

Study regulations for the Bachelor's degree programme in Materials Science

From 28 April 2019

On the basis of § 36 paragraph 1 of the Saxon Higher Education Freedom Act (Sächsisches Hochschulfreiheitsgesetz) in the version published on 15 January 2013 (SächsGVBl. p. 3), Technische Universität Dresden enacts the following study regulations as statutes.

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§ 1

Scope

Based on the Saxon Higher Education Freedom Act and the examination regulations, these study regulations govern the objectives, content, structure and procedure of the study programme for the Bachelor's degree course in Materials Science at the Technische Universität Dresden.

§ 2

Aims of the study

(1) The degree programme enables students to apply scientific fundamentals, methodological competence and professional qualifications in the field of materials science. After completing the degree programme, the students master the basic knowledge of materials science, which includes, for example, the necessary mathematical, scientific and engineering fundamentals. They recognise engineering problems, can present them appropriately, analyse them using scientific methods and work out possible solutions independently. Furthermore, they have general and in-depth abilities, skills and knowledge to recognise interdisciplinary problems and to develop possible contributions to solving such problems.

(2) Graduates are able to meet the fundamental requirements in the field of materials science in professional practice due to their basic scientific and technical knowledge, their mastery of specialist knowledge and scientific methods. They can apply their knowledge and, due to a high degree of general education, are able to fulfil their economic, social and ecological responsibility. They are able to reach professional and social judgement early in their professional development. Possible occupational fields can be found in the areas of development and research of properties, the testing and further development of a wide variety of materials and their manufacturing processes. Graduates have the basics for the optimal and efficient processing of materials such as metal, ceramics or plastics. Future employers may be companies in the chemical or ceramic, wood or glass industries, in plastics processing, in mechanical and plant engineering or at materials testing authorities. Other opportunities open up in scientific institutions, testing and expert bodies, in the public sector and in freelance jobs. The development and marketing of one's own products, ideas and processes also opens up promising prospects for the future.

§ 3

Access requirements

The prerequisite for admission to the degree programme is a general higher education entrance qualification, a subject-specific higher education entrance qualification in the relevant subject area or a higher education entrance qualification recognized as equivalent by the higher education institution.

§ 4

Start and duration of studies

(1) The degree programme can be commenced in the winter semester.

(2) The standard period of study is six semesters and includes attendance, self-study and the Bachelor's examination.

§ 5

Teaching and learning methods

(1) The course content is structured in modules. In the individual modules, the teaching content is taught, consolidated and deepened through lectures, exercises, practicals, excursions, language courses, self-study and tutorials. In modules that are recognisably subject to several study regulations, synonyms are permitted for teaching and learning forms with the same content.

(2) Lectures introduce the subject matter of the modules. Exercises enable the application of the subject matter in exemplary sub-areas. Internships serve the application of the taught material as well as the acquisition of practical skills in potential professional fields. Excursions enable students to experience the acquired knowledge in practical application and to get to know potential occupational fields. Language courses impart and train knowledge, skills and abilities in the respective foreign language. Students develop communicative and intercultural competence in an academic and professional context as well as in everyday situations. Self-study enables students to acquire basic as well as in-depth subject knowledge independently with the help of various media (teaching materials, literature, internet, etc.) in individual work or in small groups. In tutorials, students, especially first-year students, are supported in acquiring practical and theoretical skills.

§ 6

Structure and sequence of studies

(1) The degree programme has a modular structure. The courses are spread over six semesters. The fifth semester is designed in such a way that it is particularly suitable for a temporary stay at another university (mobility window). Part-time study is possible in accordance with the regulations on part-time study.

(2) The degree programme comprises 21 compulsory modules and compulsory elective modules amounting to 10 credit points, which allow the student to choose a focus. The choice of compulsory elective modules is binding. A one-time change of choice is possible; it is made by a written application of the student to the examination office, in which the compulsory elective module to be replaced and the newly chosen one are to be named.

(3) Qualification objectives, contents, teaching and learning forms covered, prerequisites, usability including any combination restrictions, frequency, workload and duration of the individual modules can be found in the module descriptions (Annex 1).

(4) The courses are held in German or in English according to the module descriptions.

(5) The appropriate allocation of the modules to the individual semesters, the observance of which enables the completion of the degree programme in the standard period of study, as well as the type and scope of the courses included in each case and the number and standard time of the required study and examination achievements are to be taken from the attached study schedule (Annex 2) or an individual study schedule confirmed by the faculty for the part-time degree programme.

(6) The range of compulsory elective modules as well as the study schedule can be changed by the Faculty Council on the proposal of the Study Commission. The current range of compulsory elective modules shall be announced at the beginning of the semester in the usual manner of the faculty. The amended study schedule shall apply to the students to whom it is announced in the customary manner at the beginning of the semester. The Examination Board shall decide on exceptions to sentence 3 upon application by the student.

§ 7

Content of the study programme

(1) The scientific and engineering content includes, in particular, differential and integral calculus, linear algebra, stochastics, atomic structure, energetic consideration of chemical reactions, basic concepts of thermodynamics and catalysis, basic principles of cost accounting with cost types, cost centres and cost unit accounting as well as the structure of business accounting, study and job-related communication, mechanics, thermodynamics, electricity and magnetism, Wave mechanics and optics, equilibrium of plane and spatial structures, moments of area, differential calculus for functions of several variables, ordinary differential equations and differential geometry, basic knowledge of organic chemistry, relationships between charge, electric current, electric voltage, power and energy, Fourier series, basics of preparing and understanding technical documentation, use of complex computer systems, methods of software technology, Material properties and their causes as well as possibilities for influencing and changing them, material production processes for important metallic materials, production engineering basics of component production by forming, machining and joining, basics and applications of processes for determining the structural and damage state of materials, basics of steels and cast iron as well as aluminium, titanium, nickel and magnesium alloys, chemical-physical basics of ceramics, Fundamentals of production, structure, structural principles including processing and application-relevant material properties as well as application of polymer materials and biomaterials, powder metallurgical processes as well as theoretical fundamentals of sintering processes, fundamentals of chemical equilibria in materials, the structural chemistry of compound structures and the fundamentals of solid-state reactions, social science, environmental protection, work science and organisation as well as business and patent law.

(2) The compulsory elective area includes the basics of modelling the properties of materials, the theoretical and practical basics of grinding, contrasting and microscopic microstructure examination, atomic force microscopy, electron microscopy, micro-computer tomography, dental implantology, bone replacement materials and the manufacture and production of different types of dental prostheses.

§ 8

Credit points

(1) ECTS credit points document the average workload of students as well as their individual study progress. One credit point corresponds to a workload of 30 hours. As a rule, 60 credit points are awarded per academic year, i.e. 30 credit points per semester. The total workload for the degree programme corresponds to 180 credit points and comprises the forms of teaching and learning described in the module descriptions according to type and scope, the study and examination achievements as well as the Bachelor's thesis and the colloquium.

(2) The module descriptions indicate how many credit points can be acquired through a module in each case. Credit points are acquired if the module examination has been passed. Section 26 of the examination regulations remains unaffected.

§ 9

Student advisory service

(1) General student counselling is provided by the Central Student Counselling Office of the Technische Universität Dresden and covers questions regarding study opportunities, enrolment modalities and general student matters. The student counselling of the Faculty of Mechanical Science and Engineering is responsible for the academic counselling during the studies. This academic counselling supports the students in particular in questions of study organisation.

(2) At the beginning of the third semester, every student who has not yet completed a course of study shall take part in a course guidance session.

§ 10

Adaptation of module descriptions

(1) In order to adapt to changed conditions, the module descriptions can be changed in a simplified procedure within the framework of an optimal study organisation with the exception of the fields "Module name", "Qualification objectives", "Contents", "Forms of teaching and learning", "Requirements for the award of credit points" as well as "Credit points and grades".

(2) In a simplified procedure, the Faculty Council of the Faculty of Mechanical Science and Engineering decides on the amendment of the module description on the proposal of the Study Commission. The changes are to be published in the customary manner of the faculty.

§ 11

Entry into force, publication and transitional provisions

(1) These study regulations shall enter into force on 1 June 2019 and shall be published in the Official Announcements of the Technische Universität Dresden.

(2) It applies to all students newly enrolled in the Bachelor's degree programme in Materials Science in the winter semester 2019/2020 or later.

(3) For students enrolled earlier than the winter semester 2019/2020, the study regulations for the Bachelor's degree programme in Materials Science previously valid for them before the entry into force of these regulations shall continue to apply.

(4) These study regulations shall apply from the winter semester 2020/2021 for all students enrolled in the Bachelor's degree programme in Materials Science.

(5) In the case of transfer according to Paragraph 3 or Paragraph 4, the module examinations already completed, including the grades, shall be transferred ex officio, and individual examination performances shall also be transferred ex officio on the basis of equivalence tables which are determined by the Examination Committee and announced in the customary manner of the faculty. With the exception of § 14 Paragraph 5 of the Examination Regulations, module examinations and examinations not graded with at least "sufficient" (4.0) or "passed" shall not be transferred. As a rule, the module grade is not recalculated on the basis of the grades of exclusively transferred examinations; exceptions can be found in the equivalence tables.

Issued on the basis of the resolution of the Faculty Council of the Faculty of Mechanical Science and Engineering of 19 December 2018 and the approval of the Rectorate of 19 February 2019.

Dresden, 28 April 2019

The Rector
of the Technical University of Dresden

Prof. Dr.-Ing. habil. DEng/Auckland Hans Müller-Steinhagen