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.

Please 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 Master's Degree Programme 'Advanced Materials and Processes' (MAP) of the Elite Network of Bavaria at the Faculty of Engineering at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)
– FPO MAP –
Dated 15 May 2006

amended by statutes of
9 March 2011
30 July 2013
13 March 2017
15 January 2019

With reference to Section 13 (1) in conjunction with Sections 43 (5), 58 (1) and 61 (2) of the Bavarian Higher Education Act (BayHSchG), FAU passes the following degree programme and examination regulations:

Preamble
As part of the Elite Network of Bavaria (ENB), FAU, the University of Bayreuth and the University of Würzburg offer an Elite degree programme in the field of 'Advanced Materials and Processes' taught in English.

Section 1
Scope

(1) [1]The degree programme and examination regulations shall govern admission to the Elite Network of Bavaria Master's degree programme 'Advanced Materials and Processes' and the examinations required for successfully completing the degree programme. [2]They complement the current version of the General Examination Regulations for the Bachelor's and Master's Degree Programmes of the Faculty of Engineering at FAU **– ABMPO/TechFak –** dated 18 September 2007 as amended from time to time.

Section 2
Degree Title

[1]The degree title 'Master of Science' (abbreviated as MSc) shall be awarded to students who pass the Master's examination. [2]The degree may also be used with the addition '(FAU Erlangen-Nürnberg)'.

Section 3
Qualification for Admission to the Elite Degree Programme

(1) [1]The qualification requirements for the Master's degree programme 'Advanced Materials and Processes' shall be a degree with an above-average final grade that meets the requirements specified in Section 29 (1)(1) **ABMPO/TechFak** in chemical and biological engineering or materials science or a related subject (in particular life science engineering, medical engineering, biotechnology) and passing the qualification assessment process according to **Appendix 3** in conjunction with **Appendix ABMPO/ TechFak**. [2]Section 12 (3) **ABMPO/TechFak** shall apply accordingly to degrees graded using a different grading system.

(2) [1]Applicants should have completed this degree with an overall grade of at least 2.00 (good). [2]Section 12 (3) sentences 1 to 3 of **ABMPO/TechFak** shall apply accordingly.

Section 4
Joint Admissions Committee

(1) [1]An Admissions Committee shall be formed pursuant to Section 11 **ABMPO/ TechFak** to review whether applicants meet the qualification and admission requirements for the Elite Master's degree programme pursuant to Section 3. [2]The committee shall be made up of one professor involved in the teaching of the Elite degree programme for each of the areas of chemical and biological engineering, and materials science and one research associate from each of these areas.

(2) The members shall be appointed by the Faculty Council of the Faculty of Engineering for a term of office of three years based on the proposal of the steering committee for the degree programme; re-election shall be permitted.

(3) The members of the joint admissions committee shall elect one of their members to the position of chairperson and one as deputy chairperson.

Section 5
Scope and Structure of the Degree Programme, Start of Degree Programme, Teaching and Examination Language

(1) [1]The degree programme consists of 17 modules worth 120 ECTS credits in total according to **Appendix 1.** [2]The courses to be taken in modules 1–4 are determined in an individual study plan for each student.

(2) [1]At the beginning of the first semester, the Admissions Committee shall determine the fundamentals (M1–M4) to be completed by each individual student according to the module handbook. [2]The module descriptions of the chosen modules must demonstrate that students acquire more advanced knowledge within the context of the learning outcomes of the Master's degree programme Advanced Materials and Processes (MAP) than compared to their previous Bachelor's degree programme.

(3) [1]In the MAP Elite degree programme, students must choose two of the following four focal subjects (M5–M8):

- Advanced processes
- Biomaterials and bioprocessing
- Computational materials science and process simulation
- Nanomaterials and nanotechnology.

[2]The focal subjects shall be chosen at the latest by the end of the first semester.

(4) The degree programme may only be started in the winter semester.

(5) [1]Notwithstanding Section 4 (5) **ABMPO/TechFak**, the teaching and examination language of the Elite degree programme Advanced Materials and Processes is English. [2]Section 4 (4) **ABMPO/TechFak** applies with the provision that individual courses and examinations in (compulsory) elective subjects may also be held in German.

Section 5a
Compulsory Elective Modules M9–M12

(1) [1]The first learning outcome of the compulsory elective modules M9–M12 is to give students the opportunity to explore two of the four focal subjects pursuant to Section 5 (3)(1) in more depth. [2]The second learning outcome of the modules is methodological, training students in interdisciplinary approaches. [3]Thirdly, the element of choice gives students the opportunity to create their own particular profile in view of their future career.

(2) [1]The type and scope of the examination are dependent on the skills for the chosen module according to (1) and **Appendix 1** or the module handbook. [2]Graded work may take the form of an oral examination (45 minutes) or a written examination (120 minutes). [3]The module catalogue is announced before the beginning of the semester in accordance with local practice.

(3) The compulsory elective modules generally consist of either two lectures (2 SWS) and two practicals (1 SWS); two lectures (2 SWS), one practical (1 SWS) and one seminar (1 SWS); or three lectures (3 SWS) and one practical (1 SWS). [SWS = semester hour]

Section 6
Master's Degree Examinations

[1]Graded and non-graded work serves to prove that students possess the required expertise to successfully complete a module. [2]The type and scope of the graded and non-graded work are set out in **Appendix 1**.

Section 7
Registration for the Master's Examination

[revoked]

Section 8
Admission Requirements for the Master's Thesis

Modules 1–16 must be completed successfully for students to gain admission to the Master's thesis.

Section 9
Master's Thesis

(1) [1]The student shall register for the Master's thesis after successfully completing modules 1–16. [2]Exceptions are only permitted in exceptional circumstances (e.g. partaking in the additional qualifications according to Section 11 in conjunction with **Appendix 2**).

(2) [1]The Master's thesis is intended to demonstrate students' ability to solve problems independently in a relevant current area of research. [2]The Master's thesis includes an oral presentation followed by a discussion on the results of the thesis. [3]The date for the oral presentation shall be set by the supervisor.

(3) The topic for the Master's thesis shall be issued by a professor or a researcher who is eligible to act as an examiner and who teaches in the Elite degree programme Advanced Materials and Processes of the Elite Network of Bavaria or at the Departments of Materials Science or Chemistry and Biological Engineering.

(4) The Master's thesis shall be written in English.

Section 10
Evaluation of Achievements in the Master's Degree Programme, Resitting Examinations

(1) The Master's degree programme has been passed when the modules M1–M16 have been passed and the Master's thesis (Module 17) including presentation is evaluated as at least 'ausreichend' (sufficient).

(2) The overall grade for the Master's degree programme is calculated from the average of the grades for modules M5–M13, M15 and M17 weighted according to Section 18 (7) **ABMPO/TechFak**.

(3) [1]There are only limited possibilities to resubmit graded and/or non-graded work in the Advanced Materials and Processes Elite degree programme graded 'nicht ausreichend' (unsatisfactory). [2]Notwithstanding Section 28(1) in conjunction with Section 33 **ABMPO/TechFak**, graded and non-graded work for modules M1–M17 may only be resubmitted once.

Section 11
Additional Qualifications Research Focus and Industry Focus

(1) [1]Students enrolled on the Master's degree programme Advanced Materials and Processes may also complete the additional qualifications Research Focus or Industry Focus parallel to their degree programme. [2]By successfully completing the additional qualifications, students can show evidence of in-depth qualifications relating to academic working (Research Focus) or industry-related qualifications (Industry Focus).

(2) [1]The additional qualification Research Focus comprises four modules with ECTS credits as follows:
- M18: Free specialisation, preferably with a scientific and technical focus (5 ECTS)
- M19: Science-oriented soft skills (5 ECTS)
- M20: Research-oriented mini project (10 ECTS)
- M21: Research internship in industry, non-university institutes or universities (10 ECTS).

[2]The additional qualification Industry Focus comprises four modules with ECTS credits as follows:
- M22: Free specialisation, preferably with a technical or business focus (5 ECTS)
- M23: Soft skills for the work environment (5 ECTS)
- M24: Research-oriented mini project (10 ECTS)
- M25: Industrial internship (10 ECTS).

[3]Further information on the modules and on the type and scope of examinations can be found in **Appendix 2**. [4]These examination regulations shall apply in conjunction with **ABMPO/TechFak** to registering for examinations, withdrawal, breach of regulations, fraud and assessment. [5]For resit examinations Section 10 (3) shall apply accordingly. [6]Module 13 must be completed successfully before students are admitted to the examinations for Modules M20 and M24.

(3) [1]Modules M18 and M22 are free specialisation modules which must be chosen from the modules offered at FAU or the partner universities in Würzburg and Bayreuth and have a preferably scientific and technical focus (M18) or a preferably technical or business focus (M22). [2]The learning outcome of the free specialisation modules is to acquire additional knowledge and skills in a new subject area or to gain a more in-depth understanding of a topic already included in the MAP curriculum by attending an advanced course. [3]Notwithstanding (2)(3), the type and scope of teaching units and examinations depend on the specific manner in which the respective module is taught and are regulated by the applicable **degree programme and examination regulations** and/or the module handbook.

(4) [1]After successfully completing the module examinations stipulated in (2)(1) or (2)(2), the student is granted a certificate in Additional research qualifications or Additional qualifications for business and industry stating the successfully completed achievements including ECTS credits and grades for the modules. [2]These achievements are not listed separately in the transcript of records. [3]If not all modules required for the additional qualification are completed successfully, the achievements the student has obtained are shown in a separate section of the transcript of records. [4]If the student files a request with the Examinations Office at the latest eight weeks before certificates are issued, results of the modules for the additional qualification may be omitted from the final certificate.

Section 12
Master's Thesis

[revoked]

Section 13
Evaluation of Achievements

[revoked]

Section 14
Legal Validity

(1) These degree programme and examination regulations shall come into effect on the day after their publication.

(2) [1]The fourth amendment statute shall come into effect on the day after its publication. [2]It shall apply to all students starting the degree programme from the winter semester 2019/2020 onwards. [3]Notwithstanding sentence 2, the changes in **Appendix 1** relating to the changes to Modules M5 to M8 also apply to all students who started to study from winter semester 2018/2019 and who have not yet commenced examination proceedings for the relevant module.

Appendix 1: Study plan

Module groups	No.	Module		SWS (semester hours)		ECTS credits	1st sem.	2nd sem.	3rd sem.	4th sem.	Type and scope of graded and non-graded work
				L+T	P	ECTS credits	ECTS credits	ECTS credits	ECTS credits	ECTS credits	
Fundamentals (20 ECTS credits)	M1	Compulsory elective I		2+1		**5**	5				NGW (W 90min)
	M2	Compulsory elective II		2+1		**5**	5				NGW (W 90min)
	M3	Compulsory elective III		2+1		**5**	5				NGW (W 90min)
	M4	Compulsory elective IV		2+1		**5**	5				NGW (W 90min)
Basics (20 ECTS credits)	**M5**	**Advanced processes**				**5**					GW (W 120min or W 60min) [2]
	M5a	-Advanced processes I		2			2.5				
	M5b	-Advanced processes II		2				2.5			
	M6	**Biomaterials and bioprocessing**				**5**					GW (W 120min or W 60min) [2]
	M6a	-Biomaterials and bioprocessing I		2			2.5				
	M6b	-Biomaterials and bioprocessing II		2				2.5			
	M7	**Computational materials science and process simulation (CMSPS)**				**5**					GW (W 120min or W 60min) [2]
	M7a	-CMSPS I		2			2.5				
	M7b	-CMSPS II		2				2.5			
	M8	**Nanomaterials and nanotechnology**				**5**					GW (W 120min or W 60min) [2]
	M8a	-Nanomaterials and nanotechnology I		2			2.5				
	M8b	-Nanomaterials and nanotechnology II		2				2.5			
Focal subject A [1] (15 ECTS credits)	M9	Focal subject A		4+2		**7.5**		7.5			[1]
	M10			4+2		**7.5**			7.5		[1]
Focal subject B [1] (15 ECTS credits)	M11	Focal subject B		4+2		**7.5**		7.5			[1]
	M12			4+2		**7.5**			7.5		[1]
Mini project (10 ECTS)	M13				8	**10**			10		GW (AT: written elaboration)
Scientific skills I (2.5 ECTS credits)	M14	General laboratory course			2	**2.5**	2.5				NGW (PT: series of reports)
Scientific skills II (2.5 ECTS credits)	M15	Literature review		2		**2.5**			2.5		GW (AT: written elaboration)
Soft skills (5 ECTS)	M16	Soft skills, excursions		4		**5**		2.5	2.5		GW [3]
Master's thesis (30 ECTS)	M17	Master's thesis	Colloquium			**30**				3	GW (presentation 30min) and GW (Master's thesis) [4]
			Master's thesis							27	
Total semester hours and ECTS credits:				**58**	**10**	**120**	**32.5**	**27.5**	**30**	**30**	

GW = graded work,
NGW = non-graded work,
PT = practical task pursuant to Section 6(3) **ABMPO/TechFak**,
AT = assessed task pursuant to Section 6(3) **ABMPO/TechFak**,
W xmin= written examination x minutes,
o xmin = oral examination x minutes.

[1] cf. Section 5a.
[2] For their graded work, students may choose between a 120-minutes written examination (combination examination) or two partial examinations of 60 minutes each in the individual subject areas (e.g. M5a and M5b).
[3] The type and scope of the examinations depend on the specific manner in which the chosen module is taught; see module handbook for details.
[4] cf. § 32 **ABMPO/TechFak**.

Appendix 2: Additional qualifications within the meaning of Section 11

Additional qualifications *Research Focus*										
Module groups	**No.**	**Module**	**SWS (semester hours)**		**ECTS credits**	**1st sem.**	**2nd sem.**	**3rd sem.**	**4th sem.**	**Type and scope of graded and non-graded work**
			L+T	**P**	**ECTS credits**	**ECTS credits**	**ECTS credits**	**ECTS credits**	**ECTS credits**	
Free specialisation pursuant to Section 11 (3) (5 ECTS credits)	M18	see Section 11 (3)	2+1		**5**		5			see Section 11 (3)
Soft skills	M19	Science-oriented soft skills in addition to what is offered in M14	4		**5**		5			NGW [1)]
Mini project 2	M20	Research-oriented mini project		8	**10**			10		GW (AT)
External internship	M21	Research internship in industry, non-university institutions or universities (in Germany or abroad) of at least 12 weeks			**10**			10		NGW: (PT)
		Total semester hours and ECTS credits	**7**	**8**	**30**		**10**	**20**		

GW = graded work,
NGW = non-graded work,
AT = assessed task pursuant to Section 6(3) **ABMPO/TechFak**,
PT = practical task pursuant to Section 6(3) **ABMPO/TechFak**.

[1)] The type and scope of the examinations depend on the specific manner in which the chosen module is taught; see module handbook for details.

Additional qualifications *Industry Focus*										
Module groups	**No.**	**Module**	**SWS (semester hours)**		**ECTS credits**	**1st sem.**	**2nd sem.**	**3rd sem.**	**4th sem.**	**Type and scope of graded and non-graded work**
			L+T	**P**	**ECTS credits**	**ECTS credits**	**ECTS credits**	**ECTS credits**	**ECTS credits**	
Free specialisation pursuant to Section 11 (3) (5 ECTS credits)	M22	see Section 11 (3)	2+1		**5**		5			see Section 11 (3)
Soft skills	M23	Soft skills for the work environment; in addition to what is offered in M14	4		**5**		5			NGW [1)]
Mini project 2	M24	Application-oriented mini project		8	**10**			10		GW (AT)
External internship	M25	Industrial internship of at least 12 weeks			**10**			10		NGW (PT)
		Total semester hours and ECTS credits	**7**	**8**	**30**		**10**	**20**		

GW = graded work,
NGW = non-graded work,
AT = assessed task pursuant to Section 6(3) **ABMPO/TechFak**,
PT = practical task pursuant to Section 6(3) **ABMPO/TechFak**.

[1)] The type and scope of the examinations depend on the specific manner in which the chosen module is taught; see module handbook for details.

Appendix 3: Qualification assessment process

(1) The qualification of applicants for the Elite Master's degree programme shall be assessed by the joint Admissions Committee.

(2) Applications for admission to the qualification assessment process shall be submitted to the chairperson of the Admissions Committee by 1 June for the following winter semester of that year.

(3) The application shall include:

1. CV in tabular form, with a recent photo, listing all qualifications from school and university and, if applicable, all work experience, without any gaps.
2. Documents showing fulfilment of admission requirements according to Section 3.
3. If the applicant did not acquire their higher education entrance qualification or relevant undergraduate degree in English: Proof of English language skills equivalent at least to Level B2 of the Common European Framework of Reference (CER) for languages or equivalent proof of English language skills (for example TOEFL test, at least 85 points in iBT).
4. If applicable, other qualifications of relevance to the degree programme e.g. proof of completed modules in scientific or research-related studies (minimum 7.5 ECTS credits), proof of completed modules with an explicit engineering focus (minimum 7.5 ECTS credits) or proof of internships in a scientific or technical environment (minimum 3 months full-time) or similar qualifications.

(4) [1]The Admissions Committee shall carry out a preselection based on the submitted documents as part of the qualification assessment process to assess whether an applicant qualifies for the Master's degree programme. [2]Applicants with a degree within the meaning of Section 29 **ABMPO/TechFak** in conjunction with Section 3 (1) or in the case of Section 29 (3) **ABMPO/TechFak** with an average grade of 2.0 (='gut', good) or better in their achievements to date shall be invited to an interview lasting at least 20 minutes, which may also be conducted via video conference. [3]Section 12 (3) sentences 1 to 3 **ABMPO/TechFak** shall apply accordingly for qualifications with a differing grading system. [4]Applicants with a degree within the meaning of Section 29 **ABMPO/TechFak** in conjunction with Section 3 (1)(1) or in the case of Section 29 (3) **ABMPO/TechFak** with an average grade of 2.01 to 2.20 (='gut', good) or better in their achievements to date shall be invited to an interview if they can provide evidence of other qualifications relevant to the Elite Master's degree programme within the meaning of Section 3 (4). [5]The remaining applicants will receive a notification of rejection; this will specify the reasons for rejection and provide information on available legal remedies. [6]The interview shall be conducted by at least two members of the Admissions Committee. At least one member must come from the area of materials science and one member from the area of chemical and biological engineering. [7]The interview shall be held in English. [8]In the interview, the applicant shall outline and defend their qualifications and previous work on subjects relevant to the degree programme and answer technical questions regarding topics relevant to the Elite degree programme at an appropriate level. The suitability of applicants for the Elite degree programme shall be assessed on the basis of the following criteria:

1. Quality of basic knowledge in chemical and biological engineering or materials science (weighting 40 %)
2. Quality of subject knowledge acquired through voluntary internships or lectures attended during the Bachelor's degree programme as the basis for a future specialisation in two of the four focal subjects in the Master's degree programme. Applicants are expected to be able to use their fundamental knowledge of chemical and biological engineering or materials sciences to identify connections to the respective focal subjects. The focal subjects for the interview will be chosen by the applicant (weighting 40 %).

3. The ability to deal with interdisciplinary problems in the areas of chemical and biological engineering and materials sciences and develop suggestions for solutions (weighting 20 %).

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

(6) Confirmation of passing the qualification assessment process shall remain valid indefinitely, provided the Master's degree programme has not been changed significantly.

Appendix 4: Glossary

Allgemeine Fächer	Basics
Externes Praktikum (Industrie)	Internship (industry)
Externes Praktikum (Wissenschaft)	Internship (research)
Grundlagenfächer	Fundamentals
Klausur (K)	Written examination
Masterarbeit	Master's thesis
Miniprojekt	Mini project
Mündliche Prüfung	Oral examination
Praktikumsleistung (PrL)	Practical task
Prüfungsleistung (PL, benotet)	Graded work
Schriftliche Ausarbeitung	Written elaboration
Schwerpunkt A	Focal subject A
Schwerpunkt B	Focal subject B
Seminarleistung (SeL)	Assessed task
Soft-Skills / Schlüsselqualifikationen	Soft skills
Studienleistung (SL)	Non-graded work
Vortrag	Oral presentation
Wahlmodul	Free specialisation
Wissenschaftsskills I – Laborpraktikum	Scientific skills I – lab course
Wissenschaftsskills II – Literaturrecherche	Scientific skills II – literature review
Zusatzstudien Industrie	Additional qualifications for business and industry / industry focus
Zusatzstudien Wissenschaft	Additional research qualifications / research focus