

**GAZİANTEP ÜNİVERSİTESİ MÜHENDİSLİK FAKÜLTESİ TEKSTİL MÜHENDİSLİĞİ  
BÖLÜMÜ 2018-2019 EĞİTİM ÖĞRETİM YILI SONRASI LİSANS ÖĞRENCİLERİ İÇİN  
DERS LİSTESİ**

1. Yarıyıl	Kredi	ECTS	2. Yarıyıl	Kredi	ECTS
<b>1. YIL</b>					
L.ENG 101 Freshman English-I	(4-0) 4	5	L. ENG 102 Freshman English-II	(4-0) 4	5
MATH 151 Calculus I	(4-0) 4	5	MATH 152 Calculus II	(4-0) 4	5
EP 103 General Physics I	(3-0) 3	4	EP 104 General Physics II	(3-0) 3	4
EP 107 General Physics I-LAB	(0-2) 1	1	EP 108 General Physics II-LAB	(0-2) 1	1
FE 101 General Chemistry I	(3-2) 4	5	TE 114 Organic Chemistry	(3-0) 3	5
TE 120 Fiber to Fabric	(3-0) 3	5	TE 112 Fiber Science I	(2-0) 2	3
GME 100 General and Professional Ethics	(2-0) 2	2	TE 116 Material Sciences	(2-0)2	2
TDP 101 Social Awareness Project-I	(1-0) 1	1	TDP 102 Social Awareness Project-II	(2-0) 2	2
TURK 101 Turkish Language-I	(2-0) 2	2	TURK 102 Turkish Language-II	(2-0) 2	2
			GOS *** Common Elective	(1-1) N.C	1
<b>Toplam</b>	21+3	30	<b>Toplam</b>	19+4	30
<b>2.YIL</b>					
MATH 255 Linear Algebra	(3-0) 3	4	MATH 256 Differential Equations	(3-0) 3	4
ME 101 Engineering Graphics	(2-2) 3	5	TE 205 Introduction to Probability and Statistics	(3-0) 3	6
TE 241 Computer Programming	(3-0) 3	6	TE 252 Fiber and Polymer Chemistry	(2-0) 2	5
TE 211 Yarn Manufacturing I	(2-2) 3	5	TE 230 Weaving Technology I	(2-2) 3	5
TE 221 Fiber Science II	(3-0) 3	4	TE 240 Yarn Manufacturing II	(3-0) 3	4
TE 204 Thermodynamics	(2-0) 2	2	TE 224 Strength of Materials	(2-0) 2	2
TE 208 Statics	(2-0) 2	2	TE 232 Fluid Mechanics	(2-0) 2	2
HIST 201 Atatürk's Principles and History of the Turkish Renovation I	(2-0) 2	2	HIST 202 Atatürk's Principles and History of the Turkish Renovation II	(2-0) 2	2
<b>Toplam</b>	19+2	30	<b>Toplam</b>	18+2	30
<b>3.YIL</b>					
TE 301 Mechanisms	(2-0) 2	2	TE 321 Machine Elements	(2-0) 2	2
TE 333 Ready-Made Clot.	(3-0)3	5	TE 331 Introduction to Mechatronics	(2-0) 2	2
TE 351 Weaving Technology II	(3-0) 3	5	TE 332 Quality Control in Textile Engineering	(2-2) 3	5
TE 341 Knitting Technology	(3-0) 3	5	TE 353 Fabric Design	(3-0)3	4
TE 352 Nonwoven	(3-0) 3	5	TE 362 Printing Technologies and Machinery	(3-0) 3	4
TE 361 Dyeing Technology and Machinery	(3-0) 3	5	TE 334 Entrepreneurship and Innovation	(2-0) 2	3
TE 363 Textile Finishing	(2-0) 2	3	TE 336 Introduction to Experimental Design	(3-0) 3	5

			TE 300 Graduation Design Project	(0-4) 2	4
			INF 398 Activities Participation	(0-2)1	1
<b>Toplam</b>	19	30	<b>Toplam</b>	20+1	30
<b>4. YIL</b>					
Tech Elective	(3-0) 3	5	TE 400 Engineering Orientation	4	30
Tech. Elective	(3-0) 3	5			
Tech. Elective	(3-0) 3	5			
Tech. Elective	(3-0) 3	5			
Tech. Elective	(3-0) 3	5			
Non Tech. Elective	(2-0) 2	3			
Non Tech. Elective	(2-0) 2	3			
<b>Toplam</b>	19	31	<b>Toplam</b>	4	30

### SEÇMELİ DERSLER

Ders Adı	Kredi	ECTS	Ders Adı	Kredi	ECTS
TE 415 New Yarn Production Processes	(3-0)3	5	TE 436 Wool Spinning	(3-0)3	5
TE 416 Filament Yarn Production	(3-0)3	5	TE 437 Yarn Unevenness and Faults	(3-0)3	5
TE 417 Filament Yarn Texturing	(3-0)3	5	TE 438 Polymer Processing Fundamentals	(3-0)3	5
TE 418 Weaving Machinery	(3-0)3	5	TE 439 Technical Textiles	(3-0)3	5
TE 419 Knitting Machinery	(3-0)3	5	TE 440 Clothing Comfort	(3-0)3	5
TE 420 Consumer Information	(3-0)3	5	TE 441 Textile Applications I	(3-0)3	5
TE 422 Design Fundamentals of Textile Machinery	(3-0)3	5	TE 442 Textile Applications II	(3-0)3	5
TE 423 Colour Analysis	(3-0)3	5	TE 443 Heat Transfer	(3-0)3	5
TE 424 Control System Technology	(3-0)3	5	TE 444 Textile Pretreatment	(3-0)3	5
TE 425 Weft Knitting Technology	(3-0)3	5	TE 445 Automatic Control	(3-0)3	5
TE 426 Warp Knitting Technology	(3-0)3	5	TE 446 Dynamics of Machinery	(3-0)3	5
TE 427 Finishing Machinery	(3-0)3	5	TE 451 Introduction to Nanotechnology	(3-0)3	5
TE 428 Finishing Materials	(3-0)3	5	TE 452 Nonwoven Materials and Products	(3-0)3	5
TE 429 Textile Dyeing Technology	(3-0)3	5	TE 454 Textile Composites	(3-0)3	5
TE 430 Woven Structure and Design	(3-0)3	5	TE 457 Smart Textiles	(3-0)3	5
TE 431 Textile Printing Technology	(3-0)3	5	TE 458 Composite Materials	(3-0)3	5
TE 432 Testing of Textiles	(3-0)3	5	TE 460 Machine Woven Carpet Techniques	(3-0)3	5
TE 433 Quality Control in Clothing Manufacture	(3-0)3	5	TE 461 Tufted Carpet Manufacture	(3-0)3	5
TE 434 Preparation of Materials for Weaving	(3-0)3	5	TE 462 Introduction to Fashion and Design	(3-0)3	5
TE 435 Carpet Technology	(3-0)3	5	TE 463 Production and Cost Calculations in Textiles	(3-0)3	5

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**TEKSTİL MÜHENDİSLİĞİ BÖLÜMÜ 2018-2019 EĞİTİM ÖĞRETİM YILI**  
**SONRASI LİSANS ÖĞRENCİLERİ İÇİN DERS İÇERİKLERİ**

**TDP 101 Toplumsal Duyarlılık Projesi I (1-0)1**

**TDP 102 Toplumsal Duyarlılık Projesi II (2-0)2**  
The main aims of Civic Involvement Projects can be counted as; getting stronger the relation between university and society, building up students with a sense of social responsibility and sensitive to social subjects, preparing projects to determine current social issues and generate solution, encouraging the taking place within the framework of social responsibility as a volunteer, gaining basic knowledge and skills for implementation of social service studies in faculty and vocational schools .

**TE 120 Fiber to Fabric (3-0)3**

Fiber fundamentals. Production methods of various yarns used in textile and garment industry, their physical properties, introduction to their end uses and production performances, yarn numbering. Woven fabric manufacture; principles of cloth construction, basic weaves and variations. Classification of knitted fabrics; weft and warp knitted fabrics. Nonwovens; production methods. Textile finishing; fundamentals, preparation, colouration, finishing, coating and lamination.

**TURK 101 Turkish I (2-0)2**

İmla kuralları, noktalama işaretler (kullanım ve örnekleri ile) Kompozisyon hakkında genel bilgiler (Tanımı, türleri, etkinliği, plan ve çeşitleri). Anı, tanımı uygulamada dikkat edilecek hususlar; tarihi ve edebi değeri Dilin tanımı ve türleri. Dilbilgisi ve bölümleri. Türk dilinin tarihi gelişimi. Yeryüzündeki dil grupları ve Türkçenin bunlar arasındaki yeri. Konuşma dili türleri, yazı dili türleri. Ses olayları, Sohbet, tanımı, uygulamada dikkat edilecek özellikler ve örnekler.

**TURK 102 Turkish II (2-0)2**

Türkçe'de vurgu ve vurgu çeşitleri; seçmeli vurgu, tabii vurgu. Fiiller (Basit ve birleşik zamanlı), fiil çatıları, Ek Fiiller, Haberleşme yazıları, mektup ve çeşitleri. Dilekçe, özgeçmiş. Kelime, isim ve fiil kökleri. Ekler, yapım ekleri ve çeşitleri; çekim ekleri ve çeşitleri. Yapılarına, yüklemelerine, dizilişlerine ve anlamlarına göre cümle çeşitleri. Eleştirisi.

**HIST 201 History I (2-0)2**

Atatürk's Principles (Analysis of the Principles of republicanism, populism, etatism, secularism and reformism; phases in the development of the ideology of the Turkish Renovation).

**HIST 202 History II (2-0)2**

The interpretation of Atatürkism, Turkey's relations with Europe and the neighbouring states within the context of Turkish Foreign policy and an overview of some recent development in Turkish political life.

**Leng 101 Freshman English I (4-0)4**

This course is designed to consolidate the student's working knowledge of the English language through reinforcement of reading comprehension, listening and writing skills in academic English.

**Leng 102 Freshman English II (4-0) 4**

Academic reading comprehension skills are further reinforced through and intensive reading of both scientific and academic texts and techniques of writing are further developed with emphasis on the usage of technical vocabulary.

**EP 103 General Physics I (3-0)3**

Measurement and units. Vectors. Kinematics. Relative motion. Force and momentum. Equilibrium. Work and energy. Simple harmonic motion. Rotational kinematics of rigid bodies.

**EP 107 General Physics I-LAB (0-2)1**

**EP 104 General Physics II (3-0)3**

Electric charges and fields. Electric potential. Magnetic fields. Ampere's and Faraday's Laws. Inductance, magnetism, electromagnetic oscillations and waves.

**EP 108 General Physics II-LAB (0-2)1**

**MATH 151 Calculus I (4-0)4**

Real numbers, inequalities, algebra of sets, functions, graphs, limits., continuity, the derivative, maxima-minima and other applications, the differential, the definite integral, mean-value theorem, the indefinite integral, the antiderivative, the fundamental theorem of calculus, techniques of integration, inverse functions

**MATH 152 Calculus II (4-0)4**

Numerical integration, polar coordinates, vector algebra, arclenght. curvature, area of a surface of revolution, the plane, linear algebra, partial differentiation, the gradient, directional derivatives, normals to surfaces, maxima, minima, double and triple integrals with applications. Improper integrals. Taylor's Formula. Sequences, infinite series, power series, Taylor series.

**FE 101 General Chemistry I (3-2) 4**  
Atoms, molecules and ions; chemical compounds; chemical reactions; oxidation-reduction; gases; thermochemistry; periodic properties of elements; liquids and solids; solutions; principles of chemical equilibrium; acids and base; entropy and free energy; electrochemistry.

**ME 101 Engineering Graphics (2-2)3**  
Introduction to engineering graphics course and the importance of the course, Essential Geometrical Constructions, Orthographic Drawing and Sketching, Oblique and Isometric Drawing, Section and conventions, Dimensioning, notes and limits.

**GME 100 General and Professional Ethics(2-0)2**  
History of ethics. Professionalism and codes of ethics. Understanding ethical problems. Theories of ethical risks. Safety and accidents. The rights and responsibilities of engineers. Ethic and institutions. Management and ethic. Ethic and globalization. Ethical issues in engineering practice.

**TE 112 Fiber Science I (2-0)2**  
Defining and classification of textile fibers. Describing scientific textile-related properties of natural fibers. A comparison between natural and man-made fibers. An overview on natural fiber production Physical and chemical properties of cellulosic fibers, bast and leaf fibers, protein fibers, silk and mineral fibers.

**TE 114 Organic Chemistry for Textile Engineering (3-0)3**  
To acquaint students introduction to Organic Chemistry with principal classes and functional groups of organic compounds. Also, to acquaint students a new mechanistic approach to the study of chemical reactions and survey of organic compounds. The course emphasizes fundamental properties of organic compounds.

**TE 116 Material Sciences (2-0)2**  
Introduction to materials science and classification of atomic structures of the materials. Crystal structures and imperfections. Mechanical and physical properties of the engineering materials. Solid-state diffusion. Phase diagrams and solidification. Ferrous / non-ferrous alloys and heat treatment. Electrical, optical, thermal and magnetic properties associated with electron band structures of the materials. Metallic corrosion and prevention from corrosion. Principle geomaterials, their properties and application areas. Deterioration of geomaterials.

**TE 204 Thermodynamics (2-0)2**  
Concepts and definitions. Equation of state, heat and work. First law of thermodynamics, Second law of thermodynamics, Entropy, Mixtures and solutions, Heat transfer modes; Conduction, convection, radiation.

**TE 205 Introduction to Probability and Statistics (3-0)3**  
Basic topics in probability and statistics, random variables and probability density functions, mathematical expectation, some discrete and continuous probability distributions, central limit theorem and normal distribution, parametric statistics, estimation, confidence intervals, and hypothesis testing, analysis of variance, regression and correlation analysis, application in statistical quality control, elementary design of experiments and data collection; computer implementations using available up to date statistical software.

**TE 208 Static (2-0)2**  
Idealization and principles of mechanics, important vector quantities, classification and equivalence of force systems, state of equilibrium. Elements of structures: Trusses, beams. Frames and machines. Friction. Variational methods: principles of virtual work and potential energy.

**TE 211 Yarn Manufacturing I (3-0)3**  
Introduction to natural fiber's spinning. Production steps. Blending and carding theory. Effects of fiber quality on yarn. Explaining ring and rotor spinning systems and their properties. Other yarn production systems.

**TE 221 Fiber Science II (3-0)3**  
Background of man-made fibers. Defining and classification of polymers. Requirements of fiber-forming polymers. A comparison between natural and man-made fibers. Man-made fiber manufacturing. Regenerated cellulose and protein fibers. Synthetic polymer fibers. Inorganic fibers. Some new type man-made fibers.

**TE 241 Computer Programming (3-0)3**  
Introduction to computer systems; analog and binary signals; computer memory; processor; programming in Java; primitive data; variables and assignment statement; expressions; object data; arithmetic and logic operations, branching, looping, arrays; program structuring and subprograms; file

input and output; applications to engineering problems aiming to orient the student computer user.

**TE 224 Strength of Materials (2-0)2**

Concepts of stress and strain in view of material's parameters. Properties of materials in tension, compression, bending, torsion, fatigue and hardness. External and internal forces. Stresses in uniaxial and biaxial loading. Design load, factor of safety. Failure theories. Properties of cross-section. Elastic curve. Strain energy.

**TE 230 Weaving Technology I (2-2)3**

Yarn preparation for weaving, basic loom mechanisms for shuttle and shuttleless looms. The properties and operation systems of warp preparation machines. The technique required to accurately analyze fabric for all critical components and methods to design fabric for specific weight and compact cover with consideration given to yarn size, texture, fiber type, weave and other fabric parameters will be learned. Advanced multi-layer weaves will be studied and analyzed.

**TE 232 Fluid Mechanics (2-0)2**

Introduction to the study of fluid motion. Fluid statics, foundations, and flow analysis. Continuity equation. Energy equation. Momentum equations. Engineering applications. Dimensional analysis and similitude.

**TE 240 Yarn Manufacturing II (3-0)3**

Basic principles of producing synthetic yarns. Yarn production systems of polyester, polyamide, acrylic and polypropylene yarns. Texturing systems and their differences. Properties of synthetic yarns.

**TE 252 Fiber and Polymer Chemistry (2-0)2**

Introduction to fiber and polymers; molecular weight and distribution; chemistry of cellulose and protein fibers; chemistry of fiber forming synthetic polymers; types of polymerization; step-growth polymerization; chain-growth polymerization.

**MATH 255 Linear Algebra (3-0)3**

Real vector spaces, Linear transformations and matrices, Eigenvalues and eigenvectors. Quadratic forms. Euclidean spaces, orthogonality of functions, Fourier series, Orthogonal polynomials, boundary-value problems associated with partial differential equations.

**MATH 256 Differential Equations (3-0)3**

What is differential equation? How do they arise? First order differential equations. Orthogonal

trajectories. Linear differential equations of arbitrary order. Approximate methods of solution of D.E., Power series solutions of D.E., Laplace transforms. System of linear D.E. Introduction to partial differential equations.

**TE 301 Mechanisms (2-0)2**

Introduction to kinematics. Basic concepts. Degrees of freedom of mechanisms. Kinematic analysis; position, velocity and acceleration analysis of mechanisms. Gear trains. Cam mechanisms.

**TE 321 Machine Elements (2-0)2**

Fundamentals of element design. Theories of fatigue, stress concentration. Basic concepts of design: factors of safety, reliability, standardization. Material selection. Joints: riveted, welded, soldered. Screws and screw fastenings, shafts, keys, pins, springs. Power transmissions and drive systems.

**TE 331 Introduction to Mechatronics (2-0)2**

Introduction to mechatronics and measurement systems. Electric circuits and components, operational amplifiers, data acquisition, sensors, DC motors, AC motors, DC servo motors, AC servo motors and stepping motors. Case studies.

**TE 332 Quality Control in Textile Engineering (2-2)3**

Defining and quantifying of textile products. Principles of measuring basic physical properties of textile materials, techniques of in-process control and evaluation of product quality.

**TE 333 Ready-Made Clothing (3-0)3**

Apparel chain from fiber to cloth. Fashion analysis and design development. Cloth analysis and procurement planning. Fabric laying, cutting and sewing. Stitch types, sewing needle and sewing thread. Labelling, ironing and packaging. Apparel distribution and retailing.

**TE 334 Entrepreneurship and Innovation (2-0)2**

Entrepreneurship and economy. Invention for entrepreneurship. Success of entrepreneur. Conversion of new concept into project. Plan for production. Investment. Financial support and financial providers. Rights for intellectual property. Certification. Types of companies. Entrepreneurship around the World. New developments in entrepreneurship. Advises for young entrepreneurs.

**TE 336 Introduction to Experimental****Design (3-0)3**

Guidelines for designing experiments, Review of basic concepts in statistics, Simple comparative experiments, Experiments with a single factor: The analysis of variance, Randomized blocks, Latin squares and related designs, Introduction to factorial designs, The 2k factorial design, Blocking and confounding in the 2k factorial design.

**TE 341 Knitting Technology (3-0)3**

Technology of producing knitted fabrics. Range of fabric structures. Emphasis on yarn preparation for knitting, basic knowledge about warp and weft knitted structures and machinery, patterning mechanisms, technologies of production, new developments and management of knitting operations. Yarn properties, fabric faults and the solutions for overcoming.

**TE 351 Weaving Technology II (3-0)3**

Technology of producing woven fabrics. New development and management of weaving operations. The variations, function, auxiliary devices and design characteristics of cam, dobby and jacquard weaving machines and the equipment used to support the weaving process are studied along with relevant calculations regarding time, materials and production woven fabrics.

**TE 352 Nonwoven (3-0)3**

Production methods of nonwoven fabrics; Selection of raw materials for nonwovens, web forming methods by carding and air laid processes, electrostatic spinning, wet laid web formation, spunbonding and meltblowing processes. Web bonding methods; needlepunching, stitch bonding, spunlaced technologies, chemical web bonding methods, thermal web bonding methods. Web enhancement and converting methods. End uses of nonwoven fabrics and their importance. The place of nonwoven fabrics in the textile industry.

**TE 353 Fabric Design (3-0)3**

Properties of woven, knitted and nonwoven fabrics. Methods of reproducing structural design. Fabric design for specifications. Study of fabric formation techniques designed to explore the principles and theories of modern technology. Evaluation and analysis of weaving, knitting and nonwoven fabric.

**TE 361 Dyeing Technology and Machinery(3-0)3**

Introduction to dyeing technology. Color concept. Dyeing principles. Important fiber and dye properties. Dye classes. Dyeing of cellulose and

protein fibers. Dyeing of manmade fibres and blends. Dyeing machineries.

**TE 362 Printing Technology****And Machinery (3-0)3**

General information about textile printing. Printing techniques (direct, discharge, resist and specials) and machines (roller, flat, rotary). Digital printing technology. Fixation methods and after treatment processes. Properties of printing pastes, printing of cellulosic and synthetic fabrics. Carpet and yarn printing.

**TE 363 Textile Finishing (3-0)3**

Dyeing recipes in application and coloring mechanisms. Washing, drying, singeing, sizing, desizing, mercerization, bleaching, optical whitening, impregnation, transfer, coating, spraying. Fiber, yarn, tops, fabric, garment and blend dyeing. Printing applications. Finishing of cotton, wool and synthetic products. Special finishing applications.

**TE 300 Graduation Design Project (0-4)2**

To give idea about a product, a system or a process and factors those influence them. To found design methods. Design management. Teamwork in design. Design strategy. To gather information and data processing in design. Thought of design and problem solving. To find and create new idea. Decision problem and the properties of making decision. The importance of design in textile applications.

**TE 400 Engineering Orientation (4-0)4**

Engineering applications. Internship practices. Innovation. Project development and management. New system and product design. Research development and technology management. Business planning. Commercialization. Technology foresight and forecasting. Technology assessment. Process analysis. Principles of business. Business and administration disciplines. Safety. Communication in business life.

**TE 415 New Yarn Production Processes (3-0)3**

Basic principles of new yarn production systems, their technologies and importance in textile industry are explained.

**TE 416 Filament Yarn Production (3-0)3**

Description of filament yarn production systems. Technologies of machines used for filaments. Types of filament fibers. Their thermal, chemical

and physical properties. Thermoplastic and thermosetting polymers.

**TE 417 Filament Yarn Texturing (3-0)3**  
Description of texturing systems. The analysis of texturing process. New technologies used in texturing. Crimp-speed analysis.

**TE 418 Weaving Machinery (3-0)3**  
Types of machines used for weaving process are discussed. Working principles of weaving machines, differences, advantages, disadvantages, production rates and production qualities are explained.

**TE 419 Knitting Machinery (3-0)3**  
Types of machines used for knitting process are discussed. Working principles of knitting machines, differences, advantages, disadvantages, production rates and production qualities are explained.

**TE 420 Consumer Information (3-0)3**  
Summary of fiber qualities; strength, elasticity, resilience, drapability, heat conductivity, absorbency, washability, reaction to bleaches and shrinkage. Specialized fabrics for apparel; insulation fabric, quilted fabrics, pile fabrics, imitation suede fabrics, knitwear, underwear and outerwear. Fabrics for home furnishing; types of fabric, types of blankets, construction of terry towels, tablecloths, carpet and rugs construction. Fabric care.

**TE 422 Design Fundamentals of Textile Machinery (3-0)3**  
Introduction to design. Problem formulation; preliminary stages, detailed design stages and documentation stages. Engineering model. Load determination. Material and process. Actuators types. Design of power transmission elements. Gear and cams are discussed.

**TE 423 Colour Analysis (3-0)3**  
Colour theory, colouring in textile, colour measurements and analysis methods and colour-matching spectrophotometer are explained.

**TE 424 Control System Technology (3-0)3**  
Basic concept and terminology, types of control, actuator types and feedback elements are discussed. Transfer functions. Characteristics equation. Stability. Design of tracing control and heating control systems. Industrial application examples explained.

**TE 425 Weft Knitting Technology (3-0)3**  
Understanding of weft knitting systems. Emphasis on machine efficiency, parts and units of weft knitting machines (flat, circular) and machine control (knitting mechanism, program med control, systems of yarn supply and fabric take-down, machine check etc.). CAM, CAD, CIM systems in weft knitting. Standard and special technologies of weft knitting fabric.

**TE 426 Warp Knitting Tecnology (3-0)3**  
Preparation of materials for warp knitting. Construction of warp-knitting machines; their characterization and applications. Technology of production and designing of warp-knitted fabrics. Special technologies used in warp knitting. Basic production processes of warp-knitted fabrics for technical applications. Structures of warp-knitted fabrics and testing methods.

**TE 427 Finishing Machinery (3-0)3**  
Understanding of machines used in textile finishing. Emphasis on machine types of preperation, washing, drying and dyeing (hot-flue, tenter, kier, batch, pad-steam, pad-roll, jigs and continuous etc.) new developments in the machinery and technology.

**TE 428 Finishing Materials (3-0)3**  
Properties of textile materials which have prominence for their finishing. Physical and chemical basis of textile finishing. The utility of theoretical knowledge of the control elements. Mechanical technology of textile finishing. Ecological aspects of textile finishing.

**TE 429 Textile Dyeing Technology (3-0)3**  
Classification of dyeing systems, kinds of dye/fibre bonds. Kinetics of dyeing. Measurement of diffusion coefficients. Kinetical equations. Effects of temperature, diffusion models. Equilibrium of dyeing systems. Adsorption isothermes. Thermodynamic criterions. Affinity. Compatibility of dyes. Applications of the theoretical approaches on the important coloristic cases.

**TE 430 Woven Structure and Design (3-0)3**  
Advanced multi-layer; double, treble and four ply cloths, tubular, pleated and figured quilt cloths, figuring and tapestry cloths, pile fabrics, and leno fabrics will be studied and analyzed. Pattern design, fabric structures, characteristics, manufacturing and applications of different woven structures including

leno, terry, tubular and multi-width fabrics, interlocked three dimensional multilayer fabrics, jacquard, carpet weaves.

**TE 431 Textile Printing Technology (3-0)3**

Theory of textile printing. Types of printing, early forms and industrial. Emphasis on hand, block, mordant, resist, screen, rotary, roller, heat transfer, digital and other printing techniques. Thickeners and printing pastes. Cotton, wool, synthetic fibres and blends printing. Evaluation of the print quality. Textile printing machines. Special styles in printing. Dye fixation and after treatment processes. Developments in textile printing.

**TE 432 Testing of Textiles (3-0)3**

General aspects of textile testing and monitoring of textile processes. Testing and quality evaluation in textile engineering. Application of computers in textile laboratories. Statistical treatment of nominal, ordinal and cardinal data. Testing of the physical and geometrical characteristics of textiles. Mechanical and time dependent mechanical properties. Utility properties testing. Process parameter testing. Complex and integrated testing devices. On-line and off-line quality control. Statistical process control, capability incidences, control charts, loss function, off-line quality optimisation.

**TE 433 Quality Control in Clothing Manufacture (3-0)3**

Clothing manufacturing aspects in clothing manufacture. Emphasis on all types of control methods, control points of a typical clothing manufacturing organization, sampling, data collection, evaluation of data, problems and solutions.

**TE 434 Preparation of Materials for Weaving (3-0)3**

Material preparation technology for weaving (winding, warping, sizing, drawing-in). Operational sequences in the preparation room. Thread unwinding from supply packages, ballooning. Thread tensioners, dynamics of friction and yarn braking. Defects during unprecise winding and their removal. Precise winding, weft winding. Arrangement of winding units on machines. Automation of winding machines. Twisting, fancy yarns. Warping, creels. Sizing, automation and regulation of the sizing process. Material handling, warp knotting and drawing-in.

**TE 435 Carpet Technology (3-0)3**

A study of materials and production systems used in carpet manufacturing such as carpet fiber and carpet yarn production, carpet weaving, carpet coloration processes, carpet backing, carpet finishing and other carpet manufacturing technologies will be examined. Carpet structures and performance will be analyzed.

**TE 436 Wool Spinning (3-0)3**

Spinning technology of worsted, semi-worsted and woolen yarn, cotton type technology of the production of wool type yarn. Tow-to-top system of preparation of sliver from man-made fibers, carding in woolen yarn technology, preparatory operations in semi-worsted technology, geometrical characteristic of worsted yarn.

**TE 437 Yarn Unevenness and Faults (3-0)3**

Basics of statistical dynamics. Theory of the mass unevenness-parameters and characteristic functions (spectrogram and variance-length function). Tester for mass unevenness-analysis, evaluation and utilisation in the technology. Types of defects, identification of the cause and elimination. The influence of the technological and corrective processes on the structure of the mass unevenness.

**TE 438 Polymer Processing Fundamentals(3-0)3**

Introduction to polymers, thermal properties of polymer, mechanical behaviour of polymers, polymer rheology. Polymer processing technique; extrusion, mixing, fiber spinning, film production, blow moulding, calendaring, coating, foaming.

**TE 439 Technical Textiles (3-0)3**

Introduction to technical textiles. Selection of raw materials, their conversion into fibers, yarns and fabrics followed by finishing of technical textiles. Production of heat and flame protective textiles, waterproof textiles, composites. Textiles in filtration and defense, medical textiles.

**TE 440 Clothing Comfort (3-0)3**

Comfort concept in textile. Classification of comfort. Psychological, physical and physiological comfort. The relations between comfort and clothing. Comfort-related properties of fabrics and clothings. Heat and mass transfer properties of fabrics and clothing. The measurements of comfort-related fabric properties.

**TE 441 Textile Applications I (3-0)3**

Basic fiber properties and the effects of these properties on yarn spinning process. Examining the working principle of bale opener, premixer, cleaner and opener, multimixer, inclined opener and



effective cleaner machines available in the blowroom. Examining the working principle of carding and draw frame machines. Examining the working principle of roving, ring spinning and winding machines. Examining the working principle of open-end rotor spinning machine all the adjustments for these machines, the effects on yarn production and quality.

**TE 442 Textile Applications II (3-0)3**

Practical placement of yarn on knitting machine. Examination of knitting machinery elements in details. Performing of knitting action. Quality control of knitted fabrics. Practical placement of warp beam on weaving machine. Examination of basic weaving movements. Quality control of woven fabrics. Calculations in knitted and woven fabrics production.

**TE 443 Heat Transfer (3-0)3**

General and particular laws in heat transfer. Steady and unsteady state one dimensional heat conduction. Fundamentals of convective heat transfer. Analogies between heat and momentum transfer. Dimensional analysis in forced and natural convection. Heat exchangers. Fundamentals of radiative heat transfer. Heat exchangers. Dryers in Textile Industry.

**TE 444 Textile Pretreatment (3-0)3**

Pretreatment of cotton; singeing, desizing, scouring, bleaching, mercerization, optical whitening. Pretreatment of wool; carbonization, fulling and washing, chlorination, bleaching. Pretreatment of silk; weighting, bleaching. Pretreatment of PES, PA, PAC, Acetate.

**TE 445 Automatic Control (3-0)3**

Introduction to automatic control. Open loop and closed loop systems. Mathematical modeling of mechanical and electrical systems. The concept of feedback, block diagrams. Solutions of differential equations by Laplace transform. System performance specifications. Continuous time systems. Stability of linear feedback control systems by using Routh criterion. Root locus. Design of PID controller and application examples.

**TE 446 Dynamics of Machinery (3-0)3**

Static and dynamic force analysis of planar and spatial mechanisms. Static and dynamic balancing of rotating masses. Cam dynamics. Gear dynamics. Vibration of mechanical systems. Shock isolation. Flywheel analysis.

**TE 451 Introduction to Nanotechnology (3-0)3**

Electrospinning of nanofibers and the charge injection method, producing nanofiber structure by electrospinning for tissue engineering, continuous yarns from electrospun nanofibers, controlling the morphologies of electrospun nanofibers, electrospinning process.

**TE 452 Nonwoven Materials and Products(3-0)3**

Raw materials for nonwovens and their important characteristics; nonwovens for hygiene, medicine, household products, home textiles, apparel, technical applications including insulation, filtration, geotextile, agriculture, automotive, and acoustic; recycling nonwoven products; overview of characteristics and testing of nonwovens; recent developments in nonwoven materials and products.

**TE 454 Textile Composites (3-0)3**

Introduction to textile composites; fiber reinforcements; matrices; fiber architecture; composite processing; long fiber composites; laminates; short fiber composites; interface; recent developments in composites; novel textile composites.

**TE 457 Smart Textiles (3-0)3**

Methods and models for intelligent garments design, phase change materials (PCM), intelligent textiles with PCMs, shape memory materials, temperature sensitive shape memory polymers for smart textile applications, chromic materials, conductive materials, formation of electrical circuits in textile structures, textile micro system technology.

**TE 458 Composite Materials (3-0)3**

Polymer matrix reinforced composites is focus point of this course. Fibers and matrices commonly used to produce fiber reinforced composites will be examined, brief explanation of composite manufacturing techniques are presented. An introduction to the theory of composites materials, basic principles underlying properties of composite materials as related to properties of individual constituents and their interactions

emphasis on design of composite systems to yield desired combinations of properties.

**TE 459 Marketing in Textile (2-0)2**

The total credit of the non technical elective courses is 4. Non technical elective courses are assigned by the student's advisor, considering the present facilities in the department.

**TE 460 Machine Woven Carpet**

**Techniques (3-0)3**

Introduction to machine woven carpet types, pile fibres and properties, carpet yarn manufacturing (filament pile yarns and spun pile yarns), Wilton carpet weaving, Axminster carpet weaving, Velvet carpet weaving, cost analysis, finishing of oven carpets, carpet back coating (latex application), brushing and shearing, final inspection/warehousing.

**TE 461 Tufted Carpet Manufacture (3-0)3**

Introduction to machine woven carpet types, fibre formation and morphology, fibre structural, physical, and chemical characterization, main carpet fibres and their properties, carpet yarn formation, tuft carpet weaving, primary and secondary backing construction, carpet construction, carpet finishing, carpet coating.

**TE 462 Introduction to**

**Fashion and Design (3-0)3**

Designing terms, textile and fashion terms, designing methods, presenting methods, technical design methods and applications.

**TE 463 Production and Cost Calculations in Textile (3-0)3**

The general perspective for textile cost calculations, basics of accounting, budgeting, cost-volume-profit analysis, pricing decisions. Cost analysis, the production and cost calculations for spinning, weaving preparation, weaving, dyeing and ready-made clothing.