



RĪGAS TEHNISKĀ UNIVERSITĀTE

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Study programme "Materials Science"

Main attributes

Title	Materials Science
Identification code	WBW0
Education classification code	43524
Level and type	Academic Bachelor (First Cycle) Studies
Higher education study field	Physic, Materials Science, Mathematics and Statistics
Head of the study field	Juris Blūms
Department responsible	Faculty of Material Science and Applied Chemistry
Head of the study programme	Remo Merijs-Meri
Professional classification code	
The type of study programme	Full time
Language	Latvian
Accreditation	31.05.2013 - 31.12.2023; Accreditation certificate No 2020/41
Volume (credit points)	120.0
Duration of studies (years)	Full time studies - 3,0
Degree or/and qualification to be obtained	Bachelor of Engineering Science in Materials Science
Qualification level to be obtained	The 6th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LQF)
Programme prerequisites	General Secondary or 4-year Vocational Education

Description

Abstract	<p>The study programme “Materials Science” is a multidisciplinary study programme, which has been implemented since the academic year 1999/2000.</p> <p>The study programme consists of 120 credit points. 86 credit points are allocated to the compulsory study courses. Besides traditional study courses (mathematics, physics, chemistry, etc.), more than half of the credits are allocated to the courses, which deal with general aspects of materials science (structure-property relationships, the guide to materials development, materials of different origin, composite materials, handling and processing of materials, quality assessment and certification of materials, aging, recycling, ecology, and selection of materials, etc.).</p> <p>Field-specific study courses (15 credits) are based on the study of a wide range of materials, devoting attention to their applications (construction, electronics, fibre materials, coatings, adhesives, etc.).</p> <p>The study programme ensures students with the background knowledge that enables them to continue their studies achieving master's and doctoral degrees in materials science.</p> <p>The study programme is implemented by experienced lecturers and scientists of the Institute of Polymer Materials of the Faculty of Materials Science and Applied Chemistry in collaboration with the academic staff of Departments of Chemistry, Silicate Materials, Technical Physics, General Chemical Technology, and the Institute of Biomaterials and Biomechanics.</p> <p>The study programme aims to ensure that students acquire research skills and gain experience in the novel experimental techniques and equipment of the above-mentioned departments. The study programme envisages the elaboration and defence of the bachelor thesis that is independent mandatory research conducted by a student on a chosen topic in the relevant disciplinary field.</p>
Aim	<p>The aims of the study programme are to provide students with the theoretical knowledge of materials design, manufacturing, quality assurance, etc. related industries and to develop professional and research skills necessary for future employment and further studies at academic master study programmes or professional higher education study programmes.</p>
Tasks	<p>The aims of the study programme are the following:</p> <ul style="list-style-type: none">• to develop students' independent thinking and skills necessary for effective use of acquired knowledge of specific topics in materials science in order to perform different tasks and solve problems;• to ensure amendments to the content, learning process in line with the changes in the field of materials science, applied research and didactics; to promote the students to carry out independent research and to encourage the students to exercise their initiative;• to enable students to independently use modern experimental techniques; to perform the systematic study of various experimental methods and equipment at the facilities of the organizers of the study programme;• to effectively and efficiently organize the independent students' research;• to ensure that the planned results of the programme are efficiently achieved;• to educate and train students for professional careers and further education at the master's level.

Learning outcomes	<p>The graduates of the study programme:</p> <ul style="list-style-type: none"> • understand the correlations between material composition, structure, handling and processing conditions, technology and performance; • understand the technological processes of a variety of materials (including composites) and relevant equipment; • understand effective recycling methods and techniques and the related ecological problems; • manage and are able to use the basic experimental techniques and testing equipment for the evaluation of properties and quality of materials; • orient themselves in quality management and environmental management issues related to the production of materials; • know modern search methods, classification approaches and perform the analysis of information; • manage to use computers and related software; • are able to apply theoretical knowledge to solve certain research and engineering problems
Final/state examination procedure, assessment	<p>To complete the study programme, the student has to fulfil the final prerequisite, i.e., to elaborate and defend the bachelor thesis, which amounts to 10 credit points. The bachelor thesis is independent experimental research on a topic related to materials science.</p> <p>The bachelor thesis enables the student to demonstrate the ability to formulate research tasks, to find the solutions to the problem, to perform the planned experiments, to analyse the results, to draw valid conclusions, as well as present the results.</p> <p>The thesis is elaborated and defended according to RTU Regulations on the Elaboration and Evaluation of the Bachelor Thesis (RTU Senate Resolution of 15 December 2003, Minutes No.482) and in compliance with the Regulations for Writing a Bachelor Thesis and the Guidelines for Defence of a Bachelor Thesis approved by the Faculty of Materials Science and Applied Chemistry (FMSAC) (2003). The bachelor's degree is granted by the FMSAC.</p>
Description of the future employment	<p>The graduates are qualified to work as quality service professionals at manufacturing companies; as quality experts at building companies; as experts at raw material companies, material testing and research equipment dealer firms, materials testing laboratories and certification bodies, as well as in public service areas as materials experts.</p>
Special enrollment requirements	No special requirements
Opportunity to continue studies	The graduates can continue their education at the master study programme "Materials Science" of Riga Technical University.

Courses

No	Code	Name	Credit points
A		Compulsory Study Courses	84.0
1	DDM101	Mathematics	9.0
2	MFA107	Physics	8.0
3	ĶVĶ701	Chemistry in Materials Science	4.0
4	BTG131	Descriptive Geometry and Engineering Graphics	2.0
5	ĶPI101	Introduction to Materials Science	3.0
6	IUV101	Fundamentals of Law	2.0
7	SDD701	Innovative Product Development and Entrepreneurship	4.0
8	ICA101	Civil Defence	1.0
9	EEE226	Electrical Engineering and Electronics	2.0
10	DMS365	Mathematical Statistics in Materials Science	2.0
11	DIM212	Supplementary Mathematics (for materials science)	2.0
12	MMP170	Mechanics of Deforming Materials	2.0
13	ĶVĶ201	Structure of Matter	5.0
14	MFB201	Structure and Properties of Materials	4.0
15	ĶTF304	Information Literacy	2.0
16	MAT117	Metals and Alloys	3.0
17	ĶPI202	Polymer Materials	3.0
18	ĶST207	Inorganic Materials	3.0
19	ĶPI301	Composite Materials	4.0
20	ĶPI302	Interface and Boundary Processes	3.0
21	ĶPI303	Fabricating and Processing of Materials	5.0
22	MKI486	Quality Assessment and Certification	2.0
23	ĶPI304	Basics of Materials Selection	3.0
24	ĶPI305	Ageing of Materials	3.0
25	ĶPI306	Recycling of Materials and Ecology	3.0
B		Compulsory Elective Study Courses	20.0
B1		Field-Specific Study Courses	15.0
1	ĶPI336	Wood Materials	3.0
2	ĶST208	Silicate and Polymer Building Materials	3.0
3	REA305	Electronic Materials	3.0
4	ĶPI307	Fibre Materials	3.0
5	BBB101	Basics of Biomaterials	3.0
6	ĶPI308	Adhesives and Coatings	3.0
7	ĶVĶ202	Fuel and Lubricants	3.0
8	ĶVT422	Interactions of Materials with Biological Environment	3.0
9	ĶVT318	Fundamentals of Experimentation Theory	3.0
10	ĶST720	Chemical Analysis of Silicate Materials	3.0
B2		Humanities and Social Sciences Study Courses	5.0
1	HSP377	General Sociology	2.0
2	HSP375	Sociology of Management	2.0
3	HSP376	Sociology of Personalities and Small Groups	2.0
4	HSP379	Political System of Latvia	2.0
5	HSP380	United Europe and Latvia	2.0
6	HVD261	Elementary Course in English	3.0
7	HVD153	The Terminology Minimum in English	3.0
C		Free Elective Study Courses	6.0
E		Final Examination	10.0
1	ĶPK001	Bachelor Thesis	10.0
2	ĶST001	Bachelor Thesis	10.0
3	ĶVT001	Bachelor Thesis	10.0
4	MFB001	Bachelor Thesis	10.0
5	ĶNK001	Bachelor Thesis	10.0