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Study Regulations of the Faculty of Physics and Astronomy of the Friedrich Schiller University Jena for the Program Master of Science in Photonics as of 23 February 2023

Pursuant to § 3 (1) in conjunction with § 38 (3) of the Thuringian Tertiary Education Act (ThürHG) of 10 May 2018 (published in GVBl [German legal and regulatory code]: p. 149), as last amended by Article 1 of the Act of 7 December 2022 (GVBl: p. 483), the Friedrich Schiller University Jena decrees the following Study Regulations for the Master of Science in Photonics degree program of the Faculty of Physics and Astronomy. The Council of the Faculty of Physics and Astronomy pronounced the Regulations on 25 January 2023. The Senate of the Friedrich Schiller University Jena approved the Regulations on 21 February 2023. The President approved the Regulations on 23 February 2023.

Contents

§ 1
Applicability

(1) [1]These Regulations specify the goals, content, and structure of the consecutive, research-oriented degree program Master of Science in Photonics of the Faculty of Physics and

Astronomy of the Friedrich Schiller University Jena. [2]It applies in conjunction with the relevant examination regulations (hereinafter referred to as "MPO") in the respective current version and with the study plan and module catalog adopted by the faculty council.

(2) These Regulations also apply to cooperative degree programs offered jointly with other universities on the basis of a cooperation agreement.

§ 2
Admission Requirements

(1) Admission requirements for the Master of Science in Photonics degree program are as follows:

a) graduation from a Bachelor of Science degree program in physics or a related degree program in addition to, in the latter case, the necessary aptitude. The necessary aptitude can be demonstrated by the following examinations totaling 20 CP:

- Examinations totaling 12 credit points (CP) in mathematics (especially analysis, linear algebra, and numerical analysis) with a minimum average grade of 2.0, or evidence of equivalent qualifications based on relevant activities already completed and experience gained in addition to

- Examinations totaling 8 credit points (CP) in the theory of electromagnetic waves (especially electrodynamics and optics) with a minimum average grade of 2.0, or evidence of equivalent qualifications based on relevant activities already completed and experience gained.

b) Evidence of English language proficiency at level B2 of the Common European Framework of Reference for Languages.

c) For applicants within the framework of a cooperative degree program: Admission to the cooperative degree program granted by the respective selection committee

(2) If admission requirements according to § 2(1) are submitted, the Examinations Committee decides on admission to the degree program.

§ 3
Program Length

(1) [1]The standard period of study, including time for the master's examination, is two years. [2]The university ensures that the program can be completed within the standard period of study.

(2) [1]Leaves of absence are not counted towards the standard period of study according to (1). [2]Details are regulated by the Enrollment Regulations of the Friedrich Schiller University Jena.

(3) The degree program is generally suitable for part-time study.

(4) A master's thesis will be prepared at the completion of the degree program.

§ 4
Program Commencement

The master's degree program begins in the winter semester.

§ 5
Distance Learning

(1) [1]The program can be partially completed as distance learning if the corresponding program contents are designated as distance learning compatible ("hybrid course offering") at the time of enrollment. [2]A portion of the degree program must be attended in-person. [3]Details are governed by an administrative regulation.

(2) Parts of the degree program completed as distance learning will be identified as such on the master's diploma.

§ 6
Program Goals

(1) The aim of the master's degree program in Photonics is to prepare students for research-oriented and science-based professional activities in the fields of optics and optical technologies or to provide them with the academic training needed to pursue further educational programs within or outside of the university context.

(2) The students gain in-depth knowledge in experimental and theoretical optics as well as specialized training in multiple subfields of optics.

(3) [1]Upon successful completion of the degree program, students will have acquired the key qualifications necessary for a research-oriented and science-based career field both within and beyond their disciplines (such as social competency and the ability to work in a team). [2]The students will be capable of developing and implementing research concepts specific to their field. [3]In this way, the students will demonstrate their ability to critically evaluate scientific findings, think across disciplines, act responsibly, and analyze and solve complex, interdisciplinary optical problems.

§ 7
Program Structure

(1) [1]The degree program is organized into modules. [2]Individual modules consist of different learning and working formats such as lectures, seminars, practical exercises, independent studies, and exams. [3]Each module forms a learning and examination unit and is documented on the transcript with the corresponding result. [4]A module usually lasts one semester but may also include content from multiple semesters.

(2) [1]The program is divided into the mandatory module areas "Adjustment (Anpassung)" [16 CP], Fundamentals (Grundlagen) [16 CP], and Research Phase (Forschungspraktische Module) [34 CP] and the elective module area Specialization (Spezialisierung) [24 CP]. [2]The program concludes with the master's thesis [30 CP].

(3) [1]The module area "Adjustment (Anpassung)" aims to address the different needs of students entering the master's degree program in order to equip them uniformly for the successful

completion of later program phases. [2]This module area pays special attention to the international orientation of the master's degree program. [3]At the same time, there are significant differences in the entry qualifications of students according to their either natural science-physical or engineering-technical orientation in the preceding bachelor's degree program. [4]This is addressed by special adjustment courses in the module area "Adjustment (Anpassung)", whose composition is determined by the module coordinator individually for each student.

(4) Students choose lectures totaling 24 CP within the modules of the optical elective area Specialization (Spezialisierung).

(5) The degree program provides progressively advanced qualifications and competencies over the course of both academic years.

a) In the first year of study, the following topics will be taught under the themes "Fundamentals (Grundlagen)", "Adjustment (Anpassung)", and "Specialization (Spezialisierung)":

- The fundamentals of modern knowledge in the fields of optics, photonics, solid-state, and laser physics
- The current state of research in selected areas
- In-depth methodological and methodical competencies
- Integrative thinking
- Essential experimentation methods in optics
- Occupation-related practical knowledge
- Conceptual competencies for structuring research fields, application of theories to individual cases, and presentation of results

b) During the second year of study, the following topics will be taught under the themes "Specialization (Spezialisierung)" and "Research Phase (Forschungspraktische Module)":

- Advanced knowledge in further optical elective areas
- Implementation of theoretical, experimental, and methodological foundations in a topic-centered research project
- Planning and conduct of a research project
- Systematic research work in a team
- Writing of a scientific project report
- Presentation of results and moderation

§ 8
Scope and Content of the Program

(1) [1]The program comprises a total of 120 credit points (CP) according to the European Credit Transfer and Accumulation System (ECTS). [2]Sixty credit points are to be obtained each academic year. [3]In accordance with the European Credit Transfer and Accumulation System (ECTS) guidelines, a workload of about 30 hours of both attendance and self-study is assumed for the allocation of one credit point.

(2) [1]The modules of the first year of study serve to provide students with the current state of research in the fields of optics, photonics, solid-state, and laser physics. [2]Additionally, students are familiarized with the latest findings in selected disciplines and the transmission

of research-oriented methodological approaches in the respective elective subject area.

(3) The first year of studies is structured as follows:

- 16 CP from the individually determined mandatory module area of "Adjustment (Anpassung)"
- 16 CP from the offered mandatory module area of "Fundamentals (Grundlagen)"
- 12 CP from the elective module area "Specialization (Spezialisierung)" offered in the summer semester
- 16 CP through the modules Experimental Optics and Internship in the mandatory module area "Research Phase (Forschungspraktische Module)"

(4) In the second year of studies, the acquired skills will be complemented by additional elective modules and applied in research-oriented projects.

(5) The second year of study is structured as follows:

- 12 CP from the elective module area "Specialization (Spezialisierung)" offered in the winter semester
- 18 CP through the Research Lab module in the elective module area "Research Phase (Forschungspraktische Module)"
- 30 CP from the master's thesis module

(6) [1]Module descriptions can be found in the module catalog attached to the study plan. [2]The module descriptions provide information on the module coordinators, prerequisites for participation, applicability, status of a module, learning and work forms, workload and credit points to be earned, and content and qualification objectives of the module as well as the methods of examination and their weighting. [3]Additionally, the module description provides information on the offering frequency of the module and its duration.

(7) The modules are typically offered in English.

§ 9
International Mobility of Students

(1) [1]The faculty is committed to promoting the international mobility of students. [2]To this end, concrete teaching offers are to be developed with selected partner universities that will provide meaningful supplements to the academic program.

(2) When studying abroad, the establishment of an ECTS Learning Agreement before the start of the stay guarantees the recognition of study periods, coursework, and examinations completed outside the scope of the Higher Education Framework Act.

§ 10
Coursework and Examinations

[1]The nature and scope of the coursework and examination requirements for the master's examination are regulated by the Master's Examination Regulations (MPO). [2]The examination formats for the individual module exams and the weighting of partial examinations are announced in the module descriptions in the module catalog. [3]The module coordinator determines the timing of the

examinations. [4]In addition, she/he can determine the extent of examination requirements within the framework of the provisions of § 9 MPO. [5]Examination dates and other stipulations will be announced at the beginning of the module.

§ 11
Admission to Program Segments and Individual Modules

(1) [1]The recommended order for completing the modules is provided by the sample study plan and the module descriptions. [2]Special requirements for admission to the modules are not expected.

(2) The number of participants in individual modules may be limited if this is necessary for objective reasons, particularly due to spatial and equipment limitations.

§ 12
Academic Advising

(1) [1]Academic advisors at the Faculty of Physics and Astronomy are available as experts in the field of optics to provide individual academic counseling. [2]They advise students on subject-specific academic issues so that the students can structure their studies towards achieving their academic goals and complete their studies within the standard period of study.

(2) [1]Furthermore, academic advising is among the responsibilities of all instructors. [2]Students can choose a trusted person from the entire teaching staff of the degree program as a mentor and seek advice from them during their studies regardless of participation in courses taught by that mentor.

(3) If students have questions concerning examination and study regulations, the chairperson of the Examinations Committee, their deputy, or a person appointed by the Examinations Committee can provide advice.

(4) The Central Student Advisory Service of the Friedrich Schiller University Jena is available for non-subject-specific study problems.

§ 13
Program Evaluation and Quality Assurance

(1) [1]The faculty is committed to continuously updating and improving the range of courses offered. [2]The Examinations Committee evaluates the study plan and the range of modules at regular intervals in accordance with § 7(4) of the Master Examination Regulations (MPO), taking into account developments in the field and professional requirements.

(2) [1]In addition, teaching evaluations are conducted every semester in collaboration with the Physics Student Council, discussed with the teachers involved, and assessed by the faculty council. [2]The aim of these evaluations is to optimize the individual courses and improve the master's program's overall manageability, particularly in terms of student acceptance and course content, and to ensure the possibility of completion within the standard period of study.

§ 14
Non-Discrimination Provision

Status and functional designations in these Regulations apply equally to men, women, and individuals who do not identify with either gender regardless of these designations' German grammatical gender.

§ 15
Entry into Force, Abrogation, and Transitional Provisions

(1) [1]These Regulations come into effect on 1 October 2023 after their publication in the Official Bulletin (Verkündungsblatt) of the Friedrich Schiller University Jena. [2]They apply to all students who commence their studies in the Master of Science in Photonics degree program during or after the winter semester of 2023/24.

(2) [1]At the same time, the Study Regulations of the Faculty of Physics and Astronomy of the Friedrich Schiller University Jena for the Master of Science in Photonics degree program dated 18 May 2009 (published in the Official Bulletin (Verkündungsblatt) of the Friedrich Schiller University Jena, Nr. 13/2009, p. 1247), as last amended by the First Amendment of 16 January 2013 (Official Bulletin of the Friedrich Schiller University Jena, Nr. 1/2013, p. 12), will be repealed. [2]In deviation from Sentence 1, the previously effective Study Regulations for the Master of Science in Photonics degree program will continue to apply for students of the Master of Science in Photonics degree program who commenced their studies prior to the entry into force of these Regulations.

Jena, 23 February 2023

Prof. Dr. Walter Rosenthal

President of the Friedrich Schiller University Jena