



**TECHNISCHE
UNIVERSITÄT
DRESDEN**

Faculty of Electrical and Computer Engineering

**Study regulations for the consecutive Master's programme
Nanoelectronic Systems**

as of 26th April, 2024

Pursuant to § 37 sec. 1 of the of the Saxon Higher Education Act (*Sächsisches Hochschulgesetz - SächsHSG*) of 31st May, 2023 (*SächsGVBl.* p. 329), the Technische Universität Dresden enacts the following Study Regulations as a statute.

Please note: This is an English translation of the German original. **Only the German version is legally binding.**

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§ 1

Area of applicability

These Study Regulations define the objective, the contents, the structure and the order of events during studies for the consecutive Master's programme Nanoelectronic Systems at the Technische Universität Dresden on the basis of the Saxon Higher Education Act (*Sächsisches Hochschulgesetz - SächsHSG*) and the Examination Regulations.

§ 2

Aims of the programme

(1) After completing the Master's degree programme Nanoelectronic Systems, graduates will be familiar with methods, techniques and tools for the design and manufacture of nanoelectronic systems as well as for the application of these systems in selected fields of application and will be able to apply this knowledge with confidence. They are able to analyze problems from these subject areas and develop effective solutions based on them. They recognize interrelationships and dependencies and can take them into account when finding solutions. Graduates are familiar with the latest research and developments in the field of nanoelectronic systems and can contribute constructively to processes for the design, manufacture and application of nanoelectronic systems. They are capable of critical self-reflection and social commitment and have developed their personality.

(2) Thanks to their broad specialist knowledge and their familiarity with the global research community in the fields of design, production and application of nanoelectronic systems acquired during their internationally oriented studies, graduates are able to deal with diverse and complex tasks in the design, production and application of nanoelectronic systems in professional practice after an appropriate training period and chosen specialization. In particular, they can work in microelectronics, information technology, semiconductor technology, IC design and system design.

§ 3

Admission requirements

(1) To be admitted to the programme, students must have earned a first job-qualifying university degree or a degree at a state-run or officially recognised university of cooperative education in Electrical Engineering, Information Systems Engineering, Computer Science, Physics or equivalent areas.

(2) Specialist knowledge is required in the areas of higher mathematics, digital and analog circuit technology, electric and magnetic fields, system theory, structure and function of electronic components and object-oriented programming. Proof of this special aptitude is provided through the aptitude assessment procedure in accordance with the Nanoelectronic Systems aptitude assessment regulations.

(3) Furthermore, English language skills at level B2 of the Common European Framework of Reference for Languages are required. If English is not the applicant's native language, proof is provided by submitting a relevant certificate or language certificate. In particular, this can be a certificate of a university degree completed entirely in English or a language certificate such as IELTS (at least 6.5) or TOEFL (at least 94).

§ 4

Beginning and duration of studies

- (1) Students can commence studies in the winter semester.
- (2) The standard period of study is 4 semesters during which students are required to accomplish face-to-face studies, self-study and the Master examination.

§ 5

Types of teaching and learning

(1) The academic material is organised in a modular structure. In the individual modules, the academic content is communicated, consolidated and deepened in lectures, exercises, seminars, practical lab courses, tutorials, language courses, excursions, projects and also in self-study. In modules that are subject to several examination regulations synonyms are possible for assessments that are identical in content.

(2) The individual forms of teaching and learning according to section 1 sentence 2 are defined as follows:

1. Lectures provide an introduction to the subject areas of the modules.
2. Exercises allow the application of the teaching content in selected sub-areas.
3. Seminars allow students to gather information about a chosen topic under supervision based on technical literature or other material, to present and discuss in a group what they worked out and to present it in writing.
4. Practical lab courses serve to apply the subject matter taught and to acquire practical skills in potential professional fields.
5. In tutorials, students are supported in learning how to solve technical and methodological problems independently.
6. Language courses teach and train knowledge, skills and abilities in the respective foreign language. They develop communicative and intercultural competence in an academic and professional context as well as in everyday situations.
7. Excursions allow students to get an insight into different production and research facilities and to get to know subject-specific industry solutions and potential application areas.
8. In projects, students carry out scientific work and develop the ability to work in a team and to develop independent solutions and implement them within a specified period of time. They also develop and train the ability to document the results in a subject-specific form and to present them in a factually and linguistically correct manner.
9. In self-study, students can work on, repeat and deepen the course content at their own discretion.

§ 6

Structure and organisation of the programme

(1) The programme has a modular structure. The courses are spread over three semesters. The third semester is designed in such a way that it is particularly suitable for a temporary stay at another university (mobility window). The fourth semester is intended for the completion of the final thesis, including the colloquium. In addition, as part of the cooperation with the KU Leuven (Belgium) and in accordance with the cooperation agreement in the field of Nanoscience and Nanotechnology, students have the opportunity to begin their studies at the KU Leuven (Belgium) and to continue and complete their studies at the Technische Universität Dresden after the first year. Part-time study is possible in accordance with the regulations for part-time study.

(2) The programme comprises the branch of studies Nanoelectronics as well as Nanoscience and Nanotechnology, which allow students to choose their own specialization. The student must choose one of the two branches of studies when applying. The branch of studies Nanoelectronics comprises 7 compulsory modules and 6 to 9 compulsory elective modules amounting to 41 credit points, which allow the student to choose a specialization. Students can choose from modules on materials and technologies for nanoelectronic systems, memory technology, nanotechnology, optoelectronics and molecular electronics, design methods and techniques for the realization of nanoelectronic systems, integrated circuit and system design, design, construction and use of software systems, modelling and simulation methods, business and economic topics, languages. The choice is binding. A change of choice is possible; this is done by means of a written application from the student to the Examination Office, in which the module to be replaced and the newly chosen module are to be named. The first year of the branch of studies Nanoscience and Nanotechnology includes an obligatory year abroad at the KU Leuven (Belgium) as part of a joint study programme, which is regulated in detail in a cooperation agreement. The coursework and examinations to be completed correspond to those to be completed in the Master's degree programme in Nanoscience and Nanotechnology at KU Leuven (Belgium). In the second year of study, the branch of studies comprises 2 compulsory modules and 3 compulsory elective modules amounting to 15 credit points, which allow the student to choose a specialization. To this end, students can choose from modules on materials and technologies for nanoelectronic systems, memory technology, nanotechnology, optoelectronics and molecular electronics, design methods and techniques for the realization of nanoelectronic systems, integrated circuit and system design, design, construction and use of software systems, modelling and simulation methods. The choice is binding. A change of choice is possible; this is done by means of a written application from the student to the Examination Office, in which the module to be replaced and the newly chosen module must be named.

(3) The module descriptions contain contents and qualification aims, the types of teaching and learning used, usability, frequency, amount of work involved and duration of the various modules.

(4) Courses are held in English or, depending on the module description, in German. If foreign language qualifications are acquired in a module, courses can also be held in the respective language depending on the content and qualification objectives.

(5) The appropriate distribution of the modules over the individual semesters, the observance of which enables the degree course to be completed within the standard period of study, as well as the type and scope of the courses covered in each case and the number and regular time of the required coursework and examinations, can be found in the study plans or in an individual study plan for part-time study confirmed by the faculty.

(6) The required elective modules offered and the curriculum plan can be modified by the Faculty Council on suggestion of the Academic Committee. The currently offered required elective modules shall be communicated by the faculty in the known manner as the semester starts. The modified curriculum plan is binding on those students to whom the faculty communicates it in the known manner as soon as studies begin. On application, the Examination Committee may decide on

exceptions to sentence 3.

(7) If participation in a selectable course of a compulsory or compulsory elective module or in a non-selectable course of a compulsory elective module is limited by the number of places available in accordance with the module description, participants are selected according to the order of enrolment for the corresponding course. To this end, the student must enroll for the corresponding course. The form and deadline for enrolment will be announced to students in the usual manner. Enrolment may result in the selection pursuant to section 2, sentence 5 and sentence 11. At the end of the enrolment period, the student will be informed in the usual manner whether he or she is a selected participant in the corresponding course.

§ 7

Course contents

(1) The major focus of the Master's programme Nanoelectronic Systems is on research.

(2) The programme includes an interdisciplinary education in the fields of semiconductor technology, circuit design and system design. The topics of the compulsory elective modules of the programme are materials and technologies for nanoelectronic systems, in particular memory technology, nanotechnology, optoelectronics and molecular electronics, design methods and techniques for the realization of nanoelectronic systems, characterization and modelling of electrical components, integrated circuit and system design, fields of application and design for embedded nanoelectronic systems, in particular design, construction and use of software systems, modelling and simulation methods, business and economic topics as well as the German language and culture.

§ 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 120 credit points and includes the teaching and learning forms specified in the module descriptions according to type and scope, the coursework and examinations as well as the final thesis and the colloquium.

(2) The module descriptions indicate how many credits students can earn in one module. Students can earn credit points after having passed the module examination. § 34 of the examination regulations remains unaffected.

§ 9

Student advisory service

(1) The general student advisory service is the responsibility of the Central student advisory service of TU Dresden and answers all questions regarding programmes offered, terms of enrolment and general student affairs. The academic advisory service throughout studies is the responsibility of the Faculty of Electrical and Computer Engineering. This academic advisory service supports students, particularly in matters relating to the organization of their studies.

(2) At the beginning of the third semester, every student who has not yet provided proof of academic achievement should consult with the academic advisory service.

§ 10

Adaptation of module descriptions

- (1) In order to adapt to changed conditions, the module descriptions can be changed in a simplified procedure as part of an optimal study organization with the exception of the fields "Module name", "Objectives", "Contents", "Modes of teaching and learning", "Requirements for the award of credit points", "Credit points and grades" and "Duration".
- (2) In a simplified procedure, the Faculty Council decides to amend the module description at the suggestion of the Academic Affairs Committee. The changes are to be published in the usual manner.

§ 11

Coming into force, public notice and transitional provisions

- (1) These study regulations become effective as of 1st June, 2024 and are publicly announced in the Official Notices of Technische Universität Dresden.
- (2) They are valid for all students that are enrolled in the Master's programme Nanoelectronic Systems from winter semester 2024/25 on.
- (3) For students enrolled before the winter semester 2024/25, the study regulations that were valid before these study regulations became effective continue being valid.
- (4) These study regulations are valid for all students that are enrolled in the Master's programme Nanoelectronic Systems from the winter semester 2026/2027 on.
- (5) In the event of a transfer in accordance with section 4, the module examinations already completed, including the grades, are primarily transferred ex officio, as are individual examinations on the basis of equivalence tables, which are determined by the Examination Board and announced in the usual manner. With the exception of § 21 section 5 of the Examination Regulations, module examinations and examinations not graded with at least "sufficient" (4.0) or "pass" will not be transferred. The module grade is generally not recalculated on the basis of grades for examinations that have only been transferred; exceptions can be found in the equivalence tables.

Issued on the basis of the decision of the Faculty Council of the Faculty of Electrical and Computer Engineering made on 27th February, 2024 and the approval of the Rectorial Board of 28th March, 2024.

Dresden, 26th April, 2024

The Rector
of Technische Universität Dresden

Prof. Dr. Ursula M. Staudinger