V Semester

TEACHING AND EXAMINATION SCHEME

Sl No	Course Code	Course Name	Teaching Scheme					Examination Scheme						
			Instruction Periods per week			Total Periods per semester	Credits	Continuous Internal Evaluation			Semester End Examination			
			L	T	P			Mid Sem1	Mid Sem 2	Internal evaluation	Max Marks / Min Marks		Total marks	Min marks for Passing including internal
1	18TT-501C	Textile Mill Planning and Management	3	1	0	60	3	20	20	20	40	14	100	35
2	18TT-502C	Apparel Production Technology	3	1	0	60	3	20	20	20	40	14	100	35
3	18TT-503C	Textile Calculations	3	1	0	60	3	20	20	20	40	14	100	35
4	18TT-504 E	Program Elective – I A) Apparel Merchandising B) Advanced Textile Manufacture C)Technical Textiles	3	1	0	60	3	20	20	20	40	14	100	35
5	18TT-505E	Program Elective – II A) PROCESS & QUALITY CONTROL IN SPINNING B) PRCOESS AND QUALITY CONTROL IN WEAVING C) Process & Quality Control in Apparel Manufacture	1	0	2	45	1.5	20	20	20	40	20	100	50
6	18TT-506 P	Advanced Fabric Structure and Design Lab Practice	1	0	2	45	1.5	20	20	20	40	20	100	50
7	18TT-507P	Apparel Production Technology Lab Practice	1	0	2	45	1.5	20	20	20	40	20	100	50
8	18TT-508P	Textile CAD Lab Practice	1	0	2	45	1.5	20	20	20	40	20	100	50
9	18TT-509P	Programming in C Lab Practice	1	0	2	45	1.5	20	20	20	40	20	100	50
10	18TT-510P	Project Work	1	0	2	45	1.5	20	20	20	40	20	100	50
		Skill Up gradation	0	0	7	105	2.5	0	0	Rubrics			--	-
		TOTAL	**20**	**5**	**17**	**630**	**25**	**200**	**200**	**200**	**400**	**170**	**1000**	**425**

	Note: For Activities student performance is to be assessed through Rubrics. **Pass criteria:** The minimum marks required for passing in any of courses are given below 1. Cumulative 35% (Mid sem 1 + Mid sem 2+ Tutorials+ End examination) and minimum marks in end examination is 35% (i.e.14marks). 2. If the cumulative of CIE is less than 35% (i.e.21 marks out of 60) therefore more than 35% of SEE is required to get overall 35%.

18TT-501C- TEXTILE MILL PLANNING AND MANAGEMENT

Course Title :	**Textile Mill Planning and Management**	Course Code	**18TT-501C**
Semester	**V**	Course group	**Elective**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Management concepts are universal and it is a multidisciplinary subject. They are equally applicable to different types industries like Manufacturing, Service and Trade as well as different kind of business activities like industry, army, school, hospital, retail shops etc. Also, at the end of diploma course polytechnic students are expected to enter in to the Industrial Environment. This environment is altogether different and new to the students. A proper introduction and understanding of management fundamentals is therefore essential for all these students. Contents of the this subject will enable the students to address various issues related to human resource, finance, materials, legislations etc. by use of basic principles of management. This will ensure that students will play their role effectively to enhance the quality of business output in total.

Pre Requisites

This course require the knowledge of basic knowledge textile process, product and industry

Course Outcomes

At the end of the course, student will have the ability to

CO1 Explain different types of management and organisations

CO2 Identify resources and planning to establish a new organisation

CO3 Illustrate the functions of production planning and control and material management

CO4 Explain about personnel management and supervision

CO5 Plan for production of textiles yarns, fabrics

CO6 Realize the importance of safety and know the industrial laws

Course Content

1. **Organisation Management** ***Duration: 9 Periods (L:7 – T:2)***

Management - Difference between administration and management -functions of management – planning, organising, directing, controlling and decision making - types of skills required for management - Planning - types of planning -purpose, importance and steps in planning -levels of management in an Organizational -types of managerial roles - Organisation - types of ownerships with their merits and demerits- types of organisation structures- basics of ERP (Enterprises Resource Planning)-organisation behaviour - importance of work measurement -reasons for measurement of work - various consideration and methods of Job analysis - means of studying and measuring a work

2. **Resource planning and plan lay out** ***Duration: 9 Periods (L: 7– T:2)***

Identify the sources of raw material / input products-Types of capital -Sources of rising the capital -features of short term, medium term and long term sources-organization chart for spinning, weaving and garment unit -categories of workers for spinning, Weaving and Garment -job duties for each category of workers -Explain the importance of RH % in textile industry -State the RH % required for each department of spinning, weaving and garment unit -Methods of humidification and types of humidification equipment -Factors to be considered while selecting the site for a textile mill/unit-Explain different principles of plant layout-features, merits and demerits of process lay out -and product lay out -Factors affecting plant lay out -Symptoms of bad layout, Devices /tools used for improving layouts-Steps involved in planning a layout. Lay outs for spinning mill, weaving unit, chemical processing unit and for garment mill

3. **Production Planning and Control** ***Duration: 9 Periods (L:76– T: 2)***

Production planning and control -Objectives of production planning and control -Types of production-Pre planning and Market research-Scientific production planning-order of executing the production plan-PERT and CPM Network analysis -Market research and product development-productivity and its types- factors affecting productivity -Material Managemente functions of material management-Objectives of inventory control-ABC analysis-different Material handling devices -Purchase and Stores department -Functions of purchasing department- methods of purchasing -Purchase procedure-Functions of stores -Duties of store keeper-Records maintained in the stores -common stores records

4. **Personnel Management and Supervision** ***Duration: 9 Periods (L: 7 – T:2)***

qualities of personnel manager- functional areas of personal manager -Recruitment-e purpose of recruitment -different sources of recruitment -stages in recruitment process-methods and advantages of Employee training –Wages-components of wage determination process (flowchart)- types of wages -ojectives of Wages incentive schemes-Compensation-functions of Labour welfare officer- provisions for labour-Explain causes and procedure of handling of labour grievances -Supervision and motivation - elements of direction - role of supervisor-

characteristics of effective supervision- motivation -advantages of motivation -Maslow's theory of motivation- communication-process of communication-Barriers in communication-Decision making-characteristics of leadership-difference between leader and manager-Characteristics of effective leadership in shop floor

5. Production plans for textile mills *Duration: 12 Periods (L:9– T:3)*

Selection of processing parameters for different counts and different types of yarns (carded / combed) -Factors to be considered while selecting machinery in the spinning department-machine production norms - number of machines required in different departments for given volume of the production of yarn-IMaterial handling equipment used in spinning - quality Particulars of the commonly used fabrics (epi, ppi, warp & weft count, width, crimp) -Factors to be considered while selecting machinery in the weaving department. -Selection of processing parameters such as speed, efficiency, waste levels, maintenance etc. for the production of different types of fabrics- machine production norms - no. of machines required in different departments for given volume of the production of fabric. -Preparation of lay-out of calculated machines for weaving. -Material handling equipment used weaving-specifications and particulars of a garment -Factors to be considered while Selection of machines for a garment unit-Selection of process parameters - number of machines-Preparation of lay out for a garment unit - garment accessories required for a garment -Identify Material handling equipment used in garment

6. Industrial Safety and Legislation *Duration: 12 Periods (L:9 – T:3)*

Importance of safety at work place -Suggest measures to reduce air, water and noise pollution in a textile unit. -State causes and remedies for industrial accidents and health hazards in textile units. -Suggest control measures to reduce industrial accidents and health hazards in textile units. - safety measures while handling different equipments -Causes, costs and Preventive of measures of industrial Accidents- industrial hazards - types of fire extinguishers -Mention different personal protective devices used in textile mills -industrial legislation - causes of industrial disputes - Trade Union.- objects / functions of trade union -Merits and demerits of Trade unions.-State the importance of collective bargaining -Explain the rights and responsibilities of Employer and Employee-Explain the welfare measures adopted in Textile industry.-salient features of Indian Factories Act.-List the provisions of safety in Factories act - salient features of Minimum Wages Act, Industrial Disputes Act'Workmen's -compensation Act -List out the salient features of E. S .I. Act.

Recommended Books

1. Industrial Engineering and Management – OP Khanna
2. Industrial Engineering and Management - Banga & Sharma
3. Business Administration and Management – Dr. S.C.Saxena
4. The process of Management – WH Newman , E.Kirbywarran, Andrew R Mc Gille

Specific Learning Outcomes

1.0 Organisation Management

1.1 Management

1.1.1 Define Management

1.1.2 State the difference between administration and management

1.1.3 Explain the functions of management – planning, organising, directing, controlling and decision making
1.1.4 Explain different types of skills required for management

1.2 Planning
1.2.1 Mention the types of types of planning
1.2.2 Explain the purpose, importance and steps in planning
1.2.3 Explain different levels of management in an Organizational
1.2.4 Mention different types of managerial roles

1.3 Organisation
1.3.1 Discuss different types of ownerships with their merits and demerits
1.3.2 Explain different types of organisation structures
1.3.3 Explain the basics of ERP (Enterprises Resource Planning)
1.3.4 Define organisation behaviour
1.3.5 State the importance of work measurement
1.3.6 State the reasons for measurement of work
1.3.7 Explain various consideration and methods of Job analysis
1.3.8 Explain different means of studying and measuring a work

2.0 Resources Planning and Plant lay out

2.1 Identify the sources of raw material / input products
2.2 Types of capital – fixed and working
2.3 Sources of rising the capital
2.4 features of short term, medium term and long term sources
2.5 Write typical organization chart for spinning, weaving and garment unit
2.6 State different categories of workers for spinning, Weaving and Garment
2.7 Describe the job duties for each category of workers
2.8 Describe lighting requirements for different departments
2.9 Explain the importance of RH % in textile industry
2.10 State the RH % required for each department of spinning, weaving and garment unit
2.11 Methods of humidification and types of humidification equipment
2.12 Factors to be considered while selecting the site for a textile mill/unit.
2.13 Explain different principles of plant layout.
2.14 Discuss the features, merits and demerits of process lay out
2.15 Discuss the features, merits and demerits of product lay out
2.16 Factors affecting plant lay out
2.17 Symptoms of bad layout, Devices /tools used for improving layouts.
2.18 Steps involved in planning a layout.
2.19 Draw the lay outs for spinning mill, weaving unit, chemical processing unit and for garment mill

3.0 Production planning & control and Material Management

3.1 Production planning and control
3.1.1 Objectives of production planning and control
3.1.2 Mention the Types of production
3.1.3 Pre planning and Market research
3.1.4 Scientific production planning
3.1.5 Explain the order of executing the production plan
3.1.6 Explain about PERT and CPM Network analysis
3.1.7 Market research and product development
3.1.8 Define productivity and Mention the types
3.1.9 List the factors affecting productivity

3.2 Material Management
3.2.1 State the functions of material management
3.2.2 Define inventory control

3.2.3 Objectives of inventory control
3.2.4 Explain about ABC analysis
3.2.5 Explain different Material handling devices

3.3 Purchase and Stores department
3.3.1 Functions of purchasing department
3.3.2 Explain different methods of purchasing
3.3.3 Purchase procedure
3.3.4 Functions of stores
3.3.5 Duties of store keeper
3.3.6 Records maintained in the stores
3.3.7 Explain about common stores records

4.0 Personnel Management and Supervision

4.1 State the qualities of personnel manager
4.2 State the functional areas of personal manager
4.3 Recruitment
4.3.1 State the purpose of recruitment
4.3.2 Explain different sources of recruitment
4.3.3 Explain the different stages in recruitment process
4.3.4 Different methods and advantages of Employee training

4.4 Wages
4.4.1 State the components of wage determination process (flowchart)
4.4.2 Mention different types of wages
4.4.3 Objectives of Wages incentive schemes
4.4.4 Compensation
4.4.5 Explain the functions of Labour welfare officer
4.4.6 List various provisions for labour
4.4.7 Explain causes and procedure of handling of labour grievances

4.5 Supervision and motivation
4.5.1 List the elements of direction
4.5.2 Explain the role of supervisor
4.5.3 State the characteristics of effective supervision
4.5.4 Define motivation
4.5.5 State the advantages of motivation
4.5.6 Explain Maslow's theory of motivation
4.5.7 State the importance of communication
4.5.8 Explain the process of communication
4.5.9 Mention the Barriers in communication
4.5.10 Explain the process of Decision making
4.5.11 State the characteristics of leadership
4.5.12 State the difference between leader and manager
4.5.13 Characteristics of effective leadership in shop floor

5.0 Production Plans for Spinning, Weaving, chemical processing and Garment

5.1 Selection of processing parameters for different counts and different types of yarns (carded / combed)
5.2 Factors to be considered while selecting machinery in the spinning department
5.3 Identify machine production norms
5.4 Calculations of number of machines required in different departments for given volume of the production of yarn.
5.5 Layout of calculated machines for spinning.
5.6 Identify Material handling equipment used in spinning

5.7 List the quality Particulars of the commonly used fabrics (epi, ppi, warp & weft count, width, crimp)
5.8 Factors to be considered while selecting machinery in the weaving department.
5.9 Selection of processing parameters such as speed, efficiency, waste levels, maintenance etc. for the production of different types of fabrics.
5.10 Identify machine production norms
5.11 Calculations of no. of machines required in different departments for given volume of the production of fabric.
5.12 Preparation of lay-out of calculated machines for weaving.
5.13 Identify Material handling equipment used weaving
5.14 List the specifications and particulars of a garment
5.15 Factors to be considered while Selection of machines for a garment unit
5.16 Selection of process parameters
5.17 Calculation of number of machines
5.18 Preparation of lay out for a garment unit
5.19 Identify the garment accessories required for a garment
5.20 Identify Material handling equipment used in garment

6.0 Industrial Safety and Legislation In Textiles Mills

6.1 State the importance of safety at work place
6.2 Suggest measures to reduce air, water and noise pollution in a textile unit.
6.3 State causes and remedies for industrial accidents and health hazards in textile units.
6.4 Suggest control measures to reduce industrial accidents and health hazards in textile units.
6.5 Explain safety measures while handling different equipments
6.6 Explain the Causes, costs and Preventive of measures of industrial Accidents
6.7 Classify industrial hazards
6.8 Explain different types of fire extinguishers
6.9 Mention different personal protective devices used in textile mills
6.10 Define the term industrial legislation
6.11 State the causes of industrial disputes
6.12 Define Trade Union.
6.13 State the objects / functions of trade union
6.14 List the Merits and demerits of Trade unions.
6.15 State the importance of collective bargaining
6.16 Explain the rights and responsibilities of Employer and Employee
6.17 Explain the welfare measures adopted in Textile industry.
6.18 Mention State the salient features of Indian Factories Act.
6.19 List the provisions of safety in Factories act
6.20 List out the salient features of Minimum Wages Act.
6.21 List out the salient features of Industrial Disputes Act.
6.22 List out the salient features of Workmen's Compensation Act
6.23 List out the salient features of E. S .I. Act.

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com

5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Explain different types of management and organisations	R/U	1,2	9
CO2	Identify resources and planning to establish a new organisation	R/U	1,2	9
CO3	Illustrate the functions of production planning and control and material management	R/U	1,2,6	9
CO4	Explain about personnel management and supervision	R/U	1,2,6	9
CO5	Top Plan for production of textiles yarns, fabrics	R/U	1,2	12
CO6	Realize the importance of safety and know the industrial laws	R/U	1,2	12
				60

C18-TT-501C

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-I
DTT– V SEMESTER EXAMINATION

TEXTILE MILL PLANNING AND MANAGEMENT

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define management
2. Write types of business
3. Define organisation
4. What is lay out

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5 (a) Mention the types of planning
(OR)
(b)Mention different types of managerial roles

6. (a) State the importance of work measurement
(OR)
(b)State the reasons for measurements of work

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a)Explain different types of skills required for management
(OR)
(b)Explain different levels of management in an organisation

8. (a)Explain the basics of ERP

(OR)

(b)Explain the factors to be considered for textile plant location and site selection

C18-TT-501C

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-II
DTT– V SEMESTER EXAMINATION

TEXTILE MILL PLANNING AND MANAGEMENT

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define productivity
2. Write the types of production
3. Define inventory control
4. Define economic order quantity

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5.(a) State Objectives of production planning

(OR)

(b) Mention the types of productivity

6. (a) state the Objectives of inventory control

(OR)

(b state the Solve problems on EOQ

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7.(a) Explain the order of executing the production plan

(OR)

(b) Explain about PERT and CPM Network analysis

8.(a) Explain about ABC analysis

(OR)

(b) Explain different Material handling devices

C18-TT-501C

BOARD DIPLOMA EXAMINATION, (C-18)
END SEMESTER MODEL QUESTION PAPER
DTT– V SEMESTER EXAMINATION

TEXTILE MILL PLANNING AND MANAGEMENT

*Time :*2 Hours] [Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define management
2. Define productivity
3. Define capital out lay lead time
4. Define Trade Union
5. Define motivation
6. Define the term supervisor
7. What is meant by industrial disputes
8. What is meant by industrial hazards

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **THREE** marks.

9.(a) Mention the types of types of planning
(OR)
(b Mention different types of wages

10 (a). List the factors affecting productivity
(OR)
(b) List the Merits and demerits of Trade unions

11. (a) List the elements of direction
(OR)
(b) state the advantages of motivation

12.(a) State the causes of industrial disputes

(OR)

(b) State the objects / functions of trade union

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13(a) Explain different types of skills required for management

(OR)

(b) Explain the different stages in recruitment process

14(a) Explain about ABC analysis

(OR)

(b) Explain the rights and responsibilities of Employer and Employee

15 (a) Explain Maslow's theory of motivation

(OR)

(b) Explain the process of Decision making

16(a) Explain the welfare measures adopted in Textile industry

(OR)

(b) Explain the salient features of Minimum Wages Act.

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APPAREL PRODUCTION TECHNOLOGY

Course Title :	**Apparel Production Technology**	Course Code	**18TT-502C**
Semester	**V**	Course group	**Core**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Apparel Production Technology is a core subject which provides the knowledge of step by step processes involved in production of garment right from the grey fabric. This subject provides knowledge on machines and methods used for producing garments at different stages

Pre Requisites

This course requires the knowledge of basic knowledge on how the garments are made by a tailor.

Course Outcomes

At the end of the course, student will have the ability to

CO1	Explain the stages in garment pattern making and sample preparation
CO2	Explain the process of marker planning and spreading
CO3	Summarise different methods of cutting the fabric
CO4	Summarise the process of sewing machines and seams

CO5	List the support materials and explain interlinings
CO6	Explain final steps in garment production technology

Course Content

1. Pattern Making &Developments of Garment Sample Periods: 9 (L:7, T:2)

Fabric properties to be considered for selection of garments -parts of human anatomy as per Eight head theory - Importance of Measurements -Points to be considered while taking measurements - Some important definitions related to Apparel - pattern - pattern making – dart, grain line, cutting, drill holes, notches- Importance of paper pattern - advantages of paper patterns- stages for pattern making- allowances for pattern making -pattern grading - Methods of pattern grading – manual and computer aided –

Importance of pattern making - methods of garment pattern making - garment pattern construction - Types of samples and their uses -process of proto sample development using a flow chart - Sequence of garments sampling stages - sequence of garment sampling stages

2. Marker making and spreading Periods: 9 (L:7,T:2)

Define marker and marker planning - two methods of marker making different CAD systems for marker making - Marker efficiency-Objectives of marker efficiency - formula for marker efficiency-factors of marker efficiency -Calculate the marker efficiency - maker planning - requirements of marker planning-Objectives of quality control in marker planning-Check points in quality inspection for marker -Define fabric spreading -Objectives of fabric spreading- different forms of fabric packages used - requirements of the fabric spreading- procedure of fabric spreading - methods of fabric spreading- quality factors in spreading - types of fabric lay - difference between straight lay and stepped lay - different types of fabric put up and spreading modes -features of Automatic programmable spreading machine- quality factors in spreading-common problems in spreading

3. Fabric Cutting Periods:9 (L:7,T:2)

Objective of fabric cutting - process sequence of cutting section- requirements of the cutting process - Classify the types of cutting machines / methods of cutting -State the advantages and disadvantages of hand scissors- scope, advantages and disadvantages of following cutting machines :Hand shears - Straight knife cutting machine -Band knife cutting machine -Computer controlled cutting knifes -

Notchers (BL)-Drills and thread makers (BL)-Die cutter-Laser cutting -Plasma cutting -Water jet cutting -Ultra sonic cutting - common defects in fabric cutting -Points to be considered while choosing cutting technique

4. Technology of Sewing **Periods:9 (L:7,T:2)**

Stitching machines generally required for garment industry - Five steps of lock stitch formation using illustrative diagrams- different types of motors for sewing machine - reasons for thread break - reasons for needle break - reasons for skip stitch - safety rules for garment sewing machine operator-different types of garment stitches using simple sketches- four principal types of stitches used in knit fabrics - types of sewing machines generally required for apparel industry - seam - types of seams and their uses - different types of seams with simple sketches - uses of different types of seams -different Seam defects and seam quality defects - various causes of seam puckering

5. Interlinings and Garment support materials **Periods: 12 (L:9, T:3)**

Classification of garment accessories -Garment Definition, types and functions of interlining -merits, demerits and uses of non fusible interlinings -types of fusing materials -general process of fusing-types of fusible interlining –Comparison of fusible and non fusible interlinings-requirements of fusing process - methods of resin coating for fusible interlining - features, scope and working principle of continuous fusing machine, flat bed fusing press -factors to be considered in fusible interlining - other support materials – stays, lining, interfacing, shoulder pad - significance and types of elastics - importance of sewing thread in garment manufacture - essential properties required for sewing threads

6. Packing and Finishing **Periods: 12 (L:9, T:3)**

Classify garment accessories in detail -Garment closures -types of closures and their applications - types of buttons and materials used for manufacture - types of button holes - types of zippers - features of button machine -features of button hole machine -decorative garment accessories - garment decorative techniques -Pressing -objects of pressing -categories of fabric pressing - components of pressing - method of pressing by iron and by steam -the principle of Steam air finishing -Steam tunnel pressing - principle of pleating -Finishing -information contained in labels - types of labels -meaning of international care labeling codes using simple sketches - packing accessories and their functions

Specific Learning Outcomes

1. Pattern Making and development of Garment Sample

1.1 Measurements

1.1.1 Mention the fabric properties to be considered for selection of garments
1.1.2 List different types of woven fabrics used for garment manufacture
1.1.3 State the importance of Measurements
1.1.4 List the points to be considered while taking measurements
1.1.5 Define body rise, pleats, gathers, darts, grain line, drill hole, notches , tuck

1.2 Pattern making and grading

1.2.1 State the importance of pattern making
1.2.2 Explain the stages in development of garment pattern
1.2.3 Explain the tools used for drafting
1.2.4 List the allowances for pattern making
1.2.5 List the essential instructions to be made marked on apparel pattern
1.2.6 State the advantages of paper pattern
1.2.7 Define pattern grading
1.2.8 Explain the Methods of garment pattern grading – manual and computer aided

1.3 Development of garment Sample

1.3.1 List the Types of samples and their uses

1.3.2 Explain the process of proto sample development using a flow chart
1.3.3 Explain the Sequence of garments sampling stages

2. Marker making and Spreading

2.1 Marker making
- 2.1.1 Define marker and marker planning
- 2.1.2 Mention the two methods of marker making
- 2.1.3 Mention different CAD systems for marker making
- 2.1.4 Define Marker efficiency and give the formula
- 2.1.5 Explain the factors of marker efficiency
- 2.1.6 Calculate the marker efficiency
- 2.1.7 Define maker planning
- 2.1.8 Explain the requirements of marker planning
- 2.1.9 Objectives of quality control in marker planning
- 2.1.10 List check points in quality inspection for marker

2.2 Spreading / Laying
- 2.2.1 Objectives of fabric spreading
- 2.2.2 Mention different forms of fabric packages used
- 2.2.3 State the requirements of the fabric spreading
- 2.2.4 Describe the procedure of fabric spreading
- 2.2.5 Explain the methods of fabric spreading
- 2.2.6 State the quality factors in spreading
- 2.2.7 Explain the types of fabric lay
- 2.2.8 State the difference between straight lay and stepped lay
- 2.2.9 Explain different types of fabric put up and spreading modes
- 2.2.10 State the features of Automatic programmable spreading machine
- 2.2.11 Mention the quality factors in spreading
- 2.2.12 Mention common problems in spreading

3. Fabric Cutting

3.1 Objective of fabric cutting
3.2 Explain the process sequence of cutting section
3.3 State the requirements of the cutting process
3.4 Classify the types of cutting machines / methods of cutting
3.5 State the advantages and disadvantages of hand scissors
3.6 Explain the scope, advantages and disadvantages of following cutting machines
- 3.6.1 Hand shears
- 3.6.2 Straight knife cutting machine
- 3.6.3 Band knife cutting machine
- 3.6.4 Computer controlled cutting knifes
- 3.6.5 Notchers (BL)
- 3.6.6 Drills and thread makers (BL)
- 3.6.7 Die cutter
- 3.6.8 Laser cutting
- 3.6.9 Plasma cutting
- 3.6.10 Water jet cutting
- 3.6.11 Ultra sonic cutting

3.7 Mention the common defects in fabric cutting
3.8 Points to be considered while choosing cutting technique

4. Technology of Sewing

4.1 Sewing
- 4.1.1 List various sewing machines generally required for apparel industry :

4.1.2 Discuss merits and demerits of various motors for sewing machine
4.1.3 State the reasons for thread break
4.1.4 State the reasons for needle break
4.1.5 List out safety rules for garment sewing machine operator

4.2 Stitches
4.2.1 Explain the five steps of lock stitch formation using illustrative diagrams
4.2.2 Explain different types of garment stitches using simple sketches
4.2.3 Explain four principal types of stitches used in knit fabrics
4.2.4 State the reasons for skip stitch

4.3 Seams
4.3.1 Define seam
4.3.2 Explain different types of seams with simple sketches
4.3.3 Explain the uses of different types of seams
4.3.4 Explain different Seam defects and seam quality defects
4.3.5 Explain various causes of seam puckering

5. Interlinings and Garment support materials

5.1 Classification of garment accessories
5.2 Define the term interlining and mention the types
5.3 State the functions and uses of interlining
5.4 Mention the types of interlinings available for woven fabrics and knits
5.5 Explain the merits, demerits and uses of non fusible interlinings
5.6 List different types of fusing materials
5.7 Explain the general process of fusing
5.8 Mention different types of fusible interlining on the basis of fusible resin
5.9 Compare fusible and non fusible interlinings
5.10 State the requirements of fusing process
5.11 Explain different methods of resin coating for fusible interlining
5.12 Explain the features, scope and working principle of continuous fusing machine
5.13 Explain the features, scope and working principle and features of flat bed fusing press
5.14 Explain the factors to be considered in fusible interlining
5.15 Explain other garment support materials – stays, lining, interfacing, shoulder pad
5.16 Explain the significance and types of elastics
5.17 State the importance of sewing thread in garment manufacture
5.18 Explain the essential properties required for sewing threads
5.19 State the requirements / qualities of garment accessories

6. Packing and Finishing

6.1 Classify garment accessories in detail
6.2 Garment closures
6.2.1 Explain different types of closures and their applications
6.2.2 List the types of buttons
6.2.3 List the materials used for manufacture of buttons
6.2.4 Mention the types of button holes
6.2.5 Mention different types of zippers
6.2.6 State the features of button machine
6.2.7 State the features of button hole machine
6.3 List decorative garment accessories
6.4 List different garment decorative techniques
6.5 Pressing
6.5.1 Explain various objects of pressing
6.5.2 Mention different categories of fabric pressing
6.5.3 Mention basic components of pressing

6.5.4 Explain the method of pressing by iron
6.5.5 Explain the method of pressing by steam
6.5.6 Explain the principle of Steam air finishing
6.5.7 Explain the working principle of Steam tunnel
6.5.8 Explain the principle of pleating
6.5.9 Define the terms " under pressing" and "top pressing

6.6 Finishing

6.6.1 Mention the information contained in labels
6.6.2 Mention the types of labels
6.6.3 Explain the meaning of international care labelling codes using simple sketches
6.6.4 Explain different packing accessories and their functions

Recommended Books

1. Introduction to Clothing Manufacture - Gerry Cooklin
2. Elements of Fashion and Apparel design - Sumathi G. J
3. Apparel Manufacture Technology - T. Karthik, Ganeshan&Gopla Krishnan
4. Garment Manufacture Technology - Raj Kishore
5. Garment Manufacturing - PrasantaSarcar

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Explain the stages in garment pattern making and sample	R/U	1,2	9

	preparation			
CO2	Explain the process of marker planning and spreading	R/U	1,2	9
CO3	Summarise different methods of cutting the fabric	R/U	1,2,6	9
CO4	Summarise the process of sewing machines and seams	R/U	1,2,6	9
CO5	List the support materials and explain interlinings	R/U	1,2	12
CO6	Explain final steps in garment production technology	R/U	1,2	12
	Total			**60**

Model Question Paper

C18-TT-502C

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-I
DTT– V SEMESTER EXAMINATION

APPAREL PRODUCTION TECHNOLOGY

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define pattern grading.
2. Mention any two advantages of paper pattern.
3. Write any two requirements of the fabric spreading.
4. Give the definition of maker planning.

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5. (a) State the importance of Measurements.
(OR)
(b) List the Types of samples and their uses.

6. (a) State any three difference between straight lay and stepped lay .

(OR)

(b) State the quality factors in spreading.

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a) Explain the Sequence of garments sampling stages

(OR)

(b) Explain the tools used for drafting

8. (a) Explain the factors of marker efficiency

(OR)

(b)Explain any one method of fabric spreading.

C18-TT-502C

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-II
DTT– V SEMESTER EXAMINATION

APPAREL PRODUCTION TECHNOLOGY

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. What is the main objective of fabric cutting?
2. State any two advantages of hand scissors.
3. Define seam
4. Write the main reason for thread break.

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5. (a) Mention the common defects in fabric cutting

(OR)

(b) Give the classification of different types of cutting machines.

6. (a) State the reasons for skip stitch

(OR)

(b) List out safety rules for garment sewing machine operator

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a) Explain the process sequence of cutting section.

(OR)

(b) Explain the scope of Notchers (BL) cutting machine.

8. (a) Explain different types of seams with simple sketches.

(OR)

(b) Explain the five steps of lock stitch formation using illustrative diagrams.

C18-TT-502C

BOARD DIPLOMA EXAMINATION, (C-18)
END SEMESTER EXAMINATION
MODEL QUESTION PAPER
DTT– V SEMESTER EXAMINATION

APPAREL PRODUCTION TECHNOLOGY

*Time :*2 Hours] [Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Give the definition of pleats.
2. Mention any two common defects in fabric cutting.
3. Define the term interlining.
4. Mention the two methods of marker making
5. Mention the types of interlining.
6. List different types of fusing materials
7. List the types of buttons
8. Define the terms " under pressing".

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

9. (a) State the advantages of paper pattern.

(OR)

(b) State the functions of interlining.

10. (a) State the requirements of the cutting process.

(OR)

(b) List decorative garment accessories.

11. (a) Give any three comparisons between fusible and non fusible interlining.

(OR)

(b)Mention the qualities of garment accessories.

12. (a) Classify garment accessories.

(OR)

(b) Mention different categories of fabric pressing.

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13. (a) Explain the process of proto sample development using a flow chart.

(OR)

(b) Explain the essential properties required for sewing threads.

14. (a) Explain advantages and disadvantages of Straight knife cutting machine.

(OR)

(b) Explain the principle of Steam air finishing

15. (a) Explain the working principle of continuous fusing machine.

(OR)

(b) Explain the significance and types of elastics.

16. (a) Explain different packing accessories and their functions.

(OR)

(b) Explain the principle of pleating.

*****

TEXTILE CALCULATIONS

Course Title :	**Textile Calculations**	Course Code	**18TT-503C**
Semester	**V**	Course group	**Elective**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Pre Requisites

This course requires the knowledge of spinning and weaving machinery, process and mechanisms involved in Spinning and weaving.

Course Outcomes

At the end of the course, student will have the ability to

S. No	Course Outcome	Cognitive Levels	Teaching Periods

CO1	Find the fineness of fibres and yarns, solve problems in low room and carding	**R**	**9**
CO2	Find the calculations in drawing, Combing and Simplex	**R**	**9**
CO3	Solve the problems in Spinning and Winding	**R /U**	**9**
CO4	Solve the problems in yarn preparation	**R / U**	**9**
CO5	Solve the problems in loom shed and fabric materials	**U**	**12**
CO6	Solve the statistical problems in textiles	**U**	**12**
	Total Periods		**60**

Course Contents

1. **Calculations on Fibre & yarn Dimensions and blow room, Card**
   Micronaire - yarn diameter Yarn numbering systems – Direct and Indirect -Problems on count - conversion factors among Ne, Tex and Denier systems -Count of folded yarn (Resultant count) - Bale density -Number of blows / inch of a beater -Individual and combined Waste % of beaters -Total waste % in blow room -Cleaning efficiency of a beater and blow room -Surface speed - mechanical draft and actual draft -change wheel and draft constant - Card production-Cleaning efficiency of a card -Waste % and Invisible loss in carding

2. **Calculations in Drawing, Combing and Simplex**
   Drafts – creel table draft, break draft, main draft, web draft and total draft -relation among draft, Draft constant and change wheel -Draw frame production and production efficiency - hank of delivery sliver from feed hank-Finding Lap weight / length or Hank of lap from hank of feed sliver -production of sliver lap machine and ribbon lap machine from lap weight / length – drafts in combing - Production of the comber -Individual and average noil % extracted – simplex calculations - Draft – break draft, main draft and total draft based on rpm and diameter-Relation between Twist and count - Rate of delivery -Production of the speed frame -Efficiency of speed frame based on production

3. **Solve problems on Ring spinning frame and Winding**
   Draft– break draft, main draft and total draft -Front roller delivery rate-Twist in yarn - Calculation of twist -Production of a ring frame -Average spindle speed - traveller speed Yarn realization - Production of a cone / cheese winding machine-Time required to wind given weight / length of yarn -Number of drums required to wind given weight / length of yarn-Calculation of Yarn tension by tension devices-Yarn clearer setting for a given count of yarn -Yarn clearing efficiency-Production efficiency of a winding machine-Measurement of productivity in winding

4. **Calculations on Yarn Preparation**

Average count of warp -Weight of yarn on the full beam- beam count-Minimum mass of yarn for supply package-Time to complete a beam-Production of a warping machine-Warping machine running efficiency-Proportion of warper's beam to slasher beam - width of section and number of ends in the section -Number of sections to be made -Measurement of productivity in warping -Size pick up & size add on-Weight of size required -Count of sized warp-Production of a sizing machine-Sizing machine running efficiency -Number of looms that could be fed by a slasher sizing machine - Measurement of productivity in sizing

5. **Solve problems on Fabric and Garment Manufacture**

Heald and Reed calculations – Take up and regain of warp and weft -Relation between reed count and reed width-Relation between Loom pick and picks per inch in the cloth -Average speed, average reed space, average picks-Production of a loom -Efficiency of a loom -Time required to weave given length of warp -Length of warp required per loom per hour -Warp and weft crimp in woven fabric - Weight of a fabric piece of given dimensions -Weight of warp and weft required to produce given piece of fabric -Warp, weft and fabric cover factor-No of machines required for a target production - Production calculations in Garment manufacture- Production target, Operator efficiency, Line efficiency, Machine productivity , Labour productivity, Standard time, Machine efficiency, Labour cost per unit, Fabric consumption for producing a garment, Thread consumption

6. **Use of Statistical tools in quality control**

Causes of variation in textiles-problems on Mean, Median, Mode- problems on Range, Mean deviation, Standard deviation, variance, coefficient of variation-Control charts -Define control limits and specification limits- advantages of using control charts-types of control charts- Control charts for averages (X bar), ranges (R bar), fraction defective or percent defective (P bar), number of defects (C bar) - Chance causes and assignable causes- control line, Upper control limit and lower control limit for each chart - Process capability- Six sigma-importance and advantages of six sigma- considerations to be given before implementing six sigma- State the characteristics of normal distribution curve-Solve the problems on significance testing for mean and dispersion for both small and big sample –correlation- Negative and positive correlation-Linear and Non linear correlation- Methods of studying correlation- uses of correlation-Solve the problems to calculate Karl Pearson coefficient of correlation

Specific Learning Outcomes

1. **Calculations on Fibre & yarn Dimensions and blow room, Card**

1.1. Define Micronaire
1.2. Finding the yarn diameter based on yarn number
1.3. Define Yarn numbering systems – Direct and Indirect
1.4. Definition and formula for count in each system
1.5. Problems on count
1.6. Conversion factors among Ne, Tex and Denier systems
1.7. Count of folded yarn (Resultant count) in the Direct and indirect systems
1.8. Calculate Bale density
1.9. Number of blows / inch of a beater
1.10. Individual and combined Waste % of beaters
1.11. Total waste % in blow room
1.12. Cleaning efficiency of a beater and blow room
1.13. Calculation of Surface speed
1.14. mechanical draft and actual draft
1.15. Relation between Mechanical draft and Actual draft
1.16. Finding change wheel and draft constant

1.17. Card production
1.18. Cleaning efficiency of a card
1.19. Waste % and Invisible loss in carding

2. Calculations in Drawing, Combing and Simplex

2.1. Drafts – creel table draft, break draft, main draft, web draft and total draft based
2.2.Relation among draft, Draft constant and change wheel
2.3. Draw frame production
2.4. Draw frame efficiency based on production
2.5. Finding the hank of delivery sliver from hank of feed sliver, number of doublings and draft
2.6. Finding Lap weight / length or Hank of lap from hank of feed sliver
2.7. Production of sliver lap machines from lap weight / length
2.8. Production of ribbon lap machine from lap weight / length
2.9. Mechanical draft, Total draft & Technological draft
2.10. Production of the comber based on delivery rate
2.11. Production of the comber based on Feed rate
2.12. Individual and average noil % extracted
2.13. Draft – break draft, main draft and total draft based on rpm and diameter
2.14. Relation between Twist and count of textile material in the direct and Indirect
2.15. Front roller speed (Rate of delivery)
2.15.1. Production of the speed frame
2.15.2. Efficiency of speed frame based on production

3. Solve problems on Ring spinning frame and Winding

3.1.1. Draft– break draft, main draft and total draft based on surface speed
3.1.2. Front roller delivery rate
3.1.3. Twist in yarn
3.1.4. Relation between Twist and Count in direct and indirect systems
3.1.5. Calculation of twist from spindle speed and front roller delivery
3.1.6. Twist contraction
3.1.7. Production of a ring frame
3.1.8. Average spindle speed
3.1.9. Calculation of traveller speed
3.1.10. Yarn realization
3.1.11. Calculation of Production of a cone / cheese winding machine
3.1.12. Time required to wind given weight / length of yarn
3.1.13. Number of drums required to wind given weight / length of yarn
3.1.14. Calculation of Yarn tension by tension devices
3.1.15. Yarn clearer setting for a given count of yarn
3.1.16. Yarn clearing efficiency
3.1.17. Production efficiency of a winding machine
3.1.18. Measurement of productivity in winding

4. Calculations in Yarn Preparation

4.1.1. Average count of warp
4.1.2. Weight of yarn on the full beam
4.1.3. Calculation of beam count
4.1.4. Minimum mass of yarn for supply package
4.1.5. Time to complete a beam
4.1.6. Production of a warping machine
4.1.7. Warping machine running efficiency
4.1.8. Proportion of warper’s beam to slasher beam
4.1.9. To find the width of section and number of ends in the section

4.1.10. Number of sections to be made
4.1.11. Measurement of productivity in warping
4.1.12. Size pick up & size add on
4.1.13. Weight of size required
4.1.14. Count of sized warp
4.1.15. Production of a sizing machine
4.1.16. Sizing machine running efficiency
4.1.17. Number of looms that could be fed by a slasher sizing machine
4.1.18. Measurement of productivity in sizing

5. Solve problems in Fabric and Garment Manufacture

5.1. Heald calculations
5.2. Reed calculations – reed count
5.3. Take up and regain of warp and weft
5.4. Relation between reed count and reed width
5.5. Relation between Loom pick and picks per inch in the cloth
5.6. Average speed, average reed space, average picks
5.7. Production of a loom
5.8. Efficiency of a loom
5.9. Time required to weave given length of warp
5.10. Length of warp required per loom per hour
5.11. Warp and weft crimp in woven fabric
5.12. Weight of a fabric piece of given dimensions
5.13. Weight of warp and weft required to produce given piece of fabric
5.14. Warp, weft and fabric cover factor
5.15. No of machines required for a target production
5.16. Classify strength parameters of Garment
5.17. Write the formula for seam efficiency
5.18. Define needle cutting or yarn severance
5.19. Classify the parameters of texting for sewing threads
5.20. Production calculations in Garment manufacture
5.20.1. Production target
5.20.2. Operator efficiency
5.20.3. Line efficiency
5.20.4. Machine productivity
5.20.5. Labour productivity
5.20.6. Standard time
5.20.7. Machine efficiency
5.20.8. Labour cost per unit
5.21. Fabric consumption for producing a garment
5.22. Thread consumption

6. Use of Statistical tools in quality control

1.1 Explain various causes of variation in textiles
1.2 Solve problems on Mean, Median, Mode,
1.3 Solve problems on Range, Mean deviation, Standard deviation, variance, coefficient of variation
1.4 Control charts
1.4.1 Define control limits and specification limits
1.4.2 State the advantages of using control charts
1.4.3 Mention the types of control charts
1.4.4 Control charts for averages (X bar), Control charts for ranges (R bar)

1.4.5 Chart for fraction defective or percent defective (P bar)
1.4.6 Chart for number of defects (C bar)
1.4.7 Define Chance causes and assignable causes
1.4.8 Tabulate various types control charts and specify the control line, Upper control limit and lower control limit

1.5 Process capability
1.5.1 Explain the concept of process capability using a curve
1.5.2 Define Six sigma
1.5.3 State the importance of Six Sigma and advantages of six sigma
1.5.4 Explain the 5 steps involved in Six sigma
1.5.5 Mention the considerations to be given before implementing six sigma

1.6 Solve the problems on significance testing of
1.6.1 State the characteristics of normal distribution curve
1.6.2 Single mean for small and large samples
1.6.3 Difference between two means of small samples and large samples
1.6.4 Single standard deviation
1.6.5 Difference between standard deviations of two samples

1.7 Define the correlation
1.7.1 Define Negative correlation and positive correlation
1.7.2 Give examples for Negative correlation and positive correlation
1.7.3 Define Linear and Non linear correlation
1.7.4 Mention the Methods of studying correlation
1.7.5 State the uses of correlation
1.7.6 Solve the problems to calculate Karl Pearson coefficient of correlation

Recommended Books

1. Textile Mathematics Vol –I,II,III - Booth J E , The Textile Institution
2. Weaving Calculations – Sengupta, Taraporeval, Bombay
3. Elements of Raw cotton and Blow room – AR Khare
4. Elements of Carding and Drawing – AR Khare
5. Elements of Combing – AR Khare
6. Elements of Ring frame and Doubling – AR Khare

Suggested e-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. https://www.onlinetextileacademy.com
4. https://www.slideshare.net
5. https://textilechapter.blogspot.com
6. https://www.onlinetextileacademy.com

CO – PO Attainment Matrix

Course: Textile calculations		
Course	Program Outcomes	Mapped

Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	POs
CO1		3	1	1							2,3,4
CO2		3	1	1							2,3,4
CO3		3	1	1							2,3,4
CO4		3	1	1							2,3,4
CO5		3	1	1							2,3,4
CO6		3	1	1							2,3,4
Activities		3	3								2,3
Note: Correlation levels of CO with PO are rated as 1, 2 or 3 and are defined below: 3: Substantial (High), 2: Moderate (Medium), 1: Slight (Low), blank indicates no correlation											

Model Question Papers

BOARD DIPLOMA EXAMINATIONS, (C-18)

MID SEM –I EXAMINATION
Model Paper
DTT– V SEMESTER

[Time Duration: 1 Hour] [Total Marks : 20]

Sub Name : Textile Calculations

Sub Code : 18TT-503C)

PART-A

Answer **ALL** questions and each question carries **01** Marks 04×01=4

1. What is the count formula in English system?
2. Write the conversion factor to convert Tex to denier.
3. What is the count formula for cleaning efficiency of a beater?
4. Write the Relation between Mechanical draft and Actual draft.

PART-B

Answer any **TWO** questions and each question carries **03** Marks. 02×03=6

5. (a) Calculate the count of 1000 m of cotton yarn in French system if the weight is 40 grams.

   (OR)

   (b) Find the length of nylon yarn in 500gms of 40tex.

6. (a) Find out the rate of lap feed if the diameter of feed roller is 3 inches which is rotates with a speed of 20rpm In a carding machine.

(OR)

(b) Find out mechanical draft of carding if delivery speed is 3000 cm/min and input speed is 35cm/min.

PART-C

Answer any **TWO** questions and each question carries 5 Marks. 02×5=10

7. (a) Find out resultant count of three folded cotton yarn made by 20s, 30s and 40s.

(OR)

(b) Convert 60s worsted count to English count Ne.

8. (a) A lap is having 40meters length and feed to the card. The rate of lap feed is 4yards/min. Find out the time for lap exhaust.

(OR)

(b)Calculate the production of card per shift, when the doffer diameter is 27inches,speed 70rpm and deliver sliver hank is 0.14,tension draft 1.04 and efficiency is 90%.

BOARD DIPLOMA EXAMINATIONS, (C-18)
MID SEM –II EXAMINATION
Model Paper
DTT– V SEMESTER

[Time Duration: 1 Hour] **[Total Marks : 20]**
Sub Name : Textile Calculations
Sub Code : 18TT-503C

PART-A

Answer **ALL** questions and each question carries **01** Marks 04×01=4

1. Give the formula for break draft.
2. Give the noil% formula in comber.
3. What is the relation between Twist and count of textile material in the direct system?
4. What id the formulae for TPI.

PART-B

Answer any **TWO** questions and each question carries **03** Marks. 02×03=6

5. (a) In 3/3 drafting system, The calendar roller rotates with a speed of 80rpm which diameter is 2.5inches and front roller rotates with a speed of 130rpm which diameter is 2inches ,speed is 130 rpm what is the web draft.

(OR)

(b) A sliver lap is fed with 18 slivers each of 50grms, if the total draft in the machine is 1.8 then what the lap weight is delivered.

6. (a) Find out front roller delivery speed when spindle speed is 1200 rpm and TPI is 1.2.

(OR)

(b) Find out twist contraction%, when draft constant is 800 and change pinion is 20T with 59s count from 1.5 hank of roving.

PART-C

Answer any **TWO** questions and each question carries 5 Marks. 02×5=10

7. (a)Find out surface speed of creel roller and back roller and creel table draft with the following data
   1) Creel roller diameter is 80mm and speed is 171rpm
   2) Back roller diameter is 50mm and speed is 1400rpm

   (OR)

   (b) Calculate the production of comber with the following data

   Speed- 450nips/min, Feed/nip – 5.0mm, Deliver hank of sliver – 0.123

   Lap weight – 60gms/meter, Noil% - 16%, Efficiency – 90%

8. (a) In a simplex speeds of front roller, second roller, third roller and back roller is 219rpm,29rpm,26rpm and 23rpm respectively and the diameter of all rollers are 27mm.Find out all drafts and the delivery roving hank when hank of sliver feed is 0.16.

   (OR)

   (b) A ring frame working with 15000 rpm and the production is 112grams/shift, 70s cotton yarn with 90% efficiency, Find out TM value.

BOARD DIPLOMA EXAMINATION, (C-18)
END SEMESTER EXAMINATION
MODEL PAPER
DTT– V SEMESTER
18TT-503C - TEXTILE CALCULATIONS

*Time :*2 Hours] [Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define L/D ratio.
2. Give the formula for creel table draft.
3. What is the relation between Loom pick and picks per inch in the cloth.
4. Define cover factor.
5. Size add on % = ---------.
6. Give the formula for yarn clearing efficiency.

7. What do you mean by 72s Bradford reed.
8. Write relation between reed count and reed width.

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.
3. Each question carries **THREE** marks.

9. (a) Find out the actual draft if the waste is 5% and mechanical draft is 75%.

(OR)

(b)Calculate the time required to wind 400lbs of 12s cotton yarn on 10 drums if the actual production/drum/hour is 40 hanks.

10. (a)A sliver lap machine employs 1.9 draft and delivers the lap of 0.0166 hank. If the number of slivers fed is 18, find the hank of sliver fed.

(OR)

(b) A cloth was cut to a length of 10cms and average length of straight waro threads was found to be 10.8cms.find out regain value.

11. (a) Calculate the running efficiency of warping machine, if the total time is 1hour but running time is 55minutes.

(OR)

(b)A beam has 500 end with 30s PC yarn and length is 25,000 meters, Calculate the full beam weight.

12. (a)What will be the number of ends per inch in a reed of 3/80s Stockport.

(OR)

(b) Find out the tape length for 20 yards of grey cloth and regain of warp is 6%.

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13. (a) Convert 40’S English count to Tex system.

(OR)

(b)The winding drum of a high speed cone winder having a diameter of 3inches makes 2000 rpm. The actual amount of yarn wound in 8 hour was 4, 00,000 yards then what will be the efficiency of winding machine.

14. (a)Calculate the production of comber with the following data
Cylinder shaft nips/min- 90 rpm
Feed roller speed – 0.085rpm
Feed roleer diameter – 7/8inches
Lap weight – 500grains/yard
Noil% - 10%
Efficiency – 90%

(OR)

(b) A jet loom is running at a speed of 750picks per minute and producing bandage cloth with 27 picks per inch. If the efficiency of the loom is 90% then calculate the Actual picks per inch and length of cloth produced in yards per day of 8 hours.

15. (a) A stripe warp has 42 stripes of 40 ends each,40 extra pattern ends and selvedge ends 14 on each side. Find the number of sections and number of ends on each section.(The creel has a capacity of 500 bobbins)

(OR)

(b) Find out weft consumption per shift of a loom, if a loom runs at 210 picks per minute with efficiency of 85%, the warp width in reed is 1.5m and linear density of weft is 30 tex.

16. a) Calculate the warp and weft cover factors with the following details
    1.16s cotton, 50 ends per inch
    2. 36s cotton, 84 picks per inch

(OR)

(b) a loom shed contains 528 looms of the following particulars and find out the average reed space of the shed. Size of

Size of loom	56”	52”	48”	44”	40”	36”
Number of looms	48	49	44	96	122	144

APPAREL MERCHANDISNG

Course Title :	**Apparel Merchandising**	Course Code	**18TT-504E(A)**
Semester	**V**	Course group	**Elective**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Apparel Merchandising is an elective subject which is useful for the students who want to begin their career in garment merchandising.

Pre Requisites

This course require the knowledge of fabrics, garment manufacture, marketing, fashion.

Course Outcomes

At the end of the course, student will have the ability to

CO1 Define the term merchandising and explain basic steps in merchandising

CO2 Identify the role of merchandising in Apparel industry

CO3 Identify the role of merchandiser in fashion industry

CO4 Identify tasks of retail merchandising and essential tools in retail merchandising

CO5 Illustrate about export marketing

CO6 Explain about pricing, documentation and logistics in merchandising

Course Content

1. **Introduction to merchandising** ***Duration: 9 Periods (L:7 – T:2)***

Define the terms -merchandising and merchandiser - importance / necessity of merchandising - Objects of merchandising - difference between Merchandising and marketing - key activities of merchandising - activities involved in Merchandising process - flow chart of merchandising - functions / responsibilities of Merchandiser - Professional qualities and skills of merchandiser - functions / responsibilities of Merchandiser - requirements to become a merchandiser

2. **Merchandising in Apparel Industry** ***Duration: 9 Periods (L: 7– T:2)***

Key players in the apparel industry - functions/ Role of Merchandiser in Readymade Garment /Apparel industry - Sourcing of Raw material - types of merchandisers in apparel industry - items required for production file - Buyer inspection in Garment sector - job responsibilities of Merchandising department in apparel industry - effective tracking system for effective merchandising

3. **Fashion Merchandising** ***Duration: 9 Periods (L: 7– T: 2)***

Define basic terms of Fashion terminology - importance and purpose of fashion designing - Fashion cycle in Garment industry- functions / process flow chart of Fashion Merchandiser - Classify the fashion into four categories - steps in marketing of fashion design - qualities of successful fashion designer - variations in fashion adoption - consumer identification with fashion cycles

4. Retail and Visual Merchandising ***Duration: 9 Periods (L: 7 – T:2)***

Functions Retail Merchandiser - tasks of Retail Merchandiser - objectives of Visual Merchandising - functions of Visual Merchandiser - essential tools used for Visual Merchandising - types of lighting in Visual merchandising emotional response to color

5. Export Marketing ***Duration: 12 Periods (L:9– T:3)***

Export market environment - methods and means of exporting to foreign countries - difference between internal trade and international trade- differences between exporting and international marketing - international marketing environment and marketing strategy - flow chart of marketing mix and explain 4Ps of it - Channels of distribution of product- agencies which help in locating foreign buyer - Export Procedures -infrastructural support of Govt-TEXPROCIL, Apparel Export Promotion Council, PDEXCIL and Handloom Export Promotion Councilexport incentives commonly provided by Government , flow chart showing the steps in Range development and presentation , supply chain management in Garment industry

6. Exporting pricing, documentation and logistics ***Duration: 12 Periods (L:9 – T:3)***

Elements of cost sheet of a Garment - steps in execution of garment export order - methods of payment in export- import trade - L/C procedures and import - export operations in apparel industry - Inco terms of Apparel Merchandising business- Define logistics- Post shipment activities- marketing costs

Recommended Books

1. Apparel Merchandising – R. Rathina Murthy and R. Surjith
2. Apparel Merchandising and Quality Control – Mahfuzur Rehman
3. Apparel Merchandising _ David L Milson

Specific Learning Outcomes

1.0 Introduction to Merchandising

1.1 Define the terms -merchandising and merchandiser

1.2 State the importance / necessity of merchandising

1.3 Objects of merchandising

1.4 State the difference between Merchandising and marketing

1.5 Mention the key activities of merchandising

1.6 Explain various activities involved in Merchandising process

1.7 Draw the process flow chart of merchandising

1.8 List the Professional qualities and skills of merchandiser

1.9 State the requirements to become a merchandiser

2.0 Merchandising in Apparel Industry

2.1 Explain about key players in the apparel industry

2.2 Sourcing of Raw material

2.3 Explain the types of merchandisers in apparel industry

2.4 Explain the various items required for production file

2.5 Explain about Buyer inspection in Garment sector

2.6 Explain about effective tracking system for effective merchandising

3.0 Fashion Merchandising

3.1 Define basic terms of Fashion terminology

3.2 State the importance and purpose of fashion designing

3.3 Explain Fashion cycle in Garment industry

3.4 Explain the functions / process flow chart of Fashion Merchandiser

3.5 Classify the fashion into four categories

3.6 Mention the steps in marketing of fashion design

3.7 Mention the qualities of successful fashion designer

3.8 Explain different variations in fashion adoption

3.9 Explain about consumer identification with fashion cycles

4.0 Retail and Visual Merchandising

4.1 List the functions Retail Merchandiser

4.2 Explain the tasks of Retail Merchandiser

4.3 State the objectives of Visual Merchandising

4.4 List the functions of Visual Merchandiser

4.5 Explain the essential tools used for Visual Merchandising

4.6 Explain about emotional response to color

5.0 Export Marketing

5.1 Explain about export market environment

5.2 Explain the methods and means of exporting to foreign countries

5.3 State the difference between internal trade and international trade

5.4 Write the differences between exporting and international marketing

5.5 Explain about international marketing environment and marketing strategy

5.6 Draw the flow chart of marketing mix and explain 4Ps of it

5.7 Explain different Channels of distribution of product

5.8 List various agencies which help in locating foreign buyer

5.9 Explain about Export Procedures

5.10 Explain the following infrastructural support of Govt

5.10.1 TEXPROCIL

5.10.2 Apparel Export Promotion Council

5.10.3 PDEXCIL

5.10.4 Handloom Export Promotion Council

5.11 Mention the export incentives commonly provided by Government

5.12 Draw the flow chart showing the steps in Range development and presentation

5.13 Explain about supply chain management in Garment industry

6.0 Export Pricing, Documentation and Logistics

6.1 Explain the elements of cost sheet of a Garment

6.2 Explain the steps in execution of garment export order

6.3 Mention different methods of payment in export- import trade

6.4 Explain the L/C procedures and import , export operations in apparel industry

6.5 Define Inco terms of Apparel Merchandising business

6.6 Define the term logistics

6.7 List various Post shipment activities

6.8 List various marketing costs

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Define the term merchandising and explain basic steps in merchandising	R/U	1,2	9
CO2	Identify the role of merchandising in Apparel industry	R/U	1,2	9

CO3	Identify the role of merchandiser in fashion industry	R/U	1,2,6	9
CO4	Identify tasks of retail merchandising and essential tools in retail merchandising	R/U	1,2,6	9
CO5	Illustrate about export marketing	R/U	1,2	12
CO6	Explain about pricing, documentation and logistics in merchandising	R/U	1,2	12
				60

18TT-504E (A)

BOARD DIPLOMA EXAMINATION, (C-18)

MID EXAM -I

DTT– V SEMESTER EXAMINATION

APPAREL MERCHANDISNG

Time: I Hours Total Marks: 20

PART-A

4X01=04

Instructions : 1. Answer **ALL** questions.

2. Each question carries **ONE** mark.

1. Define the terms -merchandising and merchandiser
2. List the Professional qualities s of merchandiser
3. What is Sourcing of Raw material
4. Mention types of merchandisers in apparel industry

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

5(a). State the difference between Merchandising and marketing

OR

(b)List various functions / responsibilities of Merchandiser

6(a).Explain about key players in the apparel industry

OR

(b)Explain the types of merchandisers in apparel industry

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.

2. Each question carries FIVE marks.

7(a). Explain various activities involved in merchandising process

OR

(b).Explain the functions / responsibilities of Merchandiser

8(a) Explain the various items required for production file

OR

(b).Explain about Buyer inspection in Garment sector

18TT-504E (A)

BOARD DIPLOMA EXAMINATION, (C-18)

MID EXAM -II

DTT– V SEMESTER EXAMINATION

APPAREL MERCHANDISNG

Time: I Hours Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.

2. Each question carries **ONE** mark.

1. Define basic terms of Fashion terminology
2. Classify the fashion into four categories
3. List the functions Retail Merchandiser
4. State the objectives of Visual Merchandising

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

5(a). State the importance and purpose of fashion designing

OR

(b).Mention the steps in marketing of fashion design

6(a).State the objectives of Visual Merchandising

OR

(b)Mention the types of lighting in Visual merchandising

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.

2. Each question carries FIVE marks.

7(a) Explain the functions / process flow chart of Fashion Merchandiser

OR

(b) Explain about consumer identification with fashion cycles

8. (a) Explain the tasks of Retail Merchandiser

OR

(b) Explain about emotional response to color

18TT-504E (A)

BOARD DIPLOMA EXAMINATION, (C-18)

END MODEL QUESTION PAPER

DTT– V SEMESTER EXAMINATION

APPAREL MERCHANDISNG

Time: 2 Hours Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.

2. Each question carries **ONE** mark.

1. Define the terms -merchandising and merchandiser
2. State the importance and purpose of fashion designing
3. List various agencies which help in locating foreign buyer
4. List various functions / responsibilities of Merchandiser
5. Define export marketing
6. Mention the export incentives commonly provided by Government
7. Define Inco terms of Apparel Merchandising business
8. List various Post shipment activities

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

9. (a) Explain about Buyer inspection in Garment sector

(OR)

(b) State the difference between internal trade and international trade

10. (a) Mention the qualities of successful fashion designer

(OR)

(b) Mention different methods of payment in export- import trade

11. (a) Draw the flow chart of marketing mix and explain 4Ps of it

OR

(b) Explain about Export Procedures

12.(a).Explain the elements of cost sheet of a Garment

OR

(b) Mention the List of various Post shipment activities

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **FIVE** marks.

13 a). Explain the process flow chart of merchandising

(OR)

(b) Explain different Channels of distribution of product

14 (a) Explain the tasks of Retail Merchandiser

(OR)

(b) Explain the following infrastructural support of Govt Apparel Export Promotion Council

15. (a) Explain about international marketing environment and marketing strategy

OR

(b). Explain the methods and means of exporting to foreign countries

16. (a) Explain the elements of cost sheet of a Garment

OR

(b). Explain the L/C procedures and import, export operations in apparel industry

ADVANCED TEXTILE MANUFACTURE

Course Title :	**Advanced Textile Manufacture**	Course Code	**18TT-504 E(B)**
Semester	**V**	Course group	**Elective**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Advanced Textile Manufacture is the Optional subject which is extension of basic yarn manufacture and fabric manufacture. It covers unconventional and special yarns production

Pre Requisites

This course require the knowledge of basic knowledge on yarn manufacture and fabric manufacture

Course Outcomes

At the end of the course, student will have the ability to

CO1 Explain the characteristics and applications of special fibres

CO2 Explain the manufacturing and characteristics of special yarns

CO3 Explain the manufacturing and applications of terry and triaxial fabrics

CO4 Explain different types of garment decoration techniques

CO5 Explain the principles of non woven and knitted fabric manufacture

CO6 Explain the applications of electronics in Textile machines

Course Content

1. **Special Fibres** ***Duration: 9 Periods (L:7 – T:2)***

Manufacture, properties and applications - Elastomeric fibres – Rubber and Spandex**,** Aramid fibres, Glass fibres, Carbon fibres**,** Metallic fibres, Vinyon, Flouro carbons**,** Micro fibres

2. **Special Yarns** ***Duration: 9 Periods (L: 7– T:2)***

Classification of fancy yarns - Different methods of producing fancy yarns -working principle of Compact spinning system -advantages of compact yarn-different methods of producing melange yarns -manufacturing sequence and properties of melange yarns - principle of producing slub yarns, Snarl and loop yarn - classification of sewing threads - requirements of sewing threads -Sewing thread manufacture - finishes for sewing threads -Sewing thread packages and their applications -sewing thread winding systems - essential properties of sewing threads - manufacturing sequence of Sewing thread -Spiral yarn / cork screw yarn, Diamond yarn, Core spun yarn, Cloud yarn, Eccentric yarn, Tape yarn, Network yarn, Bulk yarn and Marl yarn

3. **Unconventional Weaving machines** ***Duration: 9 Periods (L: 7– T: 2)***

Types of terry pile -formation of pile by Terry motion -fringing motion of a terry loom -Loom particulars for weaving terry cloth -Principle of producing cut pile fabrics -characteristics of yarns used for terry fabrics -Representation of basic terry pile structure - working principle of narrow loom-applications of narrow loom-working principle of Tri axial loom - applications of Triaxial fabrics

4. **Garment Decoration Techniques** ***Duration: 9 Periods (L:7– T:2)***

Features, types and uses of Laces (Lace fabrics) -Define the terma Cord stay - types of stays - difference between garment accessories and trimmings -Classify the types of trims and explain the functions of different trimmings - Embroidery types of ribbons - manufacturing process of

Ribbon -importance of Bias tape -situations where embroidery is to be avoided -types of decoration technologies -scope of different Garment decoration techniques -process of direct – To-Garment printing -garment decoration techniques –Appliques, Bias trimming, Ruffles , Smocking and Faggoting

5. **Knitting and Nonwoven Technology** ***Duration: 12 Periods (L: 9 – T:3)***

Define Nonwoven fabric- classification of nonwoven fabrics - methods of web formation - methods of bonding the web - principle of producing needle punched nonwovens- techniques of adhesive bonding , Principle of hot calendar thermal bonding -Melt blown techniques - structure and general characteristics of nonwovens- applications and Scope of non woven fabrics- Basics terms of Knitting - - Definitions of Weft knitting and warp knitting-Functional elements used on a (weft) knitting machine -Explain loop forming sequence (knitting action) of knitting needle - Basic Weft knit structures –Representation of weft knit structures symbolically -Explain the characteristics of single jersey structures (plain structures)-Warp Knitting- principle of producing basic Warp knit fabric - Explain the functional elements of Tricot and Rachel machines -Explain the knitting cycles of tricot machine -the knitting cycles of Raschel machine -Differences between warp knits and Woven fabrics -Apparel and Non apparel uses of knitted fabrics

6. **Electronics in Textile machines** ***Duration: 12 Periods (L9: – T:3)***

control system -pen and closed loop control systems - generalised block diagram of Automatic textile control system -functions of various elements of Automatic textile control system - Classify sensors used in textiles - transducers and their principle of operation, quantity measured and application area in textiles various electrical control components -Programmable Logic Control (PLC)-functioning of PLC based Draw frame -Automation in spinning – automation in weaving – automation in chemical processing

Recommended Books

4. Knitting Technology – Ambumani
5. Nonwoven Technology – Madhava Murthy
6. Knitting Technology – David J Spencer, Woodhead Publishing Ltd, Cambridge, England
7. Knitting Technology – Prof D B ajgaonkar, Universal Publishing Corpn, Bombay
8. Knitting – Fundamentals, Machines and Structures and Developments – N anbumani, New Age International Structures
9. Nonwovens Manufacture – N N Banerjee

Specific Learning Outcomes

1.0 Special Fibres

1.1 Explain the manufacture, properties and applications of

1.1.1 Elastomeric fibres – Rubber and Spandex
1.1.2 Aramid fibres
1.1.3 Glass fibres
1.1.4 Carbon fibres
1.1.5 Metallic fibres
1.1.6 Vinyon

1.1.7 Flouro carbons
1.1.8 Micro fibres

2.0 Special Yarns

2.1 Give the classification of fancy yarns.
2.2 Classify different methods of producing fancy yarns
2.3 Explain the working principle of Compact spinning system
2.4 State the advantages of compact yarn
2.5 Mention different methods of producing melange yarns
2.6 Explain the manufacturing sequence of melange yarns
2.7 State the properties of mélange yarns
2.8 Explain the principle of producing slub yarns
2.9 Explain the principle of producing Snarl and loop yarn
2.10 Give the classification of sewing threads
2.11 Mention the basic requirements of sewing threads
2.12 Explain the processes involved in Sewing thread manufacture
2.13 Explain the fibre type, construction and finishes for sewing threads
2.14 Explain different types of Sewing thread packages and their applications
2.15 Mention the types of sewing thread winding systems
2.16 List essential properties of sewing threads
2.17 Explain the manufacturing sequence of Sewing thread
2.18 Define the following fancy yarns - Spiral yarn / cork screw yarn, Diamond yarn, Core spun yarn, Cloud yarn, Eccentric yarn, Tape yarn, Network yarn, Bulk yarn and Marl yarn

3.0 Unconventional weaving machines

3.1 Terry loom
3.1.1 Types of terry pile
3.1.2 Explain the method of formation of pile by Terry motion
3.1.3 State the significance of fringing motion of a terry loom
3.1.4 Loom particulars for weaving terry cloth
3.1.5 Principle of producing cut pile fabrics
3.1.6 Write the characteristics of yarns used for terry fabrics
3.1.7 Representation of basic terry pile structure
3.2 Other looms
3.2.1 Explain the working principle of narrow loom
3.2.2 State the applications of narrow loom
3.2.3 Explain the working principle of Tri axial loom
3.2.4 State the applications of Triaxial fabrics

4.0 Garment Decoration

4.1 Explain the features, types and uses of Laces (Lace fabrics)
4.2 Define the term Cord and state the applications of cord
4.3 Define stay and explain different types of stays
4.4 State the difference between garment accessories and trimmings
4.5 Classify the types of trims and explain the functions of different trimmings
4.6 Define Embroidery
4.7 Define and mention the types of ribbons
4.8 Explain the manufacturing process of Ribbon
4.9 Define and state the importance of Bias tape
4.10 Mention the situations where embroidery is to be avoided
4.11 List out different types of decoration technologies
4.12 Explain the scope of different Garment decoration techniques
4.13 Explain the process of direct –To-Garment printing

4.14 Explain following garment decoration techniques
- 4.14.1 Appliques
- 4.14.2 Bias trimming
- 4.14.3 Ruffles
- 4.14.4 Smocking
- 4.14.5 Faggoting

5.0 Knitting and Nonwoven Technology

5.1 Give the classification of nonwoven fabrics
5.2 Mention different methods of web formation
5.3 Classify different methods of bonding the web
5.4 Explain the principle of producing needle punched nonwovens
5.5 Explain different techniques of adhesive bonding
5.6 Explain the principle of hot calendar thermal bonding
5.7 Explain the principles of producing Extrusion nonwovens by
5.8 Explain the structure and general characteristics of nonwovens
5.9 Explain the applications and Scope of non woven fabrics
5.10 Basics of Knitting
- 5.10.1 Define the general terms used in Knitting - Course, wale, stitch density, technically upright, technical face, technical back, Loop, Open loop, closed loop, needle loop, sinker loop, float, under lap, stitch length, face stitch, back stitch
- 5.10.2 Compare the properties of knitted structures with woven fabrics
- 5.10.3 Explain the yarn quality requirements for Knitting
- 5.10.4 Define Weft knitting and warp knitting

5.11 Functional elements used on a (weft) knitting machine
- 5.11.1 Mention the types of knitting needles
- 5.11.2 Sketch and label the parts of the three types of needles
- 5.11.3 Explain loop forming sequence (knitting action) of knitting needle (any one of latch, bearded and compound needles)

5.12 Understand Basic Weft knit structures
- 5.12.1 Classify weft knit structures
- 5.12.2 Classify basic weft knitting machines
- 5.12.3 Explain the characteristics of single jersey structures (plain structures)

5.13 Warp Knitting
- 5.13.1 State the principle of producing basic Warp knit fabric
- 5.13.2 Explain the functional elements of Tricot and Rachel machines
- 5.13.3 Explain the knitting cycles of tricot machine
- 5.13.4 Explain the knitting cycles of Raschel machine

5.14 Apparel and Non apparel uses of knitted fabrics

6.0 Electronic Controls in Textile Machines

6.1 Define a control system
6.2 Define open and closed loop control systems
6.3 Draw the generalised block diagram of Automatic textile control system
6.4 Explain Automatic Textile Control System by an illustrative example.
6.5 Explain functions of various elements of Automatic textile control system.
6.6 Draw the generalised block diagram of Feedback control system.
6.7 Draw the generalised block diagram of Feed forward control system
6.8 Draw the generalised block diagram of combined loop control system.
6.9 Classify sensors used in textiles
6.10 Tabulate transducers and their principle of operation, quantity measured and application area in textiles
6.11 Mention various electrical control components
6.12 Explain different types of motors used in textiles

6.13 Define the term " Programmable Logic Control (PLC)
6.14 Explain the PLC application in dyeing
6.15 Explain the functioning of PLC based Draw frame
6.16 Explain the Automation in Blow room using electronic controls
6.17 Explain the functioning of Auto leveller in Carding machine
6.18 Explain Electronics application in draw frame
6.19 Explain Electronics application in speed frame
6.20 Explain the online monitoring of a Ring frame using Ring data system.
6.21 Explain electronics application in winding.
6.22 Explain applications of Electronics in weaving preparatory
6.23 Explain Electronics application in weaving machines.
6.24 Explain the working principle of Fabriscan fabric inspection system
6.25 State the functions of central monitoring system of a loom shed

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Explain the characteristics and applications of special fibres	R/U	1,2	9
CO2	Explain the manufacturing and characteristics of special yarns	R/U	1,2	9
CO3	Explain the manufacturing and applications of terry and triaxial fabrics	R/U	1,2,6	9
CO4	Explain the principles of non woven manufacturing and applications	R/U	1,2,6	9
CO5	Identify the parts of knitting machines and explain its	R/U	1,2	12

	working			
CO6	Explain the applications of electronics in Textile machines	R/U	1,2	12
				60

TECHNICAL TEXTILES

Course Title :	**Technical Textiles**	Course Code	**18TT-504E(C)**
Semester	**V**	Course group	**Core**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Technical Textiles id the Elective subjects which provides the textile technologist an exposure to various technical applications of Textile materials.

Pre Requisites

This course require the knowledge of textile fibres and their specific properties and manufacturing methods

Course Outcomes

At the end of the course, student will have the ability to

CO1 Define and identify the scope of technical textiles

CO2 Illustrate the applications of textiles in filtration

CO3 Classify geo textiles and explain the functions and applications of geo textiles

CO4 Classify the medical textiles and illustrate applications of textiles in medical field

CO5 Illustrate the applications of textiles in military and protective applications

CO6 Illustrate the applications of textiles in agriculture, sports

Course Content

1. **Introduction to Technical Textiles** ***Duration: 9 Periods (L:7 – T:2)***

Definition of Technical Textiles - Difference between apparels and technical textiles – Classification of Technical Textiles - scope of textile fibres for use in Technical applications - yarn manufacturing technologies of producing technical yarns - fabric structures (woven, knitted and nonwoven) used for technical applications -various finishes and coatings for fabrics for Technical applications -scope and utility of various technical textiles -Applications of Nonwovens in Technical Textiles

2. **Textiles in Filtration** ***Duration: 9 Periods (L:7– T:2)***

Basics of filtration - need / importance for filtration -advantages of using textiles for filtration -Scope of textiles for filtration in various industries - Liquid filtration - State the advantages of fabric filters -Aerosol filtration - different techniques of dust collection - different mechanisms of aerosol filtration - advantages of fabric filters in aerosol filtration - advantages of nonwoven filters over woven filters -theory, principles and process of dust collection in aerosol filtration - types fabric cleaning mechanisms- considerations in selection and design of fabric filters

3. **Geo Textiles** ***Duration: 9 Periods (L: 7– T: 2)***

Define geo synthetics and geo textiles - Classify geo synthetics - basic functions of geo textiles - application fields of the basic functions of geo textiles - structure and uses of different types of geo synthetics - properties of Geo Textiles - advantages of Geo textiles made by Jute.

4. **Medical Textiles** ***Duration: 9 Periods (L: 7 – T:2)***

Reasons for use of textiles in medical purposes - Classify Medical synthetics - product, fibre type and manufacturing system of implantable medical textileand Non implantable medical

textile.Health care Hygiene products - fibre type and construction of suture -extra corporeal devices- requirements of fibres for medical textiles

5. **Military and Protective Textiles** ***Duration: 12 Periods (L:9– T:3)***

Characteristics of inherently flame retardant fibres - the process of flame retardation of conventional textile fibres -water proof breathable fabrics - application of textiles for survival - physical requirements of military textiles Environmental requirements of military textiles for heat , Flame and hazards andballistic textile - typical military textiles

6. **Other Industrial Textiles** ***Duration: 12 Periods (L:9 – T:3)***

requirements of textiles for transportation - various technical textiles used in road transportation - application of textiles in Architecture and Construction - application of textiles in Agriculture application of textiles in Sports and Recreation - requirements of sports surfaces structure and manufacturing of tyre cards - basic mechanism of textile composite reinforcement - the application of textile structural composites

Recommended Books

1. Handbook of Industrial Textiles", Ed. Sabit Adanur, Technomic Publishing Co. INC
2. "Handbook of Technical Textiles", Ed. A R Horrcks and S C Anand, Woodhead Publication Ltd, Cambridge, 2000
3. " Textiles for protection, Ed. Richard A. Scott, Woodhead Publication Ltd, Cambridge,
4. " Wearable Electronics and Photonics, Ed. Xiaoming Tao, Woodhead Publication Ltd, Cambridge

Specific Learning Outcomes

1.0 Introduction to Technical Textiles

1.1 Definition of Technical Textiles

1.2 State the difference between apparels and technical textiles

1.3 Classify technical textiles based on the field of application

1.4 Explain the scope of textile fibres for use in Technical applications

1.5 Explain different yarn manufacturing technologies of producing technical yarns

1.6 Explain different fabric structures (woven, knitted and nonwoven) used for technical applications

1.7 Explain various finishes and coatings for fabrics for Technical applications

1.8 Explain the scope and utility of various technical textiles

1.9 Explain the applications of Nonwovens in Technical Textiles

2.0 Textiles in Filtration

2.1 Basics of filtration

2.1.1 Mention the need / importance for filtration

2.1.2 Classify the types of filtration

2.1.3 Mention several ways of liquid filtration

2.1.4 List the types of industrial filters available

2.1.5 State the advantages of using textiles for filtration

2.1.6 Explain the scope of textiles for filtration in various industries

2.1.7 Classify the types of filtration equipment and mention the uses

2.1.8 List the fibres used for various filtration purposes

2.2 Liquid filtration

2.2.1 Mention several ways of solid – liquid filtration

2.2.2 Mention the fibres used for liquid filtration

2.2.3 Mention the fabric structures used for liquid filtration

2.2.4 State the advantages of fabric filters

2.3 Aerosol filtration

2.3.1 Define the term aerosol filtration

2.3.2 State the importance of Aerosol filtration

2.3.3 Mention different techniques of dust collection

2.3.4 Classify different mechanisms of aerosol filtration

2.3.5 State the advantages of fabric filters in aerosol filtration

2.3.6 State the advantages of nonwoven filters over woven filters

2.3.7 Explain the theory, principles and process of dust collection in aerosol filtration

2.3.8 Explain the types fabric cleaning mechanisms

2.3.9 List the considerations in selection and design of fabric filters

2.3.10 Explain the various factors influencing filtration efficiency

3.0 Geo Textiles

3.1 Define geo synthetics and geo textiles

3.2 Classify geo synthetics

3.3 Explain basic functions of geo textiles

3.4 Explain the application fields of geo textiles based on their functions

3.5 Explain the structure and uses of different types of geo synthetics

3.6 List the properties of Geo Textiles

3.7 State the advantages of Geo textiles made by Jute.

4.0 Medical Textiles

4.1 Mention the Reasons For use of textiles in medical purposes

4.2 Classify Medical synthetics

4.3 Explain the product, fibre type and manufacturing system of Non implantable medical textile.

4.4 Explain the product, fibre type and manufacturing system of implantable medical textile

4.5 Explain the product, fibre type and manufacturing system of Health care Hygiene products

4.6 Explain the fibre type and construction of suture

4.7 Explain extra corporeal devices

4.8 State the requirements of fibres for medical textiles

5.0 Military and Protective Textiles

5.1 Explain the characteristics of inherently flame retardant fibres

5.2 Explain the process of flame retardation of conventional textile fibres

5.3 Mention the types of water proof breathable fabrics

5.4 Explain the application of textiles for survival

5.5 State the physical requirements of military textiles

5.6 State the environmental requirements of military textiles

5.7 State the requirements of military textiles for heat , Flame and hazards

5.8 Explain the requirements,fibre type and manufacture systems of ballistic textile

5.9 List typical military textiles

6.0 Other Industrial Textiles

6.1 State the requirements of textiles for transportation

6.2 Explain various technical textiles used in road transportation

6.3 Explain the application of textiles in Architecture and Construction

6.4 Explain the application of textiles in Agriculture

6.5 Explain the application of textiles in Sports and Recreation

6.5.1 State the requirements of sports surfaces

6.6 Explain the structure and manufacturing of tyre cards

6.7 Explain basic mechanism of textile composite reinforcement

6.8 Explain the application of textile structural composites

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Define and identify the scope of technical textiles	R/U	1,2	8
CO2	Illustrate the applications of textiles in filtration	R/U	1,2	10
CO3	Classify geo textiles and explain the functions and applications of geo textiles	R/U	1,2,6	8
CO4	Classify the medical textiles and illustrate applications of textiles in medical field	R/U	1,2,6	12
CO5	Illustrate the applications of textiles in military and protective applications	R/U	1,2	9
CO6	Illustrate the applications of textiles in agriculture, sports	R/U	1,2	13
				60

C18-TT-504 E(C)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-I
DTT– V SEMESTER EXAMINATION

TECHNICAL TEXTILES

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define the term Technical Textiles
2. Write any two applications of Non woven in technical textiles
3. Define the term 'aerosol filtration'
4. Write the types of filtration

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5 (a) State the difference between Apparel and Technical textiles

(OR)

(b)Classify technical textiles based on the field of application

6. (a) State the advantages of using textiles for filtration

(OR)

(b) State the importance of Aerosol filtration

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a)Explain the scope and utility of various technical textiles

(OR)

(b)Explain the application of Non woven in technical textiles

8. (a)Explain the scope of textiles for filtration in various industry

(OR)

(b)Explain the various factors influencing filtration efficiency

C18-TT-504 E(C)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-II
DTT– V SEMESTER EXAMINATION

TECHNICAL TEXTILES

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define the term'' Geo synthetics''
2. Define the term'' Geo textiles''
3 .What is ''medical synthetics''
4.Write any two uses of textiles in medical purpose

PART-B

02X03=06

Instructions : 1. Answer any TWO **questions**.
2. Each question carries **THREE** marks.

5. (a) State the advantages of Geo textiles made by jute

(OR)

(b)Explain basic functions of geo textiles

6. (a) State the requirements of fibres for medical textiles

(OR)

(b) Explain extra corporeal devices

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7 (a) Explain the application fields of geo textiles based on their functions

(OR)

(b) Explain the structure and uses of different types of geo synthetics

8 (a)Explain the product fibre type and manufacturing system of Non implantable medical textile

(OR)

(b) Explain the product, fibre type and manufacturing system of Health care Hygiene products

C18-TT-504 E (C)

BOARD DIPLOMA EXAMINATION, (C-18)
END MODEL EXAM PAPER
DTT– V SEMESTER EXAMINATION
TECHNICAL TEXTILES

*Time :*2 Hours] [Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define the term ‘’aerosol filtration’’
2. Define geo synthetics and geo textiles
3. What is Medical synthetics
4. Write basic filtration
5. What type of fibre to be used in manufacture system of ballistic textile
6. Write any two typical military textiles
7. Write any two technical textiles used in road transportation
8. What is the importance of tyre cord

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **THREE** marks.

9. (a)Explain the types fabric cleaning mechanism

(OR)

(b)Explain the characteristics inherently flame retardant fibres

10. (a)Explain the fibre type and construction of suture

(OR)

(b) Explain the various technical textiles used in road transportation

11. (a) Explain the application of textiles survival

(OR)

(b)Explain the process of flame retardation of conventional textile fibres

12. (a)Explain the structure and manufacture of tyre cards

(OR)

(b) Explain the application of textiles in architecture and construction

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13. (a)Explain the application of Non woven's in technical textiles

(OR)

(b)Explain the process of flame retardation of conventional textile fibres

14. (a)Explain the product fibre type and manufacturing system of implantable medical textile

(OR)

(b) Explain the applications of textiles in Agriculture

15. (a)Explain the requirement of military textiles for heat ,flame and hazards

(OR)

(b)Explain the requirement fibre type and manufacture system of ballistic textile

16. a)Explain the application of textiles in sports and recreation

(OR)

(b)explain the basic mechanism of textile composite reinforcement

18TT-505 E(A)- PROCESS & QUALITY CONTROL IN SPINNING

Course Title :	**Process and Quality Control in Spinning**	Course Code	**18TT-505E(A)**
Semester	**V**	Course group	**Core**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

In spinning process the fibre is gradually converted into the final product, i.e. yarn. The process of conversion starts with the purchasing of raw material and is followed by mixing, opening and cleaning, carding, drawing and doubling, combing, roving and yarn forming. The yarn, which is to be sold in the domestic and/or international markets, should be of high quality. Additionally, to get more profits, the organization should produce yarn at lowest cost and should be able to sell the yarn at higher price. This requires proper selection of raw material, and all the processes to be controlled strictly for higher production, best quality and lowest costs of production. The maintenance of the machines also is an important factor for this. Therefore, the students should have through knowledge of 'process control in

spinning and maintenance'. This subject imparts the students the knowledge of selection of raw material and the controlling the processes by using correct process parameters and settings etc. for the targeted achievements. It also deals with the methods to reduce the waste of material in processes and to increase life of accessories by correct ways of maintenance of all types of machines used in different processes.

Pre Requisites

This course require the knowledge of basic knowledge on various departments of spinning

Course Outcomes

At the end of the course, student will have the ability to

CO1	Explain the importance of process control in spinning and setting the norms
CO2	State the fibre property norms for different counts
CO3	Identify defects in carding and combing and finding remedies
CO4	Identify defects in Speed frame and draw frame and means of controlling them
CO5	Identifying factors effecting strength and end breakages
CO6	Summaries the quality management systems

Course Content

1. **Introduction to Process Control in Spinning** ***Duration: 9 Periods (L:7 – T:2)***

   Importance of process control in spinning -Importance, estimation and control of yarn realization -Norms for yarn realization. Method of process control- various departments of spinning-Method of setting the norms of productivity. Methods of adjustment of stock in process-Establishing the standards or norms.-Key Variables for process control-Taking corrective action-Machinery audit and Setting norms and schedules of checks -Adjustment to allowance for hank required-Account for reusable soft waste.

2. **Process Control in Blow room and Card** ***Duration: 9 Periods (L:7– T:2)***

   fiber properties for different counts -Norms of mixing quality for different counts-Importance and methods of control of mixing quality & cost-FQI & CQI & its importance- cleaning efficiency -Identify lap regularity and quality -Importance & control of lap regularity & quality-different waste materials in blow room-Norms for waste & cleaning efficiency etc-Effect of relative humidity and temperature on machine performance and process waste -Identify the defects in carding -Define neps and methods of measurement -neps are in carding

-Identify remedies for nep formation in carding- effect of carding parameters on nep formation- theory of formation of fibre hooks in carding - reasons for variations in sliver count-Define- transfer efficiency- Cleaning efficiency-Different Methods of Control of waste-Effect of relative humidity and temperature on machine performance and process waste

3. **Process Control in Combing, Draw frame and Speed Frame** ***Duration: 9 Periods (L:7 – T:2)***

Effect of different settings on noil-Comparison of methods of Lap preparation for comber-Evaluation of the performance of comber- Control of comber waste and sliver irregularity-Define Fractionating efficiency of comber-Effect of relative humidity and temperature on machine performance and process waste - influence of feed stock parameters on combing process-influence of machine components and settings on combing -factors governing the Comber waste % -ethods of Control of comber noil -principle of ideal roller drafting-Identify the irregularity of draw frame sliver - Control of regularity on Draw Frame- working principle of auto levelling on a card-Draw frame sliver defects and remedies- important quality parameters measured in Draw frame- norms for U% and CV% of Draw frame sliver-ffect of relative humidity and temperature on machine performance and process waste-methods of Control of stretch at Speed Frame-Methods of Control of regularity on Speed Frame- Defects in roving packages-causes and remedies- Effect of relative humidity and temperature on machine performance and process waste

4. **Process Control in Ring frame** ***Duration: 9 Periods (L:7– T:2)***

Causes, remedies and their control End breaks in ring spinning-Effect, causes and remedies for Yarn faults and package defects-Factors affecting yarn strength-Control of yarn strength: Routine control of strength, within and between strength variation, causes and remedies-Control of yarn evenness and imperfections- Control of count within and between count variation, causes and remedies-Control of waste -(Pneumaphil, bonda, hard & soft waste) - Effect of relative humidity and temperature on machine performance and process waste -Effect of twist on yarn characteristics -Different yarn faults due to raw material-Different faults due to spinning machine-Causes of yarn hairiness.

5. **Process Control in and winding** ***Duration: 12 Periods (L:9– T:3)***

splice and its quality control-effect, causes and rectification of common yarn faults yarn package defects -methods of control of yarn imperfections- and evenness-package quality with respect to all package faults-classification of the yarn faults as per Uster classmate – II - reasons for short thick faults, long thick faults and long thin faults - factors influencing classimat faults - methods to reduce classimat faults-effect of relative humidity and temperature on machine performance and process waste -Indices of Productivity – measurement of productivity -various means to improve Productivity in Spinning.

6. Process control in Quality Management Systems *Duration: 12Periods (L:9 – T3)*

Concept of quality-importance of quality-subjective and objective assessment of quality-Definitions of the Terms – quality, grade, quality control, product quality control, process quality control, quality assurance, quality management -elements of quality management - divisions of cost of quality- quality costs in relation to the garment manufacturing - benefits of standards- importance of standards-sources of standards for textiles-Quality Management Systems - ISO 9000 Standards-basic elements of TQM- quality improvement program by Kaizen- quality principles of 5 S system-the concept of quality circles-features of quality circles -Seven tools of quality Improvement- seven QC tools with an illustrative examples - Flow chart, Cause and effect diagram, Pareto diagram, Check sheets, Histogram, Scatter diagram, Run charts

Recommended Books

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1. Technology of Short Staple Spinning – Klein , Vol – I to IV
2. Essential facts in Spinning – TK Pattabhiraman
3. Quality Control in Spinning – SITRA
4. Spinning Tablets – Textile Association
5. Advances in Technology of Yarn Production – R Chatopadyaya, NCUTe, NewDelhi

Specific Learning Outcomes

Upon completion of the course a student shall be able to

1.0 Introduction to Process control in Spinning

1.1 Explain the importance of process control in spinning
1.2 Explain about Importance, estimation and control of yarn realization.
1.3 Write the Norms for yarn realization.
1.4 Explain Method of process control in various departments of spinning
1.5 Explain Method of setting the norms of productivity.
1.6 Describe the methods of adjustment of stock in process
1.7 How to establish the standards or norms.
1.8 List Key Variables for process control.
1.9 How to take corrective action
1.10 Explain machinery audit and Setting norms and schedules of checks
1.11 How to give adjust allowance for hank required.
1.12 How to write account for reusable soft waste.

2.0 Process Control in Blow room and Card

2.1 State the fiber properties for different counts
2.2 Write the norms of mixing quality for different counts
2.3 State the importance and methods of control of mixing quality & cost
2.4 State the importance of FQI & CQI
2.5 Calculate cleaning efficiency
2.6 Identify lap regularity and quality
2.7 Importance & control of lap regularity & quality.

2.8 List different waste types
2.9 Write the Norms for waste & cleaning efficiency etc
2.10 Explain the effect of relative humidity and temperature on machine performance and process waste
2.11 Identify the defects in carding
2.12 Define neps and methods of measuring neps
2.13 Explain how neps are formed in carding
2.14 Identify remedies for nep formation in carding
2.15 Explain the effect of carding parameters on nep formation
2.16 Explain the theory of formation of fibre hooks in carding
2.17 Mention the reasons for variations in sliver count
2.18 Define transfer efficiency.
2.19 Define and calculate Cleaning efficiency.
2.20 Different Methods of Control of waste
2.21 Effect of relative humidity and temperature on machine performance and process waste

3.0 Process control in Combing Process Control in Draw Frame and Speed Frame

3.1 Explain effect of different settings on noil
3.2 Comparison of methods of Lap preparation for comber.
3.3 Method of Evaluation of the performance of comber.
3.4 Methods of Control of comber waste and sliver irregularity.
3.5 Define Fractionating efficiency of comber.
3.6 Effect of relative humidity and temperature on machine performance and process waste
3.7 Explain the influence of feed stock parameters on combing process
3.8 Explain the influence of machine components and settings on combing
3.9 List the factors governing the Comber waste %
3.10 Explain the methods of Control of comber noil
3.11 State the principle of ideal roller drafting
3.12 Identify the irregularity of draw frame sliver
3.13 Methods of Control of regularity on Draw Frame.
3.14 Explain the working principle of auto levelling on a card.
3.15 Mention the Draw frame sliver defects and remedies.
3.16 Mention the important quality parameters measured in Draw frame.
3.17 Mention the norms for U% and CV% of Draw frame sliver.
3.18 Effect of relative humidity and temperature on machine performance and process waste
3.19 Explain the methods of Control of stretch at Speed Frame.
3.20 Explain the methods of Control of regularity on Speed Frame.
3.21 Mention Defects in roving packages and state the causes and remedies.
3.22 Effect of relative humidity and temperature on machine performance and process waste

4.0 Process Control in Ring Frame

4.1 Explain causes, remedies and their control End breaks in ring spinning:
4.2 Explain the factors affecting yarn strength.
4.3 State the causes of yarn strength variation, causes and remedies.
4.4 Explain about routine control of strength and its variation
4.5 Explain the causes of yarn count variation
4.6 Explain about measures to control yarn count variations.
4.7 Effect of relative humidity and temperature on machine performance and process waste
4.8 Explain the effect of twist on yarn characteristics
4.9 Explain about Control of yarn waste - (Pneumaphil, bonda,hard& soft waste)
4.10 Explain different yarn faults due to raw material
4.11 Explain different faults due to spinning machine
4.12 Explain the causes and factors effecting yarn hairiness

4.13 Explain the measure to reduce yarn hairiness

5.0 Process control in winding and control of Yarn quality

5.1 Explain splice and its quality control
5.2 Explain the effect, causes and rectification of following common yarn faults
5.3 Explain the effect, causes and rectification following yarn package defects
5.4 Explain the methods of control of yarn imperfections
5.5 Explain the methods of Control of yarn evenness
5.6 Explain package quality with respect to all package faults.
5.7 Classify the yarn faults as per Uster classmate – II
5.8 State the reasons for short thick faults
5.9 State the reasons for long thick faults
5.10 State the reasons for long thin faults
5.11 List the factors influencing classimat faults
5.12 Explain he methods to reduce classimat faults
5.13 Effect of relative humidity and temperature on machine performance and process waste
5.14 Definition of Indices of Productivity.
5.15 Describe the method of measuring productivity
5.16 Explain various means to improve Productivity in Spinning.

6.0 Process control in Quality Management Systems

6.1 Introduction to Quality
- 6.1.1 Explain the concept of quality
- 6.1.2 Explain the importance of quality
- 6.1.3 State the difference between subjective and objective assessment of quality.
- 6.1.4 State the difference between the quality and the grade
- 6.1.5 Define the terms – quality control, product quality control and process quality control, quality assurance, quality management.
- 6.1.6 Explain various elements of quality management
- 6.1.7 Mention the divisions of cost of quality
- 6.1.8 Explain various quality costs in relation to the garment manufacturing
- 6.1.9 Mention the benefits of standards
- 6.1.10 State the importance of standards
- 6.1.11 Mention the sources of standards for textiles

6.2 Quality Management Systems
- 6.2.1 Explain various elements (clauses) of ISO 9000 Standards
- 6.2.2 State the advantages of ISO 9000 certification
- 6.2.3 Explain the basic elements of TQM
- 6.2.4 Explain the quality improvement program by Kaizen
- 6.2.5 Explain the quality principles of 5 S system
- 6.2.6 Explain the concept of quality circles
- 6.2.7 State the features of quality circles

6.3 Seven tools of quality Improvement
- 6.3.1 List seven tools of quality control
- 6.3.2 Explain the following seven QC tools with an illustrative example
- 6.3.3 Flow chart
- 6.3.4 Cause and effect diagram
- 6.3.5 Pareto diagram
- 6.3.6 Check sheets
- 6.3.7 Histogram
- 6.3.8 Scatter diagram
- 6.3.9 Run charts

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Explain the importance of process control in spinning and setting the norms	R/U	1,2	8
CO2	State the fibre property norms for different counts	R/U	1,2	10
CO3	Identify defects in combing, draw frame and simplex	R/U	1,2,6	8
CO4	Identifying factors effecting strength and end breakages	R/U	1,2,6	12
CO5	Measure the productivity in winding	R/U	1,2	9
CO6	Summaries the quality management systems	R/U	1,2	13
				60

C18-TT-505E (A)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM -I
DTT– VI SEMESTER EXAMINATION
PROCESS & QUALITY CONTROL IN SPINNING

Time: I Hours Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. How to establish the standards or norms in process control in spinning
2. Write the Norms for yarn realization
3. Write the norms of mixing quality for different counts
4. State the importance of FQI & CQI

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **THREE** marks.

5. (a) Explain the importance of process control in spinning

OR

(b)Explain about Importance, estimation and control of yarn realization

6. (a) State the importance and methods of control of mixing quality & cost

OR

(b) Write the Norms for waste & cleaning efficiency

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.
2. Each question carries FIVE marks.

17. (a) Explain Method of process control in various departments of spinning

OR

(b)Explain Method of setting the norms of productivity

8. (a) Explain how neps are formed in carding

(OR)

(b Explain the effect of carding parameters on nep formation

C18-TT-505 E (A)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM -II
DTT– VI SEMESTER EXAMINATION
PROCESS & QUALITY CONTROL IN SPINNING

Time: I Hours Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define Fractionating efficiency of comber
2. List the factors governing the Comber waste
3. State the principle of ideal roller drafting
4. Methods of Control of regularity on Draw Frame

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **THREE** marks.

5. (a). Explain effect of different settings on noil

OR

(b)Explain the influence of feed stock parameters on combing process

OR

6 (a). Explain the working principle of auto levelling on a card

OR

(b).Explain the methods of Control of stretch at Speed Frame.

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.
2. Each question carries FIVE marks.

7. (a) Explain the influence of machine components and settings on combing

OR

(b).Explain the methods of Control of comber noil

8. (a) Explain the working principle of auto levelling on a card.

(b) Explain the methods of Control of stretch at Speed Frame.

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C18-TT-505E (A)

BOARD DIPLOMA EXAMINATION (C-18)
END MODEL QUESTION PAPER
DTT– VI SEMESTER EXAMINATION
PROCESS & QUALITY CONTROL IN SPINNING

Time: 2 Hours Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. List Key Variables for process control
2. Define Fractionating efficiency of comber
3. State the causes of yarn strength variation, causes and remedies
4. List different waste types
5. State the causes of yarn strength variation, causes and remedies
6. List the causes of yarn count variation
7. Classify the yarn faults as per Uster classimat – II
8. State the reasons for short thick faults

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **THREE** marks.

9. (a) Explain how neps are formed in carding

(OR)

(b) Explain causes, remedies and their control End breaks in ring spinning

10 (a) Explain the working principle of auto levelling on a card

(OR)

(b) Explain splice and its quality control

11. (a) Explain about routine control of strength and its variation

(OR)

(b) Explain the causes of yarn count variation

12. (a) Explain the effect, causes and rectification of following common yarn faults

OR

(b) Explain the methods of Control of yarn evenness

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13 (a Explain the importance of process control in spinning

(OR)

(b) Explain the factors affecting yarn strength.

14 (a) Explain the influence of machine components and settings on combing

(OR)

(b) Explain package quality with respect to all package faults.

15. (a) Explain the effect of twist on yarn characteristics

OR

(b). Explain about Control of yarn waste

16. (a) Explain the methods of control of yarn imperfections

OR

(b) Explain the effect, causes and rectification following yarn package defects

18TT-505 E(B) - PRCOESS AND QUALITY CONTROL IN WEAVING

Course Title :	**Process & Quality Control in Weaving**	Course Code	**18TT-505E(B)**
Semester	**V**	Course group	**Core**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

In weaving process the yarn is gradually converted into the final product, i.e. fabric. The process of conversion starts with the bringing the raw material i.e. yarn and it is followed by winding. warping, sizing. Drawing in and fabric forming (weaving). In today's world of high competition, the fabric should be of high quality. Additionally to get more profits, the organization should produce the fabrics at a lowest cost and should be able to sell the fabrics at higher price. This requires proper selection of raw material, and all the processes to be controlled optimally for higher production best quality and lowest

costs of production. In this mission, the maintenance of the machines also plays an important role. With these views, this subject has been introduced.
This subject imparts the student knowledge of selection of raw material and the control of the processes by using correct process parameters and settings etc. for the targeted achievements. It also deals with the methods to reduce the waste of material in processes and to increase life of equipment by planned maintenance.

Pre Requisites

This course require the knowledge of basic knowledge Weaving

Course Outcomes

At the end of the course, student will have the ability to

CO1

Course Content

CO2 find the factors affecting productivity at warping

CO3 Understand set preparation and identify sizing ingredients and their proportions

CO4 Control the productivity in loom shed

CO5 Control the fabric quality

CO6 Identify the elements of quality management systems

1. **Process Control for Weaving** ***Duration: 9 Periods (L:7 – T:2)***

setting the norms of productivity -Approach to process control, methodology of direct control.- Establishing the standards or norms - Collection and Interpretation of Data for process control - Key Variables for process control - Taking corrective action - Machinery audit - Setting norms and schedules of checks

2. **Process Control in Warping** ***Duration: 9 Periods (L: 7– T:2)***

Scope and approach of process control - Performance in warping - Minimizing end breaks in warping Controlling quality of warper's beams & their sizes -Calculation of production and controlling productivity (causes) - Temperature and relative humidity.

3. **Process Control in Sizing** ***Duration: 9 Periods (L: 7– T: 2)***

Scope and approach of process control - Choice of size recipe and size pick-up preparation of size paste, cooking & care to be taken -Control of size pick up: Determination of size recipe, pick –up and control of sizing conditions for pickup - Control of yarn stretch at all Zones of sizing machine (Creel, wet zone, drying zone, splitting, winding zone) and measurement of stretch -Control of size beam quality their sizes density, broken ends, missing ends, crossed ends, sticky ends, defective selvedges. Additional elements to improve weavability: Dry steaming of warp sheet. Foam pads After waxing. Control of productivity Calculations for Control of size loses - Temperature and relative humidity

4. **Process Control in Drawing in and Loom shed productivity** ***Duration: 9 Periods (L:7 – T:2)***

Scope and approach of process control- Control of loom speed for group and individual drive, factors affecting it & its control (loom condition) - Control of loom efficiency, Factor affecting loom efficiency -Control of loom stops due to warp breaks -Control of loom stops due to weft breaks and shuttles changes -Control of loom stops due to mechanical failure, loom tuning miscellaneous stop. Methods to assess loom performance and control of efficiency through snap technique calculation of minimum rounds of snaps - Optimum loom allocation: 1) for maximum operative efficiency 2) for minimum cost of production 3) for maximum gross profits. - Temperature and relative humidity.

5.* Process control for Fabric Quality** ***Duration: 12 Periods (L:9 – T:34)

Scope of control & approach of process control -grey fabric inspection systems -causes and remedies for warp defects and weft defects in the fabric - Quality standards for export fabric grading systems Define the term cover factor and give the formula - methods of improving the cover of the fabrics -Control of process and incidental waste in winding, warping, sizing, pirn winding, and weaving - effect of temperature and relative humidity.

6.* Quality Management in Textiles** ***Duration: 12 Periods (L:9 – T:34)

Concept of quality-importance of quality-subjective and objective assessment of quality-Definitions of the Terms – quality, grade, quality control, product quality control, process quality control, quality assurance, quality management -elements of quality management -divisions of cost of quality- quality costs in relation to the garment manufacturing - benefits of standards-importance of standards-sources of standards for textiles-Quality Management Systems - ISO 9000 Standards-basic elements of TQM- quality improvement program by Kaizen- quality principles of 5 S system-the concept of quality circles-features of quality circles -Seven tools of quality Improvement- seven QC tools with an illustrative examples -Flow chart, Cause and effect diagram, Pareto diagram, Check sheets, Histogram, Scatter diagram, Run charts

Recommended Books

1. Modern Preparation and Weaving Machinery – A. Ormorod, Woodhead Publishers Pvt Ltd
2. Process Control in Weaving – MG Kimothi, PD Patilwal, ATIRA Ahemedabad
3. Weaving Calculations – Senguptha, DB Taraporewala & Sons , Mumbai
4. Warping, Sizing and Loomshed – Maintenance Manuals
5. Weaving Machinery, Mechanics and Management – Talukdar, Mahajan Publications

Specific Learning Outcomes

1.0 Systems of Process control for weaving

1.1 Identify the method of setting the norms of productivity
1.2 Understand the approach to process control, methodology of direct control..
1.3 Establish the standards or norms.
1.4 Collect and interpret the data for process control.
1.5 Identify key variables for process control.
1.6 Take the corrective action
1.7 Identify the parameters of machinery audit
1.8 Set norms and schedules of checks

2.0 Process control in warping

2.1 Identify the scope and approach of process control
2.2 Write the causes of end breaks in warping

2.3 Explain the causes and remedies of various defects in warp beam
2.4 Write the measures to reduce waste in warping
2.5 Explain the factors influencing productivity in warping
2.6 Find the Performance in warping
2.7 Minimize end breaks in warping
2.8 Control quality of warper's beams & their sizes.
2.9 Calculate production and controlling productivity (causes)
2.10 Explain effect of temperature and relative humidity.

3.0 Process control in sizing

3.1 Identify the scope and approach of process control
3.2 Find the choice of size recipe and size pick-up
3.3 Prepare size paste and related cares to be taken.
3.4 Determine size recipe, pick –up
3.5 control of sizing conditions for pickup.
3.6 Control yarn stretch at all Zones of sizing machine (Creel, wet zone, drying zone, splitting, winding zone) and measurement of stretch.
3.7 Control size beam quality their sizes density, broken ends, missing ends, crossed ends, sticky ends, and defective selvedges.
3.8 Find out additional elements to improve weavability Dry steaming of warp sheet. Foam pads. After waxing.
3.9 Control productivity Calculations for Control of size loses
3.10 Explain effect of temperature and relative humidity.

4.0 Process control in Drawing in & loom shed with respect to productivity

4.1 Understand drawing-in process & its special requirements.
4.2 Identify scope and approach of process control,
4.3 How to minimize end breaks and mechanical l stoppages
4.4 Identify scope and approach of process control.
4.5 How to select, care, use of all types of healds and reeds
4.6 How to care in dressing and knotting,
4.7 How to care in drawing in procedure.
4.8 Understand the use of drop pins
4.9 Explain effect of temperature and relative humidity.
4.10 Identify Scope and approach of process control.
4.11 Write the factors affecting and control of loom conditions (loom speed for group and individual drive)
4.12 How to control loom efficiency, Factor affecting loom efficiency.
4.13 How to control loom stops due to warp breaks.
4.14 Understand Care and selection shuttle
4.15 How to control loom stops due to weft breaks and shuttles changes.
4.16 How to control loom stops due to mechanical failure, loom tuning miscellaneous stop.
4.17 Know the methods to assess loom performance and control of efficiency through snap technique calculation of minimum rounds of snaps
4.18 Know about optimum loom allocation: 1) for maximum operative efficiency 2) for minimum cost of production 3) for maximum gross profits.
4.19 Explain effect of temperature and relative humidity.

5.0 Process control in loom shed with respect to fabric quality

5.1 Identify the scope of control & approach of process control
5.2 Perform grey fabric inspection systems.
5.3 Explain the causes and remedies for warp defects in the fabrics
5.4 Explain the causes and remedies for weft defects in the fabric

5.5 Discuss the causes and remedies for fabric defects
5.6 Identify the Quality standards for export fabric
5.7 Explain different grading systems Define the term cover factor and give the formula
5.8 Explain different methods of improving the cover of the fabrics
5.9 Control process and incidental waste in winding, warping, sizing, pirn winding, and weaving.
5.10 Explain effect of temperature and relative humidity.

6.0 Quality Management Systems

6.1 Introduction to Quality
- 6.1.1 Explain the concept of quality
- 6.1.2 Explain the importance of quality
- 6.1.3 State the difference between subjective and objective assessment of quality.
- 6.1.4 State the difference between the quality and the grade
- 6.1.5 Define the terms – quality control, product quality control and process quality control, quality assurance, quality management.
- 6.1.6 Explain various elements of quality management
- 6.1.7 Mention the divisions of cost of quality
- 6.1.8 Explain various quality costs in relation to the garment manufacturing
- 6.1.9 Mention the benefits of standards
- 6.1.10 State the importance of standards
- 6.1.11 Mention the sources of standards for textiles

6.2 Quality Management Systems
- 6.2.1 Explain various elements (clauses) of ISO 9000 Standards
- 6.2.2 State the advantages of ISO 9000 certification
- 6.2.3 Explain the basic elements of TQM
- 6.2.4 Explain the quality improvement program by Kaizen
- 6.2.5 Explain the quality principles of 5 S system
- 6.2.6 Explain the concept of quality circles
- 6.2.7 State the features of quality circles

6.3 Seven tools of quality Improvement
- 6.3.1 Explain the following seven QC tools with an illustrative example
- 6.3.2 Flow chart
- 6.3.3 Cause and effect diagram
- 6.3.4 Pareto diagram
- 6.3.5 Check sheets
- 6.3.6 Histogram
- 6.3.7 Scatter diagram
- 6.3.8 Run charts

Suggested E-Learning References

1. www.textilelearner.blogspot.com
2. www.nptel.ac.in
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com

7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	understand the importance of process control in weaving	R/U	1,2	9
CO2	find the factors affecting productivity at warping	R/U	1,2	9
CO3	Understand set preparation and identify sizing ingredients and their proportions	R/U	1,2,6	9
CO4	Control the productivity in loom shed	R/U	1,2,6	9
CO5	Control the fabric quality	R/U	1,2	12
CO6	Identify the elements of quality management systems	R/U	1,2	12
				60

C18-TT-504E (B)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-I
DTT– V SEMESTER EXAMINATION

PROCESS AND QUALITY CONTROL IN WEAVING

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. What are the key variables for process control in weaving?
2. What is the difference between preventive action and corrective action?
3. Write the causes of end breaks in warping
4. Write any two measures to reduce end breaks in warping

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.

2. Each question carries **THREE** marks.

5. (a) Explain the approaches to process control in weaving
(OR)
(b) Explain about collection of data for process control.

6. (a) Write the measures to reduce waste in warping
(OR)
(b) Explain the factors influencing productivity in warping

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a) Explain about the parameters of machinery audit
(OR)
(b) Explain the procedure of setting the norms and schedules of checks

8. (a) Explain the causes and remedies of various defects in warp beam
(OR)
(b)Explain the effect of temperature and relative humidity in Warping.

C18-TT-505E(B)

C18-TT-504E(B)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM-II
DTT– V SEMESTER EXAMINATION

PROCESS AND QUALITY CONTROL IN WEAVING

*Time :*1 Hours] [Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Write the formula for determining size pick –up
2. Write the parameters of size beam quality
3. Write the requirements of good drawing-in process
4. What are the uses of drop pins

PART-B

02X03=06

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **THREE** marks.

5. (a) Explain about control of sizing conditions for good size pickup.
(OR)
(b) Explain about dry steaming of warp sheet.

6. (a) Explain how to select, care, use of all types of healds and reeds
(OR)
(b) Explain how to control loom stops due to warp breaks.

PART-C

02X5=10

Instructions : 1. Answer any **TWO** questions.
2. Each question carries **FIVE** marks.

7. (a) Explain the methods of improving weavability
(OR)
(b) Explain how yarn stretch is controlled at all Zones of sizing machine

8. (a) Explain the factor affecting loom efficiency.
(OR)
(b)Explain effect of temperature and relative humidity in loom shed.

BOARD DIPLOMA EXAMINATION, (C-18)
DTT– V SEMESTER
END SEMESTER EXAMINATION
PROCESS & QUALITY CONTROL IN WEAVING

*Time :*2 Hours] [Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. What do you understand by the term “process control”
2. What are the standard Temperature and humidity conditions in weaving loom?
3. Write short notes on drop pins
4. Define” pirn build”
5. What are the factors influencing productivity in warping
6. What do you understand by the term “creel”
7. Write about drawing-in process in simple terms.
8. What are the additional improvements to achieve weavability.

PART-B

04X03=12

Instructions : 1. Answer any**FOUR**questions.
2. Each question carries **THREE** marks.

9. (a)What are the measures to be taken for process control in weaving.

(OR)

(b)What are the measures to be taken for process control in warping.

10. (a) Enumerate the measures to be taken for process control in pirn winding.

(OR)

(b) How do you minimize end breaks in warping?

11. (a) Explain the terms size recipe, size pick up.

(OR)

(b) Explain drawing-in process and its special requirements

12. (a) How does a weaver select healds and reeds?

(OR)

(b) Discuss snap technique in brief.

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.
2. Each question carries **FIVE** marks.

13. (a) Explain briefly about the process control in sizing.

(OR)

(b) Write the measures to reduce waste in warping

14. (a) How to Control pirn build, productivity and efficiency in pirn winding machine?

(OR)

(b) Explain effect of temperature and relative humidity in a pirn winding machine.

15. (a) How to control loom stops due to weft breaks and shuttles changes?

(OR)

(b) How to control loom stops due to mechanical failure, loom tuning miscellaneous stop?

16. (a)Explain the causes and remedies for weft defects in the fabric

(OR)

(b) Explain the causes and remedies for warp defects in the fabrics

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18TT-505E(C) – Process & Quality Control in Apparel Manufacture

Course Title :	**Process & Quality Control in Apparel Manufacture**	Course Code	**18TT-505E(C)**
Semester	**V**	Course group	**Elective**
Teaching Scheme in Periods (L/T/P)	**3:1:0**	Credits	**3**
Methodology	**Lecture + Assignments**	Total Contact Hours	**60 Pds**
CIE Marks	**60 Marks**	SEE	**40 Marks**

Legends: L- Lecture, T- Tutorial, P-Practical

Rationale:

Quality Management in Apparel Industry

Pre Requisites

This course require the knowledge of basic knowledge on Textile Fibres and Elements of yarn manufacture

Course Outcomes

At the end of the course, student will have the ability to

CO1	Inspect the gray fabric and identify defects
CO2	Perform in process inspection in the garment industry
CO3	Test the fabric for properties and compare with norms
CO4	Test the accessories for quality
CO5	List the norms available for textiles and safety measures while making garments
CO6	Summarize the quality management system

Course Content

1. **Basics of Quality and Fabric Inspection** ***Duration: 9 Periods (L:7 – T:2)***

   objective and subjective aspects of quality -factors important to perceived apparel quality - Attributes contributing to apparel quality in consumer mind - Quality of apparel through structural integrity-difference between quality and grade -Objects of raw material inspection - Points to be considered while deciding how much to be inspected- different methods of fabric inspections systems and machines used - correlation between fabric quality and apparel quality - different systems of fabric grading- Four point fabric grading system- Ten point grading system -Define Acceptable Quality Level (AQL)- self descriptive defects in fabric- List and define common fabric defects

2. **In process Inspection** ***Duration: 9 Periods (L: 7– T:2)***

   Various quality controlling points-Quality Control in the following stages of garment construction-Patternmaking -Spreading -Cutting -Sewing- Fusing- Screen-printing- Embroidery- Pressing-Final inspection- Duties and responsibilities of quality inspector

3. **Fabric Testing – I** ***Duration: 9 Periods (L: 7– T: 2)***

Various test parameters cof the woven and knitted fabrics-Different ways of identifying the type of fibre in the fabric -ASTM Norms for Fibre content and Flammability-Evaluation of Soil and stain removal-Evaluation of Fabric stretch properties-Methods for testing of knitted fabrics-Method of testing courses and wales per unit length-Spirality intended for form-fitting apparel-Causes of fabric shrinkage and dimensional changes in garment-Principle of evaluating dimensional changes in the fabric - Durable press evaluation of the fabrics and apparels

4. **Fabric Testing – II** ***Duration: 9 Periods (L: 7 – T:2)***

Testing the sewability of the fabric -Factors influencing strength properties of apparel and related testing -Factors influencing seam strength in woven fabrics - Factors influencing seam strength in knitted fabrics-Causes of Yarn slippage in woven fabrics-Define Bow and Skewness -Yarn severance and Seam Puckering- Reasons for seam puckering-Causes of snagging-Effect of physical properties on puckering

5. **Testing of Accessories , Standards & Product Safety** ***Duration: 12 Periods (L:9– T:3)***

Characteristics in sewing threads to be checked-Methods of testing Fusible Interlining for compatibility, Shrinkage and Bond Strength-Methods of testing Elastic Waist Band-Causes of zipper failures in garment-How to avoid zipper problems in garment-Methods testing Zippers Strength and operability-Checking points in buttons, buckles, loop fasteners and snap fasteners-Durability of finish to wash, colour fastness to dry cleaning, light, crocking, laundering-Elastic Tape: Test for labelled size and resistance to degradation due to laundering-Buttons: Testing of durability of button-Various types of labels attached to garments & content-ASTM Norms for Care labelling- Documentation procedures for Quality Assurance-Different sources of standards- ASTM available standards for specifications of fabrics- ASTM available test methods for fabrics and apparels-About ASTM care labelling system-Probable safety hazards of apparels-About strangulation hazard-About ingestion hazard-About restricted substances in garments-About flammability of apparels

6. **Quality management systems** ***Duration: 12 Periods (L:9 – T:3)***

Concept of quality-importance of quality-subjective and objective assessment of quality-Definitions of the Terms – quality, grade, quality control, product quality control, process quality control, quality assurance, quality management -elements of quality management - divisions of cost of quality- quality costs in relation to the garment manufacturing - benefits of standards- importance of standards-sources of standards for textiles-Quality Management Systems - ISO 9000 Standards-basic elements of TQM- quality improvement program by Kaizen- quality principles of 5 S system-the concept of quality circles-features of quality

circles -Seven tools of quality Improvement- seven QC tools with an illustrative examples - Flow chart, Cause and effect diagram, Pareto diagram, Check sheets, Histogram, Scatter diagram, Run charts

Recommended Books

6. Quality Management Handbook for Apparel Industry – Pradip V Mehta , Newage International Ltd., New Delhi
7. Testing and Quality Management – VK Kothari
8. Evaluation of Apparel Quality – Lehnert Gertud, ASQC Quality Press, USA
9. Principles of Textile Testing – JE Booth
10. Physical Testing of Textiles – BP Saville

Specific Learning Outcomes

1.0 Basics of Quality and Fabric Inspection

1.1 Define the objective and subjective aspects of quality

1.2 List the factors important to perceived apparel quality

1.3 List the Attributes contributing to apparel quality in consumer mind

1.4 Describe Quality of apparel through structural integrity

1.5 State the difference tween quality and grade

1.6 Objects of raw material inspection

1.7 Points to be considered while deciding how much to be inspected

1.8 Explain different methods of fabric inspections systems and the machines used

1.9 Explain the correlation between fabric quality and apparel quality

1.10 List different systems of fabric grading

1.11 Explain Four point fabric grading system

1.12 Explain Ten point grading system

1.13 Define Acceptable Quality Level (AQL)

1.14 Identify various major and minor defects in grey fabric

1.15 List self descriptive defects in fabric

1.16 List and define common fabric defects

2.0 In Process Inspection

2.1 Describe the various quality controlling points

2.2 Explain quality Control in the following stages of garment construction

2.2.1 Pattern making,

2.2.2 Spreading

2.2.3 Cutting

2.2.4 Sewing

2.2.5 Fusing

2.2.6 Screen printing

2.2.7 Embroidery

2.2.8 Pressing

2.3 Final inspection

2.4 List Duties and responsibilities of quality inspector

3.0 Fabric Testing -1

3.1 Describe the various test parameters of the woven and knitted fabrics

3.2 Explain different ways of identifying the type of fibre in the fabric

3.3 State the ASTM Norms for Fibre content and Flammability

3.4 Explain about evaluation of Soil and stain removal

3.5 Explain about evaluation of Fabric stretch properties

3.6 Describe methods for testing of knitted fabrics

3.7 Explain the method of testing courses and wales per unit length

3.8 Explain Spirality intended for form-fitting apparel

3.9 Mention different levels of garment shrinkage

3.10 Explain the causes of fabric shrinkage and dimensional changes in garment

3.11 State the principle of evaluating dimensional changes in the fabric

3.12 Explain about Durable press evaluation of the fabrics and apparels

3.13 Explain testing the sewability of the fabric

4.0 Fabric Testing – II

4.1 Explain factors influencing strength properties of apparel and related testing

4.2 Explain Factors influencing seam strength in woven fabrics

4.3 Explain Factors influencing seam strength in knitted fabrics

4.4 Write the formula for seam efficiency

4.5 List the causes of Yarn slippage in woven fabrics

4.6 Define Bow and Skewness in woven and knitted fabric

4.7 Define needle cutting or Yarn severance, Seam Puckering

4.8 State the Reasons for seam puckering.

4.9 Define snagging

4.10 Define fabric growth in knitted fabric

4.11 List the Causes of snagging

4.12 Explain method of testing snagging

4.13 Describe effect of physical properties on puckering

4.14 Explain rotary drum method testing of fabric wash and wear

5.0 Testing of Accessories and Safety

5.1 Explain the characteristics in sewing threads to be checked

5.2 Explain the methods of testing Fusible Interlining for compatibility, Shrinkage and Bond Strength

5.3 Explain the methods of testing Elastic Waist Band

5.4 List the causes of zipper failures in garment

5.5 Explain how to avoid zipper problems in garment

5.6 Explain the methods testing Zippers Strength and operability

5.7 Explain the checking points in buttons, buckles, loop fasteners and snap fasteners

5.8 Durability of finish to wash, color fastness to dry cleaning, light, crocking, laundering

5.9 Elastic Tape: Test for labeled size and resistance to degradation due to laundering

5.10 Buttons: Testing of durability of button

5.11 Describe the various types of labels attached to garments & content

5.12 State the ASTM Norms for Care labelling

5.13 Explain Documentation procedures for Quality Assurance

5.14 Explain different sources of standards

5.15 List ASTM available standards for specifications of fabrics

5.16 List ASTM available test methods for fabrics and apparels

5.17 Explain about ASTM care labelling system

5.18 State the probable safety hazards of apparels

5.19 Explain about strangulation hazard

5.20 Explain about ingestion hazard

5.21 Explain about restricted substances in garments

5.22 Explain about flammability of apparels

6.0 Quality Management Systems

6.1 Introduction to Quality

6.1.1 Explain the concept of quality

6.1.2 Explain the importance of quality

6.1.3 State the difference between subjective and objective assessment of quality.

6.1.4 State the difference between the quality and the grade

6.1.5 Define the terms – quality control, product quality control and process quality control, quality assurance, quality management.

6.1.6 Explain various elements of quality management

6.1.7 Mention the divisions of cost of quality

6.1.8 Explain various quality costs in relation to the garment manufacturing

6.1.9 Mention the benefits of standards

6.1.10 State the importance of standards

6.1.11 Mention the sources of standards for textiles

6.2 Quality Management Systems

6.2.1 Explain various elements (clauses) of ISO 9000 Standards

6.2.2 State the advantages of ISO 9000 certification

6.2.3 Explain the basic elements of TQM

6.2.4 Explain the quality improvement program by Kaizen

6.2.5 Explain the quality principles of 5 S system

6.2.6 Explain the concept of quality circles

6.2.7 State the features of quality circles

6.3 Seven tools of quality Improvement

6.3.1 List seven tools of quality control

6.3.2 Explain the following seven QC tools with an illustrative example

6.3.3 Flow chart

6.3.4 Cause and effect diagram

6.3.5 Pareto diagram

6.3.6 Check sheets

6.3.7 Histogram

6.3.8 Scatter diagram

6.3.9 Run charts

Suggested E-Learning References

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net
6. https://textilechapter.blogspot.com
7. https://www.onlinetextileacademy.com

CO-PO Mapping Matrix

Course Outcome		CL	Linked PO	Teaching periods
CO1	Inspect the gray fabric and identify defects	R/U	1,2	9
CO2	Perform in process inspection in the garment industry	R/U	1,2	9
CO3	Test the fabric for properties and compare with norms	R/U	1,2,6	9
CO4	Test the accessories for quality	R/U	1,2,6	9
CO5	List the norms available for textiles	R/U	1,2	12
CO6	Take the safety measures while making garments	R/U	1,2	12
				60

C18-TT-505E (C)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM -I
DTT– VI SEMESTER EXAMINATION
Process & Quality Control in Apparel Manufacture

Time: I Hours Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

1. Define the objective and subjective aspects of quality
2. State the difference between quality and grade
3. Define the Screen printing & Embroidery
4. List Duties and responsibilities of quality inspector

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

5. (a) Describe Quality of apparel through structural integrity

OR

(b) Write Points to be considered while deciding how much to be inspected

6. (a) Describe the various quality controlling points

OR

(b) Explain quality Control stages of garment construction Pattern making & Spreading

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.

2. Each question carries FIVE marks.

7. (a Explain different methods of fabric inspections systems and the machines used

OR

(b)Explain the correlation between fabric quality and apparel quality

8. (a) Explain quality Control stages of garment construction Cutting &Sewing

(OR)

(b) Explain quality Control stages of garment construction Fusing &Screen printing

C18-TT-505E (C)

BOARD DIPLOMA EXAMINATION, (C-18)
MID EXAM -II
DTT– VI SEMESTER EXAMINATION
Process & Quality Control in Apparel Manufacture

Time: I Hours Total Marks: 20

PART-A

04X01=04

Instructions : 1. Answer **ALL** questions.

2. Each question carries **ONE** mark.

1. State the ASTM Norms for Fibre content and Flammability
2. State the principle of evaluating dimensional changes in the fabric
3. Write the formula for seam efficiency
4. Define snagging

PART-B

2X3=6

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

5. (a). Describe the various test parameters of the woven and knitted fabrics

OR

(b).Explain different ways of identifying the type of fibre in the fabric

6. (a) Explain factors influencing strength properties of apparel and related testing

OR

(b)Explain Factors influencing seam strength in woven fabrics

PART-C

2X5=10

Instructions : 1. Answer any TWO **questions**.

2. Each question carries FIVE marks.

7. (a) Explain the method of testing courses and Wales per unit length

(OR)

(b) Explain Spirality intended for form-fitting apparel

8. (a) Explain method of testing snagging

(OR)

(b) Explain rotary drum method testing of fabric wash and wear

C18-TT-505E(C)

BOARD DIPLOMA EXAMINATION, (C-18)

END MODEL QUESTION PAPER

DTT– VI SEMESTER EXAMINATION

Process & Quality Control in Apparel Manufacture

Time: 2 Hours Total Marks: 40

PART-A

08X01=08

Instructions : 1. Answer **ALL** questions.

2. Each question carries **ONE** mark.

1. State the difference between quality and grade
2. State the principle of evaluating dimensional changes in the fabric
3. List the causes of zipper failures in garment
4. List self descriptive defects in fabric
5. List the causes of zipper failures in garment
6. State the ASTM Norms for Care labelling
7. List ASTM available standards for specifications of fabrics
8. State the probable safety hazards of apparels

PART-B

04X03=12

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **THREE** marks.

9. (a) Explain Four point fabric grading system

(OR)

(b) Explain Documentation procedures for Quality Assurance

11 (a) Describe methods for testing of knitted fabrics

(OR)

(b) Explain different sources of standards

11. (a) Explain the characteristics in sewing threads to be checked

(OR)

(b)Explain the methods of testing Elastic Waist Band

12. (a) Explain about strangulation hazard

OR

(b) Explain about restricted substances in garments

PART-C

04X5=20

Instructions : 1. Answer any **FOUR** questions.

2. Each question carries **FIVE** marks.

13. (a) Explain different methods of fabric inspections systems and the machines used

(OR)

(b) Explain the checking points in buttons, buckles, loop fasteners and snap fasteners

14. (a) Explain rotary drum method testing of fabric wash and wear

(OR)

(b) Explain about flammability of apparels

15 .(a) Explain how to avoid zipper problems in garment

OR

(b).Explain the methods testing Zippers Strength and operability

16.(a) Explain about ingestion hazard

OR

(b)Explain about ASTM care labelling system

18TT-506P- ADVANCED FABRIC STRUCTRE AND DESIGN LAB PRACTICE

Course Title : Advanced Fabric structure and Design Lab Practice	Course Code : 18TT-506P
Semester : V	Core / Elective: Core
Teaching Scheme in Periods (L/T/P): 15:0:30	Credits : 1.5
Methodology : Lecture + Practical	Total Hours : 60
CIE : 60 Marks	SEE : 40 Marks

Rationale:

The fabrics are to be produced to serve certain end uses. These end uses determine the properties and the quality of the fabric that it should posses. The quality of the fabric depends on its' 'functional' and 'aesthetic' properties. These in turn are governed by raw material selection (fibre), yarn used, fabric construction, structure and texture, and ornamentation of fabric. Some of the end uses emphasis only on the functional aspects and others on both functional and aesthetic aspects. It

brings in, the importance of this subject of the fabric structure, design, and colour. In this subject the students are taught about the advanced methods of fabric design and structure and their production on the looms.

Pre requisites

This course requires the basic knowledge of fabric manufacture and design

Course Outcomes

	Course Outcome	Linked Experiment
CO1	Analyse the commercial woven fabrics for their characteristics and properties	1-9
CO2	Analyse the commercial knitted fabrics for their characteristics and properties	10-13
CO3	Analyse the nonwoven and lace fabrics for their characteristics and properties	14-15

Course Contents

S. No	Contents / Major Topic	Periods
A	Analysis of Commercial woven Fabrics	27
B	Analysis of commercial Knitted fabrics	12
C	Analysis of Nonwoven and lace fabrics	6
	TOTAL	45

Specific Skills to be developed

Intellectual Skills

1. Understand the fabric constructional particulars
2. Analyse the fabric aesthetic characteristics
3. Identifying the fabrics

List of Experiments

Analysis of following fabrics for their structure, characteristics and properties and identifying features

A- Commercial Woven Fabrics

1. Shirting Fabrics
2. Suiting / Trouser fabrics – Cotton
3. Blended fabrics
4. Suit fabric / Blazer Fabrics
5. Track suit fabric
6. Stretch fabric

7. Crepe fabrics
8. Velvet Fabric
9. Canvas Cloth

B- Commercial Knitted fabrics

10. Single jersey fabric (Identification,Unroving, counting of fabric cpi&wpi)
11. Rib fabric (Identification, Unroving,counting of fabric cpi & wpi)
12. Interlock fabric(Identification, Unroving,counting of fabric cpi & wpi
13. Warp Rib Fabric

C- Nonwoven and Lace fabrics

14. Nonwoven Fabric
15. Lace fabric

Reference

1. Advanced Fabric structure and Design – Whatson
2. Fabric Structure and Design – Gokernashan
3. Fabric Structure and Design – J Hayavadana

E Learning Resources & Suggested websites

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com

Suggested student activities

1. Collection of commercial fabrics from the market
2. Short Survey on the commercial fabrics
3. Collection of Information and photographs from the online resources

Rubrics for Assessing Student Activity

S.No	Criteria	Scale					Student Score
		2	4	6	8	10	Example
1	Response to the Activities	Very poor	Poor	good	Very good	Excellent	8
2	Preparation of charts	Very poor	Poor	good	Very good	Excellent	10

	and models						
3	Collection of Information	Very poor Collection	Poor Collection	Good Collection	Very good Collection	Excellently collects	6
4	Team work	Very poor participation	Poor Participation	Active participation	Very Actively participates	Leads the Team	8
						Average	8

CO-PO Mapping Matrix

Course Outcome		Experiment Linked	Cognitive Level	Linked PO	Lab Hours
CO1	Analyse the Shirting fabrics for their characteristics and properties	U/A	U/A	1,2,3,4	
CO2	Analyse the Trouser fabrics for their characteristics and properties	U/A	U/A	1,2,3,4	
CO3	Analyse the Suit fabrics for their characteristics and properties	U/A	U/A	1,2,3,4	
CO4	Analyse the strecth fabrics for their characteristics and properties	U/A	U/A	1,2,3	
CO5	Analyse the Knitted fabrics for their characteristics and properties	U/A	U/A	1,2,3,4	

18TT-507P- APPAREL PRODUCTION TECHNOLOGY LAB PRACTICE

Course Title : Apparel Production Technology Lab Practice	Course Code : **18TT-507P**
Semester : V	Core / Elective : Core
Teaching Scheme in Periods (L/T/P): 15:0:30	Credits : 1.5
Methodology : Lecture + Practical	Total Hours : 60
CIE : 60 Marks	SEE : 40 Marks

Rationale:

This subjects provides the practical knowledge of Apparel production Technology , ability to handle the garment manufacture machines

Pre requisites

This course requires the basic knowledge of garment manufacture process

Course Outcomes

On completion of this course the student will be able to

	Course Outcome	**Linked Experiment**

CO1	Design the Garment pattern	1,2
	Prepare paper pattern and grade it as per the size and making the marker	3-6
CO3	Spread the fabric on lying machine and cut the fabric	7-8
CO4	Join the pieces by sewing of fusing	9-11
CO5	Operate on button stitching and button hole machines	12-15

Course Contents

S. No	Contents / Major Topic	Periods
A	Design of Garment	**6**
B	Pattern drafting, Grading and Marker making	**12**
C	Spreading, Laying and Cutting	**6**
D	Garment Construction and Decoration	**9**
E	Finishing and packing	**12**
	TOTAL	**45**

Specific Skills to be developed

Intellectual Skills

4. Understand the garment to make a pattern
5. Know the pattern grading

Motor Skills

1. Draw the paper patterns
2. Grade the patterns for different sizes
3. Spread the fabric on the spreading table
4. Cut the fabric by hand scissors or using cutting machine
5. Sew the fabric and fuse the interlining
6. To complete button stitch and button hole stitch

List of Experiments

Design of Garment

1) Draw basic Garment Shapes
2) Draw the Simple sketches of different types of garments for Kids, Men and Women

Pattern Drafting, Grading and Marker Making

3) To Prepare paper Pattern for – Men wear (Formal Shirt and Formal Trouser)
4) To Prepare paper Pattern for Ladies' Wear (Salwar and Kameez)
5) Manual Grading of the Pattern (Pattern rules / Using CAD system)
6) Marker making and Calculation of fabric consumption for Men's /Women's Garment

Spreading, Laying and Cutting

7) Spreading of the fabric single / Multiple layers on the spreading table
8) Cutting the fabric as per Paper pattern using Hand Scissors / Any one type of cutting machine

Garment Construction

9) Joining the pieces of fabric patterns on sewing machine to make Garment
10) Fusing of Interlinings (using Fusing machine)
11) Produce Embroidery design on the garment (Hand embroidery / using embroidery machine)

Finishing

12) Button stitching
13) Button hole stitching
14) Pressing by Simple Electric Iron
15) Ironing, Attaching Labels and tags and Packing

Reference

1. Cooklin Gerry - Garment Technology for fashiondesigners -Black well science Ltd , England
2. Harold carr &Barbara latham - The Technology of clothing Manufacture - Om book Service.England
3. Mervinger - Step by step dress making course. - BBC Books , Eng.

E Learning Resources & Suggested websites

1. www.nptel.ac.in
2. www.textilelearner.blogspot.com
3. www.fibre2fashion.com
4. https://www.onlinetextileacademy.com
5. https://www.slideshare.net

Suggested student activities

1. Preparation of charts and Models
2. Collection of Samples from the Industry / Local shops / Domestic fields
3. Collection of small machine parts / accessories from the industry
4. Short Survey and Submission of Report
5. Collection of Brochures from the Industry
6. Analysis of data obtained
7. Collection of information from the library / Journals

8. Collection of Information and photographs from the online resources

Rubrics for Assessing Student Activity

S.No	Criteria	Scale					Student Score
		2	4	6	8	10	Example
1	Response to the Activities	Very poor	Poor	good	Very good	Excellent	8
2	Preparation of charts and models	Very poor	Poor	good	Very good	Excellent	10
3	Collection of Information	Very poor Collection	Poor Collection	Good Collection	Very good Collection	Excellently collects	6
4	Team work	Very poor participation	Poor Participation	Active participation	Very Actively participates	Leads the Team	8
						Average	8

CO-PO Mapping Matrix

Course Outcome		**Experiment Linked**	**Cognitive Level**	**Linked PO**	**Lab Hours**
CO1	Design the Garment style	U/A	U/A	1,2,3,4	6
CO2	Prepare paper pattern and grade it as per the size and making the marker	U/A	U/A	1,2,3,4	12
CO3	Spread the fabric on lying machine and cut the fabric	U/A	U/A	1,2,3,4	6
CO4	Join the pieces by sewing of fusing	U/A	U/A	1,2,3	9
CO5	Operate on button stitching and button hole machines	U/A	U/A	1,2,3,4	12

18TT-508P- TEXTILE CAD LAB PRACTICE

Course Title : **Textile CAD Practice**	Course Code : 18TT-508 P
Semester : V	Core / Elective : Core
Teaching Scheme in Periods (L/T/P): 15:0:30	Credits : 1.5
Methodology : Lecture + Practical	Total Hours : 60
CIE : 60 Marks	SEE : 40 Marks

Rationale:

This subject will give specific application of the developed concept in developing textile design. Innovation, creation with the help of high performance tool of CAD will help the user to transfer his creativity within no time.

Pre requisites

This course requires the basic knowledge of weaves, fabric structure

Course Outcomes

On completion of this course

	Course Outcome	**Linked Experiment**

CO1	Selection of thread spacing & thread diameter in the warp and weft	1-6
CO2	Use of different tools for design development in printing	7-12
CO3	Use of software for creating various woven & printed designs and storing the same for development of design library for further reference.	13-15

Course Contents

S. No	Contents / Major Topic	Periods
A	Color Charts	3
B	CAD designs	12
C	Motif designs	18
D	Designing with print software	15

Specific Skills to be developed

The students will be able to

Intellectual Skills

1. Create textile design with CAD software.
2. Use different motif /colour patterns as per need and end use of textile design.

Motor Skills

1. Operate computer
2. Efficiently use the CAD software to develop appropriate designs as per requirement of customers

List of Experiments

A. COLOUR CHARTS

1) Development of colour charts
   a. Colour modification chart. (Hue, Shade, Tint, Broken)
   b. Pigment theory of colour chart.
   c. Light theory of colour chart.
   d. Apparent change of colour in combination.
   e. Colour harmony,
   f. Colour contrast.

B. PAINED / CAD SOFTWARE

2) Development of striped shirting design
3) Development of checks shirting design
4) Development of extra thread
5) Development of jacquard design

C. MOTIF USING PRINCIPLES OF TEXTILE DESIGN AND CAD SOFTWARE

6) Development of motifs using basic CAD – Natural, Geometrical, Decorative, Abstract
7) Development of textile design with square rectangle base.
8) Development of textile design with half drop base.
9) Development of textile design with diamond base.
10) Development of textile design with ogee base.
11) Development of textile design with satin base.

D. DEVELOPMENT OF TEXTILE DESIGN WITH PRINT SOFTWARE

12) Development of ladies dress material design
13) Development of all over square design
14) Development of kinds wear design
15) Development of home textiles

Reference

4. Shah & Gandhi -Instrumental colour measurement and computer aided colour matching for textiles
   Mahajan Books,Ahmedabad
5. Watson W. Textile design and colour Longmans Greens & co.,
6. Quin Bradly Textile designer at the cutting edge Quin bradly, London
7. Gawand K. D. Colour matching -

Suggested student activities

9. Preparation of charts and Models
10. Collection of Samples from the Industry / Local shops / Domestic fields
11. Collection of small machine parts / accessories from the industry
12. Short Survey and Submission of Report
13. Collection of Brochures from the Industry
14. Analysis of data obtained
15. Collection of information from the library / Journals
16. Collection of Information and photographs from the online resources

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4	Team work	Very poor participation	Poor Participation	Active participation	Very Actively participates	Leads the Team	8
						Average	8

CO-PO Mapping Matrix

Course Outcome		Experiment Linked	Cognitive Level	Linked PO	Lab Hours
CO1	Color Charts	1	U/A	1,2,3,4	18
CO2	Cad designs	2-4			
CO3	Motif designs	5-10	U/A	1,2,3,4	18
CO4	Designing with print software	11-15	U/A	1,2,3,4	9

PROGRAMMING IN C LAB PRACTICE

Course Title:	**Programming in C lab practice**	Course Code	**18TT-509P**
Semester	**V**	Course Group	**practical**
Teaching Scheme in Periods(L: T:P)	**0:0:3**	Credits	**1.5**
Methodology	**Practical**	Total Contact periods:	**45Pds**
CIE	**60 Marks**	SEE	**40 Marks**

Pre requisites

Basic knowledge of Computer Operation.

Course outcomes

Course Outcome	
CO1	Write programs using input/output statements, variables and operators
CO2	Work on Constants, Variables, Data Types, Operators and Expressions in C
CO3	Construct programs on Decision making and Looping statements.
CO4	Develop programs using arrays and structures

Course Content

1. Programming Methodology and Introduction to C Language **Duration: 5 Periods**

Program - Define High level language and low level language-history of C language - importance of C language – Define & Differentiate Compiler, Assembler - structure of C language - programming style of C language - steps involved in executing the C program

2. Understand Constants, Variables and Data Types in C and Understand Operators and Expressions in C **Duration: 15 Periods**

Character set - C Tokens - Keywords and Identifiers- Constants and Variables - data types and classification - declaration of a variable - Assigning values to variables - Define an operator - Define an expression -Classify operators - List and explain various arithmetic operators with examples -Illustrate the concept of relational operators - List logical operators - various assignment operators - Increment and decrement operators - Conditional operator - List bitwise operators -List various special operators- Arithmetic expressions- precedence and associativity of operators- Evaluation of expressions - formatted input and output.

3. Decision making and Looping statements **Duration: 10 Periods**

Simple if statement with sample program – if else statement – else if statement – switch statement - Classification of various loop statements- while statement – do-while statement - for loop statement - break and continue statements.

4. Arrays and Structures **Duration: 15 Periods**

Arrays -declaration and initialization of One Dimensional -Accessing elements in the Array - Declaration and initialization of two Dimensional Arrays - sample programs on matrix addition and matrix multiplication–Declaration of a Structure – Structure members – Array of structures.

Course Outcome		CL	Linked PO	Teaching Hours
CO1	Write programs using input/output statements, variables and operators	**R, U, A**	**1,2,3,4,8,9,10**	**5**
CO2	Work on Constants, Variables, Data Types,Operators and Expressions in C	**R, U, A**	**1,2,3,4,8,9,10**	**15**
CO3	Construct programs on Decision making and Looping statements.	**R,U, A**	**1,2,3,4,8,9,10**	**10**
CO4	Develop programs using arrays and structures	**U, A**	**1,2,3,4,8,9,10**	**15**
			Total Sessions	**45**

REFERENCE BOOKS

1. Let Us C -- YeshwanthKanetkar BPB Publications
2. Programming in ANSI C -- E. Balaguruswamy Tata McGrawHill

3. Programming with C -- Gottfried Schaum'outline
4. C The complete Reference -- Schildt Tata McGraw Hill

List of Experiments

1. Exercise on structure of C program
2. Exercise on Keywords and identifiers
3. Exercise on constants and variables
4. Execution of simple C program
5. Exercise on operators and expressions
6. Exercise on special operators
7. Exercise on input and output of characters
8. Exercise on formatted input and output
9. Exercise on simple if statement
10. Exercise on ifelse statement
11. Exercise on elseif ladder statement
12. Exercise on switch statement
13. Exercise on conditional operator
14. Exercise on while statement
15. Exercise on for statement
16. Exercise on do...while statement
17. Exercise on one dimensional arrays
18. Exercise on two dimensional arrays
19. Exercise on structure
20. Exercise on array of structures

PROJECT WORK

Course Title:	**Project Work**	Course Code	**18TT-510P**
Semester	**V**	Course Group	**Practical**
Teaching Scheme in Periods(L: T:P)	**0:0:3**	Credits	**1.5**
Methodology	**Practical**	Total Contact periods:	**45Pds**
CIE	**60 Marks**	SEE	**40 Marks**

A list of topics suggested for project work in Textile Industry. The students may be sent to near by Mills and they may be asked to select a suitable problem for this studies in consultation with the Mill authorities based on that they have to submit a detailed report which will be assessed by the examiner during the practical examination time.

Following topics are suggested for the project work.

1. Balancing of the machinery as per the Spin Plan in all departments stating the standard hanks to be maintained at various stages and expected production to be obtained.
2. Man power requirements as per the Spin Plan in a connection with the work loads in all departments in a spinning mill.
3. Collection of Technical date regarding gear plans of all machinery in all departments and calculate Draft constant, Twist constant, Production constant, Draft and all speeds of the important moving parts.

4. Yarn Realisation – Count wise – Stating loss in process or gain in process in packing stage.
5. To find out whether there any significant difference newly buffed top rollers used in the ring frame.
6. To study frequency of spindle gauging, lappet gauging and ring traveler changing and its effect on the rate of end breakages.
7. To calculate machinery utilization % in each department in spinning mill for one mill under study.
8. Determination of the suitability of water available at any location selected for start in composite textile mill process/quality control in textile wet processing.
9. To analyse the reduction and types of end breakages in open end spinning and submit a report on the condition of machinery and performance of spinner etc.
10. To conduct a study of the performance of cards by taking nep counting after each grinding.
11. To takes warp readings either on a weaving of a spinning room and their analyse the data and interprest.
12. Study on cards frequency of different strippings for different counts an its effect on silver evenness and a nep formation.
13. To conduct a study of maintenance schedule followed in the store for a loom shed and the method followed in the card and maintenance of shuttles. Pickess, buffers reeds, healds wire and wheels etc.
14. Explain the various financial arrangement to start the manufacture of the products of yarn under techno crat scheme in small industrial sector.
15. Plan for a type of organization.
16. Use of modern material in Textile Industry.
17. Use of new technologies in coming up industries, such as non conventional energies and energy audit.
18. Study of new ideas of industrial safety for Spinning Mills.
19. Study of industrial pollution and remedies with respect to Textile Industry.
20. Balancing of the machinery as per the Plan in all departments of weaving & processing stating the student banks to be maintained at various stages. Expected production to be obtained.
21. Main power requirements as per the weaving shed plan in a connection with the work loads in all departments in a weaving mill.
22. Collection of Technical data regarding gear plans of all machinery in all departments and calculate settings, timings, production and efficiency of weaving mill machines.
23. Fabric designing by using plain weaves on plain power loom.

24. Fabric designing on jacquard looms and drawing design on graph paper with emphasis on new designs.

25. To calculate machinery utilization % in each department in weaving mill of one mill under study.
26. Determination of suitability of water available at a location selected for starting a composite Textile Mill Water Management in wet processing department of a chemical.
27. Process control in Textile Chemical Processing.
28. Quality control in Textile Chemical Processing.
29. Study of the effect of temperature and concentration on the efficiency of a given wetting agents – Nonionic, anionic and cationic.
30. Study of garments manufacturing.
31. Process and identifying problems sustaining remedies.
32. Study of preparatory machines in weaving their production and efficiency calculations.
33. Study of various automations devices, in automatic looms and preparing proto models.
34. Study of foam sizing, single end sizing.
35. To conduct a study of maintenance schedule followed in the store for a loom shed and the methods foaled in the card and maintenance of the shuttles, pickers, buffers, reeds, heald wires, wheels etc.
36. Explore the various financial arrangements to start the manufacture the fabric by using power looms or shuttleless looms under SSI schemes.
37. Plan for a type of organization.
38. Study of readymade garment manufacturing.
39. Study of dyeing units and printing units in small scale industry schemes.
40. Study of production of man made fibres manufactures and new methods of improve their textile usage.
41. Use of modern materials in textile industry like kavalar.
42. Use of new technologies in up coming industries such as non-conventional energies.
43. Study of new ideas of industrial safety.
44. Study of industrial pollution and remedies with respect of textile industry, i.e. azoic dyes problems, starch industry pollution, noise level in weaving units.
45. Study of new cottons like coloured cottons, B.T. Cottons, terminator seeds their pursed cons.

46. Study of policy changes in textile sector and assessing its impact on textile industry. Ex.GATT, WTO, multi fibre agreement (MFA), textile quota policies of U.S.A., European union etc.
47. E-commerce and its impact on hand loom exports.
48. Eco-friendly textile chemical processing (i.e. azoic dyes problem revival of natural dyes usage for dyeing and printing).
49. Textile Fibres and fabrics for leather industry.
50. Modernization of handloom sector.
51. E-commerce, scope for yarn and fabric exports.
52. CNC machines in textile industry.
53. Knitting machines and usage for export quality textile manufacture.
54. Study of Geo-textiles, its uses, scope and feasibility.
55. Study and development of textiles for medical purpose.
56. Study and development of textile CADD.
57. Study and development of computer applications in textile mill management and quality control.
58. Study and development of computer applications in fashion design.
59. Study of history of handloom. Textiles in India, suggestions for value addition of these products.

**** Any other topics recommended by Teacher.**

SKILL UP GRADATION

Credits – 2.5

Suggested Student activities

18TT-501C-Textile Mill Planning and Management

1. Prepare a chart for organisation of your institution showing different levels of management, their roles and responsibilities
2. Draw the layout of college showing class rooms, Labs, workshops and administrative departments
3. Visit any textile mill (Spinning / Weaving Mill / Chemical processing Mill / Garment Mill) and draw the layout of the machines
4. Identify the safety precautions and safety measures available in your institution / Visited Mill
5. Prepare a chart showing the various materials required for

18TT-502C-Apparel Production Technology

1. Prepare a chart showing different types of garments
2. Prepare paper patterns for different garments
3. Collect of Garment Labels, Tags, Packing material etc.,
4. Collect few garment support materials
5. Collect different types of garment accessories
6. Collect fabrics showing different types of stitches

18TT-503C – Textile Calculations

1. Visit a Spinning Mill and find out the cleaning efficiency of the machines in Blow room and Carding machine by taking some samples
2. Prepare a model drafting system and verify the actual draft by passing a sliver and compare it with theoretical draft
3. Visit a loom shed and find out the average reed space, average speed and production of the loom shed and humidity levels maintained in the Loom shed (any two units)

4. Find out the Loom setting and norms for the loom shed they are following and compare with SITRA / BTRA Norms
5. Take a polypropylene plied yarn, Verify the formula for count of doubled yarn by taking a single yarn and double yarn by finding out individual counts and count of doubled yarn.
6. Find out the cover factors of different types of fabrics
7. Find out the count variations by picking different yarn packages

18TT-504 E (A) Apparel Merchandising

1. Prepare a flow chart for various activities in merchandising
2. Make a survey on various apparels based on human psychology by visiting different places
3. Visit any textile cluster and prepare report on Govt schemes available for textiles
4. Search for online garment marketing sites and submit a report
5. Visit any Garment export unit and prepare the report on documentation of export management process

18TT-504 E (B) Advanced Textile Manufacture

1. Collect some special fibres and submit on their properties based on individual observation
2. Collect special yarns and submit on their properties based on individual observation
3. Collect few terry fabrics from the terry loom unit and draw the designs
4. Collect some warp knitted fabric samples
5. Collect some weft knitted fabric samples
6. Collect some nonwoven fabric samples

18TT-504 E (C) Technical Textiles

1. Collect some geo textile material and submit a report on your observations
2. Collect filtration fabric samples and submit a report on your observations
3. Collect medical textile samples and submit a report on your observations
4. Collect some fabric samples used for sports and recreation and submit a report on your observations
5. Collect protective textile samples and submit a report on your observations
6. Collect textile materials used for transportation and submit a report on your observations

18TT-505 E (A) –PQC in Spinning

1. Visit a spinning mill and observe the quality measures in both process and product
2. Collect some defective yarns packages from the industry / photographs of the defective yarn packages
3. Visit a spinning mill and find out end breakage rate and causes of yarn breaks
4. Visit a spinning mill and obtain quality control charts
5. Visit a spinning mill and submit a report on quality management systems like ISO, 5s principles, TQM ..etc.,

18TT-505E(B) –PQC in Weaving

1. Visit a warping unit and find out warping machine running efficiency and causes of ends down
2. Visit a sizing mill and obtain the information on sizing materials used , their suppliers and cost
3. Visit a weaving mill and find out the production efficiency of the loom shed
4. Visit a weaving mill and observe fabric quality inspection systems and prepare a report and find out warp and weft defects
5. Visit a weaving mill and submit a report on quality management systems like ISO, 5s principles, TQM..etc.,

18TT-505E(C) –PQC in Apparel Manufacture

1. Visit a garment unit and find out the observations and reports in fabric quality inspection department
2. Collect some information on manufacturers of fabric cutting machines used in garment industry
3. Collect some information on manufacturers of sewing machines used in garment industry
4.
5. Collect some information on manufacturers of embroidery machines used in garment industry
6. Collect some information on manufacturers of fabric fusing machines used in garment industry
7. Collect some information on manufacturers of fabric decorative machines used in garment industry
8. Collect some sewing threads used for garment making
9. Visit a textile chemical processing and submit a report on quality management systems like ISO, 5s principles, TQM ..etc.,

Suggested Common Activities

1. Yoga and Meditation
2. Swacha Bharat and SwachaTelangana
3. Plantation
4. Reports / Debate / Street Campaign / Street show / Quiz / Group discussion / Seminar
   a) Protecting Environment
   b) Conservation of Water and other natural resources
   c) Our Social responsibilities
   d) Social Services
   e) Use of Technology
   f) Nutritional food and Health
   g) Traffic Rules and Road Safety
   h) Media
5. Any other activities as per the teachers / student choice

RUBRICS for Assessing Student Activity

		Model Rubrics for collecting the data from the Journals / Library / internet (documents, photographs, animations, videos) and giving power point presentation				
S.No	Sub activity	Performance				
		excellent	Good	Satisfactory		Need improvement
1	Step-1	Data was collected from more than four sources.	Data was collected from three to four sources	Data was collected from two sources.		Data was collected only one source.
2	Step-2	All materials and data required for the activity were accurately prepared based on the data collected independently.	Almost all materials and data required for the activity were accurately prepared based on the data collected independently.	The materials and data required for the activity were ccurately prepared based on the data collected with the help of teacher.		The materials and data required for the activity were inaccurately prepared
3	Step-3	Procedures were outlined in a step-by-step fashion that could be followed by anyone & performed the activity effectively.	Procedures were outlined in a step-by-step fashion, require explanation & performed the activity effectively.	Procedures that outlined were complete with 1 or 2 gaps and require explanation & performed the activity normally		Procedures that outlined were not sequential, & performed the activity in a poor way
4	Step-4	Presented/ explained the information about the activity in logical, interesting sequence with attractive visuals or diagrams.	Presented/ explained the information about the activity in logical sequence with visuals or diagrams.	Presented/ explained the information about the activity in logical sequence with less visuals or diagrams.		Presented/ explained the information about the activity without sequence and visuals or diagrams.
5	Conclusion / summary	Provided a detailed	Provided a conclusion /	Student provided a		Conclusions /summary was

Model Rubrics for Visiting the field / Organization and Drawing a Process flow chart						
S.No	Sub activity		Performance			
		Excellent (5)	Very Good (4)	Good (3)	Satisfactory (2)	Need improvement
1	Use of visuals diagrams, symbols, directions	Excellent	Very Good	Good	Satisfactory	Need improvement
2	Correct sequence of machines	Excellent	Very Good	Good	Satisfactory	Need improvement
3	Identified major machines and processes and	Excellent	Very Good	Good	Satisfactory	Need improvement

		conclusion/ summary clearly based on the data and activity	summary clearly based on the data and activity	conclusion/ summary less effectively		not relevant.

	shown in the chart					
4	Defined the major process / principle of working	Excellent	Very Good	Good	Satisfactory	Need improvement
5	Participation in the work	Lead the team	Took very active role	Took active role in the team	Participated in the team	Not participated in the team

Model Rubrics for Visiting the Field / Organization and Collection samples, Brochures, Test Report formats, Spare parts						
S. No	Sub activity		Performance			
		Excellent	Very Good (4)	Good	Satisfactory	Need improvement
1	Samples Collection	Data was collected from more than four sources	Data was collected from four sources	Data was collected from three sources	Data was collected from two sources.	Data was collected only one source.
2	Participation in the work	Lead the team	Jointly lead the team	Take active role in the team	Participated in the team	Not participated in the team
3	Relevance of the collection to the subject and use	Excellent	Very Good	Good	Satisfactory	Need improvement
4	Presentation about the collected material	Excellent	Very Good	Good	Satisfactory	Need improvement
5	Conclusion / summary / Usefulness	Excellent	Very Good	Good	Satisfactory	Need improvement

Model Rubrics for carrying out a brief study / experiment / survey on a particular problem or new ideas related to the subject and submitting a report					
S. No	Sub activity	Performance			
		Excellent	Good	Satisfactory	Need improvement
1	Data Collection	Data was collected from more than four sources.	Data was collected from three to four sources	Data was collected from two sources.	Data was collected only one source.
2	Standards of Conditions for experiment	Excellent	Good	Satisfactory	Need improvement
3	Usefulness of Study conducted	Excellent	Very Useful	Moderately Useful	Less Useful
4	Presented/	Excellent	Good	Satisfactory	Need

	explained about the activity with attractive visuals or diagrams				improvement
5	Conclusion / summary	Provided a detailed conclusion/ summary clearly based on the data and activity	Provided a conclusion / summary clearly based on the data and activity	Student provided a conclusion/ summary less effectively	Conclusions /summary was not relevant.

Model Rubrics for carrying out a test on materials on quality and analyzing or comparing the with the actual / organization test results / norms

S. No	Sub activity	Performance			
		Excellent	Good	Satisfactory	Need improvement
1	Sample selection	Sample is selected randomly and size is as per the standards	A random sample selected from the lot but approximate dimensions	Sample selected from a group / category with no specific size	No specific procedure followed
2	Test method and procedure	Standard test method is followed, calibration of instrument done	Standard test method without calibration	Conventional instrument is used	A rough method is used and just estimated
	Result of the test	Excellent	Good	Satisfactory	Need improvement
3	Correlation of the values with norms	Excellent	Good	Satisfactory	Need improvement
4	Presentation and Conclusion	Excellent	Good	Satisfactory	Need improvement

Note: Any other Rubrics can be developed and used for assessment of skills / activity or activity based assignment according to the Activity.