Technische Universität Dresden
Faculty of Mechanical Science and Engineering

Study Regulations for the Consecutive Master's Degree in Textile Machinery and Textile High Performance Material Technology

24. May 2022

On the basis of § 36 paragraph 1 of the Saxon Higher Education Freedom Act in the version of the notification of January 15, 2013 (SächsGVBl. p. 3), the Technische Universität Dresden enacts the following Study Regulations as a statute.

Inhaltsübersicht

§ 1
Scope of application

Based on the Saxon Higher Education Freedom Act and the Examination Regulations, these Study Regulations govern the objectives, content, structure and procedure of the study program for the consecutive Master's degree in Textile Machinery and High Performance Material Technology at Technische Universität Dresden.

§ 2
Aims of the study programme

(1) Due to the holistic practice-related research orientation and the focus on new technical textile-based products, the students are able to grasp the growing challenges in the field of textile and assembly technology as well as ready-made clothing technology in their complexity, to recognize and work on innovative research fields and to implement the acquired expertise in research, teaching and international cooperation. Students will be able to analyze and design the complex processes of textile mechanical engineering and its peripheral areas. Upon completion of the program, graduates possess the scientific and engineering knowledge necessary for professional practice. They are able to establish connections to neighboring disciplines such as electrical engineering, power engineering, measurement and sensor technology, environmental protection, lightweight construction, civil engineering and business administration. The competence acquired in the course of study in the application of scientific working methods enables them to pursue independent, in-service training. Due to their profound scientific-technical knowledge, their mastery of textile-technical expertise and scientific methods as well as their ability to abstract, the graduates are able to meet the basic requirements in the field of mechanical engineering and the development and use of new textile-based products after an appropriate period of familiarization in professional practice. They can apply their knowledge and transfer the acquired skills to new problem areas. The ability to take a holistic view of global interrelationships in conjunction with an awareness of social responsibility enables graduates to take a solution-oriented approach in the area of conflict between textile-specific, ecological and economic problems in their professional lives. Graduates are also universally employable specialists with interdisciplinary knowledge and the ability to think in a networked manner; they can combine technical, economic and social competence.

(2) Graduates are qualified for employment in technical management functions in the textile, clothing and ready-made clothing industry, in textile and ready-made clothing machine construction, in the user industries for new, in particular technical textiles and textile products in mechanical engineering, in vehicle and aircraft construction, in the construction industry, in medicine as well as in institutions for research and research-related teaching. The research and development-oriented education enables graduates to think holistically when working out the interrelationships of the individual process stages, to solve scientific and technical problems in a team or also in independent work and to be creative in engineering, for example in product and process development as well as in production organization and process control. Graduates are able to integrate their textile-specific technical skills into an overarching technical system and to play a decisive role in interdisciplinary project groups. The graduate possesses the skills and abilities with regard to the professional presentation and documentation of research results, logistical management, the consideration of economic aspects and for independent further training as well as for the implementation of social components of the engineering activity.

§ 3
Access requirements

(1) The prerequisite for admission to the program is a first university degree recognized in Germany as qualifying for a profession or a degree from a state or state-recognized university of cooperative education in an engineering, industrial engineering-scientific, such as mechanical engineering, textile engineering, textile technology, ready-made clothing or apparel technology, industrial engineering or mathematical-scientific field, as a rule textile chemistry and textile finishing.

(2) In addition, a special aptitude for the study program is required. Proof is provided by an aptitude assessment procedure in accordance with the aptitude assessment regulations.

§ 4
Start and duration of studies

(1) The study program can be taken up in each winter semester.

(2) The regulation period of study is four semesters and includes attendance, self-study and the Master's examination.

§ 5
Teaching and learning forms

(1) The course material is structured in modules. In the individual modules, the course content is taught, consolidated and deepened through lectures, exercises, practicals, tutorials, projects and self-study.

(2) Lectures introduce the subject matter of the modules. Exercises enable the application of the subject matter in exemplary subareas. Internships serve the application of the taught material as well as the acquisition of practical skills in potential professional fields. Tutorials support students in the acquisition of practical skills. In projects, the connection between theory and practice is supported and special topics are developed with the inclusion of interdisciplinary questions. In particular, projects enable the application and deepening of methodological and social skills. Self-study enables students to acquire basic as well as in-depth specialist knowledge independently with the help of various media, in particular teaching materials, literature, Internet, in individual work or in small groups.

§ 6
Structure and sequence of studies

(1) The study program is modular. The courses are spread over four semesters. The third and fourth semesters are designed in such a way that they are particularly suitable for a temporary stay at another university (mobility window). Part-time studies are possible according to the regulations for part-time studies.

(2) The program comprises twelve compulsory modules and three compulsory elective modules, which allow the student to choose his or her focus. For this purpose, the modules Development of Complex Textile Constructions, Design and Fabrication of Technical Textiles, Machines and Technologies of Technical Textiles, Design/Construction of Textile Machines, Functionalisa-

tion and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D-CAE-Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing as well as Fiber-Based Biomaterials are available for selection. The choice is binding. A change of choice is possible; it is made by a written application of the student to the examination office, in which the module to be replaced and the newly chosen module are to be named.

(3) Qualification objectives, contents, teaching and learning methods, prerequisites, applicability, frequency, workload and duration of the individual modules can be found in the module descriptions (Annex 1).

(4) The courses are held in German language.

(5) The appropriate distribution of the modules to the individual semesters, the observance of which enables the completion of the studies in the regulation period of study, as well as the type and scope of the courses included in each case and the number and regular timing of the required study and examination achievements can be found in the attached study schedule (Annex 2) or in an individual study schedule for part-time studies confirmed by the faculty.

(6) The range of compulsory elective modules as well as the study schedule can be changed by the Faculty Council on the proposal of the Study Committee. The current range of compulsory elective modules is to be announced at the beginning of the semester in the usual manner of the faculty. The modified study schedule applies to the students to whom it is announced in the usual manner at the beginning of the semester. The Examination Board decides on exceptions to sentence 3 upon application by the student.

§ 7
Content of the study programme

(1) The Master's degree program Textile Machinery and High Performance Material Technology is research-oriented.

(2) The areas of study include engineering fundamentals as well as textile mechanical engineering and textile-specific subject areas. The engineering fundamentals in the compulsory area include in particular advanced mathematics, for example Fourier series, probability theory, mathematical statistics, computer applications in mechanical engineering, statics and strength of materials theory, design theory / machine elements, mechanism technology as well as labor science and business administration fundamentals. The textile mechanical engineering and textile-specific compulsory area covers all process stages of the textile manufacturing chain beginning with fiber and yarn production, surface formation and finishing/finishing up to the manufacture of a ready-to-use textile ready-made product or textile-based product including testing technology and methods for determining the properties of textile constructions and ready-made products with a focus on technical application areas, for example for medicine, hygiene, filter technology, lightweight construction, construction, energy technology, architecture, personal and property protection as well as smart textiles. The teaching areas are research-oriented and strongly interdisciplinary and, starting from general chemical principles, include the systematics of natural and man-made fibers, the essential synthesis principles and characterization methods of fiber-forming high-performance polymers, as well as the chemical and physical structure of classical man-made fiber materials and high-performance fiber polymers. Other areas of focus include the technologies and machinery used in the production of yarns and fabrics, particularly innovative yarn constructions, and the fabric formation technologies of weaving, knitting, and warp knitting,

considering the relationships between machine setting parameters, process conditions, and the resulting properties of yarn and fabric constructions. Woven, knitted and warp-knitted planar as well as complex and spatially shaped textile constructions continue to be the subject of the course. Further contents are methods for product construction, production preparation, cutting, joining and assembly of textile products, the possibilities of thermal shaping for the production of textile end products, ready-made products and semi-finished products with adapted moisture and heat management as well as technologies for the economic production of individualized ready-made products. The methods of scientific work and research management as well as instruments for systematization and communication in project-related research work with a high practical relevance are also part of the course. The elective area includes specific content on complex textile constructions, design of technical textiles, machines and technologies for the production and finishing of technical textiles, functionalization and boundary layer design of textile surfaces, textile finishing, fiber-based implants and biomaterials, tissue engineering, 2D/ 3D-CAE technologies for the development of textile constructions and textile products, machines and technologies for the production of nonwovens and for textile recycling, design, construction and adjustment of textile and finishing machines as well as textile management.

§ 8
Credit points

ECTS credit points document the average workload of students as well as their individual study progress. One credit point corresponds to a workload of 30 hours. As a rule, 60 credit points are awarded per academic year, i.e. 30 credit points per semester. The total workload for the study program corresponds to 120 credit points and includes the forms of teaching and learning designated in the module descriptions according to type and scope, the course and examination achievements, as well as the Master's thesis and the colloquium.
The module descriptions indicate how many credit points can be acquired through each module. Credit points are acquired if the module examination has been passed. § Section 26 of the examination regulations remains unaffected.

§ 9
Study guidance

General student advising is provided by the Central Student Advising Office of Technische Universität Dresden and covers questions about study opportunities, registration modalities and general student matters. The Institute for Textile Machinery and High Performance Material Technology is responsible for the academic advising during the studies. This specialized study advising supports the students in particular in questions of study design.

At the beginning of the third semester, every student who has not yet completed a course of study should take part in a course advisory service..

§ 10
Adaptation of module descriptions

(1) In order to adapt to changed conditions, the module descriptions can be changed in a simplified procedure within the framework of an optimal study organization with the exception of the fields "Module name", "Qualification objectives", "Contents", "Teaching and learning forms", "Requirements for the award of credit points", "Credit points and grades" and "Duration of the module".

(2) In a simplified procedure, the Faculty Council decides on the amendment of the module description on the proposal of the Study Commission. The changes are to be published in the usual manner of the faculty.

§ 11
Entry into Force, Publication and Transitional Provisions

(1) These Study Regulations come into force on the day after publication in the Official Announcements of the TU Dresden.

(2) It applies to all students newly enrolled in the Master's degree program Textile Machinery and High Performance Material Technology from the winter semester 2022/2023 or later.

(3) For students enrolled earlier than the winter semester 2022/2023, the version of the Study Regulations for the consecutive Master's degree programme Textile and Clothing Technology that has been valid for them up to now shall continue to apply.

Issued on the basis of the resolution of the Faculty Council of the Faculty of Mechanical Engineering dated April 20, 2022 and the approval of the Rectorate dated May 17, 2022.

Dresden, May 24, 2022

The Rector
of Technische Universität Dresden

Prof. Dr. Ursula M. Staudinger

Annex 1:
Module descriptions

Module number	**Module name**	**Responsible lecturer**
MW-MaTM-01	Mathematics for Textile Machinery and High Performance Material Technology	Prof. Matthies studiendokumente.mw@tu-dresden.de
Qualification goals	Students are able to deal appropriately and critically with advanced mathematical concepts and methods. They have the skills to apply these to engineering problems and are confident in the use of mathematical terminology.	
Contents	Contents of the module are Fourier series, vector analysis, integral calculus for functions of several variables, e.g. double and triple integrals, curve and surface integrals, integral theorems. Furthermore, the module contains partial differential equations, especially classification, boundary value and initial boundary value problems as well as characteristic methods, Fourier's method, d'Alembert's method, basic concepts for numerical solution. The module also includes probability theory with combinatorics, probability, random variables, distribution functions and mathematical statistics, in particular descriptive statistics, point estimators and confidence intervals.	
Teaching and learning methods	Lecture 4 lecture hours per week, exercise 4 lecture hours per week, tutorial 3 lecture hours per week, self-study.	
Requirements for participation	Basic mathematical knowledge at the level of a Bachelor's degree is required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Design Theory/Machine Elements, Mechanism Technology, Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration.	
Credit points and	10 credit points can be acquired through the module. The module	

grades	grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every academic year, starting in the winter semester.
Workload	The total workload is 300 hours.
Duration of the module	The module covers two semesters.

Module number	Module name	Responsible lecturer
MW-MaTM-02	Computer Application in Mechanical Engineering	Prof. Paetzold-Byhain studiendokumente.mw@tu-dresden.de
Qualification goals	Students are able to effectively use modern hardware and software systems. They have basic knowledge in the use of selected engineering software systems, the basic structure as well as the functionality of computer technology and the development of software.	
Contents	Contents of the module are basics about computer technology, information representation and data modeling, the use of com-plex computer systems on the basis of a calculation and modeling system as well as a 3D CAD system.	
Teaching and learning methods	Lecture 2 lecture hours per week, exercise 2 lecture hours per week, tutorial 2 lecture hours per week, self-study.	
Requirements for participation	None.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Design Theory/Machine Elements, Mechanism Technology, Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration.	
Credit points and grades	5 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the module	The module is offered every winter semester.	
Workload	The total workload is 150 hours.	
Duration of the module	The module covers one semester.	

Module number	Module name	Responsible lecturer
MW-MaTM-03	Engineering Mechanics	Prof. Wallmersperger studiendokumente.mw@tu-dresden.de
Qualification goals	The students know the basic laws of statics and apply them to the calculation of the load-bearing behaviour of simple components and constructions. They are able to determine statically and geometrically based parameters of bodies and surfaces. The students know the relationships between loads, material properties and stresses of components. They are proficient in simple calculation methods of dimensioning, strength verification and load-bearing capacity assessment of components and constructions.	
Contents	Contents of the module are the rigid body, the independent loads, force and moment as well as the principle of section, the equilibrium of plane and spatial structures through the basic laws of statics (balance of forces and balance of moments), which condition the bearing and section reactions, friction problems and centres of gravity as well as first and second order moments of area. The module covers the basic problems of strength theory, tensile, compressive and shear stresses including elementary dimensioning concepts, general stress and distortion states in linear-elastic materials with temperature influence, stresses and deformations in torsion of prismatic bars, beam bending, transverse shear force and strength hypotheses.	
Teaching and learning methods	Lecture 4 lecture hours per week, exercise 4 lecture hours per week, tutorial 3 lecture hours per week, self-study.	
Requirements for participation	Knowledge of mathematics at A-level (basic course), physics at A-level (basic course) and chemistry at A-level (basic course) is assumed.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Design Theory/Machine Elements, Mechanism Technology, Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of one written examination of 120 minutes. Bonus performance for the written examination is a performance status check of 10 hours each.	

Credit points and grades	10 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every academic year, starting in the winter semester.
Workload	The total workload is 300 hours.
Duration of the module	The module covers two semesters.

Module number	Module name	Responsible lecturer
MW-MaTM-04	Design Theory/Machine Elements	Prof. Schlecht studiendokumente.mw@tu-dresden.de
Qualification goals	After completing the module, students will have mastered the basic methods for developing, designing, manufacturing and testing mechanical engineering products and will have skills in using CAD systems. They are able to estimate the areas of application of typical machine elements such as axles and shafts, elementary connections, frictional and positive shaft-hub connections, roller bearings, plain bearings and gear drives, and to select and calculate them.	
Contents	Contents of the module are basic relationships between geometric objects, basics of the preparation and understanding of technical documentation, for example drawings and parts lists, design of machine parts suitable for production, design of machine parts suitable for function and stress. This module also covers the function and structure of individual machine elements as well as generally applicable principles for their calculation and design, in particular the fundamentals of the corresponding methods for dimensioning and recalculation of components and assemblies.	
Teaching and learning methods	Lecture 2 lecture hours per week, exercise 1 lecture hour per week, tutorial 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering and Mechanism Technology are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the module Research Management in the Textile Industry.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
Credit points and grades	5 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the module	The module is offered every winter semester.	
Workload	The total workload is 150 hours.	
Duration of the module	The module covers one semester.	

Module number	Module name	Responsible lecturer
MW-MaTM-05	Mechanism Technology	Prof. Beitelschmidt studiendokumente.mw@tu-dresden.de
Qualification goals	The students possess basic skills in the fields of design of processing and textile machines, including mechanism technology. They are able to recognize typical laws of mechanism technology and understand important relationships. Furthermore, they have basic knowledge of motion design, kinematic analyses and design principles for coupling gears, cam gears and other types of gears with unequal transmission ratios. Students will be able to understand the structure and properties of simple mechanisms and analyze them kinematically.	
Contents	Contents of the module are coupled mechanisms, multi-degree-of-freedom systems and continua. Further contents are the basics of mechanism technology, for example gear systematics, gear kinematics, kinematic analysis, motion design, design principles as well as the necessary methods and procedures.	
Teaching and learning methods	Lecture 2 lecture hours per week, exercise 1 lecture hour per week, tutorial 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering and Mechanism Technology are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the module Research Management in the Textile Industry.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
Credit points and grades	5 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the module	The module is offered every winter semester.	
Workload	The total workload is 150 hours.	
Duration of the module	The module covers one semester.	

Module number	Module name	Responsible lecturer
MW-MaTM-06	Industrial Management/Basics of Business Administration	Prof. Schmauder studiendokumente.mw@tu-dresden.de
Qualification goals	After completion of the module, the students have knowledge in the fields of labor science, in particular technical management and the basics of business administration. The students know the importance of people in the work system. They have basic knowledge of human resource management and have acquired the necessary skills for the implementation of the knowledge of labor science in technical management. The students are able to understand the importance of work science with its current problems and development trends. The students understand the importance of people with their performance requirements as a central element of the work system and work design as a challenge and attractive field of work for working in the company. The students are able to relate the basics of business administration to concrete applications and make decisions on the basis of business administration methods.They have the competencies to assess engineering work from an economic point of view and to cooperate expertly with business administrators..	
Contents	Contents of the module are intersections and interfaces to the fields of industrial and organizational psychology as well as occupational medicine, methods and procedures for work system design as well as basics and design knowledge on the elements of people, work equipment, workplace, work environment, work flow and work organization, on management and leadership, processes in companies as well as the application of the methods of industrial science. The course also covers the basic principles of cost accounting with cost types, cost centers and cost unit accounting, the structure of company accounting, cost accounting, contribution margin accounting and cost comparison accounting, company calculations and balance sheets, investment appraisal procedures, management and leadership methods, as well as the basic principles of company organizational structure and the connections with process organization and the networking of company cost and performance accounting with logistics processes and process organization.	
Teaching and learning methods	Lecture 3 lecture hours per week, exercise 2 lecture hours per week, self-study.	
Requirements for participation	None.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and	

	Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, Design/Construction of Textile Machines, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of two written examinations of 90minutes duration each.
Credit points and grades	5 credit points can be acquired through the module. The module grade results from the unweighted average of the grades of the individual examination performances.
Frequency of the module	The module is offered every academic year, starting in the winter semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers two semesters.

Module number	Module name	Responsible lecturer
MW-MaTM-07	Textile High-Performance Materials and Testing Technology	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to apply the acquired knowledge about the chemistry of textile fiber materials, structure and properties of fiber-based natural, semi-synthetic and synthetic polymer materials for textile-technical material and machine developments. Starting from the general chemical basics, the students know the essential synthesis principles and characterization methods of fiber-forming high-performance polymers as well as the chemical constitution and physical structure of fiber materials. They are able to apply the complex relationships between the structure and properties of high-performance, functional and biomedical fiber materials, their production, the necessary technology and mechanical engineering to engineering tasks in an interdisciplinary manner. The students are able to use the possibilities of high-performance and functional materials for high-tech applications, for example for lightweight construction and biomedicine, and to develop further ideas and future-oriented concepts. Students are able to independently carry out measurement and testing procedures for the qualitative and quantitative determination of the condition and properties of textile fiber materials as well as textile semi-finished and finished products. The students are able to apply the acquired knowledge of the complex relationships between the structure and properties of textile fibers and their acquired skills and abilities in the field of measurement and testing technology in a subject-specific and interdisciplinary manner to engineering tasks, especially under the aspect of the complexity of textile and clothing technology solutions for the various user industries.	
Contents	Contents are the essential chemical principles and synthesis principles of fiber-forming polymers as well as the chemical and physical structure of the fiber materials. The module covers the fiber-forming high-performance and functional materials in terms of their mechanical, physical and chemical properties to evaluate the potential for application or use. This includes the interrelationships of complex manufacturing and processing technologies of fiber-forming materials, their processing properties as well as the specific material behavior in products and composite components, fundamentals of manufacturing, technological and machine implementation as well as processing and characterization of these materials.	
Teaching and learning methods	Lecture 6 lecture hours per week, exercise 1 lecture hour per week, practical course 3 lecture hours per week, self-study.	
Requirements for participation	Basic engineering competencies, preferably in the area of textile engineering and/or basic macromolecular chemistry at the undergraduate engineering level are required.	

Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules für Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration.
Credit points and grades	10 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 300 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-08	Machines and Technologies for Yarn Structures, especially Composites	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Based on the knowledge of textile fibre materials, the students master the complex interrelationships of the threads produced from fibre materials and their machines and processes as well as their characterisation and analysis. Furthermore, the students know the associated technological interactions as well as the general or special structure and the mode of operation of fibre preparation and spinning machines as well as their interlinking to material- or product-specific systems. The students are able to combine the machines for fibre preparation and blending, web and sliver formation as well as their equalisation, but also the actual spinning into systems using the example of concrete types of fibres, including fibre materials and qualities, and to deal with complex tasks. In addition, the students have profound knowledge of the various possibilities for spinning natural fibres, synthetic fibres and high-performance fibres or their blending into high-quality fibre fleeces and yarns or hybrid yarn constructions, especially for composite applications, as well as efficient measuring and testing techniques for determining the textile-physical properties of fibres and yarn constructions and for targeted online optimisation of the fleece- and yarn-forming processes and machines.	
Contents	The contents of the module are the structure, extraction, classification and specific properties of natural and man-made fibres as well as the basics of the structure, the functional principle, the textile technological and setting parameters of the machines and technologies of yarn production and the test methods for the characterisation of fibres and yarns. The module covers the basic machine-specific control and regulation systems and gear-technical mechanisms of action.	
Teaching and learning methods	Lecture 2 lecture hours per week, exercise 2 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	Basic engineering competencies, preferably in the field of textile engineering at an engineering bachelor's level, are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Ma-	

	chine Testing, Textile Finishing and Fiber-Based Biomaterials.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 180 minutes duration.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-09	Machines and Technologies for Textile Constructions	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to apply the acquired skills and abilities as well as the well-found and extensive knowledge of the machines and technologies in the field of the development and production of textile constructions. Interdisciplinary solutions of engineering tasks for the modification and product-specific adaptation of textile machines and technologies for the structural-mechanical development of requirement-based textile constructions can also be used. The students can apply the acquired knowledge and skills for the engineering development, design and testing of textile constructions. Through the systematic and detailed description of the active principles and processing technology processes, the students understand the active pairing of textile fibre/machine element and are able to characterise and develop textile machines and systems constructively and technologically.	
Contents	This module covers, based on textile fibre materials, the production chain up to the textile construction, the relationships between material properties, process and machine parameters and the resulting structures and properties of the textile constructions. Furthermore it contains the basics of woven, knitted and warp-knitted flat-surfaces and spatially shaped textile constructions, the technologies of weaving, knitting and warp-knitting, the corresponding machines as well as the methods and devices for determining the textile-physical and textile-chemical properties of the textile constructions.	
Teaching and learning methods	Lecture 3 lecture hours per week, practical course 2 lecture hours per week, self-study.	
Requirements for participation	Basic engineering competencies, preferably in the field of textile engineering at an engineering bachelor's level, are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Research Internship Textile Machinery, Research Management in the Textile Industry, Development of Complex Textile Constructions, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration. Preliminary work for the examination is a comput-	

	er-based short control of 8 hours duration.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-10	Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products	Prof. Kyosev studiendokumente.mw@tu-dresden.de
Qualification goals	The students understand the subject area as a unity of the development of textile materials and their processing into semi-finished and finished products in the form of clothing, home and room textiles as well as technical textiles. They are familiar with the process stages of 1. product development, 2. production preparation, 3. cutting, 4. joining, 5. finishing and 6. packaging with the associated processes and machines for performance- and quality-oriented production with economic efficiency. They are able to recognize the processes and machines resulting from product requirements and material properties in context. The students are able to apply the finishing processes in a target-oriented manner to solve relevant engineering tasks in order to realize usage requirements as well as application-specific functional requirements for textile-based materials/semi-finished/semi-finished products safely and in consideration of the ecological framework conditions. At the same time, students are able to design and carry out the selection of processes and machines for new products. They are familiar with the specifics of flexurally soft materials in design and handling as well as the practical requirements of the product in question over the product life cycle and can incorporate these into decisions.	
Contents	The module includes the relevant legislation, the processes for product design, production preparation, cutting, joining and assembly of textile products, the possibilities of thermal shaping for the manufacture of textile end products, ready-made products and semi-finished products with adapted moisture and heat management, technologies for the economical manufacture of individualized ready-made products, as well as measuring methods for the determination of ready-made specific material parameters and test methods for the determination of service properties. The module also covers the manufacture of technical textiles for applications in mechanical engineering, automotive engineering, construction, medicine and other fields.	
Teaching and learning methods	Lecture 3 lecture hours per week, exercise 1 lecture hour per week, practical course 2 lecture hours per week, self-study.	
Requirements for participation	None.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology. It creates the prerequisites for the modules Research Internship Textile Machinery, Research Management in the Textile Indus-	

	try, Design and Manufacture of Technical Textiles, Machines and Technologies for Technical Textiles, Design/Construction of Textile Machines, Functionalisation and Interface Design, Fiber-Based Implants and Tissue Engineering, Textile Management, 3D CAE Technology for Fiber-Based Materials, Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency, Textile Machine Testing, Textile Finishing and Fiber-Based Biomaterials.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of an oral examination as a group examination with a maximum of four students, each lasting 30 minutes.
Credit points and grades	7 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-11	Research Internship Textile Machinery	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Students have the competence to independently apply the knowledge, skills and abilities they have acquired during their studies to solve a complex scientific problem from the fields of textile and ready-made clothing technology, to develop and implement concepts, to trace the work steps, to document them, and to present and discuss the results. Furthermore, they are able to independently acquire new findings and knowledge as well as scientific methods and skills of an advanced engineering activity.	
Contents	The content of the module is the independent solution of defined scientific problems with a basic or application-oriented character from the field of textile mechanical engineering and related fields.	
Teaching and learning methods	Project 2 lecture hours per week and self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a project work of 205 hours.	
Credit points and grades	8 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the module	The module is offered every semester.	
Workload	The total workload is 240 hours.	
Duration of the module	The module covers two semesters.	

Module number	Module name	Responsible lecturer
MW-MaTM-12	Research Management in the Textile Industry	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Through this module, students possess instrumental, systematic and communicative competences. They are familiar with the methods of scientific work and related to the scientific-methodical approach to the processing and preparation of research papers. Students are able to prepare presentations on scientific topics according to the requirements of scientific conferences with subsequent scientific dialogue between the speakers and the students. The students know the latest research results of the Institute of Textile Machinery and High Performance Material Technology of Technische Universität Dresden and of national and international partner institutes. Likewise, they possess the corresponding knowledge of practice-relevant topics and of social and intercultural components of engineering work. Through this module, students are able to approach the processing of research tasks in a scientific and methodical manner and to lead them to a solution. In doing so, they are able to use the existing scientific potential of the institute, other research institutions, the patent office as well as the expert knowledge available in various forms in a goal-oriented manner. They are able to present the results of their research work logically and comprehensibly at the highest scientific level.	
Contents	Contents are creativity techniques, basics of rhetoric and linguistic design of scientific presentations and written papers, in particular also specific insights into current doctoral theses and research projects.	
Teaching and learning methods	Lecture 2 lecture hours per week (in block), exercise 1 lecture hour per week (in block) and self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Design Theory/Machine Elements, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is a compulsory module in the Master degree programme in Textile Machinery and High Perfomance Material Technology.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a paper of 20 hours.	

Credit points and grades	5 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-13	Development of Complex Textile Constructions	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Based on the fundamentals of creativity techniques, moderation and teamwork in conjunction with fundamentals of fiber materials, machine controls, technologies and especially the methods for structure description, structure development and the use of CAD software in the fields of woven and knitted fabrics, the students are able to design and develop new complex textile structures for a wide range of applications in engineering terms. Students are able to describe technical textiles, which also include fiber-based structures with function integration and structures in multi-material design for composite and medical applications, both in terms of external shape, morphology, mechanical but also thermal, acoustic, biological and fluidic properties and to develop solutions for the targeted reproducible adjustment of these.	
Contents	Contents of the module are basics of creativity techniques, teamwork and moderation as well as the training of methods for product development using the example of concrete development tasks from the field of complex textile constructions for technical textiles with function integration and in multi-material design for high-tech applications. The content of the course continues to focus on the in-depth analysis of machines for complex textile constructions with design principles, mechatronic solutions, functions and controls, fabric flow and machine software as the basis for machine and technology developments. Another focus is the graphical, mathematical and software-supported weave-technical modeling for 2D and 3D structures up to the CAD-supported automated process chain from the CAD design to the control of textile machines using the example of complex 3D structures.	
Teaching and learning methods	Exercise 4 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the	The credit points are acquired if the module examination is passed.	

award of credit points	The module examination consists of an oral examination performance of 30 minutes duration as an individual examination.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-14	Design and Manufacture of Technical Textiles	Prof. Kyosev studiendokumente.mw@tu-dresden.de
Qualification goals	Based on the knowledge acquired in the module, the students are able to develop products of or with integrated technical textiles and to select and adapt the specific technologies as well as the machines for the fabrication. They are able to use 2D and 3D CAD software for the development of textile blanks, to generate 2D cutting patterns from them, to perform 3D visualizations and to determine load limits. Furthermore, the students are able to select cutting tools and equipment, joining machines, for example sewing and welding machines and joining methods as well as suitable process conditions, in particular sewing thread tension, needle type, joining pressure, welding energy/time, type of anvil wheels and pressing molds, taking into account the properties of the textile materials to be processed, and to carry out experimental and simulation-based investigations for their optimization.	
Contents	The module includes basics for the development of textile cuts from flexible materials using 2D/3D CAD systems as well as the presentation of the relationship between design and construction using the example of functional clothing. Furthermore, the module includes the necessary tools for this, such as anthropometry, dimensional definition and recording and the application of different construction principles. Furthermore, in order to realize the required variety of models, the module includes parametric design solutions based on practical examples, methods of marker-making to ensure effective use of materials, as well as the use of simulation tools for product development in the company and along the textile chain. Product visualization as well as stress calculations and analyses form a focal point. A further content is the execution of machine and processing examinations in the clothing technology for the determination of the machines to be used, for example sewing machines and welding machines, depending on the sewing material to be processed, in particular classical textiles and technical textiles. The module also covers the relationship between machine and process parameters in terms of sewing thread consumption, sewing thread load and needle temperature as well as the sewing material. The module also covers thermal cutting and joining processes, e.g. ultrasonic welding and cutting, hot-air and high-frequency welding, and the interaction between the process and sewing material parameters and the joining quality. Contents of the module include the possibilities for using robots to automate finishing processes for flexible textiles as well as the basics of imaging methods for quality assurance.	

Teaching and learning methods	Lecture 2 lecture hours per week, exercise 1 lecture hour per week, practical course 2 lecture hours per week, self-study.
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of an oral examination as a group examination with a maximum of four students, each lasting 45 minutes.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-15	Machines and Technologies for Technical Textiles	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Based on their knowledge of the latest technologies and special machine techniques for the design and manufacture of technical textiles to meet requirements and their fabrication, students are able to apply these to high-tech fields of application in mechanical engineering, lightweight construction, automotive engineering, biotechnology and medical technology, construction and membrane technology. Building on this in-depth knowledge, students are able to familiarize themselves with completely new fields of application and thus open up new areas. They are able to use the almost unlimited possibilities of the new high-performance materials and structures for creative further developments.	
Contents	Contents of the module are the development of structures with tailor-made properties, the conception of new technologies and the necessary construction of special machines in the entire textile process chain from fiber, thread and 2D/3D textile construction as well as finishing up to the making-up of innovative products on the basis of modern joining techniques, such as one-sided sewing, gluing as well as high-frequency and ultrasonic welding technology, with special consideration of practice-oriented requirements. Based on the specific requirements of the user, the module covers the close connection of fiber manufacturers, textile machine designers, surface producers, garment manufacturers, for example preform manufacturers, and users during product development as a basic prerequisite for targeted product design across the textile value chain. The comparison of the high-performance textile materials and structures used, their product properties with conventional materials, the advantages for future applications and necessary developments are further contents of the module.	
Teaching and learning methods	Lecture 4 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	

Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of an oral examination as a group examination with a maximum of four students, each lasting 20 minutes.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-16	Design/Construction of Textile Machines	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students master the methodical fundamentals for the design and construction of highly dynamic machine components and modules. Furthermore, they are able to analyze complex highly dynamic motion sequences and machine functions. As a whole, the students are able to understand and analyze complex interrelationships of the diverse functions and mechanisms, especially in the field of textile machines, with regard to design aspects and to develop strategies for targeted design optimization.	
Contents	The module covers the basics and methods for the design methodical approach, the abstraction and precise definition of development tasks, the selection and use of modern CAD calculation programs and CAD measurement systems using the example of design and construction. This includes the dimensioning of machine components, the definition of drive strategies, the evaluation and elaboration of design solutions. Modern tools and design systems based on current developments in textile machine engineering are also part of the content of this module. Furthermore, the module includes methods for monitoring and controlling highly dynamic processes as well as the effect of process parameters on the process and product quality.	
Teaching and learning methods	Lecture 1 lecture hour per week, exercise 2 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the	The module is offered every winter semester.	

module	
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-17	Functionalisation and Interface Design	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to analytically record the properties of surfaces and interfaces of textile materials in all presentations in order to evaluate their applicability for technical or medical tasks. They possess theoretical knowledge and practical skills that enable them to selectively finish textile materials, their phase boundaries and boundary layers to composite partners using chemical/physical processing methods. In addition, the students possess fundamental knowledge in the field of instrumental analysis of textile interfaces and layers, for the elucidation of chemical-functional structuring and the energetic interaction potentials. They are able to plan and carry out treatment and processing procedures for textile materials in such a way that sufficient compatibility of finishing agents and composite partners is achieved.	
Contents	The module covers the fundamentals of the chemical/physical nature and the associated interaction capacity of the interfaces of a wide variety of fiber and high-performance fiber materials as well as their conventional coatings. The module includes methods and procedures for the targeted modification of the properties of textile material interfaces as well as the evaluation of the possibilities in the development of technically and medically useful products, in particular instrumental surface analysis as well as thermal analysis of textile materials and polymeric materials.	
Teaching and learning methods	Lecture 2 lecture hours per week, practical course 3 lecture hours per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 120 minutes duration.	
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	

Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-18	Fiber-Based Implants and Tissue Engineering	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students master the technical fundamentals to apply material- and structure-dependent properties of fiber-based biomaterials, scaffolds and implants, their production and the necessary machine technology as well as their physical and biochemical characterization to interdisciplinary engineering tasks in biomedical engineering. Furthermore, the students are able to understand and work out the basic contexts of tissue engineering as well as the technical concepts of the reconstruction of human tissues and organs with the help of cells and carrier structures (scaffolds). In addition, students will know the basics of cell harvesting and cell culture techniques. They are able to act as an interface between medicine and engineering and to formulate and solve interdisciplinary tasks with both disciplines.	
Contents	The module covers the basics of the methods for obtaining and cultivating human cells, the material and engineering requirements for biomaterials with regard to structural and cell biological biocompatibility as well as polymeric, metallic and ceramic biomaterials. Contents of the module continue to be the basic biological and engineering aspects of the interaction of cells with each other and the interactions with the scaffold and implant as well as the cellular responses to biomaterials, in particular the use of fiber-based structures as functional substitutes for natural tissue for example in vascular replacements and patches, force transmission and plastic reinforcement in the form of ligament, tendon, joint replacement and osteosynthesis plates innovative biomaterials and biomimetic structures made from them in relation to current developments, the analysis of the biomedical-technical behavior of the different textile structures as well as the application-oriented textile-technical design of fiber-based implants.	
Teaching and learning methods	Lecture 2 lecture hours per week, practical course 2 lecture hours per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	

Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 120 minutes duration.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-19	Textile Management	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students master methodical basics of textile management, in particular quality management, environmental management, innovation and project management, organizational management. The students are able to apply aspects of the organization of tasks and processes in different areas and fields and in particular to formulate requirements for the quality management system. Students are able to recognize business and technical interrelationships and understand the interdependence of processes as well as the diverse influencing factors in the field of the textile industry and textile mechanical engineering and to develop targeted solutions for management decisions.	
Contents	The module covers the basics and methods of organizing tasks and operations of processes. This includes current textile economic and ecological aspects, such as sustainable employee management, innovation and project management, business plan preparation, operational and strategic production management, ergonomic work design/work organization, statistics and textile recycling. The module also covers methods of digitalization in the textile industry, which enable a strong individualization of products under the conditions of highly flexible production with maximum material and resource efficiency. Further focal points concern the currently applicable management systems, in particular for quality and the environment.	
Teaching and learning methods	Lecture 2 lecture hours per week, exercise 2 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a paper of 60 hours.	
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	

Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-20	3D CAE Technology for Fiber-Based Materials	Prof. Kyosev studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to apply their acquired skills and abilities for solving interdisciplinary engineering development tasks based on a well-founded and comprehensive knowledge for handling CAE tools for virtual product development by using fibre-based flexible materials,. In addition, they are able to consider the specifics of flexible materials during the design and product develpopment including wear and applications. The students understand the interactions between the anisotropic, non-linear material behaviour, the product geometry and the product properties and are able to develop functional textile products for a wide range of applications.	
Contents	The contents of the module are the parametric design of free-form surfaces, the modelling of the relationship between 3D product geometry and 2D pre-cuts as well as the consideration of the deformation behaviour of textile sheet structures during the product development. As for the calculation of 2D pre-cuts, the module includes numerical methods of kinematic modelling as well as application subjects using product examples. Another focus of the content is the realisation of continuous digital process chains from design and construction to the mechanical implementation of complex ready-made products.	
Teaching and learning methods	Lecture 1 lecture hour per week, exercise 2 lecture hours per week, practical course 2 lecture hours per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration.	
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the	The module is offered every winter semester.	

module	
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-21	Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to recognise the requirements and derive the actions for manufacturers and trading companies with regard to the recycling of textile production waste and used textiles in accordance with the Closed Substance Cycle Waste Management Act. They are able to use their practical skills and abilities to identify the nonwoven fabric structures and their allocation to the individual manufacturing processes. They are able to assess the development potentials from linking the different nonwoven technologies and equipment .	
Contents	Contents of the module are the machines and process stages for the production of nonwovens, their finishing and testing as well as the presentation of new application areas. In the field of nonwovens technology, the module covers the machines and processes for their formation, bonding based on mechanical, chemical and thermal functional principles and for functionalisation by means of finishing, as well as the special required testing methods. Further subjects included are the fibres and polymer materials required for the implementation of the most diverse nonwoven variants from an application-specific point of view. The fibres and polymer materials are the contents of the module. It also includes various technological processes for the recycling of textiles and textile products, in particular on an energetic, material and landfill basis, the processes for the recycling of car textiles, construction and agricultural textiles, geo- and hydraulic engineering materials, textile roof greening and insulation materials, as well as the essential tasks of the processing industry in the development and implementation of economic processing methods and the development of new areas of application.	
Teaching and learning methods	Lecture 4 lecture hours per week, practical course 1 lecture hour per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	

Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 150 minutes duration.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-22	Textile Machine Testing	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	Students master the methodological principles for analyzing highly dynamic machine components and modules. This enables them to diagnose and analyze complex highly dynamic motion sequences and machine functions.	
Contents	The module covers the fundamentals and methods for the abstraction and precise definition of development tasks as well as for the selection and use of modern measuring systems and methods of data processing using the example of textile machine diagnostics. This includes the analysis of dynamic behavior and machine diagnostics, theoretical and practical fundamentals of measurement and actuator systems, characterization of textile and processing technology processes as well as solution-oriented measurement station configuration and method selection for the evaluation and interpretation of measurement signals. The module also includes methods for monitoring and controlling highly dynamic processes and for the effect of process parameters on the process and product quality.	
Teaching and learning methods	Lecture 2 lecture hours per week, practical course 2 lecture hours per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of an oral examination as a group examination with a maximum of four students, each lasting 30 minutes. Preliminary work for the examination is a computer-based comprehension check of 8 hours duration.	
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Frequency of the module	The module is offered every winter semester.	

Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-23	Textile Finishing	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students are able to analytically record the processing and usage properties of natural or chemical fiber-based materials in all presentations in order to evaluate their suitability for technical or medical tasks. They possess theoretical knowledge and practical skills that enable them to carry out targeted pretreatment, finishing and finishing of textiles, for example using dyes and textile auxiliaries. In addition, the students possess basic knowledge in the field of instrumental analysis, such as rheology, colorimetry, colorimetry and tensiometry, in order to be able to present experimental results and to derive scientific correlations. Furthermore, students are able to plan and carry out finishing and finishing processes for textile materials in such a way that specific usage properties can be achieved, taking into account ecological and environmental aspects.	
Contents	The module covers basic as well as specialized theory and factual knowledge on the focus of textile finishing. Fundamentals of textile chemistry include fiber-forming polymers (natural and man-made fibers) and their polymer structure. The module includes conventional textile pretreatment and textile finishing processes, which give the textile products the required processing and usage properties. Contents of the module are the different dyeings, dyeing apparatus, finishes, textile auxiliaries and coating technologies. Further contents are basics of mass transfer processes, diffusion as well as reaction mechanisms and of chemical-physical analyses, such as rheology, colorimetry and tensiometry as well as fastness analyses and colorimetry.	
Teaching and learning methods	Lecture 2 lecture hours per week, practical course 3 lecture hours per week, self-study.	
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.	
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.	
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 90 minutes duration.	
Credit points and	6 credit points can be acquired through the module. The module	

grades	grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Module number	Module name	Responsible lecturer
MW-MaTM-24	Fiber-based Biomaterials	Prof. Cherif studiendokumente.mw@tu-dresden.de
Qualification goals	The students possess special knowledge and practical skills for the development of fiber-based biomaterials with tailored properties with special consideration of medical requirements and guidelines. as well as a profound understanding of the essential groups of materials used as biomaterials. Furthermore, students will be able to apply their in-depth knowledge of fiber-based degradable and non-degradable biomaterials of natural as well as synthetic origin and their surface functionalization and interface design. Students will be familiar with the characteristic uses of fiber-based biomaterials, particularly in the areas of tissue engineering, organ replacement, and drug delivery. Students will be able to describe the relationships and interactions between material, structure and manufacturing process. In addition, the students are familiar with the necessary manufacturing processes and current references in the presentation of device-technical realizations as well as new development trends in biomaterial research. They have a sound knowledge of medical terminology and thus possess the prerequisite for good interdisciplinary cooperation as engineers in the medical environment.	
Contents	Contents of the module are basic terminology and an overview of the use of commercially available biomaterials in particular metal, ceramic, polymer as well as composite in temporary or permanent body contact in medicine. In addition, the requirements for the use of biomaterials in clinical or health care settings as well as the interactions between biosystem and biomaterial are part of the content of the module. Furthermore, the module covers the body degradable and non-degradable fiber-based biomaterials of natural and synthetic origin such as collagen, chitosan, silk, polyglycolic acid (PGA), polylactic acid (PLA) or polyethylene terephthalate (PET). Emphasis is placed on the structural properties, biocompatibility, and performance of fiber-based biomaterials, as well as the various methods used to fabricate these biomaterials. Based on the specific requirements of medical devices, the content of the module includes the physical, chemical and biological properties of necessary biomaterials, relationships between structure and properties of biomaterials, and the tuning possibilities of property profiles through targeted polymer selection and fiber formation. The module includes insights into the currently industrially strongly accentuated topics such as sterilization processes, considerations of regulatory and legal requirements or the approval of medical devices (CE marking) and prerequisites for use on and in humans.	

Teaching and learning methods	Lecture 2 lecture hours per week, exercise 1 lecture hour per week, practical course 1 lecture hour per week, self-study.
Requirements for participation	The competencies to be acquired in the modules Mathematics for Textile Machinery and High Performance Material Technology, Computer Application in Mechanical Engineering, Mechanism Technology, Industrial Management/Basics of Business Administration, Textile High-Performance Materials and Testing Technology, Machines and Technologies for Yarn Structures, especially Composites, Machines and Technologies for Textile Constructions and Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products are required.
Usability	The module is one of twelve compulsory elective modules in the Master degree programme in Textile Machinery and High Perfomance Material Technology, of which three must be chosen.
Requirements for the award of credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written examination of 90 minutes duration.
Credit points and grades	6 credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.

Annex 2:
Curriculum

with the type and scope of the Courses in SWS as well as required performances, the type, scope and Design of which can be found in the module descriptions

Module no.	Module name	**1st Semester**	**2nd Semester**	**3rd Semester (M)**	**4th Semester (M)**	**LP**
		V/Ü/P/T	V/Ü/P/T	V/Ü/P/T	V/Ü/P/T	
Compulsory modules						
MW-MaTM-01	Mathematics for Textile Machinery and High Performance Material Technology	2/2/0/2 (5)	2/2/0/1 PL (5)			10
MW-MaTM-02	Computer Application in Mechanical Engineering	2/2/0/2 PL				5
MW-MaTM-03	Engineering Mechanics	2/2/0/2 (5)	2/2/0/1 PL (5)			10
MW-MaTM-04	Design Theory/Machine Elements			2/1/0/1 PL		5
MW-MaTM-05	Mechanism Technology			2/1/0/1 PL		5
MW-MaTM-06	Industrial Management/Basics of Business Administration	1/1/0/0 PL (2)	2/1/0/0 PL (3)			5
MW-MaTM-07	Textile High-Performance Materials and Testing Technology		6/1/3/0 PL			10
MW-MaTM-08	Machines and Technologies for Yarn Structures, especially Composites	2/2/1/0 PL				6
MW-MaTM-09	Machines and Technologies for Textile Constructions		3/0/2/0 PVL, PL			6
MW-MaTM-10	Processes and Machines of Textile Assembly Technology and Virtual Development of Textile Products	3/1/2/0 PL				7
MW-MaTM-11	Research Internship Textile Machinery			0/0/0/0 1 SWS Project (4)	0/0/0/0 PL 1 SWS Project (4)	8
MW-MaTM-12	Research Management in the Textile Industry				2/1/0/0 PL each in bulk	5
Elective modules						
Selection of 3 out of 12 modules						
MW-MaTM-13	Development of Complex Textile Constructions			0/4/1/0 PL		6

Module no.	Module name	1st Semester	2nd Semester	3rd Semester (M)	4th Semester (M)	LP
		V/Ü/P/T	V/Ü/P/T	V/Ü/P/T	V/Ü/P/T	
MW-MaTM-14	Design and Manufacture of Technical Textiles			2/1/2/0 PL		6
MW-MaTM-15	Machines and Technologies for Technical Textiles			4/0/1/0 PL		6
MW-MaTM-16	Design/Construction of Textile Machines			1/2/1/0 PL		6
MW-MaTM-17	Functionalisation and Interface Design			2/0/3/0 PL		6
MW-MaTM-18	Fiber-Based Implants and Tissue Engineering			2/0/2/0 PL		6
MW-MaTM-19	Textile Management			2/2/1/0 PL		6
MW-MaTM-20	3D CAE Technology for Fiber-Based Materials			1/2/2/0 PL		6
MW-MaTM-21	Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Effi-ciency			4/0/1/0 PL		6
MW-MaTM-22	Textile Machine Testing			2/0/2/0 PVL, PL		6
MW-MaTM-23	Textile Finishing			2/0/3/0 PL		6
MW-MaTM-24	Fiber-based Biomaterials			2/1/1/0 PL		6
Master thesis					19	19
Colloquium					1	1
LP		30	29	32	29	120

Legende

SWS Lecture hours per week
V Lecture
Ü Exercise
P Practical course
T Tutorial
PL Exam performance(s)
PVL Preliminary examination(s)
LP Credit Points - in brackets ( ) pro rata allocation to individual semesters according to Workload
M Mobility window according to § 6 Paragraph 1 Sentence 3 Study Regulations