UNIVERSITY OF MAMAGEMENT AND TECHNOLOGY

SCHOOL OF TEXTILE AND DESIGN
MS Textiles

Course Specifications

TX-601
Fiber and Yarn Studies

Fall……

COURSE SPECIFICATIONS

Basic Information			
Course Title**:**	Fiber and Yarn studies		
Course Code**:**	TX-601		
Course credits/week**:**	Theory: 03	Lab: 00	Total: 03
Pre-requisite(s)**:**	None		
Co-requisite(s)**:**	None		
Program(s) on which the course is given**:**	MS Textiles		
Is the course major or minor element of the program?	Major: ☐	Minor: ☐	
School offering the program**:**	School of Textile and Design		
Department offering the course**:**	Department of Textile Engineering		
Academic year/level**:**	1/2		
Revision #**:**	01		
Last revised on (date):	N/A		

Overall Aims of the Course
This course is designed to provide students fundamental and detailed knowledge of textile fibers, which includes their classification, and physical, mechanical and other properties. The course also discusses about the special features of cellulosic, protein and synthetic fibers with regard to their uses. The course will also shed light on the manufacturing methods of staple-spun and filament yarns and their designations.

Key Skills and Attributes to be Developed by the Course	
Textile Knowledge	An ability to apply basic knowledge of arts and science to produce conventional and new textile products
Problem Analysis	An ability to identify and formulate research literature and analyze problems using basic principles od mathematics and natural sciences
Communication	An ability to communicate effectively, orally and in writing, with textile community and society
Lifelong Learning	An ability to recognize importance of lifelong learning and pursue it in the broader context of innovation and technological development.

Course Schedule		
Week	**Module**	**Intended Learning Outcomes**
1	Introduction	At the end of this week, the students will be able to: • Define textile fiber • Describe primary and secondary properties of textile fibers • Classify natural and man-made fibers
2	Natural Cellulosic	At the end of this week, the students will be able to:

	Fibers	• Differentiate natural cellulosic fibers and their origins • Describe about the physical and chemical properties and uses of natural cellulosic fibers
3	Natural Protein Fibers	At the end of this week, the students will be able to: • Differentiate natural protein fibers and their origins • Describe about the physical and chemical properties and uses of natural protein fibers
4	Natural Mineral Fibers	At the end of this week, the students will be able to: • Describe asbestos fibers and their limitations in use
5	Regenerated Fibers	At the end of this week, the students will be able to: • Differentiate regenerated fibers, their origins, production methods and uses
6	Synthetic Fibers	At the end of this week, the students will be able to: • Describe various types of synthetic fibers and their manufacturing techniques
7	Synthetic Fibers	At the end of this week, the students will be able to: • Mention the application areas of various synthetic fibers
8	Fiber Identification	At the end of this week, the students will be able to: • Explain the physical and chemical tests to identify a wide range of textile fibers
Mid-semester Examination		
9	Short Staple-spun Yarns	At the end of this week, the students will be able to: • Describe the preparatory processes of short staple-spun yarns
10	Short Staple-spun Yarns	At the end of this week, the students will be able to: • Elaborate the spinning processes and winding processes of short staple-spun yarns
11	Long Staple-spun Yarns	At the end of this week, the students will be able to: • Explain the preparatory and spinning processes of long staple-spun yarns
12	Man Made Fibers	At the end of this week, the students will be able to: • Differentiate various conventional spinning methods for man-made fibers and filament yarns
13	Yarn Numbering Systems	At the end of this week, the students will be able to: • Determine the fiber and yarn fineness and their

		converting factors
14	Yarn Twisting and Designation of Yarn Construction	At the end of this week, the students will be able to: • Describe the yarn twisting methods and how the twisted and cabled yarns are designated
15	Fancy Yarns	At the end of this week, the students will be able to: • Know the production techniques of fancy yarns and their uses
End-semester examination		

Teaching and Learning Methods

- Lectures and discussions
- Class activities
- Industry visits

Required Learning Resources	
References:	1. Physical Properties of Textile Fibers, W. E. Morton and J. S. Hearle (2008), Woodhead Publishing 2. Identification of Textile Fibers, Max M Houck (2009) Woodhead Publishing 3. Rieter Manual of Spinning Volume 1-7, 2016 4. Spinning: Cotton and Wool Spinning, Ezio Carissoni et al. (2002) 5. Fancy Yarns: Manufacturing and Applications, R. H. Gong and R. M. Wright (2002), Woodhead Publishing 6. Textile Fibers, Dyes, Finishes and processes, Howard L. Needles (1986), Noyes Publications, New Jersey, USA 7. ASTM Standards Book, Volume 7 8. AATCC Standard Book

Facilities Required for Teaching and Learning

-Class room
-Board
-Projector
-Recommended books

Assignments Schedule			**Quiz Schedule**	
No.	**Week Assigned**	**Week Due**	**No.**	**Week**
1	2, 4	3, 5	1, 2, 3	2, 5, 7
2	10, 13, 14	11, 14, 15	4, 5	11,13

Weighting of Assessments

Quizzes	12.50 %
Assignments	12.50 %
Mid-semester examination	25.00 %
End-semester examination	50.00 %

Grading Criteria		
Letter Grade	**Percentage Marks**	**GPA**
A	**86.25 and above**	**4.00**
A-	**82.50 – 86.24**	**3.70**
B+	**78.75 – 82.49**	**3.30**
B	**75.00 – 78.74**	**3.00**
B-	**71.25 – 74.99**	**2.70**
C+	**67.50 – 71.24**	**2.30**
C	**63.75 – 67.49**	**2.00**
C-	**60.00 – 63.74**	**1.70**
F	**59.99 or lower**	**0**

Course Specifications Developed By:	**Reviewed By (Chairman):**
Dr. Mumtaz Hasan Malik	
Date: 26-10-2020	**Date:**

SCHOOL OF TEXTILE AND DESIGN
MS Textiles

Course Specifications

TX-603
Fabric Manufacturing

Fall…..

COURSE SPECIFICATIONS

Basic Information			
Course Title**:**	Fabric Manufacturing		
Course Code**:**	TX-603		
Course credits/week**:**	Theory: 03	Lab: 00	Total: 03
Pre-requisite(s)**:**	None		
Co-requisite(s)**:**	None		
Program(s) on which the course is given**:**	MS Textiles		
Is the course major or minor element of the program?	Major: ☐	Minor: ☐	
School offering the program**:**	School of Textile and Design		
Department offering the course**:**	Department of Textile Engineering		
Academic year/level**:**	1/2		
Revision **#:**	01		
Last revised on (date):	N/A		

Overall Aims of the Course
This course is designed to provide students fundamental and advanced knowledge of fabric manufacturing processes by weaving and knitting technologies. The students will also study some mathematical methods used for calculating the required weight of fabrics and other physical parameters as well as the yarn quantity required for making such structures. The inspection and testing methods of fabrics will also be studied.

Key Skills and Attributes to be Developed by the Course	
Textile Knowledge	An ability to apply basic knowledge of arts and science to produce conventional and new textile products
Problem Analysis	An ability to identify and formulate research literature and analyze problems using basic principles of mathematics and natural sciences
Communication	An ability to communicate effectively, orally and in writing, with textile community and society
Lifelong Learning	An ability to recognize importance of lifelong learning and pursue it in the broader context of innovation and technological development

Course Schedule		
Week	**Module**	**Intended Learning Outcomes**
1	**Introduction to Weaving**	At the end of this week, the students will be able to: • Learn about history of weaving and types of weaving machine • Learn about flow chart of fabric manufacturing process

		• Learn about some terminologies of woven fabrics
2	**Warping**	At the end of this week, the students will be able to: • Describe the objectives of warping and the types of warping machines • Know about different parts of warping machine • Calculate the number of warper's beams for a weaver's beam
3	**Sizing**	At the end of this week, the students will be able to: • Mention the objectives of sizing • Describe different types of ingredients and their ratios used in sizing • Describe the application process of sizing • Describe the effects sizing variables on yarn quality
4	**Drawing-in and Tying Processes**	At the end of this week, the students will be able to: • Learn how weave design is represented on paper • Explain the purpose and method of drawing-in • Differentiate between drawing-in and tying-in • Differentiate the manual and automatic drawing-in processes
5	**Looming**	At the end of this week, the students will be able to: • Explain the basic motions of a loom • Describe different types of looms • Explain the weft insertion methods, their mechanisms and advantages
6	**Looming**	At the end of this week, the students will be able to: • Explain in detail the working mechanisms of different types of looms
7	**Woven Fabric Structures**	At the end of this week, the students will be able to: • Make different weave structures and explain the equipment used for their formation

8	**Fabric Inspection and Grading**	At the end of this week, the students will be able to: Describe various defects of woven fabric Explain different types of inspection standards Mention the fabric quality parameters Describe the folding and rolling methods
Mid-semester Examination		
9	**Introduction to Knitting**	At the end of this week, the students will be able to: • Draw and explain the weft and weft knitted structures • Differentiate between warp and weft knitted structures
10	**Basic Knitting Concepts**	At the end of this week, the students will be able to: • Differentiate main parts of a knitting machine • Describe the types of needles and stitches
11	**Weft Knitted Structures**	At the end of this week, the students will be able to: • Analyze the types of weft knitted structures • Give details about the elements of a weft knitting machine and their working
12	**Warp Knitted Structures**	At the end of this week, the students will be able to: • Analyze the types of warp knitted structures • Give details about the elements of a warp knitting machine and their working
13	**Knitted Fabric Calculations**	At the end of this week, the students will be able to: • Calculate the knitted fabric physical parameters like weight, width etc.
14	**Knitted Fabric Defects**	At the end of this week, the students will be able to: • Describe knitted fabric defects, their causes and remedies
15	**Knitted Fabric Packing**	At the end of this week, the students will be able to: • Describe the methods used for packing knitted fabrics, their merits and demerits

End-semester examination		

Teaching and Learning Methods

- **Lectures and discussions**
- **Class activities**
- **Industry visits**

Required Learning Resources	
References:	9. Weaving by Giovanni Castelli, ACIMIT, 2000 10. Principles of Fabric Formation by Prabir Kumar Banerjee, 2015 11. Knitted Technology by David J Spencer, Pergamon Press, 1983 12. ASTM Standards Book, Volume 7 13. AATCC Standard Book

Facilities Required for Teaching and Learning

- Class room
- Board
- Projector
- Recommended books

Assignments Schedule			**Quiz Schedule**	
No.	**Week Assigned**	**Week Due**	**No.**	**Week**
1	2, 4	3, 5	1, 2, 3	2, 5, 7
2	10, 13, 14	11, 14, 15	4, 5	11,13

Weighting of Assessments	
Quizzes	12.50 %
Assignments	12.50 %
Mid-semester examination	25.00 %
End-semester examination	50.00 %

Grading Criteria		
Letter Grade	**Percentage Marks**	**GPA**

A	**86.25 and above**	**4.00**
A-	**82.50 – 86.24**	**3.70**
B+	**78.75 – 82.49**	**3.30**
B	**75.00 – 78.74**	**3.00**
B-	**71.25 – 74.99**	**2.70**
C+	**67.50 – 71.24**	**2.30**
C	**63.75 – 67.49**	**2.00**
C-	**60.00 – 63.74**	**1.70**
F	**59.99 or lower**	**0**

Course Specifications Developed By:	**Reviewed By (Chairman):**
Dr. Mumtaz Hasan Malik	
Date: 27-10-2020	**Date:**

UNIVERSITY OF MAMAGEMENT AND TECHNOLOGY

SCHOOL OF TEXTILE AND DESIGN

MS Textile

Course Specifications

Advance Textile wet Processing

Fall……

http://www.umt.edu.pk/

COURSE SPECIFICATIONS

Basic Information			
Course Title**:**	Advance Textile wet Processing		
Course Code**:**	TX-612		
Course credits/week**:**	Theory:03		Total: 03
Pre-requisite(s)**:**			
Co-requisite(s)**:**	None		
Program(s) on which the course is given**:**	MSTX		
Is the course major or minor element of the program**:**	Major: ☑	Minor:☐	
Department offering the program**:**	School of Textile and Design		
Department offering the course**:**			
Academic year/level**:**			
Revision **#:**			
Last revised on (date):			

Overall Aims of the Course
This course- Introduction to textile chemical processing provides founding comprehension of textile processes, material used, governing principles and scientific understanding. Students will be exposed to modern technologies coupled with the scientific principles that support the achievement of desired results. The objective of this course is to introduce the students to different areas of textile chemical processing, including chemical preparation of textiles, textile dyeing, textile printing and textile finishing on different fibers like cotton, wool, polyester etc.

Key Skills and Attributes to be Developed by the Course	
Knowledge, understanding and application skills	• Provide participant with good knowledge of all the preparatory processes, • Enabling them to understand the current needs of industry, • Provide participant with a comprehensive Knowledge of different pre treatments, dyeing and printing processes will help out the student to understand whole industry mechanism.
Analytical and problem solving skills	• Ability to analyze problems faced by industry and their remedies. The detail knowledge of different parameters will help participant to understand why industry need these parameters and industrial need of

	managing these parameters like singeing, desizing, scouring, bleaching, mercerizing, dyeing/printing and finishes.
Design, synthesis and evaluation skills	
Communication, interpersonal and IT skills	Ability to communicate the methods adopted to solve the problems and to present the final solution

Course Schedule		
Week	**Module**	**Intended Learning Outcomes**
1	Discussion of course. Introduction to textile chemical processing, Chemical processing flow chart**.**	At the end of this week, the students will be able to: • Learn about chemical processes and mechanisms of these processes.
2	Shearing & Singeing processes, Shearing Machine and its description, Singeing Machine and its description, Evaluation of singed fabric and Bio technology.	At the end of this week, the students will be able to: • Learn about the basic reasons of pilling and its effects on fabric along with singeing, shearing process and Bio technology.
3	Chemical composition of Size and Cotton, Desizing Techniques and Methods	At the end of this week, the students will be able to: • Learn about the reasons for sizing mechanism and purpose of desizing along with its types and fabric issues.
4	Scouring chemicals and Auxiliaries, Saponification, Dispersion, Suspension and Emulsion, Evaluation of desizing & scouring	At the end of this week, the students will be able to: • Learn about scouring process and reasons to do scouring and cleaning process and machines used for it. • Theories about surface mechanism related to absorbency.
5	Bleaching Chemicals and auxiliaries, Bleaching chemistry and its evaluation	At the end of this week, the students will be able to: • Learn about bleaching process and full learning about bleaching plant.

6	Effect of Mercerization on cotton fiber, Evaluation of Bleaching & Mercerizing	At the end of this week, the students will be able to: • Learn about the reason for mercerization and what are the changes associated with this mechanism.
7	Introduction to dye stuff chemistry and types	At the end of this week, the students will be able to: • Learn about chemistry and working of dyes and dye fiber interface theories.
8	Dyeing of cellulosics with direct, reactive, sulphur and vat dyes, Dyeing of polyester, nylon, acrylic, wool and silk, Important characteristics of dyed fabrics	At the end of this week, the students will be able to: • Learn about nature and working of each class of dye and their complete classification.
Mid-semester Examination		
9	Introduction to specification, measurement and quality control of color	At the end of this week, the students will be able to: • Learn about color viewing process of human eye and different color systems
10	Design Studio & Engraving, Introduction to different methods and styles of printing	At the end of this week, the students will be able to: • Learn about history and types of printing and application method of each type of printing.
11	continued	At the end of this week, the students will be able to: • As mentioned above
12	Introduction to common chemical and mechanical finishes	At the end of this week, the students will be able to: • Learn about the basic difference between types of finishes and machines used for these types of finishes.
13	Classification of finishes: chemical, mechanical	At the end of this week, the students will be able to: • Learn about detailed knowledge about finishing mechanism and its key points to use it.
14	Presentations	At the end of this week, the students will be able to: • Presentations
15	**Revision**	
End-semester Examination		

Teaching and Learning Methods

• Lectures and discussions • Class activities • Industry visits • Presentation

Required Learning Resources	
Text Book(s): (Title, Author, Edition, Publisher)	➢ Cellulosic Dyeing by John Shore, Society of Dyers and Colorists, 1995 ➢ Dyeing of Textile Materials by Jose Cegarra, Textilia, 1992
Reference Book(s): (Title, Author, Edition, Publisher)	➢ Textile Printing by W.C. Miles, Society of Dyers & Colorists, 2003 ➢ Textile Finishing by Derek Heywood, Society of Dyers & Colorists, 2003
Facilities Required for Teaching and Learning	
• Class room • Board (Black or White) • Projector • Recommended books	

Assignments Schedule			Quiz Schedule	
No.	**Week Assigned**	**Week Due**	**No.**	**Week**
1	3rd	4th	1	2nd
2	5th	6th	2	4th
3	7th	8th	3	6th
4	9th	10th	4	8th
5	11th	12th	5	10th
6	13th	14th	6	12th

Weighting of Assessments	
Quizzes	10 **%**
Assignments	10 **%**
Mid-semester examination	30 **%**
End-semester examination	50 **%**
Lab	50 **%**

Course Specifications Developed By:	Reviewed By (Chairman):

Date:	Date: