

Textile and clothing engineering

Basic informations

Level and type of study programme: Undergraduate study programme—higher education professional study programme – Study programme for acquiring knowledge

Duration: 3 years (6 semesters), 180 total credit points according to the ECTS System

Study the scope of the ISCED classification: (54) Production technology

The scientific discipline of Frascati classification: Engineering and Technology

Anticipated professional title: Graduate Textile Engineer

Competences

- Extensive professional knowledge in the field of study in question, augmented by selected knowledge in the areas of natural sciences, management, information and communication technologies, aesthetics and textile design;
- The capacity to comprehend the interdependence between technology and design;
- The capacity to communicate with co-workers and experts in related disciplines, which will facilitate active cooperation in teamwork as well as in projects based on linking the principles of professional and design practices;
- Well-developed professional ethics and environmental responsibility;
- The ability to use modern tools, skills and dexterity, especially in the field of IKT technologies, in everyday professional work;
- The capacity to recognise the harmony between function and design, construction and the proportions of the human body and clothing;
- The capacity to supervise, analyse and manage the working processes in a textile and clothing company;
- Understanding trends in the textile and clothing profession in Slovenia as well as in the rest of Europe.

Employment possibilities

With the acquired knowledge, including a semester of practical training, graduates in textile and clothing engineering can be employed in small and medium-large textile and clothing companies, and also in the textile trade and service activities.

Enrolment conditions

Enrolment in the programme shall be possible for any person who has completed the final exam, professional graduation or matura graduation in any four-year secondary school programme.

If the number of candidates applying for the programme exceeds the number of enrolment spaces, candidates shall be selected according to the following criteria:

- general success on the final exam, professional graduation or matura graduation (60%),
- general success in the 3rd and 4th year of secondary school (40%).

Student obligations

For entry into a higher class, the student must have confirmed attendance in all courses, complete all practical classes and have the following number of ECTS credit points for entry into each individual class:

- a minimum of 54 ECTS credit points for entry into the 2nd year;
- 60 credit points from the first year and a minimum of 54 ECTS credit points from the second year for entry into the 3rd year.

To repeat a class, students must have:

- all practical classes and a minimum of 28 ECTS credit points for the 1st year;
- all practical classes and a minimum of 28 ECTS credit points for the 2nd year.

During the course of his or her studies, the student can repeat a class once or change the study programme once for having failed to meet his or her obligations in the former study programme.

Grading method

The student's level of learning shall be established and graded by individual courses, and by concluding the learning process of each course with a final exam. The general rules of verifying knowledge shall be regulated according to the NTF (Faculty of Natural Sciences and Engineering) Examination Regulations approved by the senate of this institution. The methods of verifying knowledge for all courses shall be a written and/or oral exam.

At the same time, previous knowledge that is a prerequisite for taking the exam shall be verified for each individual course.

The method for verifying knowledge can be: papers and project reports, practical tasks or products, presentation and defence of papers and project works, reports on completed practical classes, oral knowledge verification during practical classes and/or an examination of practical work.

The grading scale prescribed by the Statute of the University of Ljubljana shall be used for grading. All forms of knowledge verification shall be graded with the following marks: 6—10 (positive), 1—5 (negative).

Practical training shall be completed with a paper, which will be graded according to the grading scale as: passed/not passed.

Transfer between programmes

Transfer between programmes will be possible within the first level programmes of the Faculty of Natural Sciences and Engineering and other faculties in accordance with the Higher Education Act and the criteria for transfer between study programmes and other related regulations. Students who enrolled before the introduction of new study programmes, and who have the right to repeat classes, but cannot do so according to the programme in which they have enrolled because of the gradual introduction of new study programmes, can join the new programme with equal status to the students in that programme.

1. Transfer between higher education professional programmes of the first level

Students in higher education professional study programmes at the Department of Textiles, Graphic Arts and Design of the Faculty of Natural Sciences and Engineering or related higher education professional programmes of the first level (Textile and Clothing Engineering and programmes within the AUTEX network) will receive a list of the requirements they must fulfil in order to graduate in the new programme.

2. Transfer between university study programmes and higher education professional study programmes of the first level

Students in university study programmes at the Department of Textiles, Graphic Arts and Design of the Faculty of Natural Sciences and Engineering and related university study programmes of the first level (Textile and Clothing Engineering and programmes within the AUTEX network) will receive a list of the requirements they must fulfil in order to graduate in the new programme.

3. Transfer between higher education professional programmes of the first level and two-year higher education study programmes approved before 1994

Graduates from two-year study programmes who enrolled before 1994 in related fields of study (Textile and Clothing Engineering) and who have 3 years of appropriate work experience can enrol in the 3rd year. Graduates from other professional fields can

transfer to the 3rd year if they have 5 years of work experience; during the study they must pass 8 differential exams (Textile raw materials, Yarns, Woven fabrics, Knitted fabrics and knitwear, Bleaching and finishing, Dyeing, Apparel manufacturing and Textile printing).

4. Transfer between higher education professional programmes of the first level and two-year study programmes according to the Vocational and Technical Education Act

Transfer to the second year of the higher education professional programmes of the first level shall be possible for graduates of two-year study programmes (Vocational and Technical Education Act) from related fields of study (the areas of Textile and Clothing Engineering or Fashion design) if they fulfil the conditions for enrolment in a higher education professional programme of the first level. The differential exams that they will have to pass before enrolment in the 3rd year will be determined for them.

About the transfers between programmes decided Study Commission of the Faculty of Natural Sciences and Engineering.

Selecting External Optional Courses

A student can obtain 30% of the facultative units of the programme (10 credit points) in other study programmes at the Department of Textiles, Graphic Arts and Design or through programmes at other faculties and schools of higher education.

Mobility

Students have the possibility of transferring 30 credit points (one study semester, regardless of the obligatory or elective units) from any programme in the field of textile or production technology offered by universities and other institutions of higher learning in the AUTEX network.

Curriculum

1st year

Subject	Hours					ECTS
	L	S	E	A	Σ	
1st semester					450	30
Information technologies	30	0	30	0	60	4
Aesthetics of textiles and clothing	30	30	0	0	60	4
English for specific purposes	0	60	0	0	60	4
Textile raw materials	45	30	15	0	90	6
Yarns	30	30	30	0	90	6
Physical-mechanical properties of textiles and clothing	30	30	30	0	90	6
2nd semester					450	30
Basics of finishing	45	45	0	0	90	6
Development of clothing patterns	30	15	15	0	60	4
Woven fabrics	30	15	45	0	90	6
Knitted fabrics and knitwear	30	30	30	0	90	6
Nonwovens	30	0	30	0	60	4
Basics of visual expression	30	30	0	0	60	4
TOTAL					900	60

Curriculum tags:

L - lectures,

S - seminars,

E - exercises,

A – advanced work (project work),

ECTS – credit points by the European credit system (1 credit point means 30 hours of student obligation).

2nd year

Subject	Hours					ECTS
	L	S	E	A	Σ	
3rd semester					450	30
Statistics	30	0	30	0	60	4
Fashion design	30	15	15	0	60	4
Non-wovens and composites	45	0	45	0	90	6
Basic methods in textile testing	30	15	30	15	90	6
Colour measurement in textiles	30	15	15	0	60	4
Dyeing	45	0	45	0	90	6
4th semester					450	30
Planning textiles and comfortableness of clothing	60	30	0	0	90	6
Apparel manufacturing	30	0	30	0	60	4
Textile printing	30	30	30	0	90	6
Textile care 1	30	15	15	0	60	4
Facultative complex 2					150	10
TOTAL					900	60

Facultative complex 2					450	30
Introduction to fashion design	30	30	0	30	90	6
Development of clothing patterns	30	15	15	0	60	4

3rd year

Subject	Hours					ECTS
	L	S	E	A	Σ	
5th semester					450	30
Practical training					0	30
6th semester					450	30
Facultative courses						24
Diploma						6
TOTAL					900	60

Facultative courses

Facultative courses	Hours					ECTS
	L	S	E	A	Σ	
Computer-assisted design of yarns and woven fabrics	30	0	30	0	60	4
Computer-assisted design of knitted fabrics and knitwear	15	0	45	0	60	4
Computer systems in apparel manufacturing	30	0	30	0	60	4
Computer-assisted design for printing	30	15	15	0	60	4
Production planning and management	45	30	15	0	90	6
Entrepreneurship	30	15	15	0	60	4
Quality management	30	60	0	0	90	6

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Description of courses

Information technology (4 ECTS): computer networks and services; the Internet and the World Wide Web; standards and formats; author's rights in the globalised access to multimedia content; biometrics; basics of multimedia, multi-modality and interactivity.

Aesthetics of textiles and clothing (4 ECTS): origin, function and the meaning of clothing; the psychology and sociology of fashion; the history of clothes and textiles; fashion designers; specific areas of clothing; fashion accessories; graphic design in advertising and fashion.

English for specific purposes (4 ECTS): upgrading general knowledge of English to a higher professional level; reading strategies and discourse of professional texts; determining key words and writing abstracts, articles and reports; description of graphs; business communication; taking part in discussions.

Textile raw materials (6 ECTS): textiles and technical fibres: basic concepts, systematisation, historical development, identification, production technology, molecular structure, basics of supra-molecular structure, properties, fibres important for marketing, modification, innovations, functional properties of fibres in products.

Yarns (6 ECTS): spinning properties of yarns; types and properties of yarns; technological processes of producing yarn; planning and coordination of the spinning process; significance and effect of technological stages on the properties, productivity and price of spinning yarn.

Physical-mechanical properties of textiles and clothing (6 ECTS): interaction between the geometry and physical properties of fibre and textiles; geometric and physical properties of textiles and clothing; interaction between geometric parameters and physical properties of the textile product.

Basics of finishing (6 ECTS): colour and chemical structure of dyes; determining the concentration of dyes in a solution and on fibres; solubility of dyes; aggregation of dyes; classification of dyeing systems; dye-fibre interaction; thermodynamics of dyeing; kinetics of dyeing.

Development of clothing patterns (4 ECTS): clothing anthropometry; technological documentation; pattern construction/modelling; pattern grading; pattern adaptation; computer systems for pattern construction/modelling/grading.

Woven fabrics (6 ECTS): structure, type and classification of textiles; properties of woven fabrics; stages of weaving production; types of weaving machines and their classification; mechanisms of weaving machines and their functions.

Knitted fabrics and knitwear (6 ECTS): the use of knitted fabrics and knitwear; types and properties of knitted fabrics and knitwear; parameters and planning of knitted fabrics and knitwear; planning knitting processes; quality of knitted fabrics and knitwear; care of knitted fabrics and knitwear; CAD/CAM/CIM systems in knitting.

Nonwovens (4 ECTS): definition and types of non-woven textiles; historical development and trends in non-woven textiles; classification of non-woven textiles; non-woven textile production processes; processing non-woven textiles.

Basics of visual expression (4 ECTS): visual conception and principles; distinguishing between the figure and background; the role of contrast and assimilation; the principles of organisation of the field of vision; brightness and colour; artistic elements; sensory and psychological elements of space; depth guidelines.

■ **Statistics** (4 ECTS): planning analysis; basic statistical concepts; analysis of distribution frequency; theoretical distribution models; analysis of two values; analysis of multiple values; correlation analysis; regression analysis.

■ **Fashion design** (4 ECTS): development of industrial design; functions of clothing; ideals of beauty; mass-produced ready-made clothing; haute couture; analysis of the relation between the human body and clothing; visual illusions; changing the silhouette.

■ **Non-wovens and composites** (6 ECTS): definition and types of non-woven textiles; historical development and trends in non-woven textiles; classification of non-woven textiles; non-woven textile production processes; processing non-woven textiles.

■ **Basic methods in textile testing** (6 ECTS): the importance and use of textile testing; standards and their uses; sampling and evaluation of measurements;

basic methods of fibre testing; basic methods of yarn testing; basic methods of fabric testing; basic chemical analysis of textiles.

■ **Colour measurement in textiles** (4 ECTS): electromagnetic radiation; light absorption; systems for the determination of colour and whiteness; measurement of colour and whiteness.

■ **Dyeing** (6 ECTS): technological water preparation; preparing of dyes; dyeing procedures; dyeing of natural, chemical and synthetic fibres; auxiliaries and methods for after-treatment of dyed material; colour fastness.

■ **Planning textiles and comfortableness of clothing** (6 ECTS): classification of clothing textiles, trimmings, functional properties of textiles, technological process of producing textiles—from fibre to finished fabric; analysis and evaluation of the comfort of clothing textiles: thermo-physiological, handle, movement and aesthetic comforts.

■ **Apparel manufacturing** (4 ECTS): ISO standards for apparel manufacturing; development of a product; preparing collections; preparing production; organisation of production; technological documentation; technological demands of ready-made wear; quality requirements; automation; production management.

■ **Textile printing** (6 ECTS): historical development; mechanical devices and equipment; procedures for producing printing forms; procedures of pattern reproduction; preparing fabrics; dyes; printing pastes; fixing and subsequent processing; special printing procedures; environmental issues in printing.

■ **Textile care 1** (4 ECTS): processes of textile care; theoretical approaches of wetting and washing; surface active agents; washing agents; soils; water as washing media, products and procedures for dry cleaning; removal of stains; environmental aspect.

■ **Introduction to fashion design** (6 ECTS): fashion ranges; haute couture; generally designed collections at a lower price range; development of fashion trends; selection of collections; specific design; process of fashion design; the designer's role in the development of new collections.

■ **Development of clothing patterns** (4 ECTS): clothing anthropometry;

technological documentation; pattern construction/modelling; pattern grading; pattern adaptation; computer systems for pattern construction/modelling/grading.

■ **Practical training** (30 ECTS): verification and upgrading of theoretical knowledge in the working environment; company organisation and operation; active integration into the working environment in production (learning about machine equipment, development, planning, planning products, processes and services, management of finishing processes and understanding quality).

■ **Computer-assisted design of yarns and woven fabrics** (4 ECTS): simple and demanding construction of yarn; computer simulation of yarn and textiles; possibilities of colour and other types of patterning; colour metrics in weaving; ArahPaint, ArahWeave and ArahDrape computer programs.

■ **Computer-assisted design of knitted fabrics and knitwear** (4 ECTS): CAD systems in weft knitting; CAD systems in warp knitting; principles of colour management in computer-assisted preparation of knitted fabric/knitwear collections; computer-assisted knitting yarn design.

■ **Computer systems in apparel manufacturing** (4 ECTS): CAD/CAM systems in the clothing industry; lay planning and marker making; producing technical support documentation; management of material flow and cost calculations; computer-assisted cutting; 3D visualisation of products.

■ **Computer-assisted design for printing** (4 ECTS): preparing patterns; print form production procedure; pattern reproduction procedures; picture digitalisation and saving graphic files; basics of colour management; colour reduction; repeat sketch; colour separation; vector and raster pictures; simulation of textiles and special effects.

■ **Production planning and management** (6 ECTS): organisational structures; production activities; business functions; organisation of the production function; preparing work; production; support activities; economising with the

means of work.

■ **Entrepreneurship** (4 ECTS): developing entrepreneurship opportunities; creativity techniques; entrepreneurial approaches; business planning; market analysis; economics of a business idea; marketing planning; development and production (service) process planning; entrepreneurial grouping; critical risks.

■ **Quality management** (6 ECTS): systems of quality management; theoreticians of quality management; standards in quality management; evaluation and certification of quality systems; methods and techniques of quality management; quality economics; comprehensive quality management; self-evaluation and quality awards.

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