

TF-105- TEXTILE FIBRES

Course Title	TEXTILE FIBRES	Course Code	TF-105
Year	I Year	Course group	Core
Teaching Scheme	4:1:0 (L: T: P) per week	Credits	3
Methodology	Lecture + Tutorials	Total Contact Hours	150
CIE Marks	60 Marks	SEE	40 Marks

Course Outcomes

S. No	Course Outcomes	Cognitive Level	No of Periods
CO1	Outline basic elements in textiles and their manufacturing methods	R	25
CO2	Demonstrate the process of extracting natural cellulose fibres and list their characteristics	R	25
CO3	Describe the stages in formation of natural protein fibres and list their characteristics	R/U	20
CO4	Outline the manufacturing processes of synthetic and Semi synthetic fibres	R/U	20
CO5	Interpret the properties of textile fibres and select the fibres based on their specific properties	R /A	30
CO6	Use the textile fibres as per the requirements of Apparels and industrial fields	A	30
			150

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Periods	Questions to beset for SEE			
			R	U	A	
I	Introduction to Textiles and their Manufacturing processes	25				
II	Natural Cellulose Fibres	25				
III	Natural Protein Fibres – Wool and Silk	20				
IV	Production of Staple fibres and filament yarns	20				
V	Properties of Textile Fibres	30				
VI	Applications and Comparison of textile Fibres	30				
	Total	150	8	8	8	

Course Contents

UNIT-1: Introduction to Textiles and their Manufacturing processes

Duration 25 HOURS

Textile products in domestic applications-Definition of basic terms related to textiles –different sectors of textile industry-major textile industries of India-Process flow charts of producing natural textile fibres, manufactured fibres and filaments-process flow chart for producing yarn from the fibers, producing fabric from the yarn, wet processing sequence of fabrics, producing garment from the fabric, Garment Merchandising-Stages of fibre formation in natural fibres-Steps in production of manufactured fibres and filaments - Difference between synthetic and semi synthetic -essential and desirable properties of textile fibres

UNIT-2: Natural Cellulose Fibres

Duration 25 HOURS

List of natural cellulose fibres –cultivation of cotton -properties of cotton which makes it most useful -Botanical Classification of cotton - Worldwide and Indian varieties of cotton with their characteristic properties - fibre quality parameters for grading of cotton - microscopic structure of cotton using a sketch - Crystalline and amorphous structure - Chemical Composition of Cotton - chemical structure of cotton cellulose –Bastfibres -Features of Bastfibres - Jute and Flax -Preparation of Bastfibres for extraction (Retting) -Extraction (Manufacturing) of Bastfibres - Structure of bastfibres – both Jute & Flax

UNIT-3 Natural Protein Fibres – Wool and Silk

Duration 20 HOURS

Classification of wool – by sheep, by fleece and by commercial use -general properties of wool - Define Virgin wool and shoddy wool -Major Wool producing countries in the world -Impurities in raw wool -Cleaning and preparation wool for production of Yarns-differences between Woollen and Worsted Yarns- Physical and chemical Structure of wool fibre cross section using a sketch – Silk - Varieties of Silk -Sericulture (life cycle)of silkworm- the Physical characteristics of cocoon -difference between Mulberry silk and Non mulberry silk -different stages in production of raw silk from cocoons - different methods of Drying / Stifling- methods of Cocoon cooking - methods of Mulberry Silk Reeling -Chemical Processes of silk -Process flow charts of Mulberry silk, Tassar and Muga cocoons

UNIT-4: Production of Staple fibres and filament yarns

Duration: 20 HOURS

Requirements of fibre forming Polymers - basic steps in Fibre forming process -Polymers and Monomers of textile fibres-types of polymerization reactions-difference between semi synthetic and synthetic fibre-manufacturing process of following synthetic polymers – Polyester, Polyamide fibres - Nylon 6 , Nylon 6,6, Acrylic Fibre-methods of producing filaments/fibres from polymers (spinning methods)- Melt Spinning, Wet Spinning and Dry Spinning- Spinning methods of different synthetic textile fibres - process of staple fibre production - types of filaments yarns –objects and advantages of texturization -method of draw texturizing - manufacturing process of Semi synthetic fibres - Regular Viscose, Cellulose acetate and Lyocell

UNIT-5: Properties of Textile Fibres

Duration: 30 HOURS

Classify the properties of textile fibres and define in the following ways -Physical properties, Chemical, Durability, Aesthetic, Comfort and Appearance and retention properties - the Properties of following textile fibres -Cotton, Bast, Wool, Silk, - Viscose, Lyocell, Acetate - Polyester, Nylons, Acrylic - -Tabulate heat sensitivity and burning characteristics of textile fibres

UNIT-6: Applications and Comparison of textile Fibres

Duration: 30 HOURS

Explain the applications of following fibres in apparel, furnishing and technical fields - Cotton, Bast, Wool, Silk -Viscose, Lyocell, Acetate -Polyester, Nylons, Acrylic -examples of industrial and technical textiles-Tabulate Properties common to all cellulose fibres, protein fibres and synthetic fibres and also state their importance to consumers-Compare natural and synthetic fibres -Compare Vegetable and animal fibres-Compare Jute and flax in terms of properties and applications -Compare wool and silk -Compare cotton, Viscose and Lyocell

Text Books

- | | | |
|--|---|----------------|
| 1. Textile Science | - | Gohl&Velensky. |
| 2. Textile Fibres | - | Garden & Cook |
| 3. A text book of Fibre Science and Technology | - | S.P. Mishra. |
| 4. Textiles | - | Sara J Kadolph |
| 5. Production of Synthetic fibres | - | A.A.Vaidya |

Reference Books

- | | | |
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| 4. Textiles | - | Sara J Kadolph |
| 5. Production of Synthetic fibres | - | A.A.Vaidya |

Specific learning Outcomes

On completion of this course, student will be able to

CO1: Outline basic elements in textiles and their manufacturing methods

- 1.1. Recall the textile products in domestic applications
- 1.2. Define basic terms related to textiles –fibre, filament, yarn, thread, fabric, garment, texture etc.,
- 1.3. Recognize different sectors of textile industry
- 1.4. List major textile industries of India
- 1.5. Outline the process of producing natural textile fibres with the aid of flow chart
- 1.6. Outline the production process of manufactured fibres and filaments with the aid of flow chart
- 1.7. Outline the process of producing yarn from the fibers with the aid of flow chart
- 1.8. Mention different methods of fabric manufacture
- 1.9. Outline the process of producing woven fabric from the yarn with the aid of flow chart
- 1.10. Outline the wet processing sequence of fabrics
- 1.11. Outline the process of producing garment from the fabric with the aid of flow chart
- 1.12. Outline the process of garment merchandising with the aid of flow chart
- 1.13. Classify textile fibres based on source and chemical nature
- 1.14. Explain the stages of fibre formation in natural fibres
- 1.15. Explain the steps in production of manufactured fibres and filaments
- 1.16. State the difference between synthetic and semi synthetic fibres
- 1.17. Explain the essential and desirable properties of textile fibres

CO2: Demonstrate the process of extracting natural cellulose fibres and list their characteristics

- 2.1 List natural cellulose fibres
- 2.2 Explain the cultivation process of cotton fibres
- 2.3 Explain the methods of Retting the Bastfibres for extraction (Preparation).
- 2.4 Explain the steps in extraction of Bastfibres (Manufacturing)
- 2.5 Explain the methods of extracting Bamboo fibres
- 2.6 Extraction process of Coir fibre
- 2.7 Extraction process of Banana fibres
- 2.8 Write the chemical composition of all Cellulosic fibres
- 2.9 Write the chemical structure of cellulose
- 2.10 Significance of crystalline and amorphous regions of cotton
- 2.11 State the properties of cotton which makes it most useful
- 2.12 Describe the microscopic and fibrillar structure of cotton
- 2.13 List characteristics and structural features of Bastfibres (Jute and Flax)
- 2.14 List characteristics and structural features of Coir fibres
- 2.15 List characteristics and structural features of Bamboo fibres
- 2.16 List characteristics and properties of Banana fibres
- 2.17 Explain about other minor leaf fibres

CO3: Describe the stages in formation of natural protein fibres and list their characteristics

- 3.1 List wool producing states in India
- 3.2 Classify wool by sheep and state their characteristics and properties
- 3.3 Classify wool by fleece and state their characteristics and properties
- 3.4 Classify wool by commercial use and state their characteristics and properties
- 3.5 Define Virgin wool and shoddy wool
- 3.6 List the Impurities in raw wool
- 3.7 Explain cleaning and preparation wool for production of Yarns.
- 3.8 Describe the terms used for handle of wool
- 3.9 Write the differences between Woolen and Worsted Yarns.
- 3.10 Describe the structure of wool fibre cross section using a sketch
- 3.11 Describe the Chemical Structure of Wool
- 3.12 List Silk producing states in India
- 3.13 Explain Sericulture (life cycle) of silkworm.
- 3.14 List the Varieties of Silk
- 3.15 State the physical characteristics of cocoon
- 3.16 Write the difference between Mulberry silk and Non mulberry silk
- 3.17 Explain different stages in production of raw silk from cocoons
- 3.18 Explain the different methods of Mulberry Silk Reeling
- 3.19 Describe the chemical structure of Silk
- 3.20 Explain about Throwing of silk
- 3.21 Explain about Degumming of Silk
- 3.22 Draw the Process flow chart for production of Mulberry silk

CO4: Outline the manufacturing processes of synthetic and Semi synthetic fibres

- 4.1 Define the terms – Monomer, Polymer and Degree of Polymerization
- 4.2 Tabulate raw materials used for producing commonly used synthetic fibres
- 4.3 State the requirements of fibre forming Polymers
- 4.4 Mention the types of polymerization reactions
- 4.5 List different Polymerization techniques
- 4.6 Outline manufacturing process of Polyester polymer with the aid of flow chart
- 4.7 Outline the manufacturing process of Nylon 6 polymer with the aid of flow chart
- 4.8 Outline the manufacturing process of Nylon 6,6 polymer with the aid of flow chart
- 4.9 Outline the manufacturing process of Acrylic Polymer with the aid of flow chart
- 4.10 Outline the manufacturing process of Modacrylic Polymer with the aid of flow chart
- 4.11 Describe Melt Spinning process of producing fibres / filaments
- 4.12 Describe Wet Spinning process producing fibres / filaments
- 4.13 Describe Dry Spinning process producing fibres / filaments
- 4.14 Explain the process of staple fibre production
- 4.15 Explain the process of producing filament yarns
- 4.16 Explain the manufacturing process of Regular Viscose
- 4.17 Explain the manufacturing process of Cellulose acetate
- 4.18 Explain the manufacturing process of Lyocell
- 4.19 State the functions of spin finishes
- 4.20 State the objects and advantages of texturization
- 4.21 Explain the methods of texturization

CO5: Interpret the properties of textile fibres and select the fibres based on their specific properties

- 5.1 Classify the properties of textile fibres
- 5.2 Interpret the physical properties considered for use of textile fibres
- 5.3 Interpret the chemical properties considered for use of textile fibres
- 5.4 Interpret the durability properties considered for use of textile fibres
- 5.5 Interpret the Aesthetic properties considered for use of textile fibres
- 5.6 Interpret the comfort properties considered for use of textile fibres
- 5.7 Interpret the appearance and retention properties considered for use of textile fibres
- 5.8 Explain the Properties of cotton fibres
- 5.9 Explain the properties of Bastfibres
- 5.10 Explain the properties of wool fibres
- 5.11 Explain the properties silk filaments
- 5.12 Explain the properties Viscose fibres
- 5.13 Explain the properties lyocell fibres
- 5.14 Explain the properties of acetate fibres
- 5.15 List the properties of Polyester fibres / filaments
- 5.16 List the properties of Nylon fibres / filaments
- 5.17 List the properties of acrylic and modacrylic fibres
- 5.18 List the properties of Bamboo fibres
- 5.19 List the properties of Coir fibres

CO6: Use the textile fibres as per the requirements of Apparels and industrial fields

- 6.1 Explain the applications of natural cellulose textiles
- 6.2 Explain the applications of Wool textiles
- 6.3 Explain the applications of Silk textiles
- 6.4 Explain the applications of semi Viscose textiles
- 6.5 Explain the applications of semi Lyocell textiles
- 6.6 Explain the applications of semi Acetate textiles
- 6.7 Explain the applications of Polyester textiles
- 6.8 Explain the applications of Nylon textiles
- 6.9 Explain the applications of Acrylic textiles
- 6.10 Explain the applications of Bamboo fibres
- 6.11 Explain the applications of coir fibres
- 6.12 Explain the applications of Banana fibres
- 6.13 Tabulate Properties common to all cellulose fibres and their importance to consumers
- 6.14 Tabulate properties common to all protein fibres and their importance to consumers
- 6.15 Tabulate properties common to all synthetic fibres and their importance to consumers
- 6.16 Recognize the industrial applications of textiles
- 6.17 Recognize the applications of textiles in technical fields
- 6.18 Compare cellulose and protein fibres
- 6.19 Compare cotton, Viscose and Lyocell
- 6.20 Compare natural and synthetic fibres

CO PO Matrix

Course: Textile Fibres											
Course Outcomes	Program Outcomes										Mapped POs& PSO _s
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	
CO1	2		1							2	PO1,& PSO3
CO2	2		1							2	PO1, 3,7& PSO3
CO3	2		1				2			2	PO1,3,7 & PSO3
CO4	2		1				2			2	PO1,3,7 & PSO3
CO5	2		3			1			3	2	PO1,3,6& PSO2,3
CO6	2		2			1			2	3	PO1,3,6& PSO2,3
Activities											
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											

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>

QUESTION PAPER PATTERN FOR MID SEMESTER EXAMS

MID-I Examination

S. No	Unit	Questions to be set for MID Exam			
		R	U	A	Remarks
1	UNIT-1	1, 2	5(a) 5(b)	7(a) 7(b)	
2	UNIT-2	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

MID-II Examination

S. No	Unit	Questions to be set for MID Exam			Remarks
		R	U	A	
1	UNIT-3	1, 2	5(a) 5(b)	7(a) 7(b)	
2	UNIT-4	3, 4	6(a) 6(b)	8(a) 8(b)	
Total Questions		4	4	4	

Year End Examination (SEE)

S. No	Unit	Questions to beset for SEE								Remarks
		R		U		A				
1	UNIT-1									
2	UNIT-2									
3	UNIT-3									
4	UNIT-4									
5	UNIT-5									
6	UNIT-6									
Total Questions		8		8		8				

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATION (C-26)
MID-I EXAMINATION
TF-105 TEXTILE FIBRES
Model Question Paper

Duration : 1 hours

Max. Marks: 20

Part-A

Answer All the questions.

4 X 1=4 M

1. Define fibre and fabric.
2. Name any two semi synthetic fibres
3. Write any four characteristics of Jute fibres.
4. Write any four characteristics of Coir fibres.

Part-B 2 X 3= 6 M

- 5 (a) Draw the process flow chart for wet processing of textile materials.
(or)
(b) Draw the process flow chart for producing a Garment from the fabric
- 6 (a) Explain about extraction of Banana fibres.
(or)
(b) Explain about Retting process of Bast fibres.

Part-C 2 X 5=10 M

6. (a) Explain the about essential properties of textile fibres.
(or)
(b) Draw the process flow chart for production of yarns from the fabric and outline the process.
7. (a) Explain the features observed in cross section of cotton fibre using a sketch.
(or)
(b) Explain about general characteristics and features of Bamboo fibres.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATION (C-26)
MID-II EXAMINATION
TF-105 TEXTILE FIBRES
Model Question Paper

Duration : 1 hours

Max. Marks: 20

Part-A

Answer All the questions.

4 X 1=4 M

1. List the Impurities in raw wool.
2. List the Varieties of Silk.
3. Define the term monomer and polymer
4. What is meant by texturization?

Part-B 2 X 3= 6 M

5. (a) Classify wool by sheep and state their characteristics and properties.
(OR)
(b) Write the difference between Mulberry silk and Non mulberry silk.
6. (a) Explain about the two types of polymerisation reactions
(OR)
(b) State the functions and requirements of spin finishes.

Part-C 2 X 5=10 M

- 7.(a) Explain the stages of Sericulture.
(OR)
(b) Explain the cleaning and preparation wool for production of Yarns.
8. (a) Tabulate spinning methods for production of different synthetic textile fibres
(OR)
(b) Tabulate monomers and Polymers of commonly used textile fibres.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATION (C-26)
END EXAMINATION
TF-105 TEXTILE FIBRES
Model Question Paper

Duration : 1 hours

Max. Marks: 20

Part-A

Answer All the questions.

8 X 1=8 M

1. What are the two stages in formation of fibre?
2. Define virgin wool and shoddy wool
3. Write burning characteristics of polyester fibre
4. Mention any two types of textured yarns
5. Write any two physical properties of Silk.
6. Write any two physical properties of Nylon.
7. Write any two applications of Viscose fibres.
8. Write any two applications of Flax fibres.

Part-B 4 X 3= 12 M

9. (a) Classify textile fibres based on source.
(OR)
(b) Explain the properties of Jute fibres.
10. (a) Explain the differences between Woollen yarns and worsted yarns.
(OR)
(b) Explain the applications of Acrylic fibres.
11. (a) Explain about durability properties of textile fibres.
(OR)
(b) Explain about the properties of Lyocell fibres.
12. (a) Tabulate properties common to all cellulose fibres and their importance to consumers
(OR)
(b) Compare Cotton, Viscose and Lyocell fibres.

Part-C 4 X 5= 20 M

13. (a) Outline the step by step process of producing fabrics from the yarns by weaving
(OR)
(b) Explain properties common to all protein fibres and their importance to consumer.
14. (a) Explain different stages in production of raw silk from cocoons.
(OR)
(b) Explain the applications of textiles in industrial and technical fields
15. (a) Explain about Aesthetic properties of textile fibres.
(OR)
(b) Explain the properties of Polyester fibres.
16. a) Explain the applications of Bamboo fibres.
(OR)
(b) Compare natural and Synthetic fibres.