of belts, chains, gears, lathe and welding

UNIT-3

5. To have knowledge of fundamentals of electrical engineering,
6. To have knowledge of A.C motors and transformers.

UNIT-4

7. To understand the fundamental of electronics engineering
8. To know about transducers.

UNIT-5

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Basics Of Engineering	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Basics of Mechanical Engineering – I	17
II	Basics of Mechanical Engineering –II	17
III	Basics of Electrical Engineering	17
IV	Basics of Electronics Engineering	17
V	Measuring Instruments and sensors	16
Revision, Test		12
Total		96

DETAILES SYLLABUS

I. Basics of Mechanical Engineering - I

Fuels – Brief study only - Definition of fuel and Calorific Value of Fuel - Use of Steam for Textile Applications - Types of Boiler and fire tube and water tube.

Suction and Pump – Brief study- Principles of suction - Various applications of suction in Textile Industry - Pump-Definition and types - Construction and working of Reciprocating and centrifugal pump comparison

Air Compressors and Humidification – Brief study - Air compression – Definition Use of compressed air in Textile applications - Principles of Humidification and its importance in Textile Industry - Definition of absolute and relative humidity - Norms for maintaining - temperature, humidity in Textile mills - Air Compressors – Detailed study: - Construction and working of a simple single stage reciprocating air compressor

Air Conditioning and Bearings –Brief study - Principles of air conditioning - Need and importance of bearing - Different types of bearings and their use in Textile Machines - Factors for selection of bearings - Detailed study: Construction and working of a window type air conditioner Constructional details of Ball and Roller bearings

II. Basics of Mechanical Engineering - II

Lubrication-Brief study - Purpose of lubrication and types of lubrication systems Desirable qualities of a good lubricant - Detailed study - Study of Continuous lubrication methods: Gravity feed lubrication, Pressure feed Lubrication and oil bath Lubrication

Clutches and Brakes – Brief Study - Principle of working of a friction clutch Principle of working of a shoe brake - Different types of brakes, Application of brakes in Textile Machines - Difference between a clutch and a brake Construction and working of single plate friction clutch - Construction and working of Hydraulic brake - Construction and working of Pneumatic brake

Transmission of motion and power – Brief study - Different types of drives flat, V belt and gear belt drives – merits and demerits bush roller chain drive – advantages and disadvantages spur, helical, double helical, bevel, worm and worm gear drives, pawl and ratchet drives – advantages and disadvantages Cams, different types of cams and followers - Applications of the above drives in textile machines

Transmission of motion and power – Detailed study - Need for variable speed drives in Textile machines - Working of step less cone pulleys and PIV drives for changing speed - Epicyclic gear train

Workshop machines – Brief study - Simple Lathe operations. Facing, Plain and taper turning, drilling - Study of Brazing, advantages of brazing - welding – types of welding

Workshop machines – Detailed study - Study of Oxy-acetylene gas welding – process and equipments used - Study of electric arc welding – process and equipments used - Study of a Lathe – simple line sketch, description and functions of the parts

III. Basics of Electrical Engineering

Basic ideas – Brief study (No derivations or calculations involved) - Creation of a magnetic field around a current carrying conductor (statement only) – RH thumb rule - Electromagnetic induction – Faradays laws (statement only) – Fleming’s RH rule - Force on a current carrying conductor placed in a magnetic field – (statement only) – Fleming’s LH rule - Definition of electrical quantities: Voltage, current, power and resistance – Units of these quantities, Formula for calculation of electrical power and energy in a DC circuit

Fundamentals of AC current – Brief study (No derivations or calculations involved) Alternating current, frequency, Instantaneous and RMS - values, inductance, capacitance, impedance and phase difference in AC circuits - Power factor, disadvantages of low power factor, methods to improve power factor, true, apparent and reactive powers in AC circuits (Basic idea only, no calculations) Single phase and 3phase AC supply, advantages of 3 phase supply, star and delta connections, comparison of star and delta connections, comparison of and delta connections (Basic idea only, no calculations)

Fundamentals of AC motors – Brief study (No derivations or calculations involved) Principle of working of induction motors – types of induction motors - Necessity of starters for starting induction motors - Principle of working of transformer, parts of a single phase transformer, - Transformation ratio, step up and step down transformers (Basic idea only, no calculations)

Electrical machines – Detailed study - Constructional details and working of 3 phase Induction motors - Study of starters for starting induction motors - Constructional details and working of single phase transformers.

IV. Basics of Electronics Engineering

Basic ideas – Brief study - Definition of conductors, insulators and semi conductors (both intrinsic and extrinsic) - Electron emission, different types of electron emission Photoelectric emission, photoelectric effect, principle of working of photocells

Semiconductor devices – Brief study - Doping of semi conductors, P and N types of Doping - Conduction in P and N type semi conductors - PN junction diode, properties PN junction diode and conduction through the diode for forward and reverse bias Connections - Use of diode as a rectifiers - Transistors – construction of PNP and NPN transistors ,

Semiconductor devices – Detailed study - Working of Half wave and Full wave

rectifiers, Bridge rectifiers - working of PNP and NPN transistors as signal amplifiers
Use of photocells in textile testing

Transducers – Detailed study - Principle and working of strain gauges - Application of strain gauges in textile testing

V. Measuring Instruments and sensors

Brief study - Functions of sensors – Types – Application - Instruments used to measure voltage, current, Power and energy

Detailed study - Importance of earthing, methods of earthing of Textile machines and equipments - Tendency of textile fibres to develop static charges during mechanical processing – methods and equipments used to eliminate / reduce the static charges - Temperature, Level, Flow, Pressure, Force and Humidity sensors - Voltmeter, Ammeter (moving coil and moving iron), Watt meter (dynamo meter type), Energy meter (Induction type)

Text.Book :- Basic Engineering By V.Simpson and G.K.Balamurugan
SSMITT CO-OP stores

Reference Books

S.No	Title	Authors	Year & Publisher
1	Thermal Engineering	A.S.Saro	Sathyaprakashan, New Delhi
2	A Text Book on Hydraulics, Fluid Mechanics and Hydraulic machines	R.S.Khurmi	S.Chand & Co, New Delhi
3	Mechanical Technology	V.Sivarajan	V.K.Publishers
4	Welding and Welding Technology	Richard.L.Little	2005 – Tata Megraw Hills Pub.co.Ltd.,
5	A Text Book of Electrical Technology	B.L.Theraja	Publication Division,Niraja, New Delhi
6	Essentials of Electricity	Kennard C.Grahami	D.B.Taraporewala sons & Co., Mumbai
7	Electrical Machines	Smarajit Ghosh	2005 – Person Education (Singapore) P.Ltd., Indian Branch – 482,FIE.Patparaganj ,Delhi – 110 092
8	Basic Electronics	Lawrence.A.Johnson & others	D.B.Taraporewala Sons & Co., Mumbai
9	Electronic Devices and Circuits	Jacob Millman & Christos.C.Halkins	1991 – Tata McGraw Hills Pub.Co.Ltd.,
10	Instrumentation, Devices and Systems	C.S.Rangan G.R.Sharma V.S.V.Mani	2005 – Tata Mcgraw Hills Pub.Co.Ltd.,
11	Norms for Sinning / Weaving / Processing Mills	SITRA BITRA ATIRA	Publications by SITRA BITRA and ATIRA
12	Automation and The Textile Industry	Savas G.Vassiliadis,	Eurotex, 1996

III SEMESTER
TT3.3 : YARN MANUFACTURE-I

Total Number of hours / week : 6

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- To have knowledge about the various blow room machineries.
- To understand the working of various opening and cleaning machines

Unit-2

- To understand the working of scutcher unit
- To calculate the speed, production and efficiency of blow room machinery

Unit-3

- To acquire knowledge about carding m/c
- To know the various setting in a card

Unit-4

- To understand the modern developments in a card
- To calculate the speed, draft, production and efficiency in cards

Unit-5

- To know the different drafting systems in draw frame
- To calculate the speed, draft, production and efficiency in draw frames

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Yarn Manufacture - I	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Mixing, Blending and Opening machines	17
II	Modern developments in blow room	17
III	Carding	17
IV	Modern developments in carding	17
V	Draw frame	16
Revision, Test		12
Total		96

DETAILED SYLLABUS

I. Mixing, Blending and Opening

Brief study

Ginning - objects, types of gins and their suitability. working of Knife roller gin. .Blending- objects and their effects on yarn quality. fibre properties to be considered for blending .selection of cotton – typical mixing for coarse, medium and fine counts. Comparison between mixing and blending. Contamination and its effect – contamination remover – vision shield.

Detailed study

Mixing and blending equipments - Multimixer, Aeromix, Unimix and Unifloc. Introduction - objectives of blow room process - principles of opening and cleaning. Description and working of openers and beaters hopper bale breaker – hopper feeder- step cleaner, aerodynamic cleaner, axiflow, mono cylinder and ERM cleaner. Study of pneumatic conveyers, condensers, distributors, filters, cellar less blow room, electronic metal detectors, gravity traps, and electronic feed control devices – Fire eliminators.

II. Modern development in Blow Room

study of scutcher – Two bladed beater, kirschner beater - piano feed regulating motion. Lap forming device -. Study of automatic scutcher - Auto lap doffing - salient features of modern Blow room process. Blow room sequence employing latest openers and beaters suitable for fine, medium and coarse cottons (flow chart only). Defects in Blow room laps and remedial measures. Calculation relating to speed - production and efficiency of scutcher. Brief study of chute feed system and advantages and disadvantages.

III. Carding

Objects and principles of carding. carding and stripping actions. Passage of material through SHP & HP card. study of different parts of the carding machine and their functions. Heel and toe arrangements in carding machine. Metallic wire and their specifications for cylinder and doffer, and its advantages, Speeds and settings in carding for different grades of cotton and Man made fibre. Objectives of stripping and grinding. Defects in card sliver - Causes and remedies.

IV. Modern development in carding.

Hooked fibre in carding- Its effects on yarn quality and waste. Salient features of modern high production cards. Developments in different regions of card- in feed, licker-in, flats, cylinder region, Condensing zone. Web doffing devices . Cross roll Verga - India roll .Apron doffing device. .Brief study of Auto leveler. Open and closed loop. . Dust extraction system in card - Automatic Waste Extraction System.. Calculations related to speed, draft, production and efficiency in cards.

V. Draw frame.

Objects of drawing. Principles of doubling and drafting at draw frame.. Study of fibre arrangements in the carded and drawing slivers.. Working of draw frames and functions of different sections of draw frame.. Draft and its distribution.. Roller weighting system -spring weighting system, Pneumatic-weighting system. Roller settings. Drafting systems -Platt's pressure bar drafting, Rieter's polar drafting and RSB drafting systems. Stop motions - Electronic stop motion and limit switches. Brief study of Auto leveler in draw frame. Salient features of modern draw frame. Drafting

irregularities. Drafting wave, roller eccentricity and roller slip. Calculations related to speed, draft, hank, production and efficiency in draw frame. Defects in draw frame sliver. Causes and remedies. Method of Blending at draw frame stage.

TEXT BOOK

Technology of yarn forming– I By T.Murugan and R.Narasimhan

SSMITT CO-OP Stores

REFERENCE BOOKS:

S.No.	Title of the book	Author	Publisher	Year
1	Opening and cleaning	W.A.Hunter	The Textile Institute Manchester, U.K.	1992
2	Cotton spinning	W.S.Taggart	S.S. Shroff, Bombay	1996
3	Spun yarn technology - volume I & II	A.V.Mani	Saravana Publications, Madurai	1996
4	Short Staple Spinning Series Volume I, II & III	W.Klein	The Textile Institute Manchester, U.K.	1987

III SEMESTER
TT.3.4 FABRIC MANUFACTURE - I

Total Number of hours / week : 6

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- To know the objective of winding & Rewinding
- To know about different types of Tensioning devices and their uses.
- To understand yarn clearers mechanical, electronics and splicing etc.

Unit-2

- To know about High speed pirn winding machine working
- To know about the Causes of faults and remedies in cone winding and pirn winding machine.
- To acquire knowledge about , High speed warping machine – salient features –Faults on

Unit-3

- To know about sizing and sizing in gradients
- To know about the multi cylinder sizing machine with different types of control systems used.

Unit-4

- To know about plain power loom – mechanism – timings, settings.
- To know about picking, Beat-up mechanism.

Unit-5

- To study about take –up, Let-off motions.
- To know about Drawing-in Denting, yarn numbering systems.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Fabric Manufacture -I	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Warp Winding and Weft Winding	17
II	Warping and Sizing	17
III	Loom - Primary Motions	16
IV	Loom - Secondary and Auxiliary Motions	17
V	Drawing-in, Denting & Calculations	17
Revision, Test		12
Total		96

I. Warp Winding and Weft Winding:-

Warp Winding: Brief study of Sequence of Process in Weaving Preparatory - Objects of Warp Winding Definition of Angle of Wind and no. of Wind Tensioning Devices - Types Yarn Clearers - Mechanical & Electronic Clearers Splicing – Types – Salient features of spliced yarn Detailed Study of High Speed & Fully Automatic Winding Machines like Roto Coner, Auto Coner. Package Faults- Causes and Remedies. Different types of knots and its effects.

Weft Winding: Objects of Weft Winding – Advantages of Rewound Weft, Over direct weft Detailed study of high speed Automatic pirn Winder - Bunch & its necessity.

II. Warping & Sizing:-

Warping: Objects of Warping Study of High Speed Beam Warping Machine - Types of Creels - Measuring Motion - Electrical Warp Stop Motion - Expanding Comb - Head Stock Salient features of Modern Warping Machine concept of Computerized Sectional Warping.

Sizing: Objects of Sizing - Sizing ingredients used for different types of Yarn and their functions - Factors influencing Size Pick-up - Necessity of Marking and Measuring Motion (No working) Moisture Control - Stretch Control - Temperature Control size Level Control Yarn Migration and its effect Environmental and Safety Aspects in Sizing - Detailed Study of Multi Cylinder Sizing Machine Single End Sizing Faults in Sizing, their causes & remedies.

III. Loom Primary Motions:-

Introduction to Weaving - Passage of Material through Power loom - Right hand and Left hand looms and Shuttles - Objects of Shedding - Positive & Negative Shedding - Brief Study of Over and Under Motions - Types of Sheds – Negative tappet shedding mechanisms - Working - Advantages and Defects - Early Shedding and Late Shedding and its effect on cloth.

Picking - Objects of Picking - Types - Cone over Picking Mechanism - Working - Early & Late Picking - Shuttle Checking Devices - Defects of Negative Picking - Remedies - Under Picking Mechanism - Sterns Parallel Motion - Working - Comparison of over pick and under pick mechanism.

Beat-up Mechanism - Object - Eccentricity of Sley's Motion – Factors affecting Eccentricity.

IV. Loom - Secondary and Auxiliary Motions:

Take up motions - Function - Types - Positive Take up Motion - Intermittent Take up Motions - Cloth Wind Up Systems - Seven Wheel Take up Motion - Working - Dividend Calculation - Anti-Crack Motion - Positive Continuous Take up Motion.

Let-off Motion - Objects - Types - Chain lever and Weight Negative let-off Motion - Control of Warp Tension - Oscillating back rest and its function.

Weft fork Motion - Objects - Types - Side Weft Fork Motion - Working - Study of Centre Weft Fork Motion.

Warp Protecting Mechanism - Objects - Loose Reed Motion - Working - Fast Reed Motion - Working - Functions of Brake Motion, Fly Wheel, Lease Rods, Healds, Reeds, Temples - Types and their uses. Fabric Defects, Causes and Remedies.

V. Drawing-in, Denting and Calculation:-

Manual operation of Drawing-in - Automatic Drawing-in and Reaching-in, Leasing, Knotting and Pinning - Denting.

Different Yarn Numbering System, Merits & Demerits, Conversion of Count from one system to another, Doubled and Plied Yarn Calculation.

Calculation pertaining to speed, Efficiency and Production of Warp Winding, Weft Winding, Warping, Sizing and Loom.

Heald and Reed Calculation.

Text. Books

1. Technology of Fabric Manufacture – I - Prof. R.Muthusamy M.Tech. & V.Ilango M.Tech.

Reference Books:-

S. No	Author	Book Title	Publishers	year
1	Thomas W.Fox	The Mechanism of Weaving	Universal Publishing corp.,Mumbai -2	
2	A.Ormerod	Modern Preparation and Weaving Machinery	Woodhead publishing Ltd., England.	
3	Marks & Robinson	Principles of Weaving	The Textile Institute, Manchester.	
4	N.N.Banerjee	Weaving Mechanism Vol.I	Smt Tandra banerjee & Smt Apurba banerjee , West Bengal	
5	Prof.J.C.Chakravarti	Mechanism of Weaving Vol.I & II	Prof. J.C.Chakravarty West Bengal	
6	B.Hasmukhrai	Fabric Forming	SSMITT&PC, Co-operative stores Komarapalyam.	
7		Woven Fabric Production - I	NCUTE, New Delhi	
8	R.Sengupta	Weaving Calculations	D.B.Taraporevala sons & co Ltd., Mumbai	

III SEMESTER

TT3.5 YARN MANUFACTURE - I Practical

Total Number of hours / week : 6

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

- To study the settings of blow room machinery, Card and draw frame
- To calculate the speed, production and efficiency in blow room, card and draw frame
- To calculate the draft in card and draw frame

Scheme of Instruction and Examination

Subject	Instruction		Examination				
	Hours / week	Hours / semester	Assessment mark				
Yarn Manufacture -I Practical	6	96	Internal – 25			Board exam	Total
			Perfor mance	Rec ord	Att	75	100
			10	10	5		

LIST OF EXPERIMENTS:

- 1) Estimate the speed and settings of Hopper bale breaker.
- 2) Estimate the speed and settings of Axi-flow cleaner.
- 3) Estimate the speed and settings of Mono cylinder.
- 4) Estimate the speed and settings of E.R.M. cleaner.
- 5) Estimate the speed and settings of Step cleaner.
- 6) Estimate the speed and settings of Kirschner beater.
- 7) Estimate the production of scutcher per day of 8 hours from the data available in the m/c.
- 8) Estimate the speeds of the various parts of carding machine.
- 9) Calculate actual and mechanical draft in carding machine
- 10) Calculate the draft change wheel for a given lap hank to produce the required hank of sliver in a card.

- 11) Set the card to process long staple cotton.
- 12) Set the card to process medium staple cotton.
- 13) Set the card to process short staple cottons.
- 14) Estimate the production of the card per day from the data available in the machine.
- 15) Draw the Gearing plan of the Draw frame and calculate:
 - a. Draft between intermediate rollers
 - b. Total draft
 - C. Draft constant
- 16) Draw the Gearing plan of DF and calculate:
 - a. Front roller speed
 - b. Production per day of 8 hours assuming the hank delivered
 - c. Draft between front roller and calendar roller and tension draft at the creel.
- 17) Calculate the draft change wheel for a given sliver hank to produce the required hank of sliver in a draw frame.
- 18) Set the Draw frame to process long staple cotton.
- 19) Set the Draw frame to process medium staple cotton.
- 20) Set the Draw frame to process short staple cotton.

List of equipments :- Blow room, Carding and Draw frame

Material :- Blow room lap, carding sliver

III SEMESTER
TT.3.6 FABRIC MANUFACTURE - I PRACTICAL

Objectives

- To study about the Weaving preparatory process, High speed Cone winding, and Pirn winding.
- To study about High speed Warping Machine and Sizing machine.
- To know about different mechanisms in a Plain Power Loom.
- To know about Drawing, Denting, Numbering systems and Production calculation of winding, warping, sizing and looms.

Scheme of Instruction and Examination

Subject	Instruction		Examination				
Fabric Manufacture –I Practical	Hours / week	Hours / semester	Assessment mark				
	6	96	Internal – 25			Board exam	Total
			Perform ance	Record	Attenda nce	75	100
			10	10	5		

LIST OF EXPERIMENTS:

01. Calculate the drum shaft speed and production / drum / hour from the given data in a cone winding machine.
02. Draw the Passage of material through a cone winder and set the slub catcher and tensioner for specific counts. (20^s, 40^s & 60^s)
03. Draw the diagram of the broken thread stop motion and anti-ribboning device. Set it for correct working.
04. Draw the Gearing plan of the pirn winder and estimate the number of traverse per minute.
05. Draw the Passage of material through a Pirn winding machine and calculate the spindle speed and production/ hour / spindle.
06. Draw the diagram of the bunch building mechanism and find out the functions of automatic devices in the automatic pirn winder.
07. Draw the passage of material through a sectional warping machine and find out the functions of creel, drum and split reed.

08. a) Draw the reduction gear plan and Heck-box traverse in the sectional warping machine
b) calculate the number of sections, revolutions of each section, drum speed, beaming speed and production.
09. Dismantle and assemble the parts of Tappet shedding mechanism including the top reversing device with timing and settings.
10. Dismantle and assemble the parts of the cone-over pick mechanism with timing and settings.
11. Dismantle and assemble the parts of the shuttle box of a loom with reed alignment for the given shuttle with timing and settings.
9. Dismantle and assemble the parts of the under pick mechanism or parallel picking Mechanism with timing and settings.
13. Set the crank & the sley and calculate the sley eccentricity.
14. Dismantle and assemble the parts of the negative let-off mechanism with back rest settings.
15. Dismantle and assemble the parts of the 7 wheel take-up motion and calculate the dividend.
16. Dismantle and assemble the parts of the Loose reed mechanism with timing and settings.
17. Dismantle and assemble the parts of the Fast reed mechanism with timing and settings.
18. Dismantle and assemble the parts of the Side weft fork mechanism for correct working with timing and settings.

List of Equipments :-

1. High speed Cone winding machine.
2. Automatic Pirn winding machine.
3. Sectional warping machine.
4. Plain power loom – 3 nos.

IV SEMESTER

T T.4.1 TEXTILE WET PROCESSING

Total Number of hours / week : 06

Total Number of week / semester : 16

Total Number of hours / semester : 96

OBJECTIVES:

UNIT - I

1. To get knowledge on the preparatory processes to which the grey fabric is subjected.
2. To know the process by which the fabric is made white.

UNIT - II

1. To know the classification of dyes and the methods of application onto the different textile materials.
2. To know the working of the dyeing machines suitable for dyeing the woven and knitted fabrics.

UNIT - III

1. To learn the methods/styles of producing printing designs on the fabric using several ingredients.
2. To learn the method of producing the design screens and the working of machines used for printing.

UNIT - IV

1. To learn the finishing chemicals to be applied onto the textile materials to make it fit for particular end use.
2. To know the method of producing a particular effect.

UNIT V

1. To study about the necessity of controlling the quality of the textile materials during the wet processing treatment.
2. To study about the test methods involved to determine the fastness properties of the dyed materials to washing, rubbing and light.
3. To learn the importance of eco-friendly processing and the method of treating the effluents.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Textile Wet Processing	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	PREPARATORY AND BLEACHING PROCESSES	17
II	DYEING PROCESS	17
III	PRINTING PROCESS	17
IV	FINISHING PROCESS	17
V	QUALITY AND POLLUTION CONTROLS	16
	Revision, Test	12
	Total	96

T.4.1. TEXTILE WET PROCESSING

I. PREPARATORY AND BLEACHING PROCESSES:

Impurities present in grey cotton and cotton fabric, sequence of wet processing treatments, singeing - Object - Gas Singeing Machine for woven fabric with line diagram. desizing - Object, methods of desizing - Acid and Enzyme desizing methods - Merits and demerits, Continuous Enzyme desizing method. Scouring - Object, mechanism of scouring, Process of caustic scouring using high pressure kier with line diagram.

Bleaching - Object, Types of bleaching agents, Merits and demerits of Hypo chlorite and peroxide bleaching - Advantages of H₂O₂ over other bleaching agents - Concept of full bleaching and optical brightening agents - Continuous scouring and bleaching using J Box with line diagram. Drying on vertical drying range with line diagram.

II. DYEING PROCESS:

Classification of dyes based on their mode of application - Dyeing of cotton with Azoic dyes, Reactive dyes, vat dyes and sulphur dyes - Recipe and procedure only.

Dyeing of wool with acid dyes - Dyeing of silk with basic dyes - Dyeing of Polyester with Disperse dyes - Recipe and procedure only - Dyeing of Acrylic with Basic dyes - Recipe and procedure only.

Dyeing machines - Working of Jigger, Winch, Soft flow jet dyeing machines, HTHP Beam dyeing machine and cabinet hank dyeing machine with line diagrams.

III. PRINTING PROCESS:

Comparison between dyeing and printing - Styles and methods of printing - Ingredients in printing paste.

Direct style of printing with pigments on cotton - Recipe and process only - Direct style of printing with reactive dyes on cotton - Recipe and process only - Direct style of printing with Disperse dyes on polyester - Recipe and process only.

White and colour discharge on disperse ground - White and colour resist with pigments on reactive ground. Batik style on cotton with reactive dyes - brief study only.

Flat Screen and Rotary Screen design preparation - Brief study only - Table screen printing - Flat bed screen printing machine. Rotary screen printing machine - Brief study with line diagram. Line diagram of curing machine and any one steamer - Brief study only.

IV. FINISHING PROCESS:

Advantages of finishing - Finishing of cotton fabric with stiffeners (Starch, PVA, Polyvinyl Acetate) and softeners (Anionic, Cationic and non-ionic), Anticrease finish, Sanforizing (Pre shrinking) - Use of silicones in finishing. Mercerisation - Advantages - Changes take place during mercerisation - Mercerising of fabric using chain mercerising machine and chainless mercerising machine. Damping and calendering - Finishing using Hot air stenters.

V. QUALITY AND POLLUTION CONTROLS:

Importance and need of Quality Control - Determination of wash fastness - ISO Tests, Wet and Dry rubbing fastness - Light fastness testing to day light only - Principle and Relative merits and demerits of computer colour matching.

Importance and need of environmental protection - Air, water and noise pollution - Constituents of air, water and noise pollutants with respect to textile industry.

A brief study on effluent treatment with a suitable plant layout (Process flow chart only).

A brief study on eco-friendly processing - List of banned dyes and chemicals, Eco labels - A brief study only - ISO 14000 standards - A brief study only.

TEXT BOOK:

1. Textile Chemical Processing - P.Angappan, A.Edwin Sunder, V.Ilango

REFERENCE BOOKS:

S.No.	Title	Author	Publisher
1.	Technology of Textile Processing Vol.3 Technology of Bleaching Edn. 3, 1981	Shenai V.A.	Shevak Publications 306 Shri Hanuman Industrial Estate Gousmbekar Road,Wadala Mumbai - 37
2.	Technology of Textile Processing, Vol.2 Chemistry of dyes & Principles of dyeing Edn. 2 1983	Shenai V.A.	Shevak Publications 306 Shri Hanuman Industrial Estate Gousmbekar Road Wadala, Mumbai - 37
3.	Technology of Textile Processing, Vol.6 Technology of Dyeing Edn. 2 1980	Shenai V.A.	Shevak Publications 306 Shri Hanuman Industrial Estate Gousmbekar Road Wadala, Mumbai - 37
4.	Technology of Textile Processing, Vol.4 Technology of Printing Edn. 2 1979	Shenai V.A.	Shevak Publications 306 Shri Hanuman Industrial Estate Gousmbekar Road Wadala, Mumbai - 37
5..	Technology of Textile Processing, Vol. 10 Technology of Finishing 1987	Shenai V.A.	Shevak Publications 306 Shri Hanuman Industrial Estate Gousmbekar Road Wadala Mumbai - 37
6.	Textile Printing	Miles L.W.C.	Society of Dyers & Colourist Perlein House 82 Gratlan Road, Broard fard West Yarkshire, England
7.	An Introduction to Textile Finishing	Marsh J.T.	B.I.Publications 54 Janpath New Delhi 110 001
8.	Mercerising, 1979	Marsh J.T.	B.I.Publications 54 Janpath, New Delhi 110 001
9.	Computer Colour Matching	Gandhi Shah	Mahajan book distributors Ahemedabad-380009
10.	Dyeing & Chemical Technology of textile fibres E8 1984	Trotman ER	Charles Grif in & Co Highway Combe, UK
11.	Treatment of textile effluents	Manivasagam N.	Sakthi publications Coimbatore-1

IV SEMESTER

TT4.2 - YARN MANUFACTURE II

Total Number of hours / week : 06

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- 1) To know about the combing cycles, setting between top comb to Nipper and Nipper to Unicomb.
- 2) To understand the salient features of modern comber.

Unit-2

- 1) To understand the passage of material through speed frame.
- 2) To acquire knowledge in the mechanism of building and differential motion.

Unit-3

- 1) To have knowledge about the importance of Rings and Travellers.
- 2) To understand the Different types of Top Arm loading systems.
- 3) To acquire knowledge of the Building Motion.

Unit-4

- 1) To have knowledge about the compact spinning system.
- 2) To know the salient features of modern Ring frame.

Unit-5

- 1) To learn the methods of Dry and Wet doubling machine.
- 2) To study the Plain Reel and Cross Reel with 7 Lea Motion.
- 3) To get knowledge in Bundling and Baling process.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Yarn Manufacture - II	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Combing	17
II	Speed frame	17
III	Ring frame	17
IV	Modern Ring Frame	17
V	Doubling, Reeling, Bundling and Baling	16
Revision Test and Tutorials		12
Total		96

DETAILED SYLLABUS

I. Combing –

Brief Study

- a. Combing process - Objects of combing, Objects of comber preparatory machines.
- b. Different sequence of process in the preparation to the combers, Number of passages required based on hook theory, Degree of combing, Determination of waste percentage, and Characteristics of combed yarn.
- c. Passage of material through a modern comber, Salient features of modern combers - manufacturers, models and specifications of combers.

Detailed Study

- a. Working of Comber preparatory machines, Sliver Lap Machine -Ribbon Lap machine and Super Lap former.
- b. Working of modern Comber, Combing cycle, Comber settings - Nipper to Detaching rollers, Nipper to Cylinder and Top Comb.
- d. Production calculation in comber.

II. Speed Frame

Brief Study

- a. Principles and objects of Speed Frame, Passage of material through a Speed Frame, Functions of different parts of the Speed Frame.
- b. Calculations related to production and efficiency, Salient features of modern Speed Frames, models and specifications of modern speed frames.

Detailed Study

- a. Drafting and twisting and their relationship to the material being processed, Roller settings and its importance, Study of SKF, WST and Pneumatic Drafting systems used on Speed Frames.
- b. Principles of winding - Flyer lead and bobbin lead, Function of the cone drums. Study of differential motion and Builder mechanism.
- c. Defects in Speed Frame process, Causes and remedies.

3. Ring Frame

Brief Study

- a. Objects & Passage of material through the Ring Spinning frame, Functions of different parts of the Ring Spinning frame.
- b. Different types of rings and travelers, Running-in procedure for new rings, Roller stand inclination and its effect on spinning tension, Importance of traverse motion for roving feed, Selection of top rollers, aprons, cots, spacers and their influence on yarn quality.
- c. Study of cop build, Ring rail movement and spindle driving systems. Change places in ring frame, Calculations related to production and efficiency.

Detailed study

- a. Study of Umbrella creel and its advantages, roller stands, travelers, rings and spindles for their design and efficient working, Study of conventional low crown Anti wedge rings, SU Rings.
- b. Study of top arm drafting systems - SKF, WST, and Reiter High Drafting systems, Advantages of High Drafting systems.
- c. Study of High speed Spindles and Spindle Inserts. Study of working of Building Motion.

4. Modern Ring Frame

Brief Study

- a. Salient features of modern ring frame, large package spinning, its advantages and disadvantages.
- b. Brief study of twist factor, twist, strength and count relationship for coarse, medium and fine counts.
- c. Study of Pneumatic loading system, Top and bottom roller setting, special attachments such as automatic doffing, pneumafil and Balloon control rings.

Detailed Study

- a. Methods of Driving - Objects of Dual / Variable speed drives used in Ring Frames.
Calculations pertaining to production and efficiency.
- b. Common defects in Ring spun yarn, causes and remedies.
- c. Causes of end breakages in ring frame, study of Computer monitoring systems in modern spinning Departments.
- d. Compact spinning

5. Doubling, Reeling, Bundling & Baling.

Brief Study

- a. Objects and methods of doubling, Passage of material through dry & wet doubling, Introduction to fancy doublers.
- b. Concept of balance of twist in doubled yarn. Direction of twist in doubled yarn and its relation to single yarn. Calculation of resultant counts, Specification and selection of rings and travelers for dry and wet doubling.
- c. Reeling, its objects, types- straight and cross reeling, their advantages and disadvantages, Objects of bundling and baling. Need for Bundling weight correction and its importance.

Detailed Study

- a. Different methods of threading in dry and wet doubling. English, Scotch and American systems.
- b. Study of working of reeling machine, cross and 7 lea motions, Study of Doffing mechanism.

TEXT BOOK :- Technology of yarn manufacture – II By R.Narasimhan

SSMITT CO-OP stores

REFERENCE BOOKS:

S.NO	Author	Title	publister
1	Hanter.W.A	Manual of cotton spinning volume IV & V	Textile Institute Manchester
2	Taggart.W.S	Cotton spinning	S.S.Shroff
3	Srinivasamoorthy.H.V	Cotton waste industry	Victoria Jubilee Technical Institute,Matunga, Bombay 400019
4	Jaganathan.R	Cotton spinners Hand book	Mahajan Brotheres Ahmedabad 380009
5	MerrillG.R	Cotton ring spinning	Gilbert R-Menill 364 Varnam Ave-Lowell Man
6	Klein.W	A practical guide to Ring spinning	The Textile Institute 10 Black frians street Manchester M3 5 DR UK
7	Venkatasubramanian.S	Spun Yarn Technology Vol. III	Ssmitt student co oprative Stores, Komarapalayam

IV SEMESTER
TT.4.3. FABRIC MANUFACTURE - II

Objectives

Unit-1

- To know about Dobby mechanism
- To know about Jacquard mechanisms.

Unit-2

- To study about Multiple box motion
- To know about Terry motion.

Unit-3

- To study about Automatic looms.
- To have knowledge about calculation and balancing of machineries

Unit-4

- To understand the working of Projectile shuttle less looms
- To acquire knowledge about Rapier looms

Unit-5

- To understand the working of Air jet and Water jet
- To know about Multiphase looms.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Fabric Manufacture II	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Dobby & Jacquard mechanisms	17
II	Multiple box and Terry motions	17
III	Automatic weaving	17
IV	Projectile and Rapier weaving	17
V	Jet and Multiphase weaving	16
Revision, Test		12
Total		96

DETAILED SYLLABUS

I. Dobby & Jacquard mechanisms

Dobby mechanism:- object - classification - climax dobbie - working - methods of pegging lags - jack missing - cam dobbie - working - advantages of cam dobbie over lever Dobbies. Cross border dobbie – working - brief study of electronic dobbie.

Jacquard mechanisms: - object - classification - double lift double cylinder jacquard - working – advantages. cross border jacquard – working. Jacquard harness mounting - Norwich system and London system - tie-ups - types - casting out. Piano card cutting machine – Brief study of electronic card punching machine - brief study of electronic jacquard.

II. Multiple box & Terry motions

Multiple box motion: - object - classification - 2 x 1 drop box motion - working - 4 x 1 drop box motion - working - card saving device - preparation of pattern chain for 4 x 1 drop box motion with and without card saving device. Brief study of Pick-at-will motion - defects and remedies of drop box motion.

Terry motion: - object - principles of terry motion - loose reed terry motion (any one) - working - adjustment of pile length - fringing motion.

III. Automatic Weaving

Advantages of automatic looms over non-automatic looms - Warp stop motion - mechanical and electrical - working - self threading shuttle - Weft feeler - midget weft feeler - photo electric weft feeler - working - advantages and disadvantages - Cop changing mechanism - working - Roper positive warp let-off motion - working - General loom requirement for synthetic and blended yarn weaving - Common Fabric Defects - causes & remedies. Calculation pertaining to speed, production and efficiency of loom.

Balancing of machineries from winding to loom shed for 200 looms capacity. Determination of Ex-Mill price of a metre of fabric.

IV. Projectiles And Rapier Weaving

Classification of shuttleless weaving machines -Advantages and disadvantages of shuttleless weaving machines - preparation of warp and weft for shuttleless weaving – Yarn quality requirement.

PROJECTILE: -

Working elements and stages of weft insertion - torsion bar picking mechanism, cam beat up - weft selection device – tuck in selvedge – projectile types and dimension – projectile guide and brake – salient features.

RAPIER: -

Rigid / Flexible and single / double rapiers – principles of tip and loop transfer - weft insertion cycle – rapier drives – salient features – leno selvedge. Maintenance schedule, defects and remedies, and work practice.

V. Jet and Multiphase weaving

Air jet: - Principle of weft insertion – yarn insertion systems – performance of yarn in Airjet Insertions – weft insertion cycle – salient features – Air requirement

Water Jet: -Principle of weft insertion – Machine elements and their functions - weft insertion cycle – salient features – fused selvedge.

Multiphase loom: - M8300 multiphase loom – principle – shed formation – weft insertion – beat-up and selvedge motion – machine drive and control – salient feature.

TEXT BOOK :- Technology of fabric manufacture –II by R.Muthusamy and P.Angappan
SSMITT CO-OP Stores

Reference books:

S.No	Author	Title	Pubsisher
1	Sabit Adhenur	Hand Book of Weaving	
2	Thomas W. Fox	The Mechanism of Weaving	Universal Publishing corp., Mumbai -2
3	Marks & Robinson (ATC)	Principles of Weaving	The Textile Institute, Manchester.
4	N.N.Banerjee	Weaving Mechanism Vol - I	Smt Tandra banerjee & Smt Apurba banerjee , West Bengal
5	NCUTE	Woven Fabric Production II	NCUTE New Delhi
6	R.Sengupta	Weaving Calculations	D.B.Taraporevala sons & co Ltd., Mumbai
7	A.Ormerod	Modern Preparation and Weaving	Wood Head Publishing Ltd, London
8	Prof. J.C.Chakravarthy	Mechanism of Weaving Vol - I&II	Prof. J.C.Chakravarthy West Bengal
9	B.Hasmukrai	Fabric Forming	SSMITT&PC Co-Operative Stores

IV SEMESTER
TT.4.4 TEXTILE WET PROCESSING - PRACTICALS

SCHEME OF INSTRUCTION & EXAMINATION:

Subject	Instruction		Examination				
	Hours/ Week	Hours/ Semester	Assessment Marks			Board Exam.	Total
			Internal Marks				
6041 Textile Wet Processing	6	96	Perfor mance	Reco rd	Att	75	100
			10	10	5		
			25				

OBJECTIVES:

01. To get knowledge on the method of analysing the blended yarn / fabric.
02. To get the practical experience in preparing the liquor for the complete wet processing treatments.
03. To get the practical experience in preparing the print paste and printing the fabric.
03. To know the different finishing treatments given to the dyed fabric, depending on their end use.
05. To know the different testing methods, to assess fastness of dyes to washing & rubbing.

LIST OF EXPERIMENTS

1. Determination of composition of fibres and their blend ratio in the given sample of yarn / fabric.
2. Desizing of fabric using enzyme.
3. Scouring of yarn / fabric.
4. Bleaching of yarn / fabric using Hypochlorite solution.
5. Bleaching of yarn / fabric using Hydrogen Peroxide.
6. Dyeing of cotton material with azoic dyes.
7. Dyeing of cotton material with vat dyes.

8. Dyeing of cotton material with sulphur dyes.
9. Dyeing of cotton material with cold brand reactive dyes.
10. Dyeing of cotton material with hot brand reactive dyes.
11. Dyeing of polyester material with disperse dye.
12. Dyeing of wool with acid dye.
13. Dyeing of silk with basic dyes.
14. Printing of cotton fabric with reactive dye in direct style.
15. Printing of cotton fabric with pigments in direct style.
16. Printing of polyester fabric with disperse dye in direct style.
17. Finishing of cotton fabric with stiffener.
18. Finishing of cotton fabric with softener.
19. Finishing of cotton fabric with resin.
20. Testing of colour fastness of dyed textile materials to washing.
21. Testing of colour fastness of dyed textile materials to rubbing.
22. Testing of fabric shrinkage.

No. of students : 30

No. of students / Batch : 03

Total No. of batches : 10

LIST OF EQUIPMENTS REQUIRED:

- | | | |
|-----|--|-----------|
| 01. | Dye bath for dyeing, desizing, scouring, bleaching | - 10 Nos. |
| 02. | Crockmeter for rubbing fastness testing | - 05 Nos. |
| 03. | Lauderometer for washing fastness testing | - 05 Nos. |
| 04. | Printing table | - 02 Nos. |
| 05. | Printing Screens | - 10 Nos. |
| 06. | Padding Mangle | - 02 Nos. |

IV SEMESTER

TT 4.5 - YARN MANUFACTURE II - PRACTICALS

Total Number of hours / week : 06

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

- To study the various settings of Unicombe to Nippers and Top comb settings etc in details.
- To describe the calculation of Noils extraction percentage in comber.
- To explain working of building mechanism in flyer frame and various speeds.
- To calculate various speeds and function of building mechanism in Ring frame.
- To know 7 lae mechanism, SHPR / SHCR or DHPR / DHCR

Scheme of Instruction and Examination

Subject	Instruction		Examination				
Yarn Manufacture – II Practical	Hours / week	Hours / semester	Assessment mark				
	6	96	Internal – 25			Board exam	Total
			Perfor manc e	Rec ord	Att	75	100
			10	10	5		

LIST OF EXPERIMENTS:

[Note : Suitable values for the variables A, B, C, etc are to be given and normal values of required parameters assumed wherever necessary.]

1. Estimate the Production of the given comber per shift of A hours with delivery hank B and efficiency C% for the present wheels.
2. Set the given comber for processing a mixing of the given cotton count with a noil extraction of A%.
3. Estimate the drafts and draft constant in the given Speed frame and calculate the production per shift of 8 hours with delivery hank A and efficiency B% for the present wheels.
4. Estimate twist per inch and twist constant in the given speed frame for the present wheels and calculate the production per spindle per shift of A hrs at B% efficiency, when the value of T.M. is C and the hank fed is D
5. Estimate the time taken to produce A Kilos of roving per spindle in the speed frame when the delivery hank is B for the present wheels.

6. Set the Draft and Drafting zone of the given speed frame for processing a mixing of the given cotton count.
7. Set the Builder motion unit of the given speed frame for processing a mixing of the given roving hank.
8. Estimate the coils per inch and the lay constant of the speed frame for the present wheels
9. Estimate draft, intermediate draft and draft constant of the given ring frame for the present wheels.
10. Calculate suitable draft change wheel of the given ring frame to spin count of yarn A from hank of roving B for the present wheels.
11. Estimate the twist constant and TPI in the given Ring spinning frame for the present wheels
12. Calculate the production of the given Ring frame with A spindles spinning yarn count of B with a twist multiplier of C and efficiency D%.
13. Estimate time taken to produce A Kilos of B^s yarn for C spindles of the given ring frame at D% efficiency.
14. Estimate the production in grams/spindle for A hours at B% efficiency in the ring Frame for count of the yarn C
15. Do Spindle and lappet gauging for four spindles on either side of the Ring / Doubling frame
16. Calculate the traveller speed in m/second and traveler lag at the full and bare bobbin conditions and hence estimate the variation in twist in ring frame.
17. Estimate the front roller delivery in meters/minute and the production in Kilos/day of 8 hrs for the spinning machine for the present wheels for yarn count A with B% efficiency.
18. Estimate the twist constant and TPI in the given Doubling frame for the present wheels.
19. Calculate the traveler speed in m/second and traveler lag at the full and bare bobbin conditions and hence estimate the variation in twist in doubling frame
20. Change the direction of twist in spinning frame/doubling frame.
21. Estimate the front roller delivery in meters/minute and the production in Kilos/day of 8 hrs for the doubling machine for the present wheels for yarn count A with B% efficiency.
22. Run the given reeling machine and Produce A Kilos of B^s count yarn

List of equipment: - Comber, speed frame, Ring frame, and Reeling Machine.

Material :- Ribbon Lap, Drawing Finisher Sliver, Simplex bobbin, and Ring Cops.

IV SEMESTER

4.6 FABRIC MANUFACTURE – II Practical

OBJECTIVES:

- To have practical knowledge about dobby and jacquard mechanisms.
- To know about to set the drop box and terry mechanisms.
- To understand practical knowledge about the mechanisms in an auto loom.
- To have knowledge about to calculate the production of shuttle less looms.

Scheme of Instruction and Examination

Subject	Instruction		Examination				
Fabric Manufacture – II Practical	Hours / week	Hours / semester	Assessment mark				
	6	96	Internal – 25			Board exam	Total
			Perfor manc e	Rec ord	Att	75	100
			10	10	5		

LIST OF EXPERIMENTS:

1. Dismantle and assemble the various parts of the Dobby mechanism and set it for correct working with timing and setting.
2. Prepare the Pegging of a lattice for LH dobby for the given weaves:
8 ends Honey Comb / Mock Leno Weave
3. Prepare the Pegging of a lattice for RH dobby for the given weaves:
Huck-a-back / Herring Bone Twill Weave
4. Dismantle and assemble the parts of the Eccle's drop box mechanism for correct working with timing and setting.
5. Prepare a chain of metallic cards for weaving a given pattern with card saving device in a drop box loom.
6. Prepare a chain of metallic cards for weaving a given pattern without card saving device in a drop box loom.
7. Punching and lacing of cards for a given design to be woven in a jacquard loom.
8. Prepare the timing circle for various actions of a jacquard.

9. Dismantle and assemble the parts of terry mechanism for correct working with timing and setting .
10. Dismantle and assemble the parts of mechanical weft feeler in cop changing mechanism of a automatic loom with timing and setting..
11. Dismantle and re-fix the various parts of the cop changing mechanism for correct working with timing and setting
12. Dismantle and assemble the parts of warp stop motion for correct working.
13. Dismantle and assemble the parts of positive let-off motion and setting it for correct working.
14. Sketching the gearing plan of the main drive of the Projectile weaving machine and calculate the production per hour.
15. Find out the projectile dimensions for different types and calculate the number of projectiles for different width of the machine.
16. Sketching the gearing plan of the main drive in a Rapier loom and calculate production per hour.
17. Set the accumulator for different types of materials used as weft in a shuttleless weaving machine loom.
18. Sketching the gearing plan of the main drive in an Air jet loom and calculate the production per hour.
19. Draw the air stream diagram for the relay nozzles in an Air jet loom.

List of Equipments:

Dobby loom, Jacquard loom, Terry loom, Draw box loom, Automatic loom, Projectile loom, Air jet loom, Rapier loom and card Punching machine.

Manual:

Lab manual

V SEMESTER

TT 5.1 - TEXTILE TESTING

Total Number of hours / week : 06

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- To know the relationship of moisture with textiles and related terms & definitions..
- To understand the principle and the methods of determining the moisture in the atmosphere and the textile materials.

Unit-2

- To know the properties and their importance of fibre which is the raw material for all the textiles goods.
- To understand the principles and the methods of testing the fibres to determine their basic characteristics.

Unit-3

- To know the properties and their importance the yarn.
- To understand the principles and the method of testing the yarn to determine the properties.

Unit-4

- 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.

Unit-5

- To study the statistical methods involved in controlling the quality of the textile products during their manufacture.
- To learn about the application of the statistical methods to suit textile processes.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Textile Testing And Quality Assurance	6	96	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	MOISTURE RELATIONS IN TEXTILES	17
II	FIBRE TESTING	17
III	YARN TESTING	17
IV	FABRIC TESTING	17
V	STATISTICAL QUALITY CONTROL	16
	Revision, Test	12
	Total	96

DETAILED SYLLABUS

01. MOISTURE RELATIONS IN TEXTILES:

Humidity Relations and its importance in Textiles - Definitions of Absolute Humidity, Standard Testing atmosphere and Relative Humidity - Measurement of Humidity by Wet and dry bulb Hygrometer - Moisture content, Moisture regain and standard regain - Values of standard regain for common textile fibres - Effect of moisture regain on Fibre properties - Estimation of moisture content and regain by conditioning oven.

02. FIBRE TESTING:

Length - Importance of fibre length - Methods of measuring fibre length by Baer Sorter, Digital Fibro graph, Fibre fineness - Importance of fibre fineness - Methods of measuring fibre fineness by ATIRA & Micronaire.

Fibre maturity – Importance, Measurement of fibre maturity - Sodium Hydroxide swelling method - Fibre strength - Importance of fibre strength and method of measuring fibre strength by stelometer.

Analysis of Trash content by Shirley Trash Analyses - Fibre Quality Index - High volume instrument

03. YARN TESTING:

Yarn count determination by Knowles's balance and yarn quadrant - Importance of Twist - Estimation of single yarn twist by Twist contraction method and doubled yarn by Take-up Twist Tester - Importance of yarn strength - Principle of working of yarn strength testers - Working of single yarn strength tester - Pendulum lever, lea strength and Instron. Yarn evenness - Random and periodic variation - Short term, medium term and long term variation - Index of yarn irregularity - Methods of Assessing yarn evenness by yarn appearance board - Principle and study of Uster Evenness Tester and Uster classmate.

04. FABRIC TESTING:

Study on Beesley Balance, Shirley thickness tester and Shirley crimp tester - Warp & weft cover factor - Fabric cover - Study of Shirley stiffness tester and Shirley crease recovery tester - Fabric handle, serviceability, abrasion and drape - Study of drape meter - Martindale Abrasion Tester - Fabric Pilling Tester - Importance of Tensile Strength - Study of fabric tensile strength, tearing and bursting strength - Definition of Fabric Air Permeability and Fabric Air Resistance - Shirley Air Permeability Tester.

05. STATISTICAL QUALITY CONTROL:

Classification and Tabulation of Data - Construction of Frequency Diagrams - Measures of Central tendency - Mean - Median - Mode - Measures of deviation - Mean Deviation - Standard Deviation - Normal distribution curve and its importance in Textiles Testing - Calculation of Tests of significance, 't' test for Mean - Quality Control Chart - Construction of control chart for Averages and Ranges - Interpretation of control charts - Application of X - bar chart to suit Textile Processes.

TEXT BOOK: TEXTILE TESTING BY P.ANGAPPAN & R.GOPALA KRISHNAN

SSM.ITT.CO-OP STORES

REFERENCE BOOKS

S.NO	Autor	Title	Publibter
1	J.E. BOOTH	Principles of Textile Testing	Butterworth Scientific, London
2	E.B. Groover and D.S. Hamby	Hand Book of Textile Testing and Quality Control 1 st U.S. Edition 1960. Wiley Eastern Reprint 1988	Mohinder Singh Sejwal (for Wiley Eastern Ltd) New Delhi, India.
3	V. Sundaram and R.L.N. Iyengar	Hand Book of Methods of Test for Cotton Fibers Yarns and Fabrics 1968	CTRL, Mumbai
4	E. Lord	The Characteristics of Raw Cotton Vol II Part –I in the series Manual of Cotton Spinning, 1961	The Textile Institute and Butterworths, England
5		ISI Hand book of Textile Testing SP, 15 –1981. First Edition, 1982	Indian Standard Institution, New Delhi, India
6		Methods of Test for Textiles – B.S. Hand book No. 11, 1963	British Standards Intitution, London, England
7		Method of Test for Textiles BS Hand book No. 11, 1963	British Standards Intitution, London, England
8	Gupta & Kapoor	Statistical Methods	S. Chand & Co., New Delhi
9	A. Brearley & D.R. Cox,	An Outline of statistical methods for use in the Textile Industry, 8 th Editions, 1974,	WIRA, LEEDS, U.K.
10	M.R. Spiegel	Theory and Problems of Statistics – SCHAUM' S Outline series Editions 1972	McGraw Hill International Book Combany Newyork, London, etc.,
11	P.Angappan & R.Gopalakrishnan	Textile testing 4 th revised edition 1997	SSMITT Students Co Operative Stores, Komarapalayam.

V SEMESTER
TT-5.2 GARMENT TECHNOLOGY

Total Number of hours / week : 06

Total Number of week / semester : 16

Total Number of hours / semester : 96

Objectives

Unit-1

- To know about the Indian garment industry
- To have knowledge about the tools required for garment manufacturing
- To understand the basics of home textile

Unit-2

- To know about the human anatomy
- To understand the importance of patterns
- To have knowledge about the drafting of pattern

Unit-3

- To know the pattern layouts for various design
- To have knowledge about cutting machine
- To have knowledge about stitches and seams

Unit-4

- To understand the uses of various stitching machine
- To know to construction of garments
- To know the pressing and finishing

Unit-5

- To have knowledge about packing and care of garment
- To understand the quality and control of it

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Garment Technology	6	96	Internal	<u>Board</u>	Total
				<u>exam</u>	
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	INTRODUCTION TO GARMENT MANUFACTURE	17
II	PATTERN MAKING AND GRADING	17
III	PATTERN LAYOUT AND CUTTING	17
IV	GARMENT MAKING	17
V	QUALITY CONTROL IN GARMENT INDUSTRY	16
	Revision, Test	12
	Total	96

DETAILED SYLLABUS

01. INTRODUCTION TO GARMENT MANUFACTURE

An overview about Indian Garment Industry - Fashion Trends - Labor and capital requirements in the garment industry - Different types of woven fabrics used for garments - Plain, striped, checked, printed one way design and two way design, napped, pile etc - Styles of garments - Terms and definitions as per AEPC - Garment factory organization structure - Steps in garment making - Introduction to Home Textiles - Categories.

02. PATTERN MAKING AND GRADING:

Introduction - Human anatomy - Eight head theory and its importance - Measurements and its importance - Methods of taking important body measurements for children, ladies and gents. Importance of paper patterns - Types of paper patterns - Principles for pattern drafting - Pattern grading - Drafting of children's garments - Frock - Drafting of ladies garment - Salwar and khameez - Drafting of gents garment - Long sleeve shirt - Finding of armhole and body rise measurements - Human figure analysis - proportion - disproportion and deformity of human figuration - Glossary of apparel terms - Body rise, Arm hole depth, notches, darts, pleats gatherings, tuck etc.

03. PATTERN LAYOUT AND CUTTING

Marker planning - Marker plan efficiency - Types of layout - Rules in pattern layout - Common methods for layout - Layout for asymmetric designs bold, striped, checked and one way designs - Economy of fabrics in placing patterns - Rules for placement of pattern if the fabric is not sufficient - Importance of Marshden lay - Lay length in garment industries - Importance of fabric cutting - Methods of cutting - Brief study of straight knife, round knife, band knife cutting machines, notches, drills and thread markers, computer controlled cutting knives, die cutting and laser cutting.

04. GARMENT MAKING:

Tools required for garment construction - Parts of sewing machine and its importance - Feed systems in sewing, selection of threads and needles - Types of stitches and seams, proportion of seams - Seaming defects of Redefine - Brief study of basic sewing machines - Single needle lock stitch machine, overlock machine, chain stitch machine and Interlock machine - Simple automatic machines to button hole machine - Button sewing machine, bar tack machine and label sewing machine - Pressing - Purpose, categories of pressing - Means of pressing - Importance of Fusing - Packing procedures - Ratio pack, Assortment pack, color wise pack sizewise pack - Types of

collars, pockets plackets construction, details of Men's shirt and ladies, Salwar Kameez - Study of accessories like buttons zippers, interlink ages linings hooks elastics fasteners.

5. QUALITY CONTROL IN GARMENT INDUSTRY

Introduction to Quality Control - Raw material inspection, Fabric defects - A.Q.L. - Cutting room inspections - Checking of garments - Garment measuring procedures - Inspection of garments - Statistical Quality Control garment - Defect zone rating - Sewing defects - Different types of garments defects - Critical, major, minor defects on garment, ISO concepts on garment industry - Total Quality Management.

Text books : Knitting and Apparel manufacture by K.Sukumar

SSM.ITT.CO-OP STORES

REFERENCE BOOK

S.NO	Title	Author	Publishers
1	An introduction to quality control in apparel industry	Pradeep .v.mehta	New age
2	Metric pattern cutting for men women children		Wmifred Alduck Blackwell
3	Technology of clothing manufacture	Carr	
4	Apparel manufacturing analysis	Jacol.m.solinga	
5	Apparel manufacturing analysis	Clock kneeey	
6	Evaluation of quality	Anitha	starrpa Blackwell
7	Clothing for morderns	Ereqne	Macmillon New york
8	Practical clothing construction part I & II	Mary Mathew	
9	The art of sewing	AnnaJacol Thomas	
10	Comparative clothing construction Tecnique	Virgin stolpe lewis	
11	Zarapkar system of cutting	K.R.Zarapkar	

V SEMESTER
ELECTIVE-1

TT5.3.1: ADVANCED TEXTILE MANUFACTURING

Total Number of hours / week	: 05
Total Number of week / semester	: 16
Total Number of hours / semester	: 80

Objectives

- To know about the various process involved in Texturisation process.
- To Properties and advantages of Textured yarn.
- To know about Rotor spinning machine, Dref spinning in details.
- To know about various other systems of modern spinning and yarn properties.
- To know about different types of non-wovens different web formation – different bonding etc.
- To know the applications of non woven in textile field.
- To know about weft, Warp knitting – working and uses.
- To know about Geo textiles, medical textiles, Tyre cords etc.
- To know about Reinforcement and its construction, different Belts and also in application of Technical textiles on Automobiles.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
Advanced Textile Manufacture	5	80	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Texturisation	14
II	Modern trends in yarn formation	14
III	Non woven	14
IV	Knitting Technology	13
V	Technical textiles	13
Revision, Test		12
Total		80

DETAILED SYLLABUS

1. Texturisation

Introduction – Objects – Type of Textured yarn - Texturing methods – false – twist Texturing – draw texturing – Sequential raw texturing – Simultaneous draw texturing – Post texturing process.

Stuffer box texturing - Knit-de-knit and Gear crimping methods – Air Jet texturing - Advantages of textured yarn.

2. Modern Trends in yarn formation:

Rotor spinning: Introduction – classification – O.E. Spinning – Basic principle constructional details and working of the Rotor Spinning Machine – Detailed study of All the parts of Rotor Spinning – Automation and Economics of rotor spinning system – structure of rotor yarn – yarn faults and Remedial measures – end uses.

Friction Spinning – Operating principle, technological details – yarn formation in Dref –2 and Dref – 3 process – Advantages and disadvantages. False twist spinning – working principle – end uses. Study of Murata – Jet Spinner - – working principle.

Brief study of other spinning system like twist spinning, self twist spinning, wrap spinning. Comparison of yarn quality of Rotor, Dref and Air jet yarns.

3. Non - Woven:

Introduction – Definitions – classifications of different types of non-woven – principle of web laid, web formation - principle of dry laid, parallel laid and cross-laid web formation. Random (or) pneumatic laid web formation – Random feeder – Rando – Webber only. Non-woven fabric forming techniques – adhesive bonding – saturation and spray techniques, thermal bonding and needle punching – Application of non-woven.

4. Knitting Technology:

Weft knitting – Introduction, classification – knitting terms and definition- course- wales –Stitch density – stitch length; knitted loop –needle loop – sinker loop – Face loop – back loop. Properties of knitted fabrics- plain single jersey fabrics - rib fabrics - Inter lock fabrics – Knit, tuck and miss stitch types. Knitting machines – Knitting elements - Needles- latch, beard, compound needles. Knitting action of latch needle. Passage of material through single jersey weft knitting machine. Loop formation of 1X1 riley machine.

Warp knitting:- Introduction, classification – definition of over lap & under lap. knitting action of bearded needle Tricot machine. Knitting action of latch needle. Raschel Machine. Properties of warp knitted fabrics.

5. Technical textile:

Geo textile- definition-types of geo textiles-geo textiles in temporary and permanent road construction. Fibers and fabric used as geo textiles

Filtration-Introduction-textiles used as filtration and their features

Agriculture textiles-Brief study of textiles for seed bag protection, crop covers, insect and bird netting and shade fabrics - fibres used and fabric particulars for these applications.

Hygiene and Medical Textiles-Processes involved in the manufacture of surgical - cotton and surgical cloth - materials used - Desirable properties of surgical cotton and cloth.

Tyres cords - requirements - materials used - flow chart for tyre cord manufacturing -

Hoses - definition - importance of reinforcement and its constructions - Basic types of reinforcements fibre requirements for industrial hoses and different types of industrial hoses.

Belts - materials used - characteristics of conveyor belts - Brief idea of manufacturing process of conveyor belts - Transmission belts - flat belt. Materials used and construction of V-belt.

Brief study of technical Textile on automobiles.

Text books: Advanced Textile Manufacture by R.Muthusamy & P.Angappan
SSM. ITT.CO-OP STORES

REFERENCE BOOKS:

S.NO	Title	Author	Publisher
1	Man-made Fibres	P.W.Moncrieff, Newens	Buttesworth London
2	Textile Fibres Vol-I	V.A.Shenoi	Sevak publication
3	Open-end Spinning	W.A.Hunter	
4	Modern Preparation and Weaving Machinery	A.Ormerod	Butterworth,London
5	Process control in Spinning	Garde and Subramaniam	ATIRA
6	Open-end Spinning	Nield	Rohiental (V)wrontz
7	Norms for Spinning	D.Mohan raj	SITRA
8	Norms for Weaving and Textile Wet Processing		ATIRA
9	Knitting Technology	David.J.Spencer	Academic publication
10	An Introduction to weft knitting	J.A.Smirfitt	Merrow publication England
11	An Introduction to warp knitting	Thomson	Merrow publication England

V SEMESTER
ELECTIVE-2

TT 5.3.2 STATISTICAL QUALITY CONTROL IN TEXTILE INDUSTRY

Total Number of hours / week : 05

Total Number of week / semester : 16

Total Number of hours / semester : 80

Objectives: -

Unit-1

- To have knowledge about dispersions.
- To acquire knowledge about correlation analysis
- To understand about significance test.

Unit-2

- To know about probability
- To gain knowledge about sampling.

Unit-3

- To understand the analysis of Variance.
- To know about classification of data.
- To understand about the Randomization.

Unit-4

- To acquire knowledge about the concept of quality control and measuring of control.
- To construct Various control chart

Unit-5

- To understand the management techniques of quality control.
- To about total quality control.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours / week	Hours / semester	Assessment mark		
6053 Statistical Quality Control in Textiles	5	80	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Statistical Methods	14
II	Probability Theory and Acceptance sampling	14
III	Analysis of variance and Industrial Experimentation	14
IV	Control Charts	13
V	Management and Organization of quality control	13
Revision Test and Tutorials		12
Total		80

DETAILED SYLLABUS

1. Statistical Methods :

Measures of Central tendency and dispersion
Skewness, Moments and Kurtosis-Correlation analysis
Frequency distributions- Normal distribution, Poisson distribution
Binomial distribution
Population and sample-Concept of standard error
Tests of significance- “t” test and “F” test and their application in textile industry.

2. Probability And Acceptance Sampling:

Probability - definition-Classical determination of probability
Priority probability and posteriority probability-Laws of probability
Random variable exceptions
Sampling versus hundred percent inspection
Interest of producers and customers
AQL – LTPD and OC curves
Single, double and multiple or sequential sampling plans.
Quality Assurance – incoming and outgoing.

3. Analysis of Variance And Acceptance Sampling

Chi – square tests and its application to textile industry.
Introduction to analysis of variance.
Application of analysis of variance technique to Textile industry.
One – way classification-Two – way classification
Principles of experimentation-Randomization
Replication and local control
Basic idea of Randomized Block and Latin square designs.
Design of experiments
Number of tests
Sampling and general principles underlying design of experiments.

4. Control Charts

Frequency distribution-Control charts for variables
Concepts of quality control and meaning of control
Basic principles of rational set grouping
Different types of control charts of averages, ranges and standard deviations.
Examples of control charts for textile applications.
Interpretation of control charts-Process capability and specification
Control charts for fraction defective, Number defectives and Number of defects per unit.

5. Management and Organization of Quality Control

Management techniques for quality control

Snap survey technique and its application to textile industry

Economic centering of the process

Statistical concepts of its and tolerances

Machine interference with special reference to textile industry

Simple technique of linear programming with special Economics of quality control

Objectives and specifications of Quality standards in textile mills. Routine quality standards in textile mills and garment factories.

Application and maintenance of SQC systems adopted in mills.

Total Quality Control.

Planning and organization of total quality control in mills.

Standard reporting to management.

Cost reduction and quality control

REFERENCE BOOKS

S.No	Title	Author	Publishers
1	Principles of Textile testing	J. E. Booth	CBS publishers 4596, 1-A, (1996) 11 Darya Gang, New Delhi 110002
2	Hand Book of Textile Test and Quality control	B.Grover and D.S.Hamby	Wiley Eastern Ltd Chennai, Bombay etc, 1988
3	Statistical Methods for Textile Technologists	T. Murphy, Tipper & K. M.Morris	The Textile Institute 10 Black friars street manchester 3 (1960)
4	Statistical Methods	S. P. Gupta	Sultan chand & sons, 4792/23, Daryaganj, New Delhi-110002 year -1983
5	Methods of Statistics		SITRA Publication, Coimbatore

V SEMESTER
TT5.4 TEXTILE TESTING – PRACTICAL

Total Hours per week : 06
No. of week / semester : 16
Total No. of hour / semester : 96

Objectives:

- 1) To understand the working of various textile testing instruments.
- 2) To have practical knowledge in the textile testing areas.

SCHEME OF INSTRUCTION & EXAMINATION:

Subject	Instruction		Examination				
	Hours/ Week	Hours/ Semester	Assessment Marks			Boar d Exa m.	Total
			Internal Marks				
Textile Testing Practical	6	96	Perfor mance 10	Reco rd 10	Att 5	75	100
			25				

LIST OF EXPERIMENTS

01. Determination of moisture content and moisture regain for textile fibres such as cotton by conditioning oven.
02. Determination of fibre length using Baer Sorter.
03. Determination of trash content by Trash Analyzer.
04. Determination of fibre fineness by ATIRA fibre fineness test.
05. Determination of hank of Roving.
06. Determination of count by Knowle's balance.
07. Determination of single yarn twist by tension type twist tester.
08. Determination of ply yarn twist by take up twist tester.
09. Determination of single yarn strength.
10. Determination of Lea strength and CSP.
11. Determination of yarn appearance grade as per ASTM visual examination method.
12. Determination of fabric tensile strength by tensile strength tester (Warp way & Weft way).
13. Determination of fabric tearing strength (Warp way & Weft way).
14. Determination of bending modulus by stiffness tester for given sample of fabric (Warp way & Weft way).
15. Determination of abrasion resistance of fabric.
16. Estimation of bursting strength of a given fabric.
17. Determination of crease recovery angle in warp way & weft way.

18. Determination of crimp in warp way & weft way for the given sample.
19. Estimation of drape of fabric by drape meter.
20. Estimation of air permeability of fabric.

List of equipment:- Conditioning oven, Baer sorter – 2, Trash analyzer, ATIRA fibre fineness, Wrap block, physical balance – 2, Knowle`s balance, Tension type Twist tester, Lea strength tester, Yarn appearance winder, Fabric tensile strength tester, Elmendorf tearing strength tester, Ballistic tester, Fabric thickness tester, Quadrant balance, Fabric thickness tester, Martindak abrasion tester, Fabric bursting strength tester, Crease recovery tester, crimp tester Drape meter and Air permeability tester.

Material required :- For a batch of 30 students.

- | | |
|------------------|----------------------|
| 1. Cotton fibre | - 2.0 Kgs |
| 2. Roving bobbin | - 5 bobbins |
| 3. Yarn | - 100 cops any count |
| 4. Fabric | - 30 metres |

V SEMESTER

TT 5.5 GARMENT TECHNOLOGY – PRACTICAL SCHEME OF INSTRUCTION & EXAMINATION:

Subject	Instruction		Examination				
	Hours/ Week	Hours/ Semester	Assessment Marks			Board Exam.	Total
			Internal Marks				
Garment Technology Practical	6	96	Perfor mance	Reco rd	Att	75	100
			10	10	5		
			25				

OBJECTIVES:-

1. To know pattern for various garments.
2. To acquire practical knowledge to grade the pattern.
3. To cut and assemble the patterns.

LIST OF EXPERIMENTS:

01. Working practices for different stitches and seams in the sewing machines.
02. Prepare the patterns of Full sleeve shirt for the given measurements.
03. Prepare the patterns of Ladies skirt for the given measurements.
04. Prepare the patterns of Children Frock for the given measurements.
05. Prepare the patterns of Kitchen apron for the given measurements.
06. Prepare the required patterns of Full sleeve shirt and grade it to their next lower sizes by the given measurement chart.
07. Prepare the required pattern for full sleeve shirt and grade it to their next higher sizes by the given measurement chart.
08. Using the given measurement chart, prepare the required pattern for Ladies skirt and grade it to their next lower or higher sizes.
09. Cut the given fabric as per the patterns of Full sleeve shirt.
10. Cut the given fabric as per the patterns of Ladies skirt.
11. Cut the given fabric as per the patterns of Children Frock.
12. Cut the given fabric as per the patterns of Kitchen Apron.
13. Assemble and sew the cut parts for making Full sleeve shirt.
14. Assemble and sew the cut parts for making Ladies skirt.
15. Assemble and sew the cut parts for making Children Frock.
16. Assemble and sew the cut parts for making Kitchen Apron.

Equipments:- Sewing machines- Lock stitch – 15m/cs. Over lock stitch – one m/c.

Flat lock stitch – one m/c.

Materials :- Fabric 1 1/2 – 2 meters / Expt. / students.

Manual :- Lab manual (practical observation manual)

TT 5.6.ENGLISH COMMUNICATION PRACTICAL

Detailed syllabus is kept in a separate file named “English Communication”

VI SEMESTER
TT 6.1 TEXTILE MANAGEMENT

Total No. of hours / week : 06
Total No. of weeks / semester : 16
Total No. of hours / semester : 96

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours/week	Hours/semester	Assessment Marks		
TEXTILE MANAGEMENT	6	96	Internal	Board Exam	Total
			25	75	100

Topics and allocation

UNIT	TOPIC	TIME (Hrs)
I	Concepts of Management - Planning and organizing in Textile units	17
II	Production & Financial functions in Textile Management	17
III	Managing Men in Textile units	17
IV	Supervisory and safety management in Textile Factory	16
V	International Marketing Management and Fundamentals of Entrepreneurship	17
	Revision, Test	12
	Total	96

OBJECTIVE:

The main objective of this subject is to impart knowledge and skills to succeed in shop floor management of Textile Industry, with specific reference to supervisory management in textiles.

Unit-1

1. To understand the basic concept of Management.
2. To impart. Various forms of organization, planning and control.
3. To have brief understanding on plant, location & types.

Unit-2

4. To facilitate the ideas on production & productivity.
5. To know production planning and control with emphasis on inventory.
6. To have fundamental knowledge on finance.

Unit-3

7. To know the basis of Personnel Management, highlighting "Right men for Right job" concept.
8. To know about the wage system in Textile Mills.
9. To understand industrial labour welfare and grievance handling.

Unit-4

10. To know about basic principles of "Factory Act".
11. To understand preventions and precautions of industrial accidents.
12. To have knowledge on Direction principles namely supervision, motivation, communication & leadership.

Unit-5

13. To understand the general exim policy and assistance available for Textile Export.
14. To have knowledge on Export Finance and pricing.
15. To acquaint with various documents related to export procedure
16. To understand the basic concepts of Entrepreneurial efforts.

DETAILED SYLLABUS

I. Concepts of Management - Planning and organising in Textile units.

Definition, Nature, importance of Management. Planning - Purpose, steps, types of plans. Organisational levels & span of Management. Effective organisation and various structures and types in Textile Mills. Textile Plant location and site selection - Types of industrial buildings, lighting, ventilation, Humidification. Control of Air Pollution in Textile Mills.

II. Production & Financial functions in Textile Management:

Factors of production - Productivity of Labour and Machine. Objectives of Work measurement - Definition of Work study, Method study & snap study-method of snap study.. Production lay outs types with advantages and disadvantages - Inventory control and material handling in Textile Mills. Inventory - holding & ordering cost-, economic order quantity, ABC & VED. Production planning & control - analysis of its functions - Market research and product development. Financial Management - Sources and types of finance - Importance of Costing, capital cost, working capital, and various elements of cost - Financial overheads and break-even analysis.

III. Managing Men in Textile units:

Objectives - Need & importance of Personnel Management - Manpower . Planning by job analysis and job evaluation methods. Recruitment - Various sources, merits and demerits - Selection techniques- Interviews, Tests and functional value. Employee Training - Advantages, types, methods and evaluation. components of methods of wage payments with its merits & demerits- Wages incentive compensation - Factors affecting wages and compensation - Indian wage policy in Textile Industry. Labour welfare - Principles and types - Occupational and social security in labour welfare. Labour grievances - Meaning, causes and of grievance handling - Effective grievance handling procedures.

IV. Supervisory and safety management in Textile Factory:

Brief understanding of Factory Act –to improve Shop floor working climate in textile mills. Causes for Industrial accidents - Preventions and precautions –types of fire and Fire prevention & control - Guards and safety devices in Textile Mill Direction & Supervision - Role of the supervisor - Characteristics of effective supervision. Nature, importance and theories of motivation; Maslow's theory, XYZ theory in motivation - Importance of communication, types and process of communication - Barriers in communication - Principles of effective Communications.

Role and characteristic of leadership – Difference between leader & Manager - Characteristic and forces determining effective leadership in Shop floor.

International Marketing Management and Fundamentals of Entrepreneurship.

Exim policy of India - Basis and benefits of International Marketing - Concepts of WTO, GATT and Globalisation. Export Market Entry - Institutional infrastructure for Textile Exports - Texprocil, AEPC, PEDEXIL HEPC and supporting organisation. Export finance & Export Pricing - Pre shipment & post shipment finances Documentary credit, letter of credit - Export price composition - Ex Factory, FAS, FOB, FOR, CI & F and Franco pricing in Export. Export procedure - Confirmed order, Export Production, Marine Insurance Export Documents - Shipping bill and bill of Lading. - export incentives. Entrepreneurship - Meaning, Characteristic and functions of entrepreneur. Entrepreneurial Development Programmes - Project and feasibility study reports.

TEXT BOOK: MANAGEMENT IN TEXTILES

**BY R.MUTHUSAMY & MAJOR S. SIVAPATHASEKARAN
SSM. ITT.CO-OP STORES**

TEXT BOOK: MANAGEMENT IN TEXTILES

BY R.MUTHUSAMY & MAJOR S. SIVAPATHASEKARAN
SSM. ITT.CO-OP STORES

REFERENCE BOOKS:

	TITLE	AUTHOR	PUBLISHERS
1	PRINCIPLES OF MANAGEMENT	P.C.TRIPATHI	TATA MCGROW PUBLISHING COMPNY LTD, NEW DELHI
2.	MANAGEMENT OF TEXTILES	DUDEGA.V.D	TRADE PRESS, TEXTILE INDISTRY ,AHEMADABAD.
3	INDUSTRIAL Eng. AND MANAGEMENT	BALASUNDARAM.K	SRI. RAMALINGASOWDESWARI PUBLICATIONS, COIMBATURE.
4	PERSONNEL MANAGEMENT OF HUMOUN RESOURES	MAMORIA.C.B	HIMALAYA PUBISHINGH HOUSE, MUMBAI.
5	ORGISATION THEORY&BEHAVIOUR	LUTHANS.F	PRINTECE HALL OF INDIA
6	MANAGEMENT OF TEXTILE	ORMEROD.A	BUTTER WORTH &COMPANY
7	INDUSTEIAL Eng. &MANAGEMENT SCIENCE	BAUGA.T.R;ETAL	KHANNA PUBLISHER NEW DELHI.
8	BUSINESS MANAGEMENT THEORY&MANAGEMENT	SINGA. J.C &MUGALI.V.N EDITION (5)	R.CHAND & CO NEW DELHI
9	INTRODUCTION TO WORK STUDY	ILO EDITION 5 1997	ILO GENIVITA
10	COSTING IN TEXTLE MILLS	SITRA	SITRA, COIMBATORE
11	ENTREPRENAL DEVELOPMENT	SARAVANAVEL.P 1987	ESS PEEKAY PUBLISHERS CHENNAI
12	EXPORT MANAGEMENT	BALAGOPAL .T.A.S EDITION 6- 1992	IHMALAYIA PUBLISHING HOUSE , MUMBAI
13	INTERNATIONAL MARKETING MANAGEMENT	VARSHREY .R.L B. BHATTACHARAYA	SULTAN CHAND&SONS NEW DELHI
14	EXPORT- WHAT, WHERE, HOW	PARASURAM EDITION 29- 1999	ANUPALN PUBLISHERS DELHI

VI SEMESTER
TT 6.2. FABRIC STRUCTURE

Total No. of hours / week : 06
 Total No. of weeks / semester : 16
 Total No. of hours / semester : 96

Objectives :

UNIT-1

- To know about the basic principles of construction of primary weaves.
- To know about the basic construction of elementary knitted structure.

UNIT-2

- To know about the basic construction of miscellaneous elementary weaves.
- To know about the basic construction of Bedford cord, pique weaves.

UNIT-3

- To understand the extra warp and extra weft figuring.
- To have knowledge about backed cloths.

UNIT-4

- To know about double cloth.
- To understand the figured pique structure.

UNIT-5

- To know about the principle of construction of leno structure.
- To understand terry pile structures.
- To have knowledge about velvet and velveteen's.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours/week	Hours/semester	Assessment Marks		
Fabric structure	6	96	Internal	Board Exam	Total
			25	75	100

Topics and allocation

UNIT	TOPIC	TIME(Hrs)
I	CONSTRUCTION OF ELEMENTARY WEAVES	15
II	MISCELLANEOUS ELEMENTARY WEAVES	13
III	FIGURING WITH EXTRA THREADS AND BACKED CLOTHS	15
IV	DOUBLE CLOTHS AND FIGURED PIQUES	14
V	LENO AND PILE STRUCTURES	15
	Revision, Test	12
	Total	84

DETAILED SYLLABUS

UNIT - 1. CONSTRUCTION OF ELEMENTARY WEAVES

Principles of design, draft and peg plan - Types of drafts - use of point paper - plain weave: - its characteristics - derivatives of plain weave - warp rib, weft rib, mat weaves - twill weaves: - its characteristics - derivatives of twill weave - waved twills, herringbone twills, broken twills, transposed or re-arranged twills, elongated twills, combination of twill weaves.

Sateen and satin weaves: - its characteristics – Regular and irregular sateens and satins . Knitted fabric

Structure – face loop, back loop, needle loop, sinker loop, stitch length, texture, plain, 1 x 1 rib, 1 x 1 interlock structure.

UNIT - 2. MISCELLANEOUS ELEMENTARY WEAVES

Crepe weaves: - its characteristics - construction of crepe weaves upon sateen bases, combinations of floating weave with plain threads, crepe weaves produced by reversing, insertion of one weave over another. Honey comb weaves: - its characteristics, ordinary honey comb weaves, brighten honey comb weaves. Huck-a-back weaves. Mock-leno weaves - Perforated fabrics. Bedford cord, welts and pique weaves.

UNIT - 3. FIGURING WITH EXTRA THREADS AND BACKED CLOTHS

Figuring with extra threads : - principles of figuring with extra materials - methods of disposing of surplus extra threads - comparison of extra warp and extra weft figuring - extra warp figuring - continuous and intermittent figuring with one extra warp - figuring with two extra warps. Extra weft figuring: - continuous figuring with one extra weft - clipped spot effect - figuring with two extra wefts.

Backed cloths- weft backed cloths - warp backed cloth - interchanging figured backed fabrics - backed cloths with wadding threads - imitation backed cloths.

UNIT - 4. DOUBLE CLOTHS AND FIGURED PIQUES

Double cloths- classifications of double cloth - self stitched double cloths warp and weft wadded double cloths - centre warp stitched double cloths and centre weft stitched double cloths. Interchanging double plain cloth. Triple cloth.

Figured Piques:- classifications of the structures - loose back piques - fast back piques - method of designing four, five and six pick piques.

UNIT - 5. LENO AND PILE STRUCTURES

Leno structure:- the principle of leno structure - the basic sheds of leno weaving - leno weaving with flat steel drop with an eye.

Terry pile structures:- formation of the piles - terry weaves - terry ornamentation - stripe and check doobby patterns - figured terry pile fabrics.

Weft pile structures:- All over or plain velveteens - fast pile structures - corded velveteens. Velvet – All over or continuous velvets.

REFERENCE BOOKS:

S. No	Title	Author	Publisher
1.	Watson’s Textile Design & Colour, 1988	Z.Crosiciki	Universal Publishing Corporation, Newnes, Butterworths, England
2	Elementary Design & Colour, (Reprinted in India, June 1988)	Z.Crosiciki	Universal Publishing Corporation, 534, Kalbadevi Road, Dhobi Talao, Mumbai – 400 002
3.	Watson’s Advanced Textile Designing, 1989	Z.Crosiciki	Universal Publishing Corporation, Newnes, Butterworths, England
4.	Structural Fabric Design	James W. Klibbe	North Carolina State University Printshop
5.	Fabric Structure	Golak	
6.	Woven Cloth Construction	ATC Robinson R. Mark	Textile Institute, Manchester
7.	Grammar of Textile Design	H. Nisbet	D.B. Taraporevala Sons & Co. Pvt. Ltd, Mumbai
8.	Woven Structure and Design Part I	Dori Goernar	Wira Technology group Ltd., UK

VI SEMESTER

TT 6.3.1 - ELECTIVES –II MAINTENANCE OF TEXTILE MACHINERY

Total Number of hours / week	: 5
Total Number of week / semester	: 16
Total Number of hours / semester	: 80

Objectives

UNIT-1

- To know about the basics of maintenance
- To understand about planning, scheduling and controlling.

UNIT-2

- To have knowledge about stores and inventory control.
- To gain knowledge about the tools maintenance.

UNIT-3

- To know about the tools and gauges used in Textile industry.
- To understand the balancing of machines.

UNIT-4

- To gain knowledge in routine and preventive maintenance of spinning machines.
- To acquire knowledge about lubrication of preparatory to spinning machines.

UNIT-5

- To understand the routine and preventive maintenance of Weaving,
- To understand the routine and preventive maintenance of Wet processing and knitting machines.

Scheme of Instruction and Examination

Subject	Instruction		Examination		
Maintenance of Textile Machinery	Hours / week	Hours / semester	Assessment mark		
	6	80	Internal	Board exam	Total
			25	75	100

Topics and allocation

Unit	Topic	Time (hrs.)
I	Basics of Maintenance, Planning, Scheduling and controlling	14
II	Stores, Assessment of maintenance, application of new concepts	14
III	Gauges and Erection	14
IV	Maintenance of spinning Machineries	13
V	Maintenance of Weaving, Wet Processing and Knitting Machineries	13
Revision , Test		12
Total		80

DETAILED SYLLABUS

Basics of Maintenance, Planning, Scheduling and controlling -

- a. Objects, types, scope and limitations of maintenance -
- b. Need for maintenance organization with responsibilities of vital maintenance personnel
- c. Systems and procedures involved in Planning, Scheduling and Controlling and their components -
- d. Records and Norms for maintenance

Stores, Assessment of maintenance, application of new concepts -

- a. Stores and inventory control -
- b. Importance of co-ordination between maintenance, quality and production departments
- c. Maintenance audit, Total Productive Maintenance (TPM) and Selective Maintenance Program (SMP)
- d. House keeping, Application of Computers for maintenance

Gauges and Erection -

- a. Study of tools and gauges used in Spinning and Weaving Mills
- b. Study of Erection procedures, tools and gauges used in erection of Spinning and Weaving Machines
- c. Vibration and Control of Vibration, Balancing of Machines

Maintenance of spinning Machineries

- a. Routine and Preventive maintenance programs and Lubrication charts of Blow room machines, cards, Draw frames, Combers, Fly frames and Ring frames

Maintenance of Weaving, Wet Processing and Knitting Machineries -

Routine and Preventive maintenance programs and Lubrication charts of warp and weft winding machines, Warping machines, Sizing machines, Plain and Auto weaving machines and wet processing machines such as Kiers, Jiggers, Winches, Stenters, Dyeing and printing machines, Knitting and Sewing machines.

REFERENCE BOOKS:

S.N	Title	Author	Publisher
1	Maintenance of Textile Machinery (Spinning, Weaving and Processing)		TAIRO publication Baroda (1970)
2	Maintenance Management in Spinning	T.V.Rathinam K.P.Chellamani	SITRA Coimbatore (2004)
3	Norms for Mechanical Processing	BTRA	Bombay – 86 (1979)
4	Maintenance in Ring Spinning	AT.Shahani, B.P.Todankar, C.K.Mistry and N.Balasubramanian	BTRA Publications, LBS marg Ghatkoper, Bombay – 86 (1979)
5	Maintenance In Chemical Processing Department In Textile Mill	S.V. Gokhale AK.Dhingra	ATIRA (1984) Ahamedabad 380015
6	Repair and Adjustment of Textile Machineries	T.Granovsky	MIR publisher Moscow (1984)
7	Maintenance Schedules, Practice and Check Points in Spinning		BTRA Bombay (1979)
8	Contemporary Textile Engineering	Prof. F. Happy	Universityof Bradford Academic press 24/28 Oval road London LW 1
9	Process Control in Spinning	A.R.Grade	ATIRA 1987
10	Spun Yarn Technology - Carding	Venkatasubramani	Saravana publications 91 PSK nagar, Rajapalayam 626108

**VI SEMESTER
ELECTIVE-II**

TT6.3.2 TEXTILE MARKETING AND MERCHANDIZING

Total No. of hours / week : 5

Total No. of weeks / semester : 16

Total No. of hours / semester : 80

Scheme of Instruction and Examination

Subject	Instruction		Examination		
	Hours/week	Hours/semester	Assessment Marks		
TEXTILE MARKETING AND MERCHANDIZING	5	80	Internal	Board Exam	Total
			25	75	100

OBJECTIVES:

Unit-1

- To know about basic marketing statistics
- To understand about export marketing

Unit-2

- To have knowledge about marketing firm's micro & macro environment
- To know about international markets

Unit-3

- To have knowledge about product package and labeling
- To understand about retail and whole sale

Unit-4

- To have knowledge about merchandizing
- To know about merchandizing calendar

Unit-5

- To understand about marketing research
- To know about export marketing

Topics and allocation

UNIT	TOPICS	TIME (Hrs)
I	BASIC CONCEPTS OF MARKETING	14
II	MARKETING ENVIRONMENT, SEGMENTATION & BUYER BEHAVIOR	14
III	MARKETING MIX	14
IV	MERCHANDIZING	13
V	MARKET RESEARCH AND EXPORT MARKETING	13
	Revision Test	12
	Total	80

DETAILED SYLLABUS

Unit -1. BASIC CONCEPTS OF MARKETING

Basics of Marketing - Need, Wants, demands, product, exchange and values. Marketing objectives and strategies – Market Management. Marketing Philosophies and challenges Ahead. Need & importance of Export Marketing. Services Marketing and its characteristics.

Unit - 2. MARKETING ENVIRONMENT, SEGMENTATION & BUYER BEHAVIOR

Marketing firm's Micro Environments, Macro Environment. Market segmentation - criteria for effective segment selection strategies. Consumer behavior - buying roles - Buyer Decision process. Segmentation of International Markets.

Unit - 3. MARKETING MIX

Marketing Mix - Components of Marketing Mix . Product . Product strategy; Brand, package & Labelling. - Product life cycle analysis. New product Development . Price - Pricing considerations - Adjustment pricing - Price changes. Place - Nature, Importance and behavior of Distribution channels. Retail and whole sale - Retail and Wholesale strategies for distribution. Promotion – Advertising - Copy, Media, Budget, Sales promotion. Public Relations and Personal selling.

Unit -4. MERCHANDISING

Definition of Merchandizing. Function of Merchandizing Division. Role and Responsibilities of Merchandiser. Product development line Planning & Presentation. Role of merchandiser in an apparel firm. Inter relationship between the Merchandising and other divisions. Merchandising calendar and its role in the manufacturing process. Garment presentation professional perspectives. Apparel engineer – Costing engineer – Designer customer perspective. Export business negotiations- stages- Selection & Appointment of foreign agent.

Unit -5. MARKET RESEARCH AND EXPORT MARKETING

Market research -Market research Process. Director General of Commercial Intelligence and Statistics - Its Publications. I/E license – Exchange controls regulation – Foreign exchange regulation acts – Exports Management risk. Indian Textile Policy & Exports Import Policy. Objectives of the following Organization: Ministry of Commerce, Ministry of Textiles. Export Promotion Councils- PDEXCIL-AEPC. Export Business Negotiations stages - Selection & Appointment of foreign agent. Samples for Exports. Role and significance of export documentation. Processing of an export order.

TEXT BOOKS:

1. Marketing management - Abraham koshy & Mithileshwar jha.
2. Textile marketing & merchandising - Dr.P.S.Ravichandran,
Major.S.Sivapathasekaran &
Naraashiman. Published by Student
cooperative stores, SSMITT & PC,
komarapalayam.

REFERENCE BOOKS

S N.O	Title	Author	Publitor
1	Marketing Management	Philip kotler & Armstrong	Prentice – Hall of India (p) ltd New delhi 110001
2	Exports	Parasram	Anuram Publisher R-98, model Town –III New delhi 110 009
3	Fundamentals of Modern Marketing	Cundiff (E.W) & Still (R.R)	Prentice – Hall of India (p) ltd New delhi 110001
4	Marketing Management	Sherlekar	Prentice – Hall of India (p) ltd New delhi 110001

VI SEMESTER
TT 6.4 TEXTILE CAD PRACTICAL

SCHEME OF INSTRUCTION & EXAMINATION:

Subject	Instruction		Examination			
	Hours/ Week	Hours/ Semester	Assessment Marks			
			Internal Marks		Board Exam.	Total
Textile CAD	6	96	10	10	5	100
			25		75	

Objectives:-

1. Student will be trained – To develop a designs from fabric to computer with various color combinations. Change of material, Yarn count, Reed & pick are to be made on the buyers need. Thus satisfying the buyer before going to the actual production of the fabric.
2. To know the application of drafting procedure through computer.
3. To understand the industrial pattern drafting system and application.
4. To know the pattern grading application through computer.
5. To under stand concept of computer color matching.
6. To learn procedure to measure the efficiency of bleached material in terms of various indices.
7. To acquire knowledge in measuring the important parameter of color difference.

LIST OF EXPERIMENTS:

Part – A. TEXTILE CAD

Jacquard software:

1. Learn Step by step commands to produce a Jacquard design fabric simulation.
2. Analyse of a Jacquard design fabric and produce fabric simulation in different Colour combinations.
3. Take graph print outs as per the requirements of loom and design creation.

Dobby software:

4. Learn Step by step commands to produce stripe and cross over designs.
5. Learn Step by step commands to produce check designs.
6. Analyze of a doobby design fabric to produce the fabric simulation in different Color combinations.

7. Produce calculation sheet for a fabric with costing and printouts of dobby Fabric simulation and design details.

Printing software:

8. Learn Step by step commands to produce a printed design and its colour Separations.

Texture mapping software:

9. Learn Step by step commands to make a Texture mapping on various objects and models with new designs created in other software.

Computer Color Matching

10. Measurement of whiteness Index, yellowness Index, Brightness, Redness value for the given bleached samples using computer color matching.
11. Measurement of color difference (ΔE) of given reactive dyed sample using different light sources (D65, Illuminate A, Illuminate C) using CCM
12. Measurement of different fastness (washing & rubbing) rating using CCM.

Part – B GARMENT CAD

List Of Experiments:

1. Learning of different tools used for drafting.
2. Setting the screen for drafting by using the appropriate tools like Limits, unfold mirror, flip line curves, saving open nest and close nest.
3. Practicing of drafting, editing and saving
4. Practicing of Drafting patterns to the given measurements
5. Practicing of drafting patterns and adding grade increments to create different grade sizes
6. Practicing of drafting patterns for shorts to a given size and grade it for the other sizes.
7. Practicing of drafting a pattern for a trouser and grade it to the other size.
8. Practicing of calculating the material requirement by using layout.
9. Comparing the manual and computer grading in connection with time and labour.
10. Practicing printing through Bitmap.

List of equipment :- 15 no. Personal computers. (Pentium IV – 512 MB RAM)
Textile CAD software, Scanner & printer. / LAN connected.
Garment CAD and Computer colour matching software.

Material :- Jacquard, Dobby and printed sample cloths.

One computer for two students / 30 student in a batch.

VI SEMESTER
TT.6.5 FABRIC STRUCTURE PRACTICAL

SCHEME OF INSTRUCTION & EXAMINATION

Subject	Instruction		Examination				
	Hours / week	Hours / semester	Assessment mark				
Fabric Structure Practical	6	96	Internal – 25			Board exam	Total
			Perfor mance	Reco rd	att	75	100
			10	10	5		

OBJECTIVE:

1. To find out design, draft and peg plan of given fabric samples.
2. To calculate / find out fabric particulars.
3. To calculate the cost / unit area of the fabric.

Analyze the given piece of cloth for the following:

- Weave, draft and peg plan
- Ends and picks per unit length
- Count of warp and weft
- Estimation of crimp percentage in warp and weft
- Reed count
- Cloth cover factor
- Weight of warp and weft per sq.mtr. / sq. yard
- Costing per sq.unit length
- Loom requirement

The samples should be :-

- 1) Plain - grey,
- 2) - mull,
- 3) - long cloth,
- 4) - casement,
- 5) - cambric,
- 6) - voile
- 7) - poplin
- 8) Twill
- 9) Drill
- 10) Satin
- 11) Crepe
- 12) Honey-comb
- 13) Huck-a-back
- 14) Mock-leno
- 15) Bedford cord
- 16) Extra warp

- 17) Extra weft
- 18) Terry
- 19) Gauze and leno
- 20) Double cloth
- 21) Single Jersey
- 22) 1 X 1 Rib
- 23) 1X 1 Interlock

Equipments :- Beesley`s Balance I no.s

Materials :- 2 Meters of each samples for a batch of 30 students

VI SEMESTER

TT6.6: PROJECT WORK ENTREPRENEURSHIP, ENVIRONMENTAL ENGINEERING & DISASTER MANAGEMENT

PROJECT WORK:

Students have to select any one topic of their own interest under the guidance of the department faculty in their area of specialisation, emphasising the principles studied in the theory and practical subjects. The selected topics must be related to Textile manufacturing process in Spinning/Weaving/Textile wet processing/Knitting/Garment making/ Problems related to quality control waste control, process control, productivity control, machinery maintenance in Textile Industries. After completing the work they have to submit their findings in the form of a report through the guide and Head of the Department. A viva-voce is conducted on the report submitted by the student. The number of students in a batch for a project work shall not exceed five.

ENVIRONMENTAL MANAGEMENT & DISASTER MANAGEMENT

SYLLABUS:

1. ENVIRONMENTAL MANAGEMENT:

- a) Introduction – Environmental Ethics – Assessment of Socio Economic Impact - Environmental Audit – Mitigation of adverse impact on Environment – Importance of Pollution Control – Types of Industries and Industrial Pollution.
- b) Solid waste management – Characteristics of Industrial wastes – Methods of Collection, Transfer and disposal of solid wastes – Converting waste to energy – Hazardous waste management Treatment technologies.
- c) Waste water management – Characteristics of Industrial effluents – Treatment and disposal methods – Pollution of water sources and effects on human health.
- d) Air Pollution Management – Sources and effects – Dispersion of air pollutants – Air pollution control methods – Air quality management.
- e) Noise Pollution Management – Effects of noise on people – Noise control methods.

List of Questions:

1. ENVIRONMENTAL MANAGEMENT:

1. What is the responsibility of an Engineer-in-charge of an Industry with respect to Public Health?
2. Define Environmental Ethic.
3. How Industries play their role in polluting the environment?
4. What is the necessity of pollution control? What are all the different organizations you know, which deal with pollution control?
5. List out the different types of pollutions caused by a Chemical / Textile / Leather/ Automobile / Cement factory.
6. What is meant by Hazardous waste?
7. Define Industrial waste management.
8. Differentiate between garbage, rubbish, refuse and trash based on their composition and source.
9. Explain briefly how the quantity of solid waste generated in an industry could be reduced.
10. What are the objectives of treatments of solid wastes before disposal?
11. What are the different methods of disposal of solid wastes?
12. Explain how the principle of recycling could be applied in the process of waste minimization.
13. Define the term 'Environmental Waste Audit'.
14. List and discuss the factors pertinent to the selection of landfill site.
15. Explain the purpose of daily cover in a sanitary landfill and state the minimum desirable depth of daily cover.
16. Describe any two methods of converting waste into energy.
17. What actions, a local body such as a municipality could take when the agency appointed for collecting and disposing the solid wastes fails to do the work continuously for number of days?
18. Write a note on Characteristics of hazardous waste.
19. What is the difference between municipal and industrial effluent?
20. List few of the undesirable parameters / pollutants anticipated in the effluents from oil refinery industry / thermal power plants / textile industries / woolen mills / dye industries / electroplating industries / cement plants / leather industries (any two may be asked).
21. Explain briefly the process of Equalization and Neutralization of waste water of varying characteristics discharged from an Industry.
22. Explain briefly the Physical treatments "Sedimentation" and "Floatation" processes in the waste water treatment.
23. Explain briefly when and how chemical / biological treatments are given to the waste water.
24. List the four common advanced waste water treatment processes and the pollutants they remove.
25. Describe refractory organics and the method used to remove them from the effluent.

26. Explain biological nitrification and de-nitrification.
27. Describe the basic approaches to land treatment of Industrial Effluent.
28. Describe the locations for the ultimate disposal of sludge and the treatment steps needed prior to ultimate disposal.
29. List any five industries, which act as the major sources for Hazardous Air Pollutants.
30. List out the names of any three hazardous air pollutants and their effects on human health.
31. Explain the influence of moisture, temperature and sunlight on the severity of air pollution effects on materials.
32. Differentiate between acute and chronic health effects from Air Pollution.
33. Define the term Acid rain and explain how it occurs.
34. Discuss briefly the causes for global warming and its consequences.
35. Suggest suitable Air pollution control devices for a few pollutants and sources.
36. Explain how evaporative emissions and exhaust emissions are commonly controlled.
37. What are the harmful elements present in the automobile smokes? How their presence could be controlled?
38. What is the Advantage of Ozone layer in the atmosphere? State few reasons for its destruction.
39. Explain the mechanism by which hearing damage occurs.
40. List any five effects of noise other than hearing damage.
41. Explain why impulsive noise is more dangerous than steady state noise.
42. Explain briefly the Source – Path – Receiver concept of Noise control.
43. Where silencers or mufflers are used? Explain how they reduce the noise.
44. Describe two techniques to protect the receiver from hearing loss when design / redress for noise control fail.
45. What are the problems faced by the people residing along the side of a railway track and near to an Airport? What provisions could be made in their houses to reduce the problem?

2. **DISASTER MANAGEMENT:**

- a) Introduction – Disasters due to natural calamities such as Earthquake, Rain, Flood, Hurricane, Cyclones etc – Man Made Disasters – Crises due to fires, accidents, strikes etc – Loss of property and life.

- b) Disaster Mitigation measures – Causes for major disasters – Risk Identification – Hazard Zones – Selection of sites for Industries and residential buildings – Minimum distances from Sea – Orientation of buildings – Stability of Structures – Fire escapes in buildings – Cyclone shelters – Warning systems.

- c) Disaster Management – Preparedness, Response, Recovery – Arrangements to be made in the industries / factories and buildings – Mobilization of Emergency Services – Search and Rescue operations – First Aids – Transportation of affected people – Hospital facilities – Fire fighting arrangements – Communication systems – Restoration of Power supply – Getting assistance of neighbours / Other organisations in Recovery and Rebuilding works – Financial commitments – Compensations to be paid – Insurances – Rehabilitation.

List of Questions:

DISASTER MANAGEMENT:

1. What is meant by Disaster Management? What are the different stages of Disaster Management?
2. Differentiate Natural Disasters and Man Made Disasters with examples.
3. Describe the necessity of Risk identification and Assessment Surveys while planning a project.
4. What is Disasters recovery and what does it mean to an industry?
5. What are the factors to be considered while planning the rebuilding works after a major disaster due to flood / cyclone / earthquake? (Any one may be asked).
6. List out the public emergency services available in the state, which could be approached for help during a natural disaster.
7. Specify the role played by an Engineer in the process of Disaster Management.
8. What is the cause for Earthquakes? How they are measured? Which parts of India are more vulnerable for frequent earthquakes?
9. What was the cause for the Tsunami 2004 which inflicted heavy loss to life and property along the coast of Tamilnadu? Specify its epicenter and magnitude.
10. Specify the Earthquake Hazard zones in which the following towns of Tamilnadu lie: a) Chennai b) Nagapattinum c) Coimbatore d) Madurai e) Salem.
11. Which parts of India are experiencing frequent natural calamities such as (a) heavy rain fall b) huge losses due to floods c) severe cyclones
12. Define basic wind speed. What will be the peak wind speed in a) Very high damage risk zone – A, b) High damage risk zone, c) Low damage risk zone.
13. Specify the minimum distance from the Sea shore and minimum height above the mean sea level, desirable for the location of buildings.
14. Explain how the topography of the site plays a role in the disasters caused by floods and cyclones.
15. Explain how the shape and orientation of buildings could reduce the damages due to cyclones.
16. What is a cyclone shelter? When and where it is provided? What are its requirements?
17. What Precautionary measures have to be taken by the authorities before opening a dam for discharging the excess water into a canal/river?
18. What are the causes for fire accidents? Specify the remedial measures to be taken in buildings to avoid fire accidents.
19. What is a fire escape in multistoried buildings? What are its requirements?
20. How the inmates of a multistory building are to be evacuated in the event of a fire/chemical spill/Toxic Air Situation / Terrorist attack (any one may be asked).
21. Describe different fire fighting arrangements to be provided in an Industry.
22. Explain the necessity of disaster warning systems in Industries.
23. Explain how rescue operations have to be carried out in the case of collapse of buildings due to earthquake / blast / cyclone / flood.
24. What are the necessary steps to be taken to avoid dangerous epidemics after a flood disaster?
25. What relief works that has to be carried out to save the lives of workers when the factory area is suddenly affected by a dangerous gas leak / sudden flooding?
26. What are the difficulties faced by an Industry when there is a sudden power failure? How such a situation could be managed?
27. What are the difficulties faced by the Management when there is a group clash between the workers? How such a situation could be managed?

28. What will be the problems faced by the management of an Industry when a worker dies because of the failure of a mechanical device due to poor maintenance? How to manage such a situation?
29. What precautionary measures have to be taken to avoid accidents to labourers in the Industry in a workshop / during handling of dangerous Chemicals / during construction of buildings / during the building maintenance works.
30. Explain the necessity of medical care facilities in an Industry / Project site.
31. Explain the necessity of proper training to the employees of Industries dealing with hazardous products, to act during disasters.
32. What type of disaster is expected in coal mines, cotton mills, Oil refineries, ship yards and gas plants?
33. What is meant by Emergency Plan Rehearsal? What are the advantages of such Rehearsals?
34. What action you will take when your employees could not reach the factory site because of continuous strike by Public Transport workers?
35. What immediate actions you will initiate when the quarters of your factory workers are suddenly flooded due to the breach in a nearby lake / dam, during heavy rain?
36. What steps you will take to avoid a break down when the workers union of your industry have given a strike notice?
37. List out few possible crisis in an organization caused by its workers? What could be the part of the middle level officials in managing such crisis?
38. What types of warning systems are available to alert the people in the case of predicted disasters, such as floods, cyclone etc.
39. Explain the necessity of Team work in the crisis management in an Industry / Local body.
40. What factors are to be considered while fixing compensation to the workers in the case of severe accidents causing disability/ death to them?
41. Explain the legal / financial problems the management has to face if safety measures taken by them are found to be in-adequate.
42. Describe the importance of insurance to men and machinery of an industry dealing with dangerous jobs.
43. What precautions have to be taken while storing explosives in a match / fire crackers factory?
44. What are the arrangements required for emergency rescue works in the case of Atomic Power Plants?
45. Why residential quarters are not constructed nearer to Atomic Power Plants.

**VII SEMESTER:
TT71 INDUSTRIAL TRAINING & VIVA VOCE**

Each student has to undergo industrial Training in Textile Industries for a period of 6 month during VII Semester.

ALLOTMENT OF MARKS :

TIME: 3 HRS.

MAX.MARKS: 100

Industrial Review I(3rd Month)

- 10

Industrial Review II(5th Month)

- 10

Attendance

- 05

25

Board Examination

Report writing

- 45

Viva Voce

- 30

75