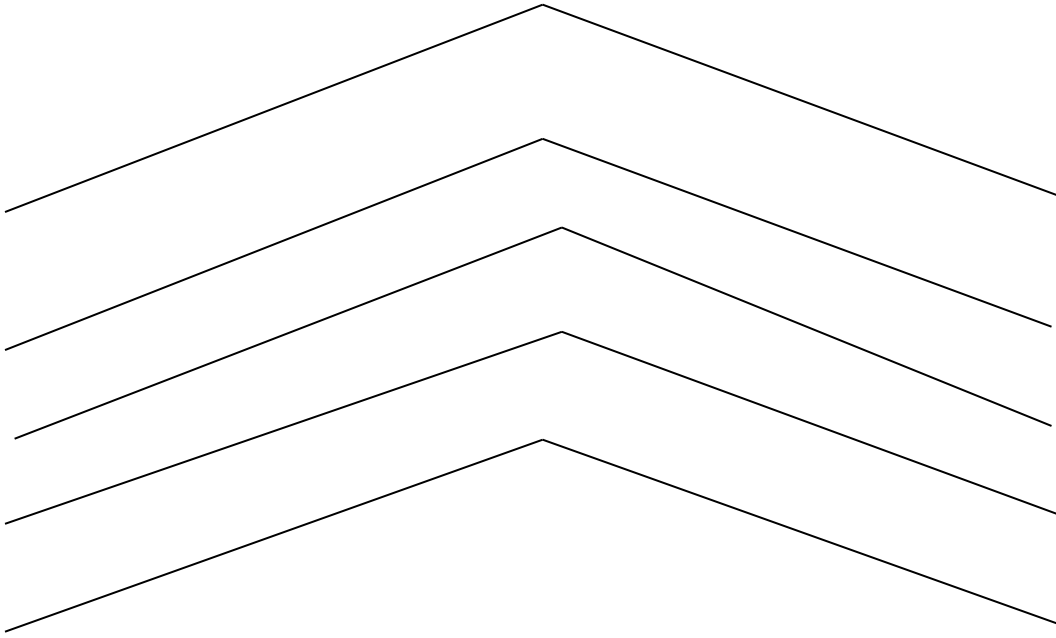


**BANGLADESH TECHNICAL EDUCATION BOARD**



**4- YEAR**

**DIPLOMA IN TEXTILE TECHNOLOGY**

**SYLLABUS**

**5<sup>TH</sup> SEMESTER**

**4-YEAR DIPLOMA TEXTILE ENGINEERING PROGRAM**  
**TEXTILE TECHNOLOGY**  
**COURSE STRUCTURE**

**FIFTH SEMESTER**

Sl. No	Subject code	Name of the subject	T P C			MARKS				
						Theory		Practical		Total
						Cont. assess	Final exam.	Cont. assess.	Final exam.	
1.	1951	Yarn Manufacturing- III	3	3	4	30	120	25	25	200
2.	1952	Fabric Manufacturing- III	2	3	3	20	80	25	25	150
3.	1953	Wet Processing- II	3	3	4	30	120	25	25	200
4.	1954	Clothing- I	2	3	3	20	80	25	25	150
5.	1955	Textile Testing & Quality Control- II	2	3	3	20	80	25	25	150
6.	1956	Fabric Structure & Analysis- I	2	3	3	20	80	25	25	150
7.	2013	Book Keeping & Accounting	2	0	2	20	80	-	-	100
			<b>16</b>	<b>18</b>	<b>22</b>	<b>160</b>	<b>640</b>	<b>150</b>	<b>150</b>	<b>1100</b>

**AIMS**

To enable the students with an opportunity to acquire knowledge, skill and attitude in the area of yarn manufacturing with special emphasis on

- Roving Frame/Speed frame/Simplex
- Ring frame
- Conditioning
- Winding
- Reeling
- Bundling and baling
- Waste

**SHORT DESCRIPTION**

Basic concept of ring spinning frame; Component parts of the ring spinning frame; Drafting and roller setting; Ring, traveler & spindle of ring spinning frame; Faults, change places and waste in spinning; Conditioning of yarn; Winding; Reeling; Bundling and baling; jute spinning frame; Draft & Twist of spinning frame; Building & winding; Technical aspects of spinning frame; Waste in cotton spinning.

**DETAIL DESCRIPTION****THEORY:****ROVING FRAME (Simplex)****1.0 Understand Roving Frame/Speed frame/Simplex.**

- 1.1 Mention the objects of roving frame.
- 1.2 Narrate the function of roving frame.

**2.0 Understand Roller and Drafting of Roving frame.**

- 2.1 State the types of roller used in roving frame.
- 2.2 Mention roller setting.
- 2.3 State the factors those influence roller setting.
- 2.4 Discuss different drafting system.
- 2.5 Differential between roller drafting and apron drafting system.

**3.0 Understand Twisting in the Roving frame.**

- 3.1 State the importance of Twist in roving.
- 3.2 Discuss Twisting mechanism.
- 3.3 Mention Twist multipliers used for different count of roving.

**4.0 Understand Winding of the bobbin in the Roving frame.**

- 4.1 Define winding
- 4.2 Discuss winding principle.
- 4.3 Discuss flyer leading and bobbin leading winding.

**5.0 Understand bobbin building in Roving frame.**

- 5.1 State the objects of building motion.
- 5.2 State the importance of building motion.
- 5.3 Discuss the functions of building motion.
- 5.4 Discuss the mechanism of building motion.

## **6.0 Understand Faults and change places in Roving frame.**

- 6.1 Discuss faults of Roving.
- 6.2 State the causes and remedies of Roving fault.
- 6.3 State the change places in Roving frame with their effects on changing.
- 6.4 Solve the problems related to Roving frame.

## **RING FRAME**

### **7.0 Understand the Ring spinning frame.**

- 7.1 Define spinning and yarn.
- 7.2 State the purposes of Ring spinning frame.
- 7.3 State the functions of Ring spinning frame.
- 7.4 Discuss the operational principles of Ring frame.
- 7.5 Mention the properties of yarn.

### **8.0 Understand the component parts of the Ring spinning frame.**

- 8.1 List the most important component parts of ring spinning frame.
- 8.2 Discuss the following component parts-creel, roving guide or trumpet, drafting rollers (with weighing systems) thread guide, Cylinder or tin roller, Separators or balloon guide, roller clearer system.

### **9.0 Understand Drafting and Roller setting.**

- 9.1 Define draft with its type/classifications.
- 9.2 Describe the drafting systems used in ring frame.
- 9.3 State the importance of Roller setting.
- 9.4 Describe the factors considered for Roller setting.

### **10.0 Understand the Ring, Traveller & spindle of Ring spinning frame.**

- 10.1 Discuss Ring, Traveller & spindle.
- 10.2 State the functions of Ring, Traveller & spindle.
- 10.3 Mention the different types of Ring, Traveller & spindle.
- 10.4 Describe the building motion of Ring frame.

### **11.0 Understand faults, change places and waste in spinning.**

- 11.1 Discuss the causes of ends-down in spinning with their causes and remedies.
- 11.2 Discuss the yarn faults in spinning with their causes and remedies.
- 11.3 Mention the change places in Ring spinning frame with their effects on changing.
- 11.4 Solve the problems relating Draft, Twist, speed production etc. in Ring spinning frame.

### **12.0 Understand the conditioning of yarn.**

- 12.1 State the objects and importance of conditioning.
- 12.2 Mention different systems of conditioning.
- 12.3 Describe the process of yarn conditioning.

### **13.0 Understand the winding.**

- 13.1 State the necessity of winding.
- 13.2 Narrate the types of winding.
- 13.3 Mention the factors effecting winding quality & production.
- 13.4 State the faults causes & remedies of winding.
- 13.5 Solve the problem regarding winding.

#### **14.0 Understand the reeling.**

- 14.1 Give the objects and importance of reeling.
- 14.2 Describe the reeling process.

#### **15.0 Understand bundling and baling.**

- 15.1 Define bundle & bale.
- 15.2 State the necessity of bundling process & baling process.
- 15.3 Describe the bundling process & baling process.
- 15.4 Mention the faults in bundling & baling with their causes and remedies.

#### **16.0 Understand the waste in cotton spinning.**

- 16.1 Define waste.
- 16.2 Classify wastes.
- 16.3 List different type of waste found in cotton spinning with their percentage and origin.
- 16.4 Discuss the waste control system in spinning process.

#### **PRACTICAL:**

- 1. Show the material passage through roving and ring spinning frame mentioning the name of its component parts & their functions.
- 2. Calculate the speed of different rollers, draft, twist & production of roving and ring spinning frame by sketching gearing diagram.
- 3. Draw the driving mechanism of winding machine & calculate its production.
- 4. Draw the driving mechanism of reeling machine.
- 5. Identify the roving frame, ring frame parts.

#### **Book Reference:**

- 1. Ring spinning-Md. Sirajal Islam.
- 2. Cotton Spinning- Gilbert R. Meril.
- 3. Bqvbc© g`vbyd`vKPvwis-2 - Av. K. g. dwi`yj AvRv`|

**AIMS**

To enable the students with an opportunity to acquire knowledge, skill and attitude in the area of Fabric manufacturing with special emphasis on

- Secondary motions
- Auxiliary motions
- Loom faults and fabric faults
- Modern loom
- Warp knitting
- Faults of knitted fabrics
- Calculation of weaving and knitting.

**SHORT DESCRIPTION**

Basic concepts of Take-up motion; Let-off motion; Weft stop motion; Warp stop motion; Temple motion; weft changing motion; Loom faults and fabric faults; Modern loom; Warp knitting; Faults of knitted fabrics; Calculation of weaving & knitting.

**DETAIL DESCRIPTION****THEORY:****1.0 Understand the Take-up motion.**

- 1.1 Mention the objects of Take-up motion.
- 1.2 Classify the Take-up motions.
- 1.3 Draw & describe the working principle of 5-wheel Take-up motion.
- 1.4 Sketch & illustrate the working principle of 6-wheel Take-up motion.
- 1.5 Describe the construction & working principle of 7-wheel Take-up motion.
- 1.6 State the working principle of negative Take-up motion.
- 1.7 Differentiate between positive & negative Take-up motion.
- 1.8 Define the construction factor.
- 1.9 Relevant calculation of Take-up motion.

**2.0 Understand the Let-off motion.**

- 2.1 State the function of Let-off motion.
- 2.2 Classify Let-off motions.
- 2.3 Describe the construction & working principle of negative Let-off motion.
- 2.4 Sketch & illustrate the working principle of semi-positive Let-off motion.
- 2.5 Describe the construction & working principle of positive Let-off motion.
- 2.6 Describe the difference between positive & negative Let-off motion.

**3.0 Understand the basic idea of auxiliary motions.**

- 3.1 State the auxiliary motions of loom.
- 3.2 Mention the importance of using auxiliary motions of loom.
- 3.3 Classify the auxiliary motion.
- 3.4 Discuss the characteristic feature of automatic loom.
- 3.5 State the benefit of auxiliary motions.

**4.0 Understand the Weft stop motion.**

- 4.1 State the function of weft stop motion.
- 4.2 Classify the weft stop motion.
- 4.3 Describe the side weft fork mechanism.

- 4.4 Describe the center weft fork mechanism.
- 4.5 Distinguish between side weft fork and center weft fork motion.

**5.0 Understand the warp stop motion.**

- 5.1 State the function of warp stop motion.
- 5.2 Classify the warp stop motions.
- 5.3 Describe the mechanical warp stop motion.
- 5.4 Describe the electrical warp stop motion.
- 5.5 Describe warp protector motion.

**6.0 Understand Temple motion.**

- 6.1 Discuss the objects of Temple motion.
- 6.2 State the functions of Temple.
- 6.3 Discuss the type of Temple.
- 6.4 Describe ring temple and roller Temple.

**7.0 Understand weft changing motion.**

- 7.1 State the objects of weft change motion.
- 7.2 Classify the weft change motion.
- 7.3 Describe automatic pirn changing mechanism.
- 7.4 Differentiate between weft mixing and weft patterning.
- 7.5 Explain the mechanism of weft mixing and Drop box motion
- 7.6 Build pattern chain for drop box motion from given designs.

**8.0 Understand the loom faults and fabric faults.**

- 8.1 State the loom faults.
- 8.2 State the fabric faults.
- 8.3 Describe the causes of loom faults and their remedies.
- 8.4 Describe the causes of fabric faults and their remedies.
- 8.5 Relevant calculation of fabric production etc.

**9.0 Understand the modern loom.**

- 9.1 Discuss the features of modern loom.
- 9.2 Classify modern loom.
- 9.3 Compare the advantages and disadvantages of shuttle loom and shuttle less loom.
- 9.4 Discuss the scope of modern loom

**10.0 Understand warp knitting.**

- 10.1 Define warp knitting.
- 10.2 Classify warp knitting machine.
- 10.3 State the basic principle of warp knitting.
- 10.4 Describe Rasel warp knitting machine.
- 10.5 Describe tricot warp knitting machine.
- 10.6 Describe different knitting action of warp knitting.
- 10.7 List the Name of warp knitting structure.
- 10.8 Discuss the basic warp knitting structure.

**11.0 Understand the Faults of knitted fabrics.**

- 11.1 State the faults of knitted fabric.
- 11.2 Describe the knitted faults and their causes and remedies.

## **12.0 Understand the calculation of knitting.**

12.1 Calculate the production of circular knitting machine in length.

12.2 Calculate the production of circular knitting machine in weight.

### **PRACTICAL:**

1. Sketch and identify side weft stop motion.
2. Sketch and identify center weft stop motion.
3. Draw and identify warp stop motion.
4. Sketch and show the Temple motion.
5. Select and adjust the temple for the specific fabric.
6. Draw and identify weft changing motion.
7. Sketch and identification of weft mixing and weft patterning mechanism.
8. Sketch and build up a pattern chain for 2 X 1 and 4 X 1 drop box motion.
9. Draw and identify Rasel Knitting machine.
10. Draw and identify tricot knitting machine.
11. Draw different warp knitting structure.
12. Sketch and show different knitting action.



To provide the students with an opportunity to acquire knowledge and skills in the area of wet processing with special emphasis on:

- Scouring
- Souring
- Bleaching
- Textile dyeing.

### SHORT DESCRIPTION

Scouring; Souring; Bleaching; color & concept of color; Dye & dyeing; Direct dyes; Basic dyes; Acid dyes; Vat dyes and Reactive dyes.

### DETAILED DESCRIPTION

#### THEORY:

#### 1.0 Understand the basic concept & Process of scouring.

- 1.1 Define scouring.
- 1.2 Explain the necessity of scouring.
- 1.3 Mention the methods of scouring.
- 1.4 Mention the types of scouring.
- 1.5 Describe the scouring process of cotton in kier, j-box and vapor lock chamber by caustic soda.
- 1.6 Faults of scouring & its remedial measures.
- 1.7 Describe the scouring of silk, wool and blended fibers.
- 1.8 Functions of different chemicals used in scouring.
- 1.9 Advantages & disadvantages of kier boiler scouring.

#### 2.0 Understand the basic concept of souring.

- 2.1 Define souring.
- 2.2 Mention the necessity/importance of souring.
- 2.3 Describe souring processes.
- 2.4 Distinguish between scouring & souring.

#### 3.0 Understand the general idea of Bleaching.

- 3.1 Define bleaching.
- 3.2 Mention the necessity of bleaching.
- 3.3 Mention the types of bleaching.
- 3.4 State the types of bleaching agents with example.
- 3.5 Describe, bleaching of cotton with hypochlorite.
- 3.6 Describe bleaching of cotton with peroxide.
- 3.7 Compare between hypochlorite and peroxide bleaching.
- 3.8 Discuss the factors affecting H<sub>2</sub>O<sub>2</sub> bleaching.

#### 4.0 Understand the bleaching processes.

- 4.1 Describe kier bleaching process.
- 4.2 Describe pad-roll process.

- 4.3 Describe continuous process.
- 4.4 Mention the points to be considered for the selection of bleaching agent.
- 4.5 Describe the bleaching of silk & wool.
- 4.6 Describe the bleaching of polyester- cotton blended fabrics.
- 4.7 Describe the advantages of per-oxide bleaching.

**5.0 Understand the color.**

- 5.1 Define color.
- 5.2 Mention color according to Pigment theory.
- 5.3 Explain, chromophore, auxochrome, chromogen.

**6.0 Understand the Dye/Dyestuff & dyeing.**

- 6.1 Define Dye/Dyestuff.
- 6.2 Describe the properties of dyes.
- 6.3 Mention the Classification of dyestuff according to application.
- 6.4 Define dyeing.
- 6.5 Distinguish between dyes & dyeing.
- 6.6 Mention the flow-chart of dyeing.

**7.0 Understand the Direct dyes and its application.**

- 7.1 Define direct dyes.
- 7.2 Mention the characteristics of direct dyes.
- 7.3 Classify direct dyes.
- 7.4 Mention the trade name of direct dyes.
- 7.5 Describe the application of direct dyes on cotton.
- 7.6 State the after treatment of direct dyes.
- 7.7 State the stripping of direct dyes.
- 7.8 List the commercial name of direct dyes.

**8.0 Understand the Basic dyes & its application.**

- 8.1 Define basic dyes.
- 8.2 Mention the properties of basic dyes.
- 8.3 List the commercial name of basic dyes.
- 8.4 Describe the application of basic dyes on Jute fabrics.
- 8.5 State the after-treatment of dyed fabrics.
- 8.6 List the commercial name of basic dyes.

**9.0 Understand the Acid dyes & its application.**

- 9.1 Define acid dyes.
- 9.2 Mention the properties of acid dyes.
- 9.3 Classify acid dyes.
- 9.4 Describe the application of acid dyes on cellulose & protein fibres.
- 9.5 List the commercial name of acid dyes

**10.0 Understand the vat dyes & its application.**

- 10.1 Define vat dyes.
- 10.2 Classify vat dyes.
- 10.3 List the commercial name of vat dyes.
- 10.4 Mention the characteristics of vat dyes.
- 10.5 Define vatting.
- 10.6 Describe the application of vat dyes on cotton.

- 10.7 State the after treatment of vat dyes.
- 10.8 Discuss the stripping of vat dyes.
- 10.9 List the commercial name of vat dyes.

**11.0 Understand the reactive dyes and its application.**

- 11.1 Define reactive dyes.
- 11.2 Classify the reactive dyes.
- 11.3 Mention the characteristics of reactive dyes.
- 11.4 Describe the application of reactive dyes on cotton fabrics.
- 11.5 Describe the application of reactive dyes on silk fabrics.
- 11.6 State the after treatment of reactive dyes.
- 11.7 List the commercial name of reactive dyes.

**PRACTICAL:**

- 1.0 Show the scouring of cotton fibres yarn and fabric by caustic soda.
- 2.0 Show the scouring or de-gumming of silk fibre yarn and fabric.
- 3.0 Show the scouring of polyester-cotton blended fabric.
- 4.0 Show the bleaching of cotton fibre, yarn and fabric by hypo chlorite.
- 5.0 Show the bleaching of cotton with hydrogen peroxide.
- 6.0 Show the bleaching of silk and wool with hydrogen peroxide.
- 7.0 Apply the direct dyes on cotton.
- 8.0 Apply the basic dyes on cotton.
- 9.0 Apply the acid dyes on wool.
- 10.0 Apply the acid dyes on silk.
- 11.0 Apply the vat dyes on cotton.
- 12.0 Apply the reactive dyes on cotton.

**References and Bibliographic**

1. Textile scouring and bleaching- E.R. Trotman
2. An introduction to textile bleaching- J.T March.
3. Btra bleaching & mercerizing-Dr.S.M. Betrabet
4. Textile chemistry-1 Md. Mozibur Rahaman

**AIMS**

- To enable the student a clear idea of garments.
- To develop basic knowledge and skill of garment cloth.
- To develop basic knowledge of garment accessories.

**SHORT DESCRIPTION:**

Garments; Garment accessories; Tailoring process; Pattern making; Marker; Cutting machines; Fabric spreading; Seam & sewing.

**DETAILED DESCRIPTION:****Theory:****1.0 Understand the basic aspects of clothing.**

- 1.1 State the term clothing.
- 1.2 Discuss the historical development of garment in Bangladesh.
- 1.3 Role of Bangladesh as a garment exporting country in the world market.
- 1.4 State the flow chart of garment manufacturing process.

**2.0 Understand the Tailoring process.**

- 2.1 State the term “Tailoring.”
- 2.2 List the different parts of human body and discuss the body measuring process.
- 2.3 Mention the steps of preparation for fabric cutting.
- 2.4 Distinguish between tailoring and industrial garments manufacturing process.

**3.0 Understand the garments cloth, quota & category.**

- 3.1 Describe the characteristics of garment cloth.
- 3.2 Define quota and category.
- 3.3 State the category and non-quota category of U.S.A, Canada, E.E.C country.
- 3.4 List the category of different garments.
- 3.5 Distinguish between quota and non-quota.

**4.0 Understand the garments trimmings.**

- 4.1 State the term trimming.
- 4.2 Discuss the different items of trimming for different garments.
- 4.3 State trimming quality.

**5.0 Understand the label and motif, ribbons & tapes.**

- 5.1 Define the term label & motif.
- 5.2 Discuss the importance of label & motif for garments.
- 5.3 Classify label.
- 5.4 Discuss the different types of label.
- 5.5 Distinguish between label & motif.
- 5.6 State the term ribbon & tapes.
- 5.7 Discuss the characteristics of ribbon & tapes.
- 5.8 List the different types of ribbon & tapes.
- 5.9 Distinguish between ribbon & tape.

**6.0 Understand the lining, interlining & fastening**

- 6.1 Define lining & interlining.
- 6.2 Discuss the characteristics of lining & interlining.

- 6.3 Classify interlining.
- 6.4 Distinguish between lining & interlining.
- 6.5 Mention the uses of lining & interlining.
- 6.6 State the term fastening.
- 6.7 List the different item of fastening.
- 6.8 Mention the uses of different fastening.

**7.0 Understand the sample of different garments.**

- 7.1 Define sample.
- 7.2 Mention the flowchart of sample making.
- 7.3 Mention the types of sample.
- 7.4 Discuss the different types of sample.
- 7.5 Describe the method of invention a new design.
- 7.6 Discuss the steps of producing new design of garments.

**8.0 Understand the pattern making & different patterns of garments.**

- 8.1 Define pattern.
- 8.2 State the necessity of pattern making.
- 8.3 State the term working pattern or production pattern, pre-shipment & shipment pattern.
- 8.4 Discuss the methods of producing a pattern.
- 8.5 Make a list of the different components of shirt.
- 8.6 Draw a pattern and identify the different parts of a shirt.
- 8.7 Make a list of the different components of a pant.
- 8.8 Draw a pattern & identify the different parts of a pant.
- 8.9 Mention the standard body measurement of gents & ladies.

**9.0 Understand the marker.**

- 9.1 Define marker & marker making.
- 9.2 State the marker efficiency.
- 9.3 Discuss the factor of marker efficiency.
- 9.4 Discuss the method of marker making.
- 9.5 Mention the method of drawing and duplication a marker.

**10.0 Understand the fabric lays & spreading.**

- 10.1 Define lays & package.
- 10.2 Mention the types of fabric lays & package.
- 10.3 Discuss the method of fabric package.
- 10.4 State the term spreading.
- 10.5 Mention the requirement of fabric spreading.
- 10.6 Discuss the methods of fabric spreading.
- 10.7 Mention the feature of automatic spreading process.
- 10.8 Discuss the method of manual & automatic spreading process.
- 10.9 Define splice.
- 10.10 Discuss the different types of splice.

**11.0 Understand the fabric preparation and fabric cutting.**

- 11.1 State the term fabric preparation.
- 11.2 Mention the factors of fabric preparation.
- 11.3 Discuss the different steps of fabric preparation before cutting.
- 11.4 Define cutting.
- 11.5 Mention the purpose of cutting.

- 11.6 State the requirement of cutting.
- 11.7 Discuss the methods or techniques of fabric cutting.
- 11.8 Mention the features of computerized cutting technique.

## **12.0 Understand the cutting machines.**

- 12.1 List the different types of cutting machines.
- 12.2 Mention the feature of straight knife machine.
- 12.3 Discuss the straight knife machine.
- 12.4 Discuss the working principle of straight knife machine.
- 12.5 State the feature of rotary blade.
- 12.6 Mention the basic principle of band knife cutting machine.
- 12.7 Discuss straight knife & band knife.
- 12.8 Discuss the advantage & disadvantage of different knife & cutting machine.
- 12.9 Distinguish between straight knife, band knife & rotary knife.

## **13.0 Understand seam & sewing.**

- 13.1 Define seam & sewing.
- 13.2 Mention the purpose of sewing.
- 13.3 Discuss the different methods of sewing.
- 13.4 Describe the problem of sewing.
- 13.5 Mention the properties of seam.
- 13.6 Discuss the different types of seam.
- 13.7 Describe the uses of seam.

## **14.0 Understand stitches & stitch class.**

- 14.1 State the term “stitch & stitch class.”
- 14.2 Classify the stitches.
- 14.3 State the term “Interloping, Interlacing.”
- 14.4 Distinguish between seam & stitch.
- 14.5 Describe the uses of stitch.
- 14.6 List the different types of stitch class.
- 14.7 Discuss the principle of chain stitch lock stitch & multi-thread chain stitch.
- 14.8 Distinguish between lock & chain stitch.

## **Practical:**

- 1.0 Draw a design of garment by hand.
- 2.0 Draw a design of garment by computer.
- 3.0 Prepare a pattern of shirt & pant.
- 4.0 Prepare a sample of shirt & pant.
- 5.0 Draw & identify the body measurement of gents & ladies.
- 6.0 Draw & identify a general sewing machine.
- 7.0 Draw & identify different tools for garment production.
- 8.0 Prepare a marker according to a set of pattern.
- 9.0 Make a sample garment according to a pattern by hand.
- 10.0 Draw & identify different component of a shirt & pant.
- 11.0 Practice the operation of cutting machine.
- 12.0 Make sample of
  - a) Shirt
  - b) Pant/trouser.
  - c) Ladies shirt/Blouse.
  - d) T-shirt.
  - e) Undergarments.

**AIMS**

To enable the students with an opportunity to acquire knowledge and skills about

- Testing
- Techniques and system of testing
- Operating systems of different modern testing instruments
- Interpretation and analysis of testing data
- Uses and maintenance of testing instrument on yarn testing

**SHORT DESCRIPTION**

Basic concept of yarn testing; Yarn count or linear density of yarn; Measurement of yarn count; Twist on yarn; Twist measurement of yarn; Strength or tensile properties of yarn; Measurement of yarn strength; Evenness of yarn; Evenness measurement; Hairiness in spun yarn.

**DETAIL DESCRIPTION****THEORY:****YARN TESTING****1.0 Understand the yarn Testing.**

- 1.1 State the importance of yarn Testing.
- 1.2 Describe the role of yarn on fabric properties.
- 1.1 Mention the requisite qualities of yarn used for knit and woven fabric production.
- 1.4 List the names of different yarn test.

**2.0 Understand the yarn count or linear density of yarn.**

- 2.1 State linear density & yarn numbering systems.
- 2.2 Describe the different systems of yarn numbering.
- 2.3 Make a table of units of length and weight of yarn numbering system.
- 2.4 Define count of yarn in different systems and show their formula.
- 2.1 Show the relation between different yarn numbering system and work out the conversion factors.
- 2.2 Find out the count of yarn from given problem in different numbering systems.

**3.0 Understand the measurement of yarn count.**

- 3.1 Discuss the importance of yarn count measurement.
- 3.2 Describe the requirements for the determination of yarn count.
- 3.3 Describe the method of length measurement -a) Yarn in package form  
b) Yarn in short lengths.
- 2.4 Describe the method of weight measurement for the determination of yarn count.
- 3.5 Explain the method of finding the count of double or ply yarn.
- 3.6 Mention the name of the instruments used for count determination and explain the procedure to find out the count.
- 3.7 Relevant problems regarding yarn count.

**4.0 Understand twist on yarn.**

- 1.1 Define Twist, direction of Twist, balanced Twist, corkscrew twist and amount of Twists.
- 1.2 Explain theory of Twist ie. the relation between Twist & yarn strength.

- 4.3 Explain the relation between Yarn Count and TPI.
- 4.4 Define twist multiplier (TM) /TF and its use.
- 4.5 List TM and TF value with respect to yarn count and types of yarn.

#### **5.0 Understand Twist measurement to yarn.**

- 5.1 Discuss the sampling methods, minimum no. of tests, length of test specimen (in inch) for the determination of yarn Twist.
- 5.2 List the methods of determination of Twist.
- 5.2 Describe the methods of determination of twist by-a) Ordinary or single yarn Twist tester, b) Tension type twist tester and c) Take-up twist tester.

#### **6.0 Understand strength or Tensile properties of yarn.**

- 6.1 Discuss the importance of yarn strength.
- 6.2 Define the terms- breaking load, tenacity, breaking length, yarn strength, tensile property.
- 6.3 State the factor affecting yarn strength.
- 6.4 Describe the procedure of finding the yarn strength.
- 6.5 Explain CSP(Count Strength Product), HSC(Highest standard count)

#### **7.0 Understand Evenness of yarn.**

- 7.1 Define yarn evenness, irregularity and imperfections.
- 7.2 Mention the types of irregularity.
- 7.3 Explain the causes of irregularity.
- 7.4 Describe the effect of irregularity.
- 7.5 Discuss about the expression of irregularity.

#### **8.0 Understand Evenness measurement.**

- 8.1 Mention the methods of measuring irregularity.
- 8.2 Discuss about the following methods of irregularity measurements
  - a) Visual examination method.
  - b) Uster evenness tester- working principle.

#### **9.0 Understand Hairiness in spun yarn.**

- 9.1 Discuss about the hairiness of spun yarn.
- 9.2 State the factor affecting yarn hairiness.
- 9.3 State the effects of hairiness.
- 9.4 List the methods of measurement of yarn hairiness.

#### **PRACTICAL:**

Perform the following tests in laboratory with suitable instrument describing the objects of the experiment, sampling procedure, machine detail, working principle, test procedure, interpretation of result, precautions to be taken with elaborate sketch of the machine or system.

1. Determine the count of a given sample viz. cotton, jute, wool, nylon, polyester etc, in different numbering system by means of
  - a) Wrap reel & analytical balance.
  - b) Knowles balance,
  - c) Quardant balance
  - d) Beesley balance.



2. Determine the Twist of a given sample of yarn by
  - a) Ordinary Twist tester.
  - b) Tension type Twist tester
  - c) Take-up Twist tester.
  
- 3.0 Determine the strength and CSP of a given sample of yarn viz cotton, jute, nylon, polyester, etc, by means of
  - a) Single yarn strength tester.
  - b) Lea strength tester (Pendulum lever machine)
  
4. Determine the evenness of a given sample of yarn by means of
  - a) Uster evenness tester.
  - b) Visual method by blackboard wrapping.

**Book References:**

1. Textile testing - J.E. Booth
2. Textile Testing. Fibre, Yarn & Fabric- Dr. Arindam basu
3. Textile testing- P. Angappan & R. Gopalakrishnan.
4. †Uw÷s Af †U·UvBjm- Av. K. g. dwi`yj AvRv`
5. †U·UvBj †Uw÷s- BwÄwbqvi †gvt gwRyei ingvb| (evsjv‡`k KwwiMwi wkÿv †evW©  
KZ,,©K cÖKvwkZ)

**AIMS**

- To develop the basic knowledge required for structural design of fabric.
- To develop the skill of the student in textile design.
- To familiarize the student with different Plain & Twill weave.
- To acquire knowledge of different structured fabric.

**SHORT DESCRIPTION**

Basic concept of Textile design; Artistic design; Drafting & lifting plan; Weave plan; Plain weave; Twill weave; Diamond; Diaper; Broken twill; Stepped twill & standard commercial fabrics.

**DETAIL DESCRIPTION****THEORY:****1.0 Understand the Textile design.**

- 1.1 Define Textile design.
- 1.2 Importance of Textile design.
- 1.3 Classify Textile designs.
- 1.4 Distinguish between Textile design & artistic design.
- 1.5 Describe fabric structure & texture.
- 1.6 Uses of Textile design.

**2.0 Understand drafting plan & lifting plan.**

- 2.1 Define drafting and lifting.
- 2.2 Define drafting plan and lifting plan.
- 2.3 Method of expressing drafting plan.
- 2.4 Mention the classification of drafting plan.
- 2.5 Draw a graph paper design of drafting & lifting plan.

**3.0 Understand basic weave structure.**

- 3.1 State the term basic weaves structure.
- 3.2 Mention the name of different basic weave for woven fabric.
- 3.3 Describe the different basic weave structure.

**4.0 Understand the plain weave structure.**

- 4.1 Define plain weave structure.
- 4.2 Mention the characteristics of plain weave structure.
- 4.3 Classify the plain weave structure.
- 4.4 Discuss the ornamentation of plain weave.
- 4.5 Describe the plain weave derivatives.
- 4.6 Distinguish between warp rib & weft rib structure.
- 4.7 Draw a design of different plain weave derivatives in graph paper.
- 4.8 Draw a cross-sectional view of different plain weave derivatives.
- 4.9 Discuss the uses of plain weave.

**5.0 Understand the twill weave.**

- 5.1 Define the term twill design.
- 5.2 Mention the characteristics of twill weave.
- 5.3 Explain the term twill angle.

- 5.4 State the classification of twill weaves.
- 5.5 List the derivatives of twill weave.
- 5.6 State the quality of twill fabric.
- 5.7 Discuss the uses of twill weave.

#### **6.0 Understand the warp & weft faced twill.**

- 6.1 Define the warp & weft faced twill.
- 6.2 State the features of warp & weft faced twill weave.
- 6.3 Draw a design of warp faced twill with drafting & lifting plan.
- 6.4 Draw a design of weft-faced twill with drafting & lifting plan.
- 6.5 Mention the uses of warp and weft faced twill weaves.

#### **7.0 Understand the zig-zag twill.**

- 7.1 Define zig-zag twill.
- 7.2 State the features of zig-zag twill.
- 7.3 Classify the zig-zag twill.
- 7.4 Draw the design of horizontal zig-zag twill with drafting & lifting plan.
- 7.5 Draw the design of vertical zig-zag twill.
- 7.6 Mention the uses of zig-zag twill.

#### **8 Understand the herring bone twill.**

- 8.1 Define herring bone twill.
- 8.2 State the features of herring bone twill.
- 8.3 Classify the herring bone twill.
- 8.4 Draw the design of horizontal herring bone twill with drafting & lifting plan.
- 8.5 Draw the design of vertical herring bone twill with drafting & lifting plan.
- 8.6 Mention the uses of herring bone twill.

#### **9.0 Understand the diamond design.**

- 9.1 Define diamond design.
- 9.2 State the features of diamond design.
- 9.3 Draw a diamond design with drafting & lifting plan.
- 9.4 Mention the uses of diamond design.

#### **10.0 Understand the diaper design.**

- 10.1 State the features of diaper design.
- 10.2 Draw the diaper design with drafting & lifting plan.
- 10.3 Mention the uses of diaper design.

#### **11.0 Understand the broken twill.**

- 11.1 State the features of broken twill.
- 11.2 Draw a design of broken twill with drafting & lifting plan.
- 11.3 Mention the uses of broken twill.

#### **12.0 Understand the stepped twill.**

- 12.1 State the feature of stepped twill.
- 12.2 Classify the stepped twills.
- 12.3 Draw different stepped twill with drafting & lifting plan.
- 12.4 Mention the uses of stepped twill.

#### **13.0 Understand the re-arranged twill.**

- 13.1 State the features of re-arranged twill.
- 13.2 Classify the re-arranged twills.

- 13.3 State the feature of cork screw weave.
- 13.4 Draw the different design of cork screw with drafting & lifting plan.
- 13.5 Mention the uses of cork screw weave.

**14.0 Understand the combined twill.**

- 14.1 State the features of combined twill.
- 14.2 Draw the design of combined twill with drafting & lifting plan.
- 14.3 Mention the uses of combined twill.

**15.0 Understand the standard commercial fabrics.**

- 15.1 Explain the term standard commercial fabric.
- 15.2 Mention the names of some standard commercial fabric.
- 15.3 Discuss the specifications of different standard commercial fabric.

**Practical:**

- 1. Construct the various types of drafting plans.
- 2. Draw the cross-sectional view of warp rib & weft ribs.
- 3. Construct the warp and weft faced twill design with drafting and lifting plan.
- 4. Draw the zig-zag twill design in graph paper with drafting & lifting plan. (horizontal & vertical).
- 5. Draw the herring bone twill design with drafting and lifting.
- 6. Draw the diamond design with drafting & lifting.
- 7. Draw the broken design with drafting & lifting.
- 8. Construct the stepped twill and re-arranged twill with drafting and lifting plan.
- 9. Create some new design of twill and marks its repeat.

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- 1. Watson`s Textile Design.  
By- Z. Grosicki
- 2. Watsons textile design & colour- nisbet.
- 3. Watson`s Advanced Textile Design.  
By- Z. Grosicki
- 4. Textile Weaving & Design.  
By- W.S. Murphy
- 5. Woven Structure and Design- Part-1 & 2  
By- Doris Goerner
- 6. d`vwe`K ÷`vKPvi GÛ wWRvBb  
BwÄt kvn †gvt Avwjgy<sup>3</sup>/<sub>4</sub>vgvb
- 7. d`vwe`K ÷`vKPvi GÛ K¬\_ A`vbvBjvBwmm  
BwÄt †gvt gwneyj Bmjvg

**AIMS**

- To be able to understand the principles and practices of book keeping and accounting.
- To be able to understand the procedures of general accounting, financial accounting and their application.

**SHORT DESCRIPTION**

Concept of book keeping and accounting; Transactions; Entry systems; Accounts; Journal; Ledger; Cash book; Trial balance; Final accounts; Cost account & financial accounting; Depreciation; Public works accounts.

**DETAIL DESCRIPTION****Theory:****1.0 Understand the concept of book keeping and accounting.**

- 1.1 Define book keeping and accountancy.
- 1.2 State the objectives of book keeping.
- 1.3 State the advantages of book keeping.
- 1.4 Differentiate between book keeping and accounting.
- 1.5 State the necessity and scope of book keeping and accounting.

**2.0 Understand the transactions.**

- 2.1 Define transactions and business transaction.
- 2.2 Explain the importance of transactions.
- 2.3 Describe the characteristic features of transactions.
- 2.4 Discuss the classification of transaction.
- 2.5 Identify the transaction from give statements stating reasons.

**3.0 Understand the entry system.**

- 3.1 State the aspects of transactions.
- 3.2 Define single entry system
- 3.3 State the objectives of single entry system.
- 3.4 Discuss the disadvantages of single entry system.
- 3.5 Define double entry system.
- 3.6 Discuss the principles double entry system.
- 3.7 Justify whether double entry system is an improvement over the single entry system.
- 3.8 Distinguish between Single entry and double entry system of book keeping.

**4.0 Understand the classification of accounts.**

- 4.1 Define accounts.
- 4.2 State the objectives of accounts.
- 4.3 Illustrate different type of accounts with example.
- 4.4 Define "Golden rules of Book keeping".
- 4.5 State the rules for "Debit" and "Credit" in each class of accounts.
- 4.6 Determine Debtor (Dr) and Creditor (Cr.) from given transactions applying golden rules.
- 4.7 Define accounting cycle.
- 4.8 State the different steps of accounting cycle.

## **5.0 Understand the Journal.**

- 5.1 Define Journal.
- 5.2 State the object of journal.
- 5.3 State the functions of journal.
- 5.4 Mention the various names of journal.
- 5.5 Journalize from given transactions.

## **6.0 Understand the ledger.**

- 6.1 Define ledger.
- 6.2 Interpret the form of ledger.
- 6.3 State the functions of ledger.
- 6.4 Distinguish between Journal and Ledger.
- 6.5 Prepare ledger from given transactions.
- 6.6 Explain ledger is called the king of all books of accounts.

## **7.0 Understand the cashbook.**

- 7.1 Define cash book (single, double and triple column).
- 7.2 Explain cashbook as both Journal and Ledger.
- 7.3 Prepare double column cashbook from given transactions showing balances.
- 7.4 Prepare triple column cash book from given transaction and find out the balances.
- 7.5 Define petty cash book.
- 7.6 Prepare analytical and imp rest system of cash book.
- 7.7 Define discount.
- 7.8 Explain the different types of discount.

## **8.0 Understand the trial balance.**

- 8.1 Define trial balance.
- 8.2 State the object of a trial balance.
- 8.3 State the methods of preparation of a trial balance.
- 8.4 Explain the limitations of preparation of a trial balance.
- 8.5 Prepare trial balance from given balance.

## **9.0 Understand the final accounts.**

- 9.1 State the components of final account.
- 9.2 Distinguish between trial balance and balance sheet.
- 9.3 Identify the revenue expenditure and capital expenditure.
- 9.4 Select the items to be posted in the trading account, profit & loss account and the balance sheet.
- 9.5 State the adjustment to be made form the given information below or above the trial balance.
- 9.6 Prepare trading account, profit & loss account and balance sheet from the given trial balance & other information.

## **10.0 Understand the cost and financial accounting.**

- 10.1 Define financial accounting.
- 10.2 State the objectives of financial accounting.
- 10.3 Define cost accounting.
- 10.4 Discuss the relationship between financial Accounting and cost accounting.
- 10.5 State the elements of direct cost and indirect cost.
- 10.6 Prepare cost sheet showing prime cost, factory cost, cost of production, total cost and selling price.
- 10.7 Explain the following terms:

- a. Fixed cost
- b. Variable cost
- c. Factory cost
- d. Overhead cost
- e. Process cost
- f. Direct cost
- g. Operating cost
- h. Standard cost

**11.0 Understand the depreciation**

- 11.1 Define depreciation.
- 11.2 State the objects of depreciation.
- 11.3 Discuss the necessity of charging depreciation.
- 11.4 Describe the different methods of determining depreciation.
- 11.5 Explain the relative merits and demerits of different method of depreciation.

**12.0 Understand the public works accounts.**

- 12.1 State the important aspects of public works accounts.
- 12.2 Describe the main features of public works accounts.
- 12.3 Explain "Revenue and Grant".
- 12.4 Define Value Added Tax (VAT)
- 12.5 State the merits and demerits of VAT.
- 12.6 Define Bill and Voucher.