

Study Regulations for the Diploma-postgraduate degree programme Process Engineering and Natural Materials Technology

From 15 February 2020

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.

Table of contents

- § 1 Scope of application
- § 2 Aims of the study programme
- § 3 Access requirements
- § 4 Start of studies and duration of studies
- § 5 Teaching and learning forms
- § 6 Structure and sequence of studies
- § 7 Content of the study programme
- § 8 Performance points
- § 9 Study counselling
- § 10 Adjustment of module descriptions
- § 11 Effectivity, Publication and Transitional Provisions

Annex 1: Module Descriptions

Annex 2: Study schedule

§ 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 Diploma-postgraduate degree programme in Process Engineering and Natural Materials Technology at Technische Universität Dresden.

§ 2

Aims of the study

(1) Graduates are high-performance engineering personalities with leadership skills who meet the growing challenges in practice and science through a holistic research-oriented education. They can analyse, model and simulate problems and challenges in the fields of process engineering and natural materials engineering and scale, implement and evaluate corresponding solution approaches. Due to the holistic problem-solving competence, graduates are able to organise and successfully work on process engineering tasks from the most diverse fields of material conversion, taking into account technical and social as well as economic and ecological boundary conditions in teams based on the division of labour. They can take up the results of others and communicate them together with their own results in the team and beyond for different target groups. Due to the increasing research orientation, graduates are familiar with current research questions from all special fields of process engineering and natural materials engineering such as general process engineering, bioprocess engineering, chemical engineering, wood technology and fibre materials engineering as well as food technology and have insights into the state of research and the application of contemporary methodology.

(2) Graduates are able to meet the requirements of professional practice in the field of process engineering and natural materials engineering through their scientific and technical knowledge, their mastery of specialist knowledge and scientific methods and are able to apply their knowledge. Possible occupational fields can be found in process development and design as well as in product development and -design, in plant construction, layout and design, in quality management and in technical service sectors as well as in teaching and training at home and abroad in various application sectors. Technology companies, manufacturing companies and plant constructors of all sizes can be future employers. Fields of employment include, for example, companies and institutions that are active in mechanical, thermal and chemical process engineering, wood technology and fibre processing, food production and bioprocess engineering. Other opportunities open up in scientific institutions, testing and expert bodies, in the public sector and in freelance activities. The development and marketing of one's own products, ideas and processes also opens up promising prospects for the future.

(3) Graduates are also qualified to fulfil their economic, social and ecological responsibilities due to a high level of general education. They are able to reach professional and social judgement early in their professional development. Graduates are universally employable specialists with interdisciplinary knowledge and the ability to think in a networked manner; they can combine technical, economic and social competence.

§ 3

Access requirements

The prerequisite for admission to the programme is a first university degree recognised in

Germany as qualifying for a profession or a degree from a state or state-recognised university of cooperative education in an engineering degree programme, in particular mechanical engineering, process engineering or chemical engineering, as well as proof of competences comparable to those of the modules Fundamentals of Mathematics, Engineering Mathematics, Special Chapters of Mathematics, Engineering Mechanics, Fundamentals of Kinematics and Kinetics, Fundamentals of Fluid Mechanics, Engineering Thermodynamics/Heat Transfer, Fundamentals of Electrical Engineering, Design Theory, Computer Science, Fundamentals of Chemistry, Physical Chemistry and Biochemistry, in Introduction to Process Engineering and Natural Materials Technology, Fundamentals of Material Science of the Diploma degree programme in Process Engineering and Natural Materials Technology.

§ 4

Start and duration of studies

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

(2) The standard period of study is five semesters and includes attendance, self-study and the Diploma examination.

§ 5

Teaching and learning methods

(1) The course content is structured in modules. In the individual modules, the course content is taught, consolidated and deepened through lectures, exercises, practicals, seminars, excursions, self-study, tutorials and projects. In modules that are recognisably subject to several study regulations, synonyms are permitted for teaching and learning methods 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. Seminars enable students to inform themselves about a selected problem area on the basis of specialist literature or other materials under guidance, to present what they have learned, to discuss it in the group and/or to present it in writing. Excursions enable students to experience the acquired knowledge in practical application and to get to know potential professional fields. 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. In projects, the connection between theory and practice is supported and special topics are developed with the inclusion of interdisciplinary questions. In particular, projects enable the application and deepening of methodological and social skills.

§ 6

Structure and sequence of studies

(1) The degree programme has a modular structure. The courses are spread over four semesters. The fifth semester serves to prepare the Diploma thesis. The third and fourth semesters are designed in such a way that they are 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 study programme comprises two compulsory modules and one field of study, at the student's choice, with the compulsory modules or compulsory elective modules provided according to the study schedule (Annex 2). The fields of study Process Engineering, Bioprocess Engineering, Chemical Engineering, Wood and Fibre Material Technology as well as Food Engineering are available for selection. The choice of the field of study and the compulsory elective modules is binding. A one-time change of choice is possible in each case; it is made by a written application of the student to the examination office, in which the field of study to be replaced and the newly chosen field of study or the compulsory elective module to be replaced and the newly chosen compulsory elective module must be named in each case.

(3) Qualification goals, contents, teaching and learning methods, requirements for participation, 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 division of the modules into 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) If participation in an elective or in a non-elective course of a compulsory elective module is limited by the number of available places according to the module description, the selection of participants shall be made according to the order of enrolment for the corresponding course. The number of available places as well as the form and deadline of the enrolment option shall be announced to the students in due time in the usual manner of the faculty.

Content of the study programme

The study programme comprises engineering fundamentals, in particular the penetration of processes, machines and plants of the processes to be realised, the physical, chemical and biological material conversion as well as their modelling, calculation, simulation and design. It includes the independent solution of delimited scientific problems with a basic or application-oriented character for the realisation of innovative economic and ecological processes as well as products from all areas of process engineering and natural materials engineering and related subject areas. The optional compulsory fields of study offer students the opportunity to focus on one of the fields of process engineering and natural materials engineering described with these fields of study:

1. The field of study Process Engineering covers basic contents of mechanical, thermal and chemical process engineering, plant engineering and safety engineering, heat and mass transfer, systems process engineering, multiphase reactions and chemical thermodynamics and multiphase thermodynamics. Furthermore, it includes the focal areas of particle technology, process automation, reactor technology and energy process engineering, recycling, interfacial engineering, process analysis, food and bioprocess engineering, cryogenics, pure technologies, process engineering plants, environmental process engineering and process control systems.
2. The Bioprocess Engineering field of study includes basic contents of mechanical and thermal process engineering, microbiology, biophysics, biochemistry and bioanalytics. Furthermore, it includes the focal points bioprocess technology and bioreaction technology, enzyme and biosensor technology, white biotechnology as well as applied biotechnology, process analysis, process engineering plants, environmental process engineering, biotechnical plants and processes, bioprocessing and food technology, chemometrics as well as systems biotechnology.
3. The field of study Chemical Engineering covers basic contents of mechanical, thermal and chemical process engineering, multiphase reactions, analytical and technical chemistry as well as methods of chemical analysis. Furthermore, it includes the focal points of plant engineering and safety engineering, high-performance materials, macromolecular chemistry and regenerative energy generation, heat transfer and mass transfer, systems and energy process engineering, food and bioprocess engineering, chemometrics, particle and water technology, food chemistry and materials synthesis.
4. The field of study Wood and Fibre Material Technology covers basic contents of mechanical and thermal process engineering, wood and fibre materials chemistry, wood anatomy, production and processing of wood materials and paper and wood and paper chemistry. Furthermore, it includes the focal points of furniture and construction element development, wood protection, machines and processes of paper production and paper processing, wood drying and wood analysis as well as fibre and paper physics, process analysis, wood construction, product design, natural fibre-based products and fibre composites, food and bioprocess engineering, product manufacturing and separation technology as well as paper recycling.
5. The Food Engineering field of study includes basic contents of mechanical and thermal process engineering, food science, food chemistry, basic food technology processes, food technology and food microbiology and hygiene. Furthermore, it includes the focal points of food rheology, quality assurance as well as special chapters of food technology and bioprocess engineering, machine and plant technology, process analysis, environmental process engineering, chemometrics, packaging and refrigeration technology as well as nutritional physiology.

§ 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 150 credit points and includes the forms of teaching and learning described in the module descriptions in terms of type and scope, the course and examination achievements as well as the Diploma 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 28 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 design.

(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 goals", "Contents", "Teaching and learning methods", "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 April 2020 and shall be published in the Official Announcements of the TU Dresden.

(2) It shall apply to all students newly enrolled in the Diploma-postgraduate degree programme in Process and Natural Materials Engineering in the winter semester 2020/2021 or later.

(3) For students enrolled earlier than the winter semester 2020/2021, the study regulations for

the Diploma-postgraduate degree programme in Process Engineering and Natural Materials Technology 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 2021/2022 for all students enrolled in the Diploma-postgraduate degree programme in Process and Natural Materials Engineering.

(5) In the case of transfer according to Paragraph 4, the module examinations already taken, including the grades, shall be taken over ex officio, and individual examination performances shall be taken over subordinately 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 § 15 Paragraph 5 of the Examination Regulations, module examinations and examinations not graded with at least "sufficient" (4.0) or "passed" shall not be transferred. In principle, the module grade is not recalculated on the basis of the grades of exclusively transferred examinations; exceptions can be found in the equivalency tables.

Issued on the basis of the resolution of the Faculty Council of the Faculty of Mechanical Science and Engineering of 16 November 2018 and the approval of the Rectorate of 12 February 2019.

Dresden, 15 February 2020

The Rector
of the Technical University of Dresden

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