Lodz University of Technology

Study programme

Faculty:	Faculty of Textiles and Design
Major:	Textile Engineering
Level of study:	second-cycle programme (magister inżynier)
Form of study:	part-time studies
Academic year:	2026/27

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Basic information

Name of the field of study:	Textile Engineering
Level of study:	second-cycle programme (magister inżynier)
Study profile:	general academic
Form of studies:	part-time studies
Duration of studies (number of semesters):	3
The number of ECTS points required to complete studies:	90
Total number of hours of classes:	1125
The number of ECTS points a student obtains as part of classes conducted with the direct participation of academic teachers or other persons conducting classes:	45
Professional title awarded to graduates:	magister inżynier
ISCED code:	0719
Language of study:	polish

Assigning the course to the disciplines to which the learning outcomes relate

Discipline	Percentage share
Material Engineering	100%

Learning outcomes (in relation to the PQF)

No.	Learning outcome code	Learning Outcome Content	Reference to the universal characteristics of the first level of PRK	Reference to the second-level characteristics of the PRK, taking into account the second-level characteristics enabling the acquisition of engineering competences
1	**2WLO1**	Has in-depth knowledge of basic and applied sciences necessary to understand, describe, model and optimize processes and phenomena, especially those occurring in technological processes, textile products and research methods, and to solve engineering problems, particularly in the field of textile engineering.	P7U_W	P7S_WG
2	**2WLO2**	Has structured and theoretically based knowledge of the structure, design, technology, properties and research methodology of fibres, textile materials and products, enabling the explanation of phenomena and relationships occurring in textile materials and processes.	P7U_W	P7S_WG
3	**2WLO3**	Knows and understands the main development trends in materials engineering, particularly in the field of textile materials and processes.	P7U_W	P7S_WG
4	**2WLO4**	Knows and understands the fundamental dilemmas of modern civilization, the economic, legal, ethical and other conditions of professional activity, including the principles of intellectual property protection and the basic principles of creating various forms of entrepreneurship, especially in the textile and fashion industries.	P7U_W	P7S_WK
5	**2WLO5**	Is able to critically evaluate, analyze and synthesize, and correctly interpret sources of knowledge and the content contained therein, and use the acquired knowledge to solve complex and unusual problems, especially in the field of textiles, and perform assigned tasks in an innovative way.	P7U_U	P7S_UW
6	**2WLO6**	Is able to select and use appropriate materials, tools and methods, including advanced information and communication techniques, to solve complex and unusual engineering problems, especially in the areas of design, technology, evaluation of raw materials, textile materials and products and auxiliaries used in the textile industry.	P7U_U	P7S_UW
7	**2WLO7**	Has the necessary preparation to work in a team, cooperate with others and manage the work of a team, is able to plan and implement his/her own development independently or in a team and motivate others in this area.	P7U_U	P7S_UO, P7S_UU
8	**2WLO8**	Can debate and communicate on general and specialist topics with various audiences, especially in the textile field, including in a foreign language, in accordance with the requirements for level B2+ of the Common European Framework of Reference for Languages.	P7U_U	P7S_UK
9	**2WLO9**	They are aware of the importance of knowledge in solving cognitive and practical problems, are ready to critically evaluate their knowledge, and collaborate with experts when necessary.	P7U_K	P7S_KK

No.	Learning outcome code	Learning Outcome Content	Reference to the universal characteristics of the first level of PRK	Reference to the second-level characteristics of the PRK, taking into account the second-level characteristics enabling the acquisition of engineering competences
10	**2WLO10**	They are ready to fulfill social obligations, initiate and implement various forms of environmental and community activities, act entrepreneurially, and fulfill social and professional roles within changing social and professional circumstances.	P7U_K	P7S_KO, P7S_KR

Matrix of course modules in relation to learning outcomes and curriculum content

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
1	Physics of Thermal and Flow Processes	Thermodynamics and fluid mechanics in the context of textile technologies, including heat and mass transfer, drying processes, humid air transformations. The basics of flows and their influence on material properties. Selected problems of the physical microstructure of fibers and indicators characterizing the physical properties of fibers as well as techniques and methods of testing the physical microstructure of fibers.	x	x				x				
2	Elements of Mechanics in Textiles	Mathematical and computer modelling of textile machine mechanisms. Analysis of kinematics and dynamics of rigid and flexible systems, synthesis of cam mechanisms, and simulation and visualisation of motion using computer programming. Analysis of two-dimensional stress and strain states, including the determination of principal stress and strain directions. Mechanical behaviour of anisotropic, orthotropic, and isotropic solids, as well as the application of the generalized Hooke’s law. Mechanical characteristics of fiber-reinforced composite materials and on strain gauge measurement techniques.		x	x			x				
3	Numerical Methods in Engineering Problems	The specifics of computation in an environment with rounding errors and to optimization procedures. Algorithms for solving systems of linear equations, solving nonlinear equations, and interpolation and approximation methods. Optimization applications including a finding the minimum of a single-variable function, finding the minimum of a multivariable function, determining the gradient, and finding local extrema.	x					x				
4	Special Textile Products	Special technologies. Braiding technologies: braiding machines for flat products, braiding machines for round products, and braiding machines for shaped and fully-fashioned products. Technology of multi-layer, shaped, spatial, and complex 3D fabrics. Multi-color computer embroidery and technical embroidery.						x				
5	Technological Suitability of Yarns	Review of existing linear textile product types. Analyse of domestic and global market. Vision of projecting threads destination. Methods of estimation of yarn quality and their useful in woven and knitted fabric. Interpretation of Uster Statistics.						x				
6	Optoelectronics in Textile Industry	The structure and operation of basic optoelectronic components. Optoelectronic sensors and biosensors with potential applications in the textile industry. Optical fibres as components for various sensors. Signal transmission in textiles and clothing using optoelectronic components. Visualisation and illumination: textile displays, textile screens, colour illumination of textiles and apparel, and adaptation of clothing colour to the ambient background colour.						x				
7	Computer Aided Design	Computer-aided design using AutoCAD, covering the creation and editing of drawings for selected spatial structures, layer management, and preparation of technical documentation in accordance with applicable standards.						x				
8	Computer Design of Knitted Fabrics	Design of weft and warp knitted fabrics with various knitted structures and functional purposes using specialized CAD/CAM systems compatible with different knitting machines, including flat and circular weft knitting machines as well as warp knitting machines.						x				

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
9	Biodegradable Fibers	Analysis of selected biodegradable fiber-forming material: existing solutions and patents. Development of a concept for a fiber production or degradation plant. Preparation of project documentation and presentation.						x				
10	Computer-oriented Modeling of Heterogeneous Materials	In this course, students will model a selected textile structure. A physical and mathematical model will be created, followed by a computational model. The distribution of state variables will be determined using the ADINA processing program.						x				
11	Textile Biomaterials	Design development of textile biomaterials. Design of bone implants, dressing materials, hemostatic materials, skin implants, etc.						x				
12	Innovative Textile Technologies	Modern spinning, weaving, knitting, and garment manufacturing technologies. Learning the principles of forming linear, flat, and 3D products with non-standard thread arrangements. Developing the imagination of a technologist and designer of unconventional spun, woven, knitted, and apparel structures, including their application in composites. Developing the skills to design and manufacture innovative linear and flat textile and clothing products.		x				x				
13	Creating of Textile Polymers Properties	Relationships between polymer chemical structure and its properties. Predicting and modeling polymer properties using additive group components. Determining additive parameters relevant to textiles. Characterizing copolymers, terpolymers, and polymer blends using additive methods. Relationships leading to the determination of: surface energy, parachore, surface tension, solubility parameters, refraction, refractive index, transition temperatures, and more.		x				x				
14	Textronics	Textronics as a New Field of Knowledge: General Principles for Combining Textiles, Electronics, and Computer Science. Properties of Textile Materials in Respect of Their Suitability for Electrical Conductivity and Sensory Applications. Integrated Textile Sensors. Fabrics Integrated with Microcircuits. Systems for Remote Monitoring of Physiological Parameters Over Long Distances.		x				x				
15	Foreign Language for Specialist Purposes	Grammar and linguistics appropriate to the needs of writing scientific texts in a given field. Preparing and delivering presentations, case studies, and review articles.								x		
16	Intellectual Property Protection. Digital Security	Introduction to intellectual property protection issues, types, protection, registration, and strategies. Technology transfer. Commercialization of research results.		x	x			x				
17	Business Management	Basic issues related to the functioning and management of a company in a modern environment. Analysis of the impact of the environment on the company's operations and key management functions. Principles of creating organisational structures and various methods and techniques of human resource management. Issues of change management and adaptation of the enterprise to dynamic market conditions. Organisational culture.				x			x			x

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
18	Textile Design	Providing students with fundamental knowledge regarding design that accounts for the specific characteristics of both the object and the subjects of design, the ability to adapt design activities to problem situations, and the stimulation and shaping of creative thinking. Making students aware of their creative potential and the use of creativity in their future work. Raising students' awareness of the importance of independent thinking and action. Informing students about the possibilities of increasing their creative abilities by refining techniques for creative problem-solving.	x	x				x				
19	Biophysical Clothing Properties	Clothing comfort. Thermophysiological comfort. Biophysical properties of clothing materials and methods for their measurement.		x						x		
20	Toxicological and Environmental Aspects of Textiles	Environmental threats. Toxic substances in fibers. Mechanisms of harmful effects of basic textile types on user health. Criteria for the environmental performance of textiles. Recycling of textile waste.		x						x		
21	Relational Databases	Introduction to problem of databases. database modeling and design, SQL. database management and administration. project of database for the selected reality.		x						x		
22	Ecology and Humanoecology in Textile Finishing	Overview of environmental and human-related aspects of textile finishing processes, including interaction between textile technologies, chemical substances, and their impact on ecosystems and human health.		x						x		
23	Technical English for Textile Technology	Nomenclature and terminology in textile technologies. Terminology related to fiber-forming polymers, processing, production stages, equipment, and applications of fibers and textile products. The use of modern tools in the translation of technical texts. The specifics of translating technical documentation and patents.		x						x		
24	Computer Design of Knitwear	Principles, methodology, and techniques of computer-aided design of weft and warp knitted structures for various product types. Specialized CAD/CAM systems for pattern and technological design of knitted fabrics and knitwear products.		x						x		
25	Smart Textiles	Materials and manufacturing techniques used to develop intelligent products, including their classification. Basics of material sensitivity to external environmental stimuli. Interactive products. Use of engineered polymers and textile technologies. Intelligent textile products for medical and clothing applications.		x						x		
26	Technical Textiles	Fibers used for technical purposes. Classification, characteristics, and applications of rovings, yarns, and cordage products for technical purposes. The influence of the structure and properties of hybrid yarns produced using various systems on the structure and properties of thermoplastic composites, and the role of fiber mixing within the system. Mats, fabrics, nonwovens, knits, braids, 3D-structured products, so-called spacers for composites. Technical textiles in composites.		x						x		
27	Alternative Applications of Knitted Fabrics	Applications of knitted fabrics with unconventional uses and the technologies of their manufacture. Construction, structure, and physical and functional properties of knitted fabrics used in special-purpose products extending beyond the field of conventional apparel textiles.		x						x		

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
28	Designing of Textile Manufacturing Processes with Ergonomic Elements	Design assumptions. Primary production technologies. Energy, ergonomic, and logistical factors. Storage. Computer-assisted optimization and modernization of technological processes.		x						x		
29	Development of Chemical Fibres	Technical and non-technical factors influencing the development of chemical fibers. Large-, medium- and small-scale production: trends and innovations. High-performance and special fibers – problems and prospects. Renewable raw materials and the impact of environmental requirements on technologies. Recycling of chemical fibers – challenges and opportunities.		x						x		
30	Fibrous Composite Materials	Classification of fibrous composite materials. Raw materials used and phenomena occurring at the fiber-matrix interface. The role of adhesion preparations. Fiber structures, textile techniques for the production of hybrid products, composite manufacturing technologies. Factors influencing composite properties.		x						x		
31	Computer Graphies II	Creating and transforming raster graphics. Creating vector graphics. Working with dockers and layers. Editing videos. Embedding videos on websites and CDs.		x						x		
32	Heat Transfer in Composite Materials	Basic information on heat transfer in fibrous composite materials. The composite model and heat transfer within the composite material. The basis for optimizing the thermal properties of the composite material.		x						x		
33	Personal Ballistic Protections	Ballistic threats. Classification of the bulletproof properties of individual ballistic shields. Types of individual ballistic shields and their testing. Selection of individual ballistic shields.		x						x		
34	Fibrous Materials for Textronics	Classification and basic requirements of textronic materials. Classification of methods for obtaining textronic materials. Characterization of electrically conductive and piezoelectric polymers and carbon allotropic structures. Methods for producing textronic materials using PVD, CVD, printing, and nonwoven techniques. Characterization of textronic materials in terms of thermal properties.		x						x		
35	Design of Made-up Products	Documenting the structure of a made-up product. Designing a made-up product. Shaping the functional properties of a made-up product. Rationalizing the making-up processes for technical products.		x				x				
36	Nanotechnologies in Textiles	Modification of fibres and textile products using physical, chemical and physico-chemical methods. Nano- and micro-scale products, their production and application in textile modification. The use of macro-, micro- and nanogels, bionanocellulose–textile composites, and basic techniques for modifying textile raw materials. Encapsulation of model compounds, hydrogels and composites, fibre–hydrogel systems, and chemical and photochemical methods for the in situ synthesis of metal nanoparticles on textile substrates.		x				x				

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
37	Textile Care. Special Fibres	A comparison of wet washing and dry cleaning, with emphasis on the chemical fundamentals of both processes. Iindustrial washing processes, the theory of the washing process, and the evaluation of the influence of key technological factors on washing efficiency and performance .Development trends, production, properties, and applications of composite fibers and high-functionality fibers. Fibers for textile, technical, medical, and protective applications. Investigation of the influence of the chemical structure of fiber materials on their thermal properties. Analysis of PCM-modified fibers (phase change materials).		x	x			x				
38	Microprocessor Systems in Textile Engineering	Types, structure and operation of microprocessor systems. Types, structure and operation of Programmable Logic Controllers. Ladder logic programming of Programmable Logic Controllers. Textile industry applications of microprocessor systems.				x	x				x	
39	Diploma Seminar	General characteristics and requirements for engineering theses and the different types of thesis. Analysis of the topic. The purpose and methodology of the thesis. Formulation of the thesis statement. Development of the experimental part and conclusions of the thesis. Competency examination.		x	x	x	x			x	x	
40	Internship	Training in safety rules and fire protection. Getting Acquainted with the organization company. Understanding the machinery/equipment laboratory and technologies used in the company. Understanding the research methods. Creating/testing a textile/clothing product with the preparation of technical and technological documentation.							x			x
41	Final Project	Reviewing available literature on the topic of the thesis. Selecting, justifying, and developing a research method (experimental or theoretical) and a method for solving the problem. Conducting experimental research, computer calculations, or preparing a technological project. Processing the research results. Publication of the thesis.		x	x	x	x			x		
42	Technological Preparation of Clothing Manufacturing	Knowledge of engineering anthropometry and technological preparation of clothing production. Methods of measuring somatic features, analysis of human body structure, and principles of creating size charts and size selection. Processes of preparing technical-technological documentation. Issues regarding the organization of cutting and sewing room processes and the influence of material parameters on production flow are discussed.		x				x				
43	Clothing Design	Documenting garment structure. The clothing design process. Shaping clothing comfort characteristics. Rationalizing garment manufacturing processes. Clothing quality issues. Quality costs. Quality standardization according to ISO standards.		x				x				
44	Quality in Textile Made-up Processes	Quality assurance and control issues in industrial clothing manufacturing processes. Classification of material and manufacturing defects and methods for their identification. Quality control systems at the initial, inter-operational, and final stages are discussed, as well as the impact of joining technologies on the finished product's quality. Pprinciples of statistical acceptance sampling and methodology for assessing the aesthetic and functional quality of ready-made products.		x				x				
45	Made-up Special Products	Range and characteristics of specialty clothing. Ready-made technical products. Multilayer structures. Intelligent clothing.		x				x				

No.	Course name	Program content	2WLO1	2WLO2	2WLO3	2WLO4	2WLO5	2WLO6	2WLO7	2WLO8	2WLO9	2WLO10
46	Development Trends in Apparel Industry	Development trends in clothing materials, the clothing manufacturing process, new technologies, clothing simulation, and 3D virtual modeling. Development trends in clothing metrology and anthropometry. Sustainable development of the clothing industry. Methods for mitigation of microplastics from clothing production and use.		x	x			x				
47	Design of Linear Products	Market assessment. Selection of raw materials for the designed linear textile product and technological process. Definition of quality requirements. Spinning plan. Evaluation of the proposed solution.		x				x				
48	Design of Woven Fabrics	Technical and technological assumptions for the special woven fabric. Selection of raw material and thread structure. Design of the special fabric structure and technological process. Project implementation. Development of technical and technological documentation.		x				x				
49	Designing of Weft Knit Fabrics	Design of weft and warp knitted fabrics and fully fashioned knitted products, in relation to their intended use, selection of raw materials, stitch type, and manufacturing technique.		x				x				
50	Design of Clothing Product	Technological design of a clothing product. Selection of materials and tools. A specialized computer program supporting the clothing production preparation process.		x				x				
51	Nonwoven Design	Identification and description of the design problem. Analysis of the current state of the art and a literature review of the design problem. Analysis of the raw material base and technology to assess its applicability to the production of the selected nonwoven fabric range. Detailed selection of raw materials, machinery, and process parameters. Preparation of a technical design for the plant (branch) for the production of the designed nonwoven fabric range.		x				x				

ECTS - subjects

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
1	Physics of Thermal and Flow Processes	4			4	
2	Elements of Mechanics in Textiles	4			4	
3	Numerical Methods in Engineering Problems	3				
4	Special Textile Products	2		2	2	
5	Technological Suitability of Yarns	2		2	2	
6	Optoelectronics in Textile Industry	2		2	2	
7	Computer Aided Design	2		2	2	
8	Computer Design of Knitted Fabrics	2		2	2	
9	Biodegradable Fibers	2		2	2	
10	Computer-oriented Modeling of Heterogeneous Materials	2		2	2	
11	Textile Biomaterials	2		2	2	
12	Innovative Textile Technologies	10		10	10	
13	Creating of Textile Polymers Properties	4		4	4	
14	Textronics	3		3	3	
15	Foreign Language for Specialist Purposes	2		2		
16	Intellectual Property Protection. Digital Security	3	3		3	
17	Business Management	4	4			
18	Textile Design	4			4	
19	Biophysical Clothing Properties	4		4	4	4
20	Toxicological and Environmental Aspects of Textiles	4		4	4	4

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
21	Relational Databases	4		4	4	4
22	Ecology and Humanoecology in Textile Finishing	4		4	4	4
23	Technical English for Textile Technology	4		4	4	4
24	Computer Design of Knitwear	4		4	4	4
25	Smart Textiles	4		4	4	4
26	Technical Textiles	4		4	4	4
27	Alternative Applications of Knitted Fabrics	4		4	4	4
28	Designing of Textile Manufacturing Processes with Ergonomic Elements	4		4	4	4
29	Development of Chemical Fibres	4		4	4	4
30	Fibrous Composite Materials	4		4	4	4
31	Computer Graphies II	4		4	4	4
32	Heat Transfer in Composite Materials	4		4	4	4
33	Personal Ballistic Protections	4		4	4	4
34	Fibrous Materials for Textronics	4		4	4	4
35	Design of Made-up Products	3		3	3	
36	Nanotechnologies in Textiles	10		10	10	
37	Textile Care. Special Fibres	2			2	
38	Microprocessor Systems in Textile Engineering	2				
39	Diploma Seminar	2				
40	Internship	4				
41	Final Project	20		20	20	

No.	Course name	ECTS	Subjects in the field of humanities and social sciences	Elective subjects	Profile items	Classes in a foreign language
42	Technological Preparation of Clothing Manufacturing	9		9	9	
43	Clothing Design	5		5	5	
44	Quality in Textile Made-up Processes	3		3	3	
45	Made-up Special Products	6		6	6	
46	Development Trends in Apparel Industry	7		7	7	
47	Design of Linear Products	5		5	5	
48	Design of Woven Fabrics	5		5	5	
49	Designing of Weft Knit Fabrics	7		7	7	
50	Design of Clothing Product	6		6	6	
51	Nonwoven Design	7		7	7	

ECTS indicators

Name	Specialty: Innovative Textile Technologies	Specialty: Clothing Engineering	Specialty: Textile Design Engineering
The total number of ECTS credits that a student must obtain through elective courses (amounting to no less than 30% of the total ECTS credits required to obtain the qualification corresponding to the given level of study)	58/90 (64.44%)	58/90 (64.44%)	58/90 (64.44%)
The total number of ECTS credits to be earned by a student through courses in the fields of humanities or social sciences	7	7	7
The total number of ECTS credits that a student must obtain from courses related to research conducted at the university, amounting to more than 50% of the total ECTS credits required to graduate from a given level of study	73/90 (81.11%)	73/90 (81.11%)	73/90 (81.11%)

Methods of verifying and assessing learning outcomes

Verifying achieved learning outcomes requires the use of diverse forms of student assessment, appropriate to the categories of knowledge, skills, and social competences to which these outcomes pertain. The selection of appropriate tools also depends on the specific nature of the subject and the format of instruction and is described in each individual course card. Achievement of the required learning outcomes is verified through:

1. written works (exams, tests, reports, essays, projects, posters, diploma thesis, etc.);

2. oral presentations (oral knowledge tests, public speaking, e.g. delivering a lecture, presentation, etc.);

3. practical and/or project tasks (team and individual);

4. observation and assessment of student activity during classes;

5. self-assessment and peer assessment of students (especially in the case of team projects);

6. competency examination and diploma examination.

Assessment may be formative (partial, repeated throughout the course) and/or summative (final grade). The final assessment result is given on the currently applicable grading scale.

During the first class of the subject, the course leader or lecturer is obliged to discuss the course card and to formulate and document the methods of verification and conditions for conducting tests to ensure that learning outcomes are achieved.

Professional internships

Internship duration: 4 weeks.

ECTS points obtained: 4

Internships carried out in accordance with the study program in a form adapted to the profile and specificity

field of study and according to the rules specified at the faculty and the University.

Specializations/degree paths offered within the study program

Specialty: Innovative Textile Technologies

Specialty: Clothing Engineering

Specialty: Textile Design Engineering

Characteristics of the course

Graduate profile

Graduates of Textile Science programs, having acquired interdisciplinary knowledge in engineering and technical sciences, particularly materials science, but also in fundamental and related sciences, are well-prepared, both theoretically and practically, for work in industries utilizing the achievements of materials science and related sciences, primarily in the textile and apparel industries. Graduates of second-cycle master's programs, in addition to knowledge of core and core subjects: textile machine mechanics, microprocessor systems, design, modeling, and maintenance of textiles and specialty fibers, possess advanced knowledge, depending on their chosen specialization, in textile design engineering, apparel, and innovative technologies in the textile industry. Graduates also possess extensive skills and competencies to carry out tasks and projects in materials science, particularly the engineering of textile materials and processes, the production and use of modern, user-friendly and environmentally friendly textile materials, in line with the principles of a circular economy and sustainable development. They possess well-established skills and competencies enabling them to undertake a wide range of activities in the design and implementation of manufacturing and processing processes for fiber-forming polymers, raw materials and textile materials, basic and advanced technologies for modifying polymers, fibers, and linear and flat textile materials, among others. They are familiar with advanced methods and techniques for testing raw materials and materials. They can apply their knowledge in practice. Graduates are prepared to work not only in manufacturing, service, and commercial enterprises in the textile and apparel industry, but also in research institutes, certification bodies, local government units, consulting and design firms, and many others. They are prepared to develop their professional skills, including continuing their studies in third-cycle (doctoral) studies. They also possess the appropriate knowledge, skills, and competencies to establish and run their own business. They demonstrate knowledge and skills in recognizing the needs of textile and apparel users, taking into account cultural aspects, traditions, habits, the environment, climatic conditions, and incorporating humanistic aspects as essential to improving the relationship between designer, manufacturer, and user.

The relationship between the field of study and the university's strategy

The main theme of the Strategy of Lodz University of Technology (TUL) is COOPERATION, and one of its pillars is EDUCATION

The Textile Studies program aligns with the university's mission and strategy of educating students to meet the economic needs of local and regional communities. Knowledge acquired through research provides the foundation for educating highly qualified graduates for the market.

The Textile Engineering curriculum aligns with TUL's strategy of educating students to meet the economic needs of local, regional, and national communities. In particular, the program aligns with the strategic goal of preparing graduates for the dynamically changing needs of the socio-economic environment. The knowledge, skills, and competencies acquired during the studies ensure the education of highly qualified graduates for market needs. The curriculum includes numerous activities designed to develop students' practical skills: laboratories, projects, seminars, as well as social competencies through the completion of selected tasks in a team-based manner.

One of the key elements of the university's strategy is the development of modern technologies and their implementation in collaboration with the industrial sector. The Textile Studies program pursues this goal by organizing student internships at textile and clothing companies, production, design, and service companies, as well as research institutes, which increases graduates' employability.

Lodz University of Technology's strategy places significant emphasis on digital transformation. The Textile Studies program pursues this goal by implementing modern analytical tools for modeling textile processes and products, including courses such as Numerical Methods in Engineering Problems, Microprocessor Systems in Textiles, Computer-Oriented Modeling of Heterogeneous Materials, and the CAD/CAM-based design of textile processes and products, which are incorporated into many courses.

Lodz University of Technology's strategy incorporates sustainable development, which is particularly important in the context of the textile industry, which is considered one of the industries that significantly contributes to environmental threats. The curriculum includes content related to sustainable development, the circular economy, and digital security, including subjects such as: Intellectual Property Protection. Security digital , Toxicological and Environmental Aspects of Textiles, Ecology and Humanoecology in Textile Finishing.

Educational objectives and employment and continuing education opportunities

The strategic goal of the curriculum is to educate highly qualified personnel for market needs. This is achieved through innovative and

interdisciplinary research at the Faculty of Textiles and Design, engaging students in research, and applying research and its results to the Textile Science curriculum – in line with the "knowledge-based society" model. Graduates are prepared to work in a wide range of fields and forms of business: small, medium, and large textile enterprises producing textiles, in design units, and in research and development centers. They are also prepared for creative activities in the field of textiles and computer-aided engineering; for leading creative and manufacturing teams; and for conducting research in materials science. Graduates are prepared to continue their education in third-cycle studies at the Interdisciplinary Doctoral School of Lodz University of Technology or other doctoral programs, both in Poland and abroad.

Description of the process and outcome of consultations on the proposed study program with the socio-economic environment

The Business Council positively evaluates the revised second-cycle program in the Textile Science field of study, deeming it substantively advanced, coherent, and adequately responding to the needs of the contemporary textile industry and the modern materials sector.
The program effectively develops specialist competencies in advanced textile technologies, the design and production of innovative textile materials, and the management of technological processes, taking into account aspects of sustainable development, the circular economy, and the implementation of new material and technological solutions. The Council particularly appreciates the emphasis on developing analytical, design, and research and development competencies, which enable graduates to work in engineering teams, product development departments, and research and development units in the textile and materials sector. Therefore, the Business Council expresses its unequivocally positive opinion and recommends the adoption of the second-cycle program in the Textile Science field of study.

Description of competencies expected from a candidate applying for admission to studies

Completion of first-cycle studies – engineer's or bachelor's degree – interview in accordance with the admissions resolution. Applicants undertaking second-cycle studies in Textile Engineering who did not acquire the required competencies upon completion of their first-cycle studies may complete them by completing additional modules, outside of the current second-cycle program, for a maximum of 30 ECTS credits. Additional modules will be assigned during the interview and included in the decision on admission to second-cycle studies.

The unit organizing education

Faculty of Textiles and Design

Education program

Semester 1

Course	Number of hours	ECTS points	Form of verification	Obligatory
Physics of Thermal and Flow Processes	Laboratory classes: 12 Lecture: 11	4	Exam	Obligatory
Elements of Mechanics in Textiles	Laboratory classes: 10 Lecture: 11	4	Exam	Obligatory
Numerical Methods in Engineering Problems	Laboratory classes: 10 Project work: 8 Lecture: 11	3	Exam	Obligatory
Elective Course 1		2	Graded assignment	Obligatory group
Special Textile Products	Project work: 8	2	Graded assignment	Optional
Technological Suitability of Yarns	Project work: 8	2	Graded assignment	Optional
Optoelectronics in Textile Industry	Project work: 8	2	Graded assignment	Optional
Computer Aided Design	Project work: 8	2	Graded assignment	Optional
Computer Design of Knitted Fabrics	Project work: 8	2	Graded assignment	Optional
Biodegradable Fibers	Project work: 8	2	Graded assignment	Optional
Computer-oriented Modeling of Heterogeneous Materials	Project work: 8	2	Graded assignment	Optional
Textile Biomaterials	Project work: 8	2	Graded assignment	Optional
Sum	**81**	**13**		

Specialty: Innovative Textile Technologies

Course	Number of hours	ECTS points	Form of verification	Obligatory
Innovative Textile Technologies	Laboratory classes: 26 Lecture: 35	10	Graded assignment	Obligatory specialization courses
Creating of Textile Polymers Properties	Tutorials: 8 Lecture: 5	4	Graded assignment	Obligatory specialization courses
Textronics	Laboratory classes: 9 Lecture: 7	3	Graded assignment	Obligatory specialization courses
Sum	**90**	**17**		

Specialty: Textile Design Engineering

Course	Number of hours	ECTS points	Form of verification	Obligatory
Design of Linear Products	Project work: 20 Lecture: 6	5	Graded assignment	Obligatory specialization courses
Design of Woven Fabrics	Project work: 20 Lecture: 8	5	Graded assignment	Obligatory specialization courses
Designing of Weft Knit Fabrics	Project work: 30 Lecture: 6	7	Graded assignment	Obligatory specialization courses
Sum	**90**	**17**		

Specialty: Clothing Engineering

Course	Number of hours	ECTS points	Form of verification	Obligatory
Technological Preparation of Clothing Manufacturing	Project work: 24 Lecture: 12	9	Graded assignment	Obligatory specialization courses

Course	Number of hours	ECTS points	Form of verification	Obligatory
Clothing Design	Laboratory classes: 5 Project work: 12 Lecture: 7	5	Graded assignment	Obligatory specialization courses
Quality in Textile Made-up Processes	Tutorials: 15 Lecture: 15	3	Graded assignment	Obligatory specialization courses
Sum	**90**	**17**		

Semester 2

Course	Number of hours	ECTS points	Form of verification	Obligatory
Foreign Language for Specialist Purposes	Tutorials: 30	2	Graded assignment	Obligatory subjects to choose from
Intellectual Property Protection. Digital Security	Project work: 8 Lecture: 6	3	Graded assignment	Obligatory
Business Management	Project work: 8 Lecture: 7	4	Exam	Obligatory
Textile Design	Project work: 8 Lecture: 16	4	Graded assignment	Obligatory
Elective Course 2		4	Graded assignment	Obligatory group
Biophysical Clothing Properties	Lecture: 14	4	Graded assignment	Optional
Toxicological and Environmental Aspects of Textiles	Lecture: 14	4	Graded assignment	Optional
Relational Databases	Lecture: 14	4	Graded assignment	Optional
Ecology and Humanoecology in Textile Finishing	Lecture: 14	4	Graded assignment	Optional
Technical English for Textile Technology	Lecture: 14	4	Graded assignment	Optional
Computer Design of Knitwear	Lecture: 14	4	Graded assignment	Optional

Course	Number of hours	ECTS points	Form of verification	Obligatory
Smart Textiles	Lecture: 14	4	Graded assignment	Optional
Technical Textiles	Lecture: 14	4	Graded assignment	Optional
Alternative Applications of Knitted Fabrics	Lecture: 14	4	Graded assignment	Optional
Designing of Textile Manufacturing Processes with Ergonomic Elements	Lecture: 14	4	Graded assignment	Optional
Development of Chemical Fibres	Lecture: 14	4	Graded assignment	Optional
Fibrous Composite Materials	Lecture: 14	4	Graded assignment	Optional
Computer Graphies II	Lecture: 14	4	Graded assignment	Optional
Heat Transfer in Composite Materials	Lecture: 14	4	Graded assignment	Optional
Personal Ballistic Protections	Lecture: 14	4	Graded assignment	Optional
Fibrous Materials for Textronics	Lecture: 14	4	Graded assignment	Optional
Sum	**97**	**17**		

Specialty: Innovative Textile Technologies

Course	Number of hours	ECTS points	Form of verification	Obligatory
Design of Made-up Products	Laboratory classes: 28 Lecture: 7	3	Graded assignment	Obligatory specialization courses
Nanotechnologies in Textiles	Laboratory classes: 30 Lecture: 15	10	Graded assignment	Obligatory specialization courses
Sum	**80**	**13**		

Specialty: Textile Design Engineering

Course	Number of hours	ECTS points	Form of verification	Obligatory
Design of Clothing Product	Laboratory classes: 12 Project work: 24 Lecture: 12	6	Graded assignment	Obligatory specialization courses
Nonwoven Design	Project work: 24 Lecture: 8	7	Graded assignment	Obligatory specialization courses
Sum	**80**	**13**		

Specialty: Clothing Engineering

Course	Number of hours	ECTS points	Form of verification	Obligatory
Made-up Special Products	Project work: 28 Lecture: 12	6	Graded assignment	Obligatory specialization courses
Development Trends in Apparel Industry	Laboratory classes: 7 Project work: 13 Lecture: 20	7	Graded assignment	Obligatory specialization courses
Sum	**80**	**13**		

Semester 3

Course	Number of hours	ECTS points	Form of verification	Obligatory
Textile Care. Special Fibres	Laboratory classes: 18 Lecture: 7	2	Graded assignment	Obligatory
Microprocessor Systems in Textile Engineering	Project work: 30 Lecture: 15	2	Graded assignment	Obligatory
Diploma Seminar	Seminar: 10	2	Graded assignment + exam	Obligatory
Internship	Internship: 0	4	Pass	Obligatory

Course	Number of hours	ECTS points	Form of verification	Obligatory
Final Project	Diploma Thesis: 0	20	Pass	Obligatory subjects to choose from
Sum	**80**	**30**		