

Design and Textile Materials,

3. cycle Doctoral Study Programme

1 General description of the programme

The postgraduate doctoral study programme Design and Textile Materials is aimed at educating specialists with theoretical knowledge and special practical skills to work on the most demanding scientific and professional problems. Students will develop the ability for abstract and associative thinking and synthesis skills. The students will learn about scientific topics from the broad field of advanced textile materials and design. They will learn to manage the most complex systems and scientific research projects and will be able to transfer research results into practice and for developing innovative processes for solving problems.

During the postgraduate doctoral study programme students will be able to work in research and development institutes, and academic and national research institutions. The contemporary-based study programme is adapted towards reflecting the rich scientific research activities of the academic staff at the Faculty of Mechanical Engineering.

The doctoral study programme of the third cycle “Design and Textile Materials” lasts three years. A student has to acquire 180 ECTS points. The study programme is aligned with the Bologna directives and is related to other study programmes throughout Europe.

The doctoral study programme of the 3-rd grade Design and Textile Materials lasts for three years and is a logical upgrade of the same-called Bologna study programs of the 1st and 2nd cycle. The first year of the programme includes compulsory subjects and some elective courses designed to deepen the study of scientific topics from the fields of design and textile materials to enable students to understand the technical-theoretical contents, related to their research work. In the second and third year, the students independently carry out research work and prepare their doctoral thesis under the guidance of mentors.

The Doctoral Thesis work comprises scientific and research study of a certain problem. The students have to prepare their Doctoral Theses, present and defend them in front of an examination board.

2 Short description of the study programme

The students of this programme will gain the most advanced theoretical knowledge needed for developing new textile materials and processes. Based on the detailed knowledge obtained from compulsory courses of organic chemistry, fibres, technical textiles, recycling, theory of textiles' constructions, design theory, mechanics of fabrics or design, etc. students will deepen their knowledge by choosing selective courses, i.e.: wastewater treatment, statistics, eco-dyeing, polysaccharides,

thermal comfort of clothes, modelling and visualisations of textile forms, bioprocesses, Analytical methods, sensors in textiles, advanced printing technologies, textile materials for medical and hygiene applications, psychology of visual communication, etc. By selecting the appropriate set of courses students can specialise within different fields, e.g. advanced textile materials or design.

3 General learning outcomes and competencies of the students

Students of the Design and Textile Materials study programme acquire the following general skills: they will be able to understanding the theoretical and methodological concepts and management techniques relevant for scientific research. They will have the ability to maintain an independent expert assessment. In problems solving scientific research work they will develop critical thinking skills, the ability to generate new ideas, ability to adapt to new situations, ability to work within an interdisciplinary team and the abilities to make decisions.

Based on the acquired knowledge students will be able to apply for scientific research projects or successfully apply their areas of expertise in practice. They will acquire the abilities to form expert groups and leaderships of expert groups for solving highly-demanding specific problems, and will also be successful within teams when solving complex demanding tasks. They will also learn skills for international communication and work in foreign universities and institutes.

Abilities regarding ethical reflection and commitment to professional ethics will also be acquired through doctoral studies at FS.

4 The main subject-specific learning outcomes and competencies of the students

The main subject-specific competencies that are obtained from the Doctor of Science study programme of Design and Textile Materials are:

- Ability for independent, innovative and creative work in solving the more complex scientific problems related to the development of new multifunctional textile materials and modern technologies,
- Ability for identifying, analysing and solving problems within the field of materials and technologies, and engineering design,
- Ability to transfer the knowledge in the form of lectures, expertise and advice,
- Ability to understand the history of industrial, graphic and fashion design, and design concepts and design activities within the context of societal development, culture, aesthetics, art features, and technology,

- Ability to search for new solutions and scientific research approaches during the designing and manufacturing of products that are associated with new techniques and advanced technologies,
- Ability to understand and use of methods of critical analyses and developing theories and their applications within the development of new knowledge and to solve real problems,
- Ability to understand theoretical and methodological concepts,
- Ability for international communication and for research work at foreign universities and institutes.
- Ability regarding ethical reflection and commitment to professional ethics will also be acquired through doctoral studies at FS.

5 General curriculum

The postgraduate doctoral study programme of Design and Textile Materials lasts three years (6. semesters) with a total amount of 180 ECTS credit points. The students can select from a list of compulsory and selective courses. The research work of the student is determined by the topic of the doctoral thesis.

1. YEAR:

1. semester		2. semester	
Course	ECTS	Course	ECTS
Elective courses	12	Elective courses	12
Methods of scientific research work	3	Individual research work 2 with presentation of 1 st year research results	18
Individual research work 1	15		
TOTAL	30	TOTAL	30

2. YEAR:

3. semester		4. semester	
Course	ECTS	Course	ECTS
Scientific publishing	3	Individual research work 4 with presentation of 2 nd year research results	30
Individual research work 3 with a dissertation topic application	27		
TOTAL	30	TOTAL	30

3. YEAR:

5. semester		6. semester	
Course	ECTS	Course	ECTS
Planning and management of research projects	3	Individual research work 6 with doctoral dissertation	30
Individual research work 5	27		
TOTAL	30	TOTAL	30

6 Detailed curriculum

1. year								
Subject	1 st semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
Elective subject	30	30	0	0	60	120	180	6
Elective subject	30	30	0	0	60	120	180	6
METHODS OF SCIENTIFIC RESEARCH WORK	15	15	0	0	30	60	90	3
INDIVIDUAL RESEARCH WORK 1	0	0	0	50	50	400	450	15
Together semester:	75	75	0	50	200	700	900	30

Subject	2 nd semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
Elective subject	30	30	0	0	60	120	180	6
Elective subject	30	30	0	0	60	120	180	6
INDIVIDUAL RESEARCH WORK 2 WITH PRESENTATION OF 1. YEAR IRW RESULTS	0	15	0	60	75	465	540	18
Together semester:	60	75	0	60	195	705	900	30
Together year:	135	150	0	110	395	1405	1800	60

2. year								
Subject	3 rd semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
SCIENTIFIC PUBLISHING	15	15	0	0	30	60	90	3
INDIVIDUAL RESEARCH WORK 3 WITH APPROVED DOCTORAL DISSERTATION TOPIC	0	15	0	90	105	705	810	27
Together semester:	15	30	0	90	135	765	900	30

Subject	4 th semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
INDIVIDUAL RESEARCH WORK 4 WITH PRESENTATION OF 2. YEAR IRW RESULTS	0	15	0	90	105	795	900	30
Together semester:	0	15	0	90	105	795	900	30
Together year:	15	45	0	180	240	1560	1800	60

3. year								
Subject	5 th semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
PLANNING AND MANAGEMENT OF RESEARCH PROJECTS	15	15	0	0	30	60	90	3
INDIVIDUAL RESEARCH WORK 5	0	0	0	60	60	750	810	27
Together semester:	15	15	0	60	90	810	900	30

Subject	6 th semester				Cont. hours	Individ. work	Hours	ECTS
	L	S	T	K				
INDIVIDUAL RESEARCH WORK 6 WITH DOCTORAL DISSERTATION	0	15	0	120	135	765	900	30
Together semester:	0	15	0	120	135	765	900	30
Together year:	15	30	0	180	225	1575	1800	60
Together 3 years:	165	225	0	470	860	4540	5400	180

L – lectures, S – seminar; T – tutorial; K - consultation

Elective subjects (1st semester, 2nd semester)

Subject	1 st , 2 nd semester			Cont. hours	Individ. work	Hours	ECTS
	L	S	T				
STRUCTURE AND PROPERTIES OF FIBRES	30	30	0	60	120	180	6
THEORY OF DESIGN	30	30	0	60	120	180	6
TECHNICAL TEXTILES	30	30	0	60	120	180	6
MECHANICS OF TEXTILE MATERIALS AND CLOTHING DESIGN	30	30	0	60	120	180	6
ORGANIC CHEMISTRY - SELECTED CHAPTERS	30	30	0	60	120	180	6
THEORY OF WOVEN FABRIC DESIGN (SELECTED CHAPTERS)	30	30	0	60	120	180	6

Subject	1 st , 2 nd semester			Cont. hours	Individ. work	Hours	ECTS
	L	S	T				
DYES AND DECOLOURATION OF WASTE WATER	30	30	0	60	120	180	6
SELECTED TOPICS IN STATISTICS	30	30	0	60	120	180	6
COLOUR AND FUNCTIONAL MATERIALS	30	30	0	60	120	180	6
POLYSACCHARIDES	30	30	0	60	120	180	6
THERMAL CLOTHING COMFORT	30	30	0	60	120	180	6
BIOPROCESSES	30	30	0	60	120	180	6
TESTING	30	30	0	60	120	180	6
SENSORS IN TEXTILE	30	30	0	60	120	180	6
ADVANCED TEXTILE PRINTING TECHNOLOGIES	30	30	0	60	120	180	6
APPLIED COLORIMETRY	30	30	0	60	120	180	6
HIGH FINISHING	30	30	0	60	120	180	6
COMPUTER BASED TECHNOLOGIES FOR TEXTILE APPLICATIONS - SELECTED TOPICS	30	30	0	60	120	180	6
MEDICAL AND HYGIENE TEXTILE MATERIALS	30	30	0	60	120	180	6
FIBRE PRETREATMENT	30	30	0	60	120	180	6
PROJECT DESING	30	30	0	60	120	180	6
THE COMMUNICATION ROLE OF CLOTHING	30	30	0	60	120	180	6
NANOTECHNOLOGIES IN TEXTILES	30	30	0	60	120	180	6
RECYCLING	30	30	0	60	120	180	6
CONTEMPORARY FASHION AND DESIGN	30	30	0	60	120	180	6