Subject-specific examination regulations for the Master's program "Industrial Mathematics and Data Analysis" at the University of Bremen

The Faculty Council of the Faculty 3 (Mathematics / Computer Science) has decided the following regulations on February 9, 2022, in accordance with § 87 sentence 1 number 2 of the Bremen University Act (German: Bremisches Hochschulgesetz; abbreviation: BremHG) in conjunction with § 62 BremHG in the version announced May 9, 2007 (incl. amendments as well as corrections).

These subject-specific examination regulations apply in conjunction with the General Part of the Examination Regulations for Master's degree programs (abbreviation: AT MPO) at the University of Bremen dated January 27, 2010, in the currently valid version.

§ 1

Scope of study and degree

(1) For the successful completion of the Master's program "Industrial Mathematics and Data Analysis" (in short: "Industrial Mathematics"), a total of 120 credit points (CP) according to the European Credit Transfer and Accumulation System (ECTS) must be acquired. This corresponds to four semesters of regular study.

(2) On the basis of the successful completion of the Master's examination, the degree

Master of Science
(abbreviated M.Sc.)

will be awarded. The successfully completed area of focus will be designated on the transcript of records and the following note will be added to the Examination Certificate: "The courses in the area of Mathematics is offered in English. The applied subject can be completed in English or German, depending on individual choice."

§ 2

Curriculum structure, modules and credit points

(1) The Master's program "Industrial Mathematics and Data Analysis" is offered as a Master's program according to § 4 article 1 sentence 1 AT MPO. This includes the study of a "Technical Application Subject" designated in accordance with Appendix 2.5, to the extent of 12 CP.

(2) The "Area of Focus" can be "Data Analysis" or "Industrial Mathematics", where one of these two must be chosen. The area of focus that is not selected forms the area "Extension". An already selected area of focus can be changed upon a formal and justified request to the examination board.

(3) The study program is structured, regardless of the chosen area of focus, as follows:

a) Master's Thesis (Master Thesis), 30 CP;
b) Foundations with compulsory modules and a total of 33 CP;
c) Area of Focus with 27 CP, of which 18 CP are compulsory modules and 9 CP are compulsory elective modules;
d) Extension with compulsory modules and a total of 18 CP;
e) A selected "Technical Application Subject" with compulsory and/or compulsory elective modules according to Appendix 2.5, amounting to 12 CP:
  - The same technical application subject as the technical application subject completed in the Bachelor's program according to the admission regulations for the Master's program "Industrial Mathematics and Data Analysis" § 1 (1) letter a and c must be selected. Alternatively, computer science can be the technical application subject.
  - The modules for the technical application subjects listed in Annex 2.5 can be supplemented by decision of the examination board before the start of the respective semester after consultation between Faculty 3 and the corresponding offering Faculty. In this case, it must be ensured that students who are in the examination process can complete the examination with the offered courses.
  - The technical application subject can be changed once and upon a formal and justified request to the examination board. At the request of the student, the work performed in the deselected application subject will be reported as additional work performed voluntarily in accordance with § 25 paragraph 2 and 3 AT MPO.

(4) Appendix 1 presents the recommended courses of study, Appendix 2 regulates the examinations to be taken.

(5) Modules are carried out as compulsory or as compulsory elective modules.

(6) The compulsory and compulsory elective modules in mathematics as well as in the applied subjects are offered at least on an annual basis.

(7) Compulsory modules are offered in English. Compulsory elective modules are offered in German or English. Compulsory as well as compulsory elective modules of the technical application subject are offered in German or English. The Faculty 3 ensures that the study program can be completed entirely in English.

(8) The courses assigned to each module are shown in the module descriptions.

(9) Courses are conducted according to § 6 paragraph 1 AT MPO. Other types of courses may be specified by decisions of the University Executive Board.

§ 3

Examinations

(1) Examinations are conducted in the forms according to §§ 8 ff. AT MPO and the Regulations of the University of Bremen for the Conduct of Electronic Examinations (DigiPrüfO UB/Digitalprüfungsordnung) in the currently valid version. The examination board may allow other forms of examinations in individual cases upon formal request of an examiner.

(2) A re-examination may be conducted in a different form than originally conducted in accordance with § 20 paragraph 4 AT MPO.

(3) Examinations are usually conducted in English, but can also be taken in another language after consultation with the examiner. In some technical application subjects, it is possible that module examinations are offered in German.

(4) The compensation principle according to § 5 paragraph 8 AT MPO is applied in the module "Modeling Project". Prerequisite for the application is passing the module in the form of a combination examination. The description for the module "Modeling Project" indicates the ratio in which the individual examination performances are included in the grade calculation of the combination examination.

§ 4

Recognition and crediting

The recognition or crediting of achievements is carried out in accordance with § AT22 MPO in the currently valid version.

§ 5

Admission requirements for modules

Except within the scope of § 6 paragraph 2, there are no admission requirements for modules.

§ 6

Module Master's thesis (including colloquium)

(1) The module "Master Thesis" (30 CP) comprises the Master's thesis and a colloquium. The topic of the Master's thesis must belong to the area of focus according to § 2, (2).

(2) Prerequisite for the registration of the Master's thesis (incl. colloquium) is the proof of at least 81 CP at the time of registration.

(3) The processing time for the Master's thesis is 26 weeks. The examination board may approve a one-time extension of a maximum of 8 weeks upon a formal and justified request.

(4) The Master's thesis is written as an individual or as a group work with up to 3 persons. In the case of a group thesis, the contribution of each individual group member must be clearly recognizable, delimitable and assessable.

(5) The Master's thesis is written in English. The examination board may allow other languages upon request, provided that supervision and assessment are guaranteed.

(6) A colloquium is held for the Master's thesis. A joint module grade is calculated for the Master's thesis and the colloquium. The Master's thesis is included with 80 % and the colloquium with 20 % in the common grade.

§ 7

Overall grade of the Master's examination

(1) The overall grade is calculated as the weighted arithmetic mean of the grades of the modules in the compulsory and the compulsory elective areas weighted with credit points; the grade of the module module "Master Thesis" receives the grade weight 72 CP.

(2) Exceptions are the three modules "Mathematical Methods for Data Analysis and Image Processing", "Numerical Methods for Partial Differential Equations" and, depending on the area of focus, one of the following modules from the area Extension: "Special Topics Industrial Mathematics A" or "Special Topics Data Analysis A". Of the three grades for these modules, only the module with the best grade is included in the overall grade. The modules not considered here are treated as ungraded modules in the further calculation.

(3) Ungraded modules are not included in the calculation.

§ 8

Scope and entering into force

These examination regulations come into force after approval by the President on October 1, 2022. They will be published in the Official Gazette of the Free Hanseatic City of Bremen. They apply to students who begin their studies in the Master's program "Industrial Mathematics and Data Analysis" for the first time in the winter semester 2022/23.

Approved, Bremen, March 29, 2022

President of the University of Bremen

Attachments:

Appendix 1: Study plan of the Master's program "Industrial Mathematics and Data Analysis"
    1.1. Study plan of the Master's program "Industrial Mathematics and Data Analysis" with area of focus "Data Analysis"
    1.2. Study plan of the Master's program "Industrial Mathematics and Data Analysis" with area of focus "Industrial Mathematics"
Appendix 2: Modules and examination requirements
    2.1. Master Thesis
    2.2. Foundations
    2.3. Area of Focus
    2.4 Extension
    2.5 Technical Application Subject
Appendix 3: Further forms of examinations

Appendix 1: Study plans of the Master's program "Industrial Mathematics and Data Analysis"

The study plans represent a recommendation for the course of study. Modules can be attended by students in a different order.

1.1 Study plan of the Master's program "Industrial Mathematics and Data Analysis" with area of focus "Data Analysis"

Study sections according to § 2, (3)		Compulsory Modules, 69 CP					Compulsory Elective Modules, 9 CP	Technical Application Subject, 12 CP	Master Thesis, 30 CP
		Foundations, 33 CP		Extension, 18 CP		Area of Focus, 18 CP	Area of Focus, 9 CP		
1st year	1st sem.	**MDAIP**, Mathematical Methods for Data Analysis and Image Processing, 9 CP	**NPDE**, Numerical Methods for Partial Differential Equations, 9 CP			**STDA-A**, Special Topics Data Analysis A, 9 CP	**ACDA**, Advanced Communications Data Analysis, 9 CP or **STDA-C**, Special Topics Data Analysis C, 9 CP	Modules from one Subject listed in appendix 2.5, 12 CP	
	2nd sem.		**MP**, Modeling Project, 15 CP	**STIM-A**, Special Topics Industrial Mathematics A, 9 CP	**ACIM**, Advanced Communications Industrial Mathematics, 9 CP	**STDA-B**, Special Topics Data Analysis B, 9 CP			
2nd year	3rd sem.								
	4th sem.								**MTIM**, Master Thesis (incl. Colloquium), 30 CP

CP = Credit Points, sem. = Semester

1.2 Study plan of the Master's program "Industrial Mathematics and Data Analysis" with area of focus "Industrial Mathematics"

Study sections according to § 2, (3)		Compulsory Modules, 69 CP					Compulsory Elective Modules, 9 CP	Technical Application Subject, 12 CP	Master Thesis, 30 CP
		Foundations, 33 CP		Extension, 18 CP		Area of Focus, 18 CP	Area of Focus, 9 CP		
1st year	1st sem.	MDAIP, Mathematical Methods for Data Analysis and Image Processing, 9 CP	NPDE, Numerical Methods for Partial Differential Equations, 9 CP			STDA-A, Special Topics Industrial Mathematics A, 9 CP	ACDA, Advanced Communications Industrial Mathematics, 9 CP	Modules from one Subject listed in appendix 2.5, 12 CP	
	2nd sem.		MP, Modeling Project, 15 CP	STDA-A, Special Topics Data Analysis A, 9 CP	ACIM, Advanced Communications Data Analysis, 9 CP	STDA-B, Special Topics Industrial Mathematics B, 9 CP	or STDA-C, Special Topics Industrial Mathematics C, 9 CP		
2nd year	3rd sem.								
	4th sem.								MTIM, Master Thesis (incl. Colloquium), 30 CP

CP = Credit Points, sem. = Semester

Appendix 2: Modules and examination requirements

Abbreviations:
K. digit = module number; P = compulsory module, WP = compulsory elective module, W = elective module; CP = credit points; MP = module examination, TP = partial examination, KP = combination examination; PL = examination performance (= graded), SL = study performance (= graded or ungraded), LV = course related designation

2.1: Master Thesis, 30 CP

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
MTIM	Master Thesis (including Colloquium)	P	30	KP		PL: 2 SL: 0

2.2: Foundations, 33 CP

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
MDAIP	Mathematical Methods for Data Analysis and Image Processing	P	9	KP		PL: 1 SL: 1
NPDE	Numerical Methods for Partial Differential Equations	P	9	KP		PL: 1 SL: 1
MP	Modelling Project	P	15	KP		PL: 3 SL: 0

2.3: Area of Focus, 27 CP

2.3.1: Data Analysis

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
STDA-A	Special Topics Data Analysis A	P	9	KP (LV)		PL: 1 SL: 1
STDA-B	Special Topics Data Analysis B	P	9	KP (LV)		PL: 1 SL: 1
STDA-C	Special Topics Data Analysis C	WP	9	KP (LV)		PL: 1 SL: 1
ACDA	Advanced Communications Data Analysis	WP	9	TP (LV)	Part 1, 4.5 CP Part 2, 4.5 CP	PL: 2 SL: 0

2.3.2: Industrial Mathematics

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
STIM-A	Special Topics Industrial Mathematics A	P	9	KP (LV)		PL: 1 SL: 1
STIM-B	Special Topics Industrial Mathematics B	P	9	KP (LV)		PL: 1 SL: 1
STIM-C	Special Topics Industrial Mathematics C	WP	9	KP (LV)		PL: 1 SL: 1
ACIM	Advanced Communications Industrial Mathematics	WP	9	TP (LV)	Part 1, 4.5 CP Part 2, 4.5 CP	PL: 2 SL: 0

2.4: Extension

2.4.1: Extension with Focus on "Data Analysis", 18 CP

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
ACIM	Advanced Communications Industrial Mathematics	P	9	TP (LV)	Part 1, 4.5 CP Part 2, 4.5 CP	PL: 2 SL: 0
STIM-A	Special Topics Industrial Mathematics A	P	9	KP (LV)		PL: 1 SL: 1

2.4.1: Extension with Focus on "Industrial Mathematics", 18 CP

K. digit	Module title	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
ACDA	Advanced Communications Data Analysis	P	9	TP (LV)	Part 1, 4.5 CP Part 2, 4.5 CP	PL: 2 SL: 0
STDA-A	Special Topics Data Analysis A	P	9	KP (LV)		PL: 1 SL: 1

2.5: Technical Application Subject, 12 CP

Before choosing an application subject, it is strongly recommended to take advantage of an advising session in the Faculty 3 at the Advisory Office – Mathematics (szmathe@uni-bremen.de) as well as a specialized advising session in the respective application subject. The advising consultant typically checks whether the respective modules of the application subject are to be completed in English and in accordance to the recommended CP distribution (30 per semester, maximum plus/minus 3 CP) as well as according to the respective recommended course of study (see Appendix 1).

2.5.1: Electrical Engineering (German: Elektrotechnik), 12 CP

This application subject can be completed in English, but the selection is limited in this language.

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
GEAT	Grundlagen der der Energie- und Automatisierungstechnik	Introduction to Energy and Automation Engineering	WP	9	TP	Grundlagen der elektrischen Energietechnik, 4 CP	PL: 1 SL: 0
						Grundlagen der Regelungstechnik, 4 CP	PL: 1 SL: 0
						Einführung in die Automatisierungstechnik, 1 CP	PL: 1 SL: 0
GIKT	Grundlagen der Informations- und Kommunikationstechnik	Introduction to Information and Communication Technology	WP	9	TP	Grundlagen der Hochfrequenztechnik, 3 CP	PL: 1 SL: 0
						Grundlagen der	PL: 1 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
						Nachrichtentechnik, 3 CP	
						Grundlagen der Informationstechnik, 3 CP	PL: 1 SL: 0
GMN	Grundlagen der Mikrosystemtechnik und Mikroelektronik	Introduction to Microsystems and Microelectronics	WP	9	TP	Grundlagen der Mikrosystemtechnik und Mikroelektronik, 6 CP	PL: 1 SL: 0
						Praktikum Grundlagen der Mikrosystemtechnik und Mikroelektronik, 3 CP	PL: 0 SL: 1
ATP	Automatisierung Technischer Prozesse	Automation Projects	WP	6	MP		PL: 1 SL: 0
CTh1(a)	Regelungstheorie 1	Control Theory 1	WP	6	MP		PL: 1 SL: 0
LRT	Praktikum Regelungstechnik	Advanced Control Lab	WP	3	MP		PL: 0 SL: 1
EAT(a)	Elektrische Antriebstechnik	Electrical Drives	WP	6	MP		PL: 1 SL: 0
Antec	Praktikum Antriebstechnik	Laboratory Electrical Drives	WP	3	MP		PL: 0 SL: 1
Paut(a)		Process Automation in Power Grids	WP	6	MP		PL: 1 SL: 0
LEA	Leistungselektronik in der Automatisierungstechnik	Power Electronics for Automation Technology	WP	6	MP		PL: 1 SL: 0
EPC(a)	Stromrichtertechnik	Electrical Power Converters	WP	6	MP		PL: 1 SL: 0
EPCL	Praktikum Stromrichtertechnik	Laboratory Electrical Power Converters	WP	3	MP		PL: 0 SL: 1
NetDy(a)	Dynamik und Stabilität in Übertragungsnetzen	Dynamics and stability in transmission grids	WP	6	MP		PL: 1 SL: 0
WEAG	Windenergieanlagen – Grundlagen	Wind Power Converters – Foundations	WP	6	MP		PL: 1 SL: 0
ADSP		Advanced Digital Signal Processing	WP	6	MP		PL: 1 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
CNS(a)		Communications Networks	WP	6	KP		PL: 2 SL: 0
NetSim		Network Simulation	WP	6	MP		PL: 1 SL: 0
RFC(a)		RF Frontend Devices and Circuits	WP	6	MP		PL: 1 SL: 0
IKT1	Praktikum Informations- und Kommunikationstechnik I	Information and Communication Technology I"	WP	3	MP		PL: 0 SL: 1
IKT2	Praktikum Informations- und Kommunikationstechnik II	Information and Communication Technology II	WP	3	MP		PL: 0 SL: 1
DiTe(a)		Digital Technology	WP	6	MP		PL: 1 SL: 0
SSc(a)		Sensor Science	WP	6	MP		PL: 1 SL: 0
SAMS(a)		Sensors and Measurement Systems	WP	6	MP		PL: 1 SL: 0
DDsy	Praktikum Entwurf digitaler Systeme	Laboratory Design of Digital Systems	WP	3	MP		PL: 0 SL: 1
MiSP	Praktikum Mikrosystemtechnik	Laboratory Micorsystems	WP	3	MP		PL: 0 SL: 1
SCL		Laboratory Sensor Characterization	WP	3	MP		PL: 0 SL: 1
CAMC		Circuits and Architectures for Mobile Communication Systems	WP	6	MP		PL: 1 SL: 0
ASV(a)	Architekturen der digitalen Signalverarbeitung	Architectures for Digital Signal Processing	WP	6	MP		PL: 1 SL: 0

2.5.2: Geosciences (German: Geowissenschaften), 12 CP

This application subject can only be completed in English.

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
MAG-GL1		Glaciology I	WP	6	MP		PL: 1 SL: 0
MAG-GL2		Glaciology II	WP	6	KP		PL: 2 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
MAG-GH1		Hazard – Risk Assessment	WP	6	MP		PL: 1 SL: 0
MAG-GH2		Environmental Hazards	WP	6	MP		PL: 1 SL: 0
MAG-RE1		Renewable Energy in the Earth System	WP	6	KP		PL: 2 SL: 0
MAG-RE2		Renewable Energy Resources II – Offshore Wind Energy	WP	6	MP		PL: 1 SL: 0
MMG-CC1		Climate Change I: Fundamentals	WP	6	MP		PL: 1 SL: 0
MMG-CC2		Climate Change II: Models and Data	WP	6	MP		PL: 1 SL: 0

2.5.3: Computer Science (German: Informatik), 12 CP

This application subject can be completed in English, but the selection is limited in this language.

2.5.3a Compulsory Modules, 6 CP

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
IBAP	Aufbau Praktische Informatik	Practical Computer Science (Intermediate Level)	P	6	MP		PL: 1 SL: 0

2.5.3b Compulsory Elective Modules, 6 CP

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
IMK-SQ	Kern (SQ)	Core (SQ)	WP	6	MP		PL: 1 SL: 0
IMK-AI	Kern (AI)	Core (AI)	WP	6	MP		PL: 1 SL: 0
IMK-DMI	Kern (DMI)	Core (DMI)	WP	6	MP		PL: 1 SL: 0
IMK-VMC	Kern (VMC)	Core (VMC)	WP	6	MP		PL: 1 SL: 0
IMA-SQ	Aufbau Informatik (SQ)	Computer Science (SQ)	WP	6	MP		PL: 1 SL: 0
IMA-AI	Aufbau Informatik (AI)	Computer Science (AI)	WP	6	MP		PL: 1 SL: 0
IMA-DMI	Aufbau Informatik (DMI)	Computer Science (DMI)	WP	6	MP		PL: 1 SL: 0
IMA-VMC	Aufbau Informatik (VMC)	Computer Science (VMC)	WP	6	MP		PL: 1 SL: 0
IMAP-SQ	Aufbau Praktische Informatik (SQ)	Practical Computer Science (SQ)	WP	6	MP		PL: 1 SL: 0
IMAP-AI	Aufbau Praktische Informatik (AI)	Practical Computer Science (AI)	WP	6	MP		PL: 1 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
IMAP-DMI	Aufbau Praktische Informatik (DMI)	Practical Computer Science (DMI)	WP	6	MP		PL: 1 SL: 0
IMAP-VMC	Aufbau Praktische Informatik (VMC)	Practical Computer Science (VMC)	WP	6	MP		PL: 1 SL: 0
IMVP-SQ	Vertiefung Praktische Informatik (SQ)	Advanced Practical Computer Science (SQ)	WP	6	MP		PL: 1 SL: 0
IMVP-AI	Vertiefung Praktische Informatik (AI)	Advanced Practical Computer Science (AI)	WP	6	MP		PL: 1 SL: 0
IMVP-DMI	Vertiefung Praktische Informatik (DMI)	Advanced Practical Computer Science (DMI)	WP	6	MP		PL: 1 SL: 0
IMVP-VMC	Vertiefung Praktische Informatik (VMC)	Advanced Practical Computer Science (VMC)	WP	6	MP		PL: 1 SL: 0
IMVT-SQ	Vertiefung Theoretische Informatik (SQ)	Advanced Theoretical Computer Science (SQ)	WP	6	MP		PL: 1 SL: 0
IMVT-AI	Vertiefung Theoretische Informatik (AI)	Advanced Theoretical Computer Science (AI)	WP	6	MP		PL: 1 SL: 0
IMVT-DMI	Vertiefung Theoretische Informatik (DMI)	Advanced Theoretical Computer Science (DMI)	WP	6	MP		PL: 1 SL: 0
IMVT-VMC	Vertiefung Theoretische Informatik (VMC)	Advanced Theoretical Computer Science (VMC)	WP	6	MP		PL: 1 SL: 0
IMVA-SQ	Vertiefung Angewandte Informatik (SQ)	Advanced Applied Computer Science (SQ)	WP	6	MP		PL: 1 SL: 0
IMVA-AI	Vertiefung Angewandte Informatik (AI)	Advanced Applied Computer Science (AI)	WP	6	MP		PL: 1 SL: 0
IMVA-DMI	Vertiefung Angewandte Informatik (DMI)	Advanced Applied Computer Science (DMI)	WP	6	MP		PL: 1 SL: 0
IMVA-VMC	Vertiefung Angewandte Informatik (VMC)	Advanced Applied Computer Science (VMC)	WP	6	MP		PL: 1 SL: 0

2.5.4: Physics (German: Physik), 12 CP

This application subject can be completed in English, but the selection is limited in this language.

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
ExpPhyAM	Fortgeschrittene Experimentalphysik – Atom & Molekülphysik		WP	9	KP		PL: 1 SL: 1
ExpPhyFKP	Fortgeschrittene Experimentalphysik – Festkörperphysik		WP	9	KP		PL: 1 SL: 1
FP	Fortgeschrittenenpraktikum		WP	9	MP		PL: 0 SL: 1
TheoPhys	Fortgeschrittene Theoretische Physik		WP	12	KP		PL: 1 SL: 1
WP AO	Angewandte Optik		WP	12	KP		PL: 1 SL: 1
WP AP	Astrophysik		WP	12	KP		PL: 1 SL: 1
WP BP	Biophysik		WP	12	KP		PL: 1 SL: 1
WP CMS	Computerunterstütze Materialwissenschaften		WP	12	KP		PL: 1 SL: 1
WP FKP	Festkörperphysik		WP	12	KP		PL: 1 SL: 1
WP UP	Umweltphysik		WP	12	KP		PL: 1 SL: 1
AMMDA		Applied Mathematical Methods and Data Analysis	WP	6	MP		PL: 1 SL: 0
AtPhy		Atmospheric Physics	WP	6	MP		PL: 1 SL: 0
Dyn1		Dynamics I	WP	6	MP		PL: 1 SL: 0
Dyn2		Dynamics II	WP	3	KP		PL: 1 SL: 1
PhyO1		Physical Oceanography I	WP	6	MP		PL: 1 SL: 0
CliS1		Climate System I	WP	3	KP		PL: 1 SL: 1
MES		Modelling of the Earth System	WP	3	MP		PL: 1 SL: 0
MeTe		Measurement Techniques	WP	6	KP		PL: 1 SL: 1

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
RemS		Remote Sensing	WP	3	KP		PL: 1 SL: 1
CTh1(a)		Control Theory I	WP	6	MP		PL: 1 SL: 0
SpEl(a)		Space Electronics	WP	6	MP		PL: 1 SL: 0
SEM		Science and Exploration Missions	WP	3	MP		PL: 1 SL: 0
AtPhy		Atmospheric Physics	WP	6	MP		PL: 1 SL: 0
ComSp-		Communication Technologies for Space	WP	6	MP		PL: 1 SL: 0
RSOC		Remote Sensing of Ocean and Cryosphere	WP	6	KP		PL: 1 SL: 1
AtCM1(a)		Atmospheric Chemistry Modelling: Part 1	WP	3	MP		PL: 1 SL: 0
CliS1		Climate System 1	WP	3	KP		PL: 1 SL: 1
SAMS(a)		Sensors and Measurement Systems	WP	6	MP		PL: 1 SL: 0
GNSS		The Global Navigation Satellite System	WP	3	MP		PL: 1 SL: 0
CNSp		Communication Networks for Space	WP	3	KP		PL: 1 SL: 1
01-29-03 LSpa1		Space Lab, Part 1	WP	3	KP		PL: 1 SL: 1
LSpa2		Space Lab, Part 2	WP	3	MP		PL: 1 SL: 0
DIP		Digital Image Processing	WP	3	KP		PL: 1 SL: 1
AtSp		Atmospheric Spectroscopy	WP	3	MP		PL: 1 SL: 0
GG		Geodesy and Gravity	WP	3	MP		PL: 1 SL: 0
DiTe(a)		Digital Technology	WP	6	MP		PL: 1 SL: 0
RFC(a)		RF Frontend Devices and Circuits	WP	6	MP		PL: 1 SL: 0

2.5.5: Production Engineering (German: Produktionstechnik), 12 CP

This technical application subject can only be completed in German.

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
M11-BM1-AM	Basismodul 1 – Allgemeiner Maschinenbau	Foundation module 1 – Mechanical Engineering	WP	6	TP	Strömungslehre, 3 CP / Höhere Festigkeitslehre und Strukturmechanik im Leichtbau, 3 CP	PL: 2 SL: 0
M11-BM1-ES	Basismodul 1 – Energiesysteme	Foundation module 1 - Energy Systems	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM1-FT	Basismodul 1 – Fertigungstechnik	Foundation module 1 - Manufacturing Technology	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM1-IM	Basismodul 1 – Industrielles Management	Foundation module 1 - Industrial Engineering	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM1-LT	Basismodul 1 – Luftfahrttechnik	Foundation module 1 - Aviation Engineering	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM1-MW	Basismodul 1 – Materialwissenschaften	Foundation module 1 - Materials Science	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM1-VT	Basismodul 1 – Verfahrenstechnik	Foundation module 1 - Process Engineering	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM2-AM	Basismodul 2 – Allgemeiner Maschinenbau	Foundation module 2 - Mechanical Engineering	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0
M11-BM2-ES	Basismodul 2 – Energiesysteme	Foundation module 2 -	WP	6	TP	1. PL 3 CP / 2. PL 3 CP	PL: 2 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
		Energy Systems					
M11-BM2-FT	Basismodul 2 – Fertigungstechnik	Foundation module 2 - Manufacturing Technology	WP	6	MP		PL: 1 SL: 0
M11-BM2-IM	Basismodul 2 – Industrielles Management	Foundation module 2 - Industrial Engineering	WP	6	TP	1. PL 3 CP 2. PL 3 CP	PL: 2 SL: 0
M11-BM2-LT	Basismodul 2 – Luftfahrttechnik	Foundation module 2 - Aviation Engineering	WP	6	TP	1. PL 3 CP 2. PL 3 CP	PL: 2 SL: 0
M11-BM2-MW	Basismodul 2 – Materialwissenschaften	Foundation module 2 - Materials Science	WP	6	TP	1. PL 3 CP 2. PL 3 CP	PL: 2 SL: 0
M11-BM2-VT	Basismodul 2 – Verfahrenstechnik	Foundation module 2 - Process Engineering	WP	6	TP	1. PL 3 CP 2. PL 3 CP	PL: 2 SL: 0
M11-VM1-AM	Vertiefungsmodul 1 – Allgemeiner Maschinenbau	Advanced module 1 - Mechanical Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM1-ES	Vertiefungsmodul 1 – Energiesysteme	Advanced module 1 - Energy Systems	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM1-FT	Vertiefungsmodul 1 – Fertigungstechnik	Advanced module 1 - Manufacturing Technology	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM1-IM	Vertiefungsmodul 1 – Industrielles Management	Advanced module 1 - Industrial Engineering	WP	9	TP	1. PL 3 CP 2. PL 6 CP	PL: 2 SL: 0
M11-VM1-LT	Vertiefungsmodul 1 – Luftfahrttechnik	Advanced module 1 - Aviation Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0

K. digit	Module title, *German*	Module title, *English translation*	Module type P/WP/W	CP	MP/TP/KP	Allocation of the CP at TP	PL/SL (number)
M11-VM1-MW	Vertiefungsmodul 1 – Materialwissenschaften	Advanced module 1 - Materials Science	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM1-VT	Vertiefungsmodul 1 – Verfahrenstechnik	Advanced module 1 - Process Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-AM	Vertiefungsmodul 2 – Allgemeiner Maschinenbau	Advanced module 2 - Mechanical Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-ES	Vertiefungsmodul 2 – Energiesysteme	Advanced module 2 - Energy Systems	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-FT	Vertiefungsmodul 2 – Fertigungstechnik	Advanced module 2 - Manufacturing Technology	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-IM	Vertiefungsmodul 2 – Industrielles Management	Advanced module 2 - Industrial Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-LT	Vertiefungsmodul 2 – Luftfahrttechnik	Advanced module 2 - Aviation Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-MW	Vertiefungsmodul 2 – Materialwissenschaften	Advanced module 2 - Materials Science	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0
M11-VM2-VT	Vertiefungsmodul 2 – Verfahrenstechnik	Advanced module 2 - Process Engineering	WP	9	TP	1. PL 3 CP 2. PL 3 CP 3. PL 3 CP	PL: 3 SL: 0

Appendix 3: Further forms of examinations

In addition to the forms of examination listed in § 8 ff. AT MPO, the following form of examination is possible:

- Poster presentation: format DIN A0 or A1, written and graphic presentation of a problem or question that the students have worked on independently, as well as its oral presentation. Posters should be used by students to present their own investigations and their results in a concentrated form. In addition to the poster as a printed product, a poster presentation must always include an oral explanation of the contents of the poster by the students and a discussion with the other seminar participants or persons outside the seminar, e.g. interested members of the public.