

These examination regulations have been worded carefully to be up to date; however, errors cannot be completely excluded. The official German text available at the Examinations Office is the version that is legally binding.

Note: For students who started their studies before the latest amendment came into effect, please also note the previous amendments with their transitory provisions.

**Degree Programme and Examination Regulations for the
Elite Master's Degree Programme
Advanced Optical Technologies
at the Faculty of Engineering of Friedrich-Alexander-Universität
Erlangen-Nürnberg
Dated 2 October 2007**

amended by statutes of
3 September 2009
11 August 2010
9 March 2011
26 July 2013
8 July 2014
8 March 2016

Based on Section 13 (1)(2), Section 43 (5), Section 61 (2)(1) of the Bavarian Higher Education Act (Bayerisches Hochschulgesetz, BayHSchG), Friedrich-Alexander-Universität Erlangen-Nürnberg enacts the following examination regulations:

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Part 1: General Conditions

Preamble

Friedrich-Alexander-Universität Erlangen-Nürnberg offers an Elite Master's degree programme in Advanced Optical Technologies (MAOT) as part of the Elite Network of Bavaria.

Section 34 Scope

The degree programme and examination regulations for the Elite Master's degree programme in Advanced Optical Technologies complement the current version of General Examination Regulations for the Bachelor's and Master's degree programmes at the Faculty of Engineering of Friedrich-Alexander-Universität Erlangen-Nürnberg (**AB-MPO/TechFak**) from 18 September 2007.

Section 35 Standard Duration of Studies, ECTS Credits

¹120 ECTS credits shall be required in order to pass the Elite Master's degree programme Advanced Optical Technologies. ²The standard duration of studies shall be four semesters.

Section 36 Degree Title for the Elite Master's Degree Programme

The student is conferred the degree Master of Science (abbreviated MSc) after passing the Master's examination.

Section 37 Bilingualism

¹The teaching and examination language of the Elite Master's degree programme in Advanced Optical Technologies shall generally be English. ²Oral examinations shall be conducted in either English or German as agreed beforehand between the student and the examiner. ³The Master's thesis shall usually be written in English. ⁴Exceptions shall require the Examination Committee's approval.

Section 38 Admissions Committee, Examinations Committee

(1) ¹An Admissions Committee shall be established to admit qualified students. ²It shall consist of the speaker of the degree programme and a representative from each of the six specialisation areas of the MAOT. ³The representatives shall be university lecturers or full-time research associates; at least two of these shall be professors. ⁴The members shall be appointed by the Faculty Council of the Faculty of Engineering for a term of office of three years. ⁵The Admissions Committee shall elect a chairperson and a deputy chairperson. ⁶The degree programme manager may attend the meetings upon invitation from the chairperson.

(2) The Admissions Committee shall be responsible for the review of qualification and admission requirements for the Elite Master's degree programme according to Section 39.

(3) The Admissions Committee shall carry out the Examination Committee's tasks set forth in Section 8 of **ABMPO/TechFak** for the Elite Master's degree programme.

Section 39 Qualification for the Elite Master's Degree Programme

(1) ¹The qualification requirements for a Master's degree shall be a degree in a relevant engineering or science discipline with above-average grades as well as passing the qualification assessment process according to **Appendix 2**. ²Completed Bachelor's degrees in physics, optical technologies or electrical engineering shall generally be con-

sidered relevant. ³The same applies for degrees obtained at a faculty of engineering or sciences for which at least 20 ECTS credits had to be achieved in the areas of optics or optical technologies. ⁴The Admissions Committee can grant admission under the condition that proof of further achievements worth up to a maximum of 20 ECTS credits and to be determined by the Admissions Committee be submitted within one year of taking up the Master's degree programme.

(2) Certificates for the following may be submitted as proof of the university degree:

1. a Bachelor's, Master's or Diplom examination at a German or foreign university or
2. a Bachelor's, Master's or Diplom examination at a German university of applied sciences
3. other university degrees that are equivalent to the qualification specified in point 1

(3)¹Paragraph 2 notwithstanding, students enrolled in a Bachelor's degree programme may be admitted to a Master's degree programme if they have achieved at least 140 ECTS credits and make a request stating reasons. ²Proof of the successfully completed Bachelor's degree shall be submitted at the latest within one year of beginning the degree programme; completing the Bachelor's degree is a prerequisite for formally starting the Master's degree. ³Admission to the Master's degree programme shall be granted with reservations.

(4) The application for admission to the Elite Master's degree programme shall be submitted to the Admissions Committee in due time together with all documents listed in **Appendix 2**.

Section 40 Structure of the Elite Master's Degree Programme

¹The Elite Master's degree programme shall comprise 16 modules as listed in **Appendix 1**. ²The modules M4–M12 shall be chosen from at least two of the major topics listed in **Appendix 1**. ³In this respect, at least four modules shall be selected for one of the chosen major topics and at least three modules for another major topic; a maximum of two further modules can be replaced by modules offered by FAU's Faculty of Engineering, Faculty of Sciences or Faculty of Medicine on condition that the Degree Programme Committee confirms that the subject of these modules sufficiently conforms with one of the student's chosen major topics. ⁴The two practical courses in the module M12 shall be completed in the major topics chosen according to Sentence 3 (1). ⁵The modules M1 and M2 shall be completed by the end of the second semester by all students; otherwise the Master's degree programme shall be regarded as having been failed at the final attempt, unless the reasons for failing to complete the modules in due time are beyond the student's control.

Section 41 Choice of Major Topics

¹Students shall inform the Admissions Committee about the major topics they intend to choose by the beginning of the lecture period of the second semester (modules M4–M12). ²The Admissions Committee shall be notified in case of a change after this deadline. ³The choice of major topics according to Sentence 1 and the change of major topics according to Sentence 2 shall be regarded as permitted unless the Admissions Committee objects within a four-week deadline.

Section 42 Examination and Coursework Achievements

¹The examination and coursework achievements shall serve to prove that students possess the required expertise to successfully complete a module. ²The nature and the ex-

tent of the examination and coursework achievements are shown in the module plan in **Appendix 1**. ³Section 16 (1)(2) **ABMPO/TechFak** applies.

Section 43 Research Project

(1) ¹Students shall carry out a research project and write a research project report in the module group M15. ²The research project enables students to learn to solve problems independently. ³Students shall register their projects with the MAOT office and the written report shall be submitted to the office by the given deadline. ⁵The research project shall have a workload of approximately 300 hours. ⁶The research project period should generally not exceed six months.

(2) The research project shall preferably be carried out in one of the major topics chosen according to Section 40 (2) and (3) and supervisors shall preferably be lecturers teaching the subject in question.

Section 44 Internship

¹The internship shall have a minimum duration of five weeks and shall preferably be completed in a research area at FAU's Faculty of Engineering, Faculty of Sciences or Faculty of Medicine that is relevant to the degree programme. ²If the internship is completed outside the University of Erlangen-Nürnberg, the internship guidelines set forth by MAOT shall apply.

Section 45 Admission to the Master's Thesis

(1) Students shall pass modules worth 80 ECTS credits to gain admission to the Master's thesis.

(2) ¹In justified, exceptional cases, the Admissions Committee shall be entitled to grant admission to the Master's thesis early. ²Proof of obtaining the missing credits shall be submitted during the period for thesis work.

Section 46 Master's Thesis

(1) ¹The Master's thesis is supposed to demonstrate students' ability to solve problems in one of their major topics independently. ²Requirements for the thesis shall be such that it can be completed with a workload of approximately 900 hours within six months. ³The Master's thesis shall include a presentation on the results of the thesis followed by a discussion. ⁴The date of the presentation shall be determined by the supervising lecturer either after the student has submitted their Master's thesis or during the final stage of thesis work.

(2) ¹The Master's thesis shall preferably deal with a scientific subject at the intersection of two of the student's major topics. ²The subject of the Master's thesis shall be allocated by a full-time university lecturer teaching the degree programme who represents one of the chosen major topics.

Section 47 Evaluation of Achievements in the Master's Degree Programme, Termination of the Degree Programme

(1) The final academic record shall list all of the student's modules including

1. the examination and coursework achievements
2. the subject of the Master's thesis

and the corresponding grades or a comment if the module is ungraded.

(2) The Master's degree programme shall have been passed if all modules of the module groups M1–M16 have been passed.

(3) ¹The final grade of the Master's degree programme shall be calculated from the grades of the modules M1 and M2, M4 to M12, M14 and M16. ²The module grades shall be weighted according to the modules' ECTS credits. ³The grades within a module shall be calculated from all graded examination and coursework achievements, which shall be weighted according to the ECTS credits of the relevant course or lecture.

(4) The examination achievements in modules M1 to M2 of the first semester can be repeated twice; the examination achievements in modules M4 to M12 can be repeated once.

(5) ¹Students who must terminate the Elite degree programme due to the provision in Paragraph 4 shall be granted admission to a Master's degree programme at FAU's Faculty of Engineering if their university degree fulfils the degree programme's admission requirements according to Section 39 (2)(1) to (2)(3). ²Examination and coursework achievements from the Elite degree programme shall be recognised in the degree programmes unless the relevant degree programme and examination regulations state otherwise. ³The relevant Master's degree programme shall be determined by the Degree Programme Committee with the approval of the degree programme representatives on the Degree Programme Committee.

Part 2: Concluding Provisions

Section 48 Legal Validity and Transitory Provisions

(1) ¹These degree programme and examination regulations shall come into effect on the day after their publication. ²They shall apply to all students who enter the Elite Master's degree programme 'Advanced Optical Technologies' in the winter semester 2007/2008 or later.

(2) ¹The amendment statute of 11 August 2010 shall come into effect on 01 October 2010. ²It shall apply to students who enter the Elite Master's degree programme in the winter semester 2010/2011 onwards.

Appendix 1: Major topics

- Optical Metrology
- Optical Material Processing
- Optics in Medicine
- Optics in communication and IT
- Optical Materials and Systems
- Computational Objects
- Physics of Light

Appendix 1

Module	Subject	Lecture SWS (semester hours)	Practical SWS	Semester	ECTS credits	Achievements	ECTS/module
M1	Fundamentals of optics	8	4	1	15	PfE: EA (written examination 120 min.) and EA (oral examination 30 min.)	15
M2	Basics of laser	2	2	1	5	PfE: EA (written examination 90 min.) and CA: laboratory course achievement (laboratory report; 5–7 pages)	5
M3	Tools for numerical solutions	2	-	1	2.5	PfE: CA: (seminar achievement: 3 presentations and homework)	5
	Topics of optical technologies	2	-	1	2.5		
M4	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M5	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M6	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M7	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M8	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M9	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M10	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M11	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M12	Subject 1 ¹	2	2	2/3	5	EA (according to module handbook)	5
M13	Lab course 1	-	2	2/3	2.5	CA (laboratory course achievement: laboratory reports)	5
	Lab course 2	-	2	2/3	2.5		
M14	Research project	approx. 300 h in 6 months		1/2/3	10	EA (seminar achievement: written assignment (project report))	10
M15	Internship	min. 5 weeks		2/3	5	CA (internship certificate)	5
M16	Master's thesis with presentation	approx. 900 h in 6 months + presentation of approx. 30 min.		4	30	Master's thesis (90%) and presentation (approx. 30 min.; 10%)	30
							$\Sigma = 120$

PfE = portfolio examination (Portfolioprüfung); CA = coursework achievement (Studienleistung); EA= examination achievement (Prüfungsleistung)

¹ The subject combination follows from the choice from the seven major topics according to Section 40 (3); the corresponding examination achievements are determined in the module handbook.

Appendix 2: Qualification Assessment Process

(1) ¹Applicants for admission to the Master's degree programme shall submit the following documents to the Committee:

1. A certificate according to Section 39 (2) with a final grade of at least 2.0 or proof showing that the applicant belongs to the top 15 percent of their class.
2. An English-language CV with proof of any relevant professional activity or placements which are relevant with regard to the subject of the Master's degree programme.
3. An application form completed in English (available on the MAOT website or from the MAOT office).
4. If the student's first language is not English: proof of English language proficiency at least at level B2 (Common European Framework of Reference for Languages) in the form of school, university or language course certificates; the determination of equivalence is based on recommendations by the University's Language Centre.

²If 1. applies, the Admissions Committee can set a deadline for the subsequent submission of the documents.

(2) ¹Applications shall be submitted so as to arrive at the MAOT office by 15 April for foreign applicants and by 15 July for German applicants. ²The Admissions Committee may grant an extension of this deadline upon request.

(3) ¹Applicants with a degree within the meaning of Section 39 (2) or in the case of Section 39 (3) with an average grade of their achievements to date of 2.0 (= gut, good) or better or an average module grade in the areas of optics and optical technologies of 2.5 (= gut, good) or better shall be invited to a 20-minute interview, which may also be conducted via video phone. ²It shall be conducted by at least one member of the Admissions Committee and an observer. ³In the interview, the applicant shall outline their qualifications and previous papers on subjects relevant to the degree programme and answer questions regarding their papers and topics relevant to the Elite degree programme at an appropriate level. ⁴The applicant's qualification for the Elite degree programme will be assessed based on:

1. previous knowledge in physics, in particular in the areas of electromagnetism and optics (50%),
2. knowledge of mathematical processes required for these areas, such as matrix operations and complex numbers (20%) and
3. knowledge of important technical applications, in particular lasers and optical fibres (30%).

(4) The Admissions Committee may admit students with conditions, particularly the subsequent submission of a qualified university degree within one year of taking up the degree programme.

(5) ¹The Admissions Committee shall notify applicants of the result of the qualification assessment process. ²A rejection notification shall include reasons and information on the legal remedies available. ³A repetition of the qualification assessment process on the basis of the documents submitted for the first application shall not be permitted.

(6) ¹The qualification assessment process shall be adjusted to take into account the nature and extent of a student's disability. ²Students with a doctor's certificate showing credibly that they are either in part or fully incapable of sitting the examination in the intended manner due to long-term or permanent physical disabilities shall be entitled to have the permission of the chairperson of the Admissions Committee to offset this disadvantage by a corresponding extension of their working time or by the examination process being structured differently.