Textile and Clothing Planning NTO (UN)

General Information

The degree and type of study: Undergraduate study programme – university study programme

Duration: 3 years (6 semesters), total of 180 credits ECTS

Field of study according to ISCED classification: (54) Manufacturing and processing

Classification of the study programme according to KLASIUS-P: (5420) Textiles, clothes, footwear, leather (broad programmes)

Classification of the study programme according to KLASIUS-SRV: (16204) Academic higher education (first Bologna cycle)

Scientific research discipline according to Frascati classification: Engineering and Technology

Basic goals and competences

The basic goal of the university study programme Textile and Clothing Planning is to train experts capable of managing the most technologically demanding processes in the textile and clothing industry, to train them in planning complex products and technological processes, and at the same time provide appropriate basic natural science and professional knowledge for further education at the second level.

Competence profile of a graduate

General competences

- expertise gained by the study of theoretical and methodological concepts;
- ability to transfer theoretical knowledge into practice and use it to solve problems, especially by seeking new sources of knowledge and using scientific methods;
- ability to experiment and visually transfer various concepts of thinking;
- developed capacity for independent learning in a specific professional area;
- initiative and independence in decision making and management of the most demanding work;
- ability to communicate with colleagues and experts in related disciplines, which facilitates active cooperation in teamwork and in the area of projects based on linking professional principles with the design practice;
- developed professional, ethical and environmental responsibility;
- ability to use modern tools, skills and dexterity, primarily in the field of IKT technologies in daily professional and scientific research work.

Subject-specific competences

- in-depth knowledge of mathematics, physics and chemistry with the developed capacity for thinking in terms of natural sciences;
- theoretical knowledge that allows good judgment and linking properties of fibres to their morphological structure, or its modification during the technological processing of fibres;
- understanding the interdisciplinary development of modern fibre forming polymers by combining different scientific disciplines: chemistry, bio

(techno)logy, nanotechnology, information technology, to create responsive and intelligent fibre forming polymers;

- capacity to link the effects of various raw materials and technological factors to the structure and properties of yarns, woven and knitted fabrics, nonwovens and knitwear;
- learning about basic weaving and knitting structures, the properties originating from them, and their advantages and shortcomings;
- capacity of optimising technological processes of clothing production by transferring theoretical knowledge into practice and achieving higher quality of the final product;
- knowledge of the theoretical basics of finishing, which forms the basis for independent creative research work in the fields of dyeing, printing, finishing and care of textiles;
- capacity of planning pre-finishing, dyeing, printing and finishing processes with regard to the constructional characteristics of the textiles and with consideration for environmental requirements;
- mastering computer-assisted patterning of yarns, woven and knitted fabrics, knitwear and printing patterns;
- capacity of supervision, analysis and management of the production process, the capacity of planning the production process using the methods of network planning and recognition of the possibility of introducing computer applications in the production process as well as their evaluation from the standpoint of cost and humanisation of work;
- ability to understand modern concepts of quality management systems and their importance in the context of global competition.

Employment possibilities

With their acquired knowledge, the Textile and Clothing Planning graduates can be employed in textile and clothing companies in the fields of the production and marketing of fibres, 2D textiles, medical and technical textiles, and textiles with improved properties. They can also be employed in research institutes working in the field of textiles and clothing activities in counselling organisations, trade and government administration.

Enrolment conditions

Enrolment conditions and criteria for selection in case of limited enrolment

Enrolment in the programme shall be possible for:
a) any person who has graduated from secondary school,
b) any person who has passed the vocational Matura exam in any secondary school programme and an examination in one of the Matura courses; the chosen course cannot be the same course that the candidate had already passed at their vocational Matura exam,
c) any person who has completed any four-year secondary school programme prior to 1 June 1995.

If the number of candidates applying for the programme exceeds the number of enrolment spaces:

- the candidates from items a) and c) shall be selected according to their
  - overall performance at the general Matura exam or final examination (60%);
  - overall performance in the 3rd and 4th years at secondary school (40%);
- the candidates from item b) will be selected according to their:
  - overall performance at their vocational Matura exam (40%);
  - overall performance in the 3rd and 4th years at secondary school (40%);
  - performance in the chosen Matura course (20%).

Criteria for crediting knowledge and skills obtained before enrolment

The Faculty of Natural Sciences and Engineering (FNSE) may choose to credit student's knowledge (obtained in the framework of different kinds of education) if it corresponds to the course content of the study programme Textile and Clothing Planning. The FNSE Studies Committee is charged with crediting knowledge and skills obtained before the enrolment, which is conducted on the basis of the student's written application and provided certificates or other documents proving the type of knowledge successfully acquired.

When crediting knowledge obtained before enrolment, the Studies Committee will take into account the following criteria:

- Whether the conditions for enrolling into a specific educational course are adequate (required prior education for starting the study programme);

- Whether the scope of the completed educational course (number of hours of prior education as compared to the scope of the subject in question) adequately compares with the credited requirements;
- Whether the areas covered by the prior education programme the applicant would like to have credited adequately compare with the subjects which are dealt with in the Faculty course.

The acquired knowledge and skills may be credited as a completed study activity if the conditions for taking part in the educational programme were the same as for enrolling into the programme Textile and Clothing Planning, if the prior educational programme encompassed at least 75% of the scope of the subject and if at least 75% of its contents cover the same areas as the subject which the applicant would like to have credited. In the event the Committee finds that the acquired knowledge can be credited, the same number of ECTS points is granted as awarded for the subject in question.

Other information

Grading method

The student's level of learning shall be established and graded at 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 FNSE Examination Regulations approved by the senate of this institution. The methods of verifying knowledge for all courses shall be written and/or oral exams. 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 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).

Progression of studies

Conditions for entry into a higher class

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

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

The FNSE Studies Committee may exceptionally grant the enrolment in a higher class to a student who has collected at least 42 ECTS credit points in the previous year if they can prove justifiable cause. Justifiable causes are specified in the Statute of the University of Ljubljana.

Conditions to repeat a class:

To repeat a class, students need to have:

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

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

During the course of studies, a student can repeat a class once or change the study programme once if they failed to meet their obligations in the previous study programme.

Completion of studies

To complete the studies, students must meet the obligations in all enrolled courses, prepare a diploma thesis and defend it.

Transfer between programmes

The transfer between programmes is 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 the study programmes and other related regulations.

Students who enrolled before the introduction of the new study programmes, and who have the right to repeat classes but cannot do so according to the programme they have enrolled in due to the gradual introduction of the new study programmes can join the new programme with an equal status to the students in that programme.

Transfer between university study programmes of the first level

Students in the university study programmes at the FNSE and related university study programmes of the first level (Textile production, Textile materials and the programmes within the AUTEX network) who fulfil the conditions for enrolling into new FNSE study programmes will receive a list of requirements they must meet in order to graduate in the new programme.

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

Students in higher education professional study programmes at the FNSE and related higher education professional study programmes of the first level (Textile production, Textile materials and the programmes within the AUTEX network) who fulfil the conditions for enrolling into university study programmes of the first level can on the basis of presented certificates transfer to corresponding courses at the

FNSE university programmes. The bridging examinations that they will have to pass in order to graduate in the new programme will be set for them.

Transfer between two-year programmes approved before 1994 and university programmes of the first level

Graduates of two-year programmes who enrolled before 1994 in related fields of study (Textile production, Textile materials) and who have 3 years of work experience can transfer to the 3rd study year.

Transfer between two-year study programmes according to the Vocational and Technical Education Act and university study programmes of the first level

Transfer to the second year of the university programmes of the first level shall be possible for graduates of two-year study programmes (Vocational and Technical Education Act) from the related fields of study (Textile production, Textile materials) if they meet the conditions for enrolment in the university study programme of the first level. The bridging examinations (Mathematics, Chemistry, Physics, Fibres, Planning yarns) that they will have to pass before the enrolment in the 3rd year will be set for them.

The Studies Committee of the Faculty of Natural Sciences decides whether the transfer between programmes is possible.

External electives and mobility

External electives

Students have the possibility to obtain 10 ECTS credit points through the electives offered by other programmes at the Department of Textiles, Graphic Arts and Design or by choosing courses at other faculties of the University of Ljubljana (in this case, the student needs a permission from their faculty).

Mobility

Students have the possibility to transfer 30 ECTS credit points (one semester, regardless of the obligatory or elective units) from any programme in the field of textile or clothing activities offered by the universities and other higher education institutions in the AUTEX and Erasmus+ network.

Modes and forms of study

The undergraduate study programme Textile and Clothing Planning is organised as a full-time study. In the academic year 2016/17, the undergraduate programme Textile and Clothing Planning will be implemented if at least three candidates are enrolled.

The official language of courses is the Slovenian language. The instructions for experimental work are provided in the English language to foreign mobility students. Parallel courses in the English language are organised if there are more than 5 students registered for an individual course and the financing is ensured. Otherwise, the contents of lectures in English are provided in writing.

Curriculum

1st year

Course	Hours					ECTS
	L	S	P	O	Σ	
1st semester					**450**	**30**
Mathematics 1	45	0	45	0	90	6
Physics	45	0	45	0	90	6
Chemistry 1	60	0	30	0	90	6
Fibres	45	0	15	0	60	4
Creativity and product development	30	30	0	0	60	4
Interdisciplinarity of textiles	45	15	0	0	60	4
2nd semester					**450**	**30**
Mathematics 1	45	0	45	0	90	6
Physics	45	0	45	0	90	6
Chemistry 2	45	15	30	0	90	6
Fibres	45	0	15	0	60	4
Planning yarns	30	0	30	0	60	4
Clothing tradition	45	15	0	0	60	4
TOTAL					**900**	**60**

Abbreviations used in the syllabus:

L – lectures
S – seminar work
P – practical courses
O – other forms of educational activities (mainly project work)
ECTS – European Credit Transfer System (1 credit point equals a 30-hour student workload)

2nd year

Course	Hours					ECTS
	L	S	P	O	Σ	
3rd semester					**450**	**30**
Statistics	30	0	30	0	60	4
Planning woven fabrics	45	15	30	0	90	6
Planning knitted fabrics and knitwear	45	15	30	0	90	6
Planning non-wovens and composites	45	0	15	0	60	4
Testing of textiles	30	15	30	15	90	6
English for specific purposes	0	60	0	0	60	4
4th semester					**450**	**30**
Woven structures	30	0	30	0	60	4
Knitted structures	30	0	30	0	60	4
Theory of dyeing and finishing	45	15	0	0	60	4
Planning pre-treatment processes	45	15	30	0	90	6
Development of clothing patterns	30	0	30	0	60	4
Elective course 1					60	4
Elective course 2					60	4
TOTAL					**900**	**60**

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3rd year

Course	Hours					ECTS
	L	S	P	O	Σ	
5th semester					**450**	**30**
Planning apparel	45	15	30	0	90	6
Planning dyeing processes	30	15	45	0	90	6
Planning finishing processes	45	30	15	0	90	6
Planning printing processes	45	15	30	0	90	6
Colour measurement in textiles	30	0	15	0	45	3
Information sources and methodology of thesis work	30	15	0	0	45	3
6th semester					**450**	**30**
Ecology in textiles 1	30	15	15	0	60	4
Textile care 1	30	15	15	0	60	4
Elective course 3					60	4
Elective course 4					60	4
Elective course 5					60	4
Diploma work					150	10
TOTAL					**900**	**60**

Elective courses

Course	Hours					ECTS
	L	S	P	O	Σ	
Computer assisted design of yarns and woven fabrics	30	0	30	0	60	4
Computer assisted design of knitted fabrics and knitwear	30	0	30	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 management	45	15	0	0	60	4
Marketing textiles and clothing	45	15	0	0	60	4
Entrepreneurship	30	15	15	0	60	4
Communication and marketing psychology	30	15	0	15	60	4
Quality management	30	30	0	0	60	4
Leather and fur	45	15	0	0	60	4
Basic of 3D modelling	30	15	15	0	60	4

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L – lectures
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Description of courses

Mathematics 1 (12 ECTS): basic concepts of calculus and linear algebra; numbers and functions; limits and continuity; derivatives; integrals; functions of several variables; applications of differential and integral calculus; linear algebra.

Physics (12 ECTS): mechanics of point particles and rigid bodies; oscillation; elastic deformations; mechanics of liquids; fluctuation; temperatures; laws of energy; electrical currents; electric and magnetic fields; EM oscillation and fluctuation; wave optics; photometry; colour perception; geometric optics; atoms and molecules.

Chemistry 1 (6 ECTS): structure of substances, elements and compounds; mass and energy relations in chemical reactions; periodic law; chemical bonding; ideal and real gasses; water and solutions; crystals; chemical kinetics and balance; chemistry of surfaces; electrolytes and non-electrolytes; basics of electrochemistry; ecology.

Fibres (8 ECTS): classification of fibre; fibre-forming polymers; supra-molecular structure; fibre structure; thermodynamics of stretching; orientation; supra-molecular forces: metastable states and dimensional stability of fibre; factors of fibre properties; modification of fibres (profiled and hollow fibres, bi-component fibres, microfibres, nanofibres)

Creativity and product development (4 ECTS): importance of creativity in development of new products; creativity and engineering design; limitations and contradictions in design and technology; ideas, creativity, innovation, improvements and inventions; creative process, methods and techniques for promoting creativity; new product and phases of new product development; synergy of form and function of a product; characteristics of successful products

Interdisciplinarity of textiles (4 ECTS): definition of textiles and materials of fibre forming polymers and placement among other materials; distribution of textile materials and products according to the scope of their structure and properties; use of modern technologies in textiles; economic importance of the textile and leather industries and comparison with other industries; integration of textile skills into other areas of economy

Chemistry 2 (6 ECTS): chemical bonds and molecular structures; colour in organic chemistry; stereo-chemistry; chemistry of natural and synthetic macro-

molecules; stereo-chemistry of polymers; lipids, carbohydrates, amino acids, polyamides, peptides and proteins.

Planning yarns (4 ECTS): spinning properties of yarn; theory and structure of the formation of yarn; structure and properties of yarn; mechanics, kinematics and dynamics of technological stages of yarn production; analysis of influence factors; planning the spinning process.

Clothing tradition (4 ECTS): origin and meaning of dress; functions of dress; psychology and sociology of fashion; art-design-science-technology; lifestyle of various market segments of the population; image impact of the beauty ideal on fashion and body; importance of fashion sketch, fashion illustration and fashion technical drawing; analysis of the relationship between dress and body in the process of visual transformation of the body; designing fashion trends.

Statistics (4 ECTS): learning about the basics of statistics; data, planning analysis and use of statistical methods; definitions of basic concepts; analysis of frequent distribution; theoretical models of distribution; analysis of two values; analysis of multiple values; correlation analysis; regression analysis.

Planning woven fabrics (6 ECTS): structure of woven fabrics; types of woven fabrics and their classification; parameters influencing the properties of woven fabrics; properties of woven fabrics; phases in weaving production; mechanisms of the weaving machine; decomposition of woven fabrics; planning woven fabrics with the desired properties.

Planning knitted fabrics and knitwear (6 ECTS): importance and use of knitted fabrics and knitwear; principles and methods of knitting; types and properties of knitted fabrics and knitwear; geometry of knitted structures and loop models; specialities in testing and ensuring the quality of knitted fabrics and knitwear; CAD/CAM/CIM systems in knitting.

Planning non-wovens and composites (4 ECTS): definitions and types of non-woven textiles; classification of non-woven textiles; theory and technology of process stages in non-woven textile production; extruded double or multi-layered composites; finishing non-woven textiles.

Testing of textiles (6 ECTS): importance and use of textile testing; standards and their use; evaluation of measurements; properties and methods of fibre testing; properties and methods of yarn testing; properties and methods of fabric testing;

elasticity and viscoelasticity of textiles; dimensional stability of textiles; labelling textile products.

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

Woven structures (4 ECTS): design and construction parameters of woven fabrics; basic weaves and their derivatives; ArahWeave and ArahDrape computer programs; basic principles of patterning woven textiles; basic use of colour metrics in textiles.

Knitted structures (4 ECTS): principles and methods of presenting knitted structures; economics of patterning knitted fabrics/knitwear; CAD systems in knitting; preparing technological documentation for knitted structures.

Theory of dyeing and finishing (4 ECTS): physical chemistry of dyeing; theoretical approaches of colour measurements and determination of dye concentration; aggregation of dyes; dye-fibre interactions; dyeing mechanisms; thermodynamics and kinetics of dyeing; physical chemistry of surfaces; surface active agents.

Planning pre-treatment processes (6 ECTS): preparing textile substrates for finishing; goals and effects of processing; machine equipment; chemical substances; environmental impact; analysis of pre-treatment effects in a substrate.

Development of clothing patterns (4 ECTS): clothing anthropometry and standards; consumers' size charts; impact of textile properties on pattern construction/modelling; technical documentation; construction/modelling of garment patterns; pattern grading.

Planning apparel (6 ECTS): introduction to a modern preparation of clothing manufacture; technological cutting process; fusing technology; sewing technology: technological requirements of stitches and seams, threads and modern sewing machines; pressing technology; quality requirements of materials and processes.

Planning dyeing processes (6 ECTS): technological water for dyeing process; theoretical basics of dyes; preparing dyes for dyeing textiles; dyeing procedures; dyeing fibres, fibre mixtures and fibres with special properties; auxiliaries in dyeing

processes; auxiliaries and methods for after-treatment of dyed material; identification of dyes.

Planning finishing processes (6 ECTS): classification of chemical and mechanical finishing; structure of finishes, aim and effect of finishing; effect of additives; processes and conditions of applications; evaluating the quality of finishing; environmental acceptability of agents and processes.

Planning printing processes (6 ECTS): methods, processes and technique of textile printing; machine equipment; processes of manufacturing printing forms; pattern reproduction; preparing fabrics before printing; dyes for printing textiles; importance of subsequent treatment; special printing processes; environmental aspects of textile printing.

Colour measurement in textiles (3 ECTS): light and colour; colour vision; basic principles of CIE colorimetry; colour order systems; measuring of whiteness and colour according to standards in textile technology; calculation of colour differences.

Information sources and methodology of thesis work (3 ECTS): training (in terms of information and methods) for preparing thesis work; data mining, acquisition and processing of relevant professional information; types of primary information sources; preparing references and citing; bibliographic databases; search profiles; factual databases; basics of intellectual property; development and testing of research hypotheses; structure and planning of thesis work; data processing and presentation of results.

Ecology in textiles 1 (4 ECTS): basics of ecology and environmental protection; textile production ecology; textile human ecology; classification of environmentally friendly products and environmentally friendly textiles; criteria for gaining eco-labels; textile disposal ecology; environmental analysis; environmental legislation and standardisation.

Textile care 1 (4 ECTS): classification of processes of textile care; theoretical approaches of wetting and washing; stains; products and procedures of washing and dry cleaning; removal of stains; faults and damages; environmental aspects.

Computer assisted design of yarns and woven fabrics (4 ECTS): simple and complex 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 knitted fabric 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; pattern reproduction; 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 management (4 ECTS): organisation and management of production; preparing work; standardisation of the technological process; nomenclature and standards of materials; production planning process and capacities (MRP); production; humanisation of work; optimisation of work and workplace; setting norms.

Marketing textiles and clothing (4 ECTS): significance of marketing textiles and clothing; markets and market research methods; market segmentation; fashion forecasting; designing of marketing mix; brand management in fashion.

Entrepreneurship (4 ECTS): learning about the process of planning a new company; entrepreneurship, creativity and innovation; business planning; market analysis; testing the economics of a business idea; marketing planning; development planning of the production/service process; gaining suitable human resources; critical risk; financing initial business.

Communication and marketing psychology (4 ECTS): learning about basic psychological processes, mechanisms and basic personality structures; interrelations, communication, negotiation, group psychology, organisation and teamwork; psychology of purchase and sale; decision-making about a purchase; target groups; symbols and functional significance of products and services.

Quality management (4 ECTS): learning concepts of quality; management and quality management systems; historical review of management systems; competitiveness; development and demands of standards (ISO 9000, 9001);

assessment and certification according to standards (ISO 9001); methods and techniques of quality management; economics of quality; self-evaluation and quality awards.

Leather and fur (4 ECTS): history and future of leather and fur; trading of leather and fur; sources of skins to produce leather and fur; types and characteristics of natural and artificial leather; types and characteristics of natural and artificial furs; applied properties of leather; applied properties of fur; labelling of leather and fur and regulatory constraints; maintenance and care of leather and fur.

Basics of 3D modelling (4 ECTS): 3D computer graphic: development, history, trends; geometrical background of 3D computer graphic; fundamental and complex 3D modelling; significance of topology for production; professional modelling practices; scene setting; textures and materials; maps and texturing; theoretical basis of light interactions in 3D space; light and shadow generation in 3D space; theoretical background of 3D lightning; virtual camera and composition; techniques and algorithms of simple and advanced rendering engines.

Contact

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