Department of Textile Engineering

The department of Textile Engineering offers the following programs:

1. Graduate Diplomas

1.1 Specialized Graduate Diploma in Spinning Engineering

The student must complete 30 credit hours.
Compulsory courses: The student must pass four courses with a total of 12 credit hours with course numbers (07 13 611, 07 13 613, 07 13 614, 07 13 615,07 13 616).
Elective courses: The student can choose the remaining credit hours from any other courses that are specified as "Diploma courses"

1.2 Specialized Graduate Diploma in Weaving Engineering

The student must complete 30 credit hours.
Compulsory courses: The student must pass three courses with a total of 9 credit hours with course numbers (07 13 612, 07 13 613, 07 13 615, 07 13 616).
Elective courses: The student can choose the remaining credit hours from any other courses that are specified as "Diploma courses"

2. Master Degrees

2.1 Master of Engineering in Textile Engineering

The student must complete 30 credit hours in the form of courses and an additional 3 credit hours in the form of a scientific report.
Compulsory courses: The student must complete six courses with a sum of 18 credit hours with course numbers (07 13 711, 07 13 712, 07 13 713, 07 13 14, 07 13 715, 07 13 716).
Elective courses: The student can choose the remaining credit hours from any other courses that are specified as "Master courses". The student is allowed to choose 2 courses from another major.

2.2 Master of Science in Textile Engineering

The student must complete 24 credit hours in the form of courses and an additional 8 credit hours in the form of a thesis.

Compulsory courses: The student must complete six courses with a sum of 18 credit hours with course numbers (07 13 711, 07 13 712, 07 13 713, 07 13 14, 07 13 715, 07 13 716).

Elective courses: The student can choose the remaining credit hours from any other courses that are specified as "Master courses". The student is allowed to choose 2 courses from another major.

3. Doctor of Philosophy- Ph.D. Degree

3.1 Doctor of Philosophy in Architectural Engineering

The student must complete 18 credit hours in the form of courses and an additional 24 credit hours in the form of a dissertation.

Compulsory courses: The student must complete four courses with a sum of 12 credit hours with course numbers (07 13 811 to 07 13 816).

The student must choose the remaining courses from those specified as "Doctorate courses". The student has the right to choose another two courses from another major.

List of Diploma, Master and Ph.D. courses

No	Course Code	Course Name	Credit Hours	Exam Duration	Pre - requisites
1	07 13 611	Spinning Technology	3	3	
2	07 13 612	Weaving Technology	3	3	
3	07 13 613	Mechanics of Textile Machinery	3	3	
4	07 13 614	Textured Yarn Production	3	3	
5	07 13 615	Physics and Properties of Textile Raw Material	3	3	
6	07 13 616	Computer Application in Textiles I	3	3	
7	07 13 621	Technology of Yarn Formation	3	3	
8	07 13 622	Developments in Yarn Manufacturing	3	3	

No	Course Code	Course Name	Credit Hours	Exam Duration	Pre - requisites
9	07 13 623	Filament Yarn Production, Processing and Properties	3	3	
10	07 13 624	New Developments in Weaving Machinery	3	3	
11	07 13 625	Technology of Warp and Weft knitting	3	3	
12	07 13 626	Organization and Planning of Weaving Mills	3	3	
13	07 13 627	Cloth Production	3	3	
14	07 13 628	Performance Evaluation of Textile Materials	3	3	
15	07 13 629	Production Costing in The Textile Industry	3	3	
16	07 13 631	Non-woven Fabric Technology	3	3	
17	07 13 711	Advanced Studies in Yarn Evenness	3	3	
18	07 13 712	Multi-phase Weaving Machines	3	3	
19	07 13 713	Friction in Textile	3	3	
20	07 13 714	Organic Chemistry of Polymers	3	3	
21	07 13 715	Textile Quality and Process Control	3	3	
22	07 13 716	Statistics and Experimental Design	3	3	
23	07 13 721	Physical and Mechanical Properties of Yarns	3	3	
24	07 13 722	Textured Yarn Production and Properties	3	3	
25	07 13 723	Spinning Technology of Blended Yarns	3	3	

No	Course Code	Course Name	Credit Hours	Exam Duration	Pre - requisites
26	07 13 724	Spinning Mill Organization	3	3	
27	07 13 725	Advanced Woven Fabric Designs	3	3	
28	07 13 726	Advanced Weaving Preparation	3	3	
29	07 13 727	Knitted Fabric Technology	3	3	
30	07 13 728	Apparel Technology and Management	3	3	
31	07 13 729	Mechanics of Textile Structures	3	3	
32	07 13 731	Textile Material Design	3	3	
33	07 13 732	Total Quality Management in Textiles	3	3	
34	07 13 811	Theoretical Aspects in Spinning	3	3	
35	07 13 812	Theoretical Aspects in Weaving	3	3	
36	07 13 813	Mechanics of Textiles	3	3	
37	07 13 814	Processing Dynamics	3	3	

No	Course Code	Course Name	Credit Hours	Exam Duration	Pre - requisites
38	07 13 815	Polymer Engineering	3	3	
39	07 13 816	Textile Costing	3	3	
40	07 13 821	Advanced Yarn Studies	3	3	
41	07 13 822	Yarn Engineering	3	3	
42	07 13 823	Mechanics of Twisted Structures	3	3	
43	07 13 824	Theories of Yarn Formation in Modern Spinning Systems	3	3	
44	07 13 825	Advanced Knitting Systems and Fabrics	3	3	
45	07 13 826	Advances in Woven Fabric Formation and Structure	3	3	
46	07 13 827	Mechanics of Weaving Machinery	3	3	
47	07 13 828	Mechanical and Rheological Properties of Fibrous Materials	3	3	
48	07 13 829	Advanced Non-Woven fabric Processing	3	3	
49	07 13 831	Technology of Composites and Smart Textiles	3	3	
50	07 13 832	High-tech in Clothing Production	3	3	
50	07 13 601	Diploma Project in Spinning Engineering	3	Presentation	
51	07 13 602	Diploma Project in Weaving Engineering	3	Presentation	
52	07 13 701	Scientific Report for the Master of Engineering in Textile	3	Defense	

No	Course Code	Course Name	Credit Hours	Exam Duration	Pre - requisites
		Engineering			
53	07 13 705	Thesis for the Master of Science in Textile Engineering	8	Defense	
54	07 13 801	Ph. D. Dissertation in Textile Engineering	24	Defense	

Description of Courses for Graduate Programs (Diploma- Master- Doctor of Philosophy)

07 13 611 Spinning Technology
Advanced studies in the technology of opening lines and its effect on yarn properties. Advanced studies in the technology of yarn properties and machinery. Advanced technological studies in the combing. Drawing, roving and spinning operations. Advanced technology in open-end spinning. Jet-spinning and friction spinning. Advanced technology in winding.

07 13 612 Weaving Technology
Technical production of different carpets. Defects of textile products. Modern weaving machinery, single phase weaving machines. air-jet weaving machine, water jet weaving and rapier weaving machine

07 13 613 Mechanics of Textile Machinery
Vibration, analysis of different mechanisms in textile machinery. Energy conservation in spinning. Conventional weaving machines, projectile weaving machine. Air jet, water jet and rapier weaving machines

07 13 614 Textured Yarn Production
Properties and structure of polymers. Thermo-mechanical texturing techniques: false twist, stuffer-box, trapped twist, knife-edge, crinkle texturing. Mechanical texturing techniques: air–jet, intermingling/interlacing. Bi-Component texturing, differential shrinkage texturing, chemical texturing. Theoretical aspects of yarn formation using false twist and air-jet texturing techniques.

07 13 615 Physics and Properties of Textile Material
Structure of different textile materials. Physical, chemical and mechanical properties of different textile materials. Advanced methods for the measurement of the properties of textile materials

07 13 616 Computer Applications in Textiles I
Introduction of computers in textile industry, computer language, computer applications in different textile sectors, expert systems and database management systems.

07 13 621 Technology of Yarn Formation
Limitations of the existing spinning systems- principles of formation of yarns on new spinning systems, mechanisms of production of new yarn.

07 13 622 Developments in Yarn Manufacturing
A critical appraisal of developments in yarn manufacturing, with emphasis on their influence on process and products quality and range in short and long staple systems.

07 13 623 Filament Yarn Production Processing and Properties
Structure, properties and processes for manufacturing and treating continuous filament yarns. Response of fibers to elevated temperature, twist, false twist and various bulking processes. Yarn structures and properties required for stretch and molded fabrics. Independent laboratory and critical literature review in general area of filament yarn processing, properties and test methods.

07 13 624 New developments in weaving machinery
Modern methods of weaving, weaving on single phase weaving machines. projectile, air-jet, water-jet, rapier weaving and multi-phase weaving machines.

07 13 625 Technology of Warp and Weft Knitting
Modern knitting machines. Different knitted fabric structures, knitted fabric defects: causes and remedy. Geometrical engineering of knitted fabrics, design of knitting machines and their setting and maintenance.

07 13 626 Organization and planning of weaving mills
Tender and evaluation of textile machines. Layout, labor and machine efficiency. Labor allocation and number of machines. Weaving costs. Factors influencing economics in textile mills, feasibility study. Computer in textile mills.

07 13 627 Cloth Production
Concepts and practices for the production of apparel items, beginning with development of basic fit blocks and extending through the stylized garments using pattern engineering techniques, supported by computerized pattern development. Techniques for development of styled patterns which address issues of body measurements, body shape, comfort and fit.

07 13 628 Performance Evaluation of Textile Products
Standards, principles and effects of test conditions in measuring basic physical and mechanical properties of textile materials. Design of test and interpretation of test results in relation to end-use performance, product development, process control, research and development and other requirements.

07 13 629 Production Costing in the Textile Industry
Cost issues in yarn manufacturing, fabric formation, finishing, apparel production and retail operations. Traditional and activity-based costing systems. Relevance of costing to managerial decisions as well as cost reduction strategies.

07 13 631 Non-Woven Technology
Definition of non-woven, planary basic and combined systems. Principle of non-wovens. Development of production. Types of fibers suitable for non-woven fabrics. Different methods for web formation (mechanical – pneumatic – cross laying of web – polymer – to – web methods (centrifugal – compressed air – electro – static). Bonding methods (adhesive – heat fusing – adhesive power – needle punching – stitch knitted – spun bonded – thermoplastic screen bonding). Characteristics of different types and end uses.

07 13 711 Advanced Studies in Yarn Evenness
Mathematical model for yarn formation. Yarn evenness. Factors affecting yarn evenness. Measurement methods and control. Theoretical studies of the drafting process.

07 13 712 Multi-Phase Weaving Machines
Modern weaving machinery, multi-phase weaving machines. Warp way weaving machines. Weft way weaving machines.

07 13 713 Friction in Textiles
This Course aims to teach students the theories of friction and lubrication. The practical problems in textile processing and attempts to give critical account of drafting theories. Main methods and techniques used in measuring friction of textile materials.

07 13 714 Organic Chemistry of Polymers
Principles of step reaction and additional polymerizations; copolymerization; emulsion polymerization; ionic polymerization; characterization of polymers; molecular structure and properties.

07 13 715 Textile Quality and Process Control
Quality control and improvement methods for textile processes and products including quality systems, statistical control chart procedures, process capabilities, acceptance sampling plans, textiles process and product designs, on-line and off-line control systems

and specific quality factors governing textile products and processes and their variabilities.

07 13 716 Statistics and Experimental Design
Population and samples. Method of maximum likelihood. Test of hypothesis. Analysis of Variance. One-way ANOVA. Two-way ANOVA. Experimental Design for ANOVA. Design of experiments: Design of experiments with extremes: full factorial design, factorial replicates. Applications in textile industry.

07 13 721 Physical and Mechanical properties of yarns
Different types of yarns and their structures. Theories of yarn structures. Fiber arrangement in different yarn structures. Mechanics of staple fiber yarns. Mechanics of blended yarns.

07 13 722 Textured Yarn Production and Properties
Structure and properties of continuous filament yarns. Examine response to elevated temperature and variables for texturing methods for producing bulked, textured and torqued yarns. Testing of yarn behavior and discussion of problems encountered during processing.

07 13 723 Spinning Technology of Blended Yarns
The needs of blending, theories of blending, effect of fiber blending on yarn and fabric properties, technology of blending.

07 13 724 Spinning Mill Organization
Feasibility study for spinning mill, costing and cost e1ements in spinning mill, inventory control for materials and spare parts. Linear programming applications in textile mills. General computerized control for production

07 13 725 Advanced Woven Fabric Design
Design and production requirements for highly specialized woven fabric structures. The laboratory activities will include a project on design from concept to final production and finishing

07 13 726 Advanced weaving preparation
Automatic control in warping. Automatic tension control in sizing. Sizing of continuous filament. Preparation of super density warp sheet**.**

07 13 727 Knitted Fabric Technology
Review of knitted fabric production techniques. Technology of more advanced weft and warp knitting. Jersey and rib fabric modification techniques, yarn knitability and

productivity, yarns, creels, patterning and machinery developments, manufacture and properties of warp knit fabrics such as mesh, laid-in, weft insertion and plush. Quality measures, measurement and standards, defects and problem solving. Management of knitting operations**.**

07 13 728 Apparel Technology and Management
Requirements for garment manufacturing, raw materials specifications, properties and control. Apparel process objects, modern developments and control. End product quality and performance to satisfy the global customer demand. Quality assurance for garment products.

07 13 729 Mechanics of Textile Structures
Study of the basic mechanics of fibrous assemblies. Topics included are geometry and mechanical behavior of twisted, woven, knit, and non-conventional structures under various stress conditions, and end use application.

07 13 731 Textile Materials Design
Functional textile materials design, modeling techniques and fault analysis methodologies. Product development from initial design phase, testing, analysis, to prototype production. Advanced elements of textile materials design and development. Process-structure-property relationships of manufacturing processes. Risk and reliability. Design, testing, analysis, and prototype production**.**

07 13 732 Total Quality Management in Textiles
Management and quality engineering concepts, strategies, practices and operating tools required to initiate and sustain a Total Quality Management program which can succeed in modern textile environments.

07 13 811 Theoretical Aspects in Spinning
Theory of drafting and carding processes. Combing Theory. Theory of yarn balloon in ring spinning, winding and unwinding**.**

07 13 812 Theoretical Aspects in Weaving
Theory of weft insertion in conventional and non-conventional weaving machines. Air-jet, projectile, Rapier and water-jet

07 13 813 Mechanics of Textiles
Mechanical dependency relationships in textiles are discussed. Included are the role of fiber and yarn twist, yarn crimp, finishes, and coatings to mechanical response of textiles. Dynamic and static response to various types of loading are investigated. Tearing, abrasion, and wear properties as a function of textile form are presented.

07 13 814 Processing Dynamics
Theoretical analysis of the dynamics and machine-fiber assembly interaction in textile processes. The interrelations between mechanics of production and mechanical properties of yarn, fabrics, and other fiber assemblies are studied. Unit operations required to process fibers to the finished products are considered**.**

07 13 815 Polymer Engineering
Chemical, physical and mechanical properties of polymers and fibers; thermodynamics of crystallization, time dependent phenomena, fracture mechanics and rheology. Advanced topics on extrusion.

07 13 816 Textile Costing
The costs of raw materials, labor, overhead and waste are studied in relation to textile production and finishing. Case studies illustrate cost systems used in textile mills. Interrelationships between labor, machine and facilities are analyzed to determine their relative importance for cost reduction programs**.**

07 13 821 Advanced Yarn Studies
This section of Yarn Studies allows for an independent pursuit of advanced knowledge through a literature search in a selected area of research. Further, the course is structured toward an advanced study of the newer methods of yarn manufacture, and the latest developments in processing, computerized control, and testing methods. Relationships between yarn properties and product properties are investigated

07 13 822 Yarn Engineering
The processes necessary for the manufacture of continuous filaments, staple, bulk, and novelty and stretch yarns are studied. Staple yarn manufacturer including the processing of natural and manmade fibers on the carded cotton, combed cotton, woolen and worsted staple yarn manufacturing system. Quality control procedures are emphasized**.**

07 13 823 Mechanics of Twisted Structures
Structure and mechanics of twisted linear textiles (yarns, cords, ropes) with particular emphasis on translating fiber load deformation behavior into load deformation behavior of product.

07 13 824 Theories of Yarn Formation in Modern Spinning Systems
Principles and practices involved in modern yarn manufacturing; including machine-fiber interactions occurring during different processing stages.

07 13 825 Advanced Knitting Systems and Fabrics
Loop forming concepts and mechanisms of complex warp and weft-knitted fabrics. Structural design and limitations, potential applications and knitability. Analysis of mechanical systems and tensioning forces on fabric formation. The effect on dimensional and mechanical properties.

07 13 826 Advances in Woven Fabric Formation and Structure
Advances in formation mechanics and structure of woven fabrics covered through lectures, seminars and independent studies. Advances in yarn preparation processes, essential weaving motions, auxiliary motions, automation, and their impact on weaving room management. Recent research in formation of advanced complex woven structures**.**

07 13 827 Mechanics of Weaving Machinery
Energy conservation in the weaving machines. Air jet weaving machine, water-jet-weaving machine**.**

07 13 828 Mechanical and Rheological Properties of Fibrous Material
In-depth study of the stress-strain, bending, torsional, dynamic and rheological behavior of natural and man-made fibers. Presentation and discussion of theoretical relations and advanced techniques**.**

07 13 829 Advanced Non-Wovens Processing
An in-depth understanding of the mechanisms and processes used in the production of nonwoven materials. Design and operation of these mechanisms and processes. Process flow, optimization of process parameters, influence of process parameters on product properties

07 13 831 Technology of Composites and Smart Textiles
Introduction to smart textiles. Properties of smart textiles. Fields of applications. Materials applied. Production of smart textiles. Different theories in Bionics e.g. Lotus effect**.**

07 13 832 High-tech in Clothing Production
Automated assembly and manufacturing simulation, innovation in fabric joining methods, 3D design involving drape, fit and comfort simulation. Engineering value networks in fashion industry.

07 13 601 Diploma Project in Spinning Engineering

07 13 602 Diploma Project in Weaving Engineering

07 13 701 Scientific Report for the Master of Engineering in Textile Engineering

07 13 705 Thesis for the Master of Science in Textile Engineering

07 13 801 Ph. D. Dissertation in Textile Engineering