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OFFICIAL TRANSLATION OF

**Fachspezifische Bestimmungen für den Studiengang
Atmospheric Science (M.Sc.)
(Amtliche Bekanntmachung Nr. 73 vom 7. August 2023)**

**THIS TRANSLATION IS FOR INFORMATION ONLY –
ONLY THE GERMAN VERSION SHALL BE LEGALLY
VALID AND ENFORCEABLE!**

**Subject-Specific Provisions for the Master of Science (MSc) in
Atmospheric Science**

dated 18 January 2023

On 17 April 2023 in accordance with Section 108 subsection 1 of the Hamburg higher education act (Hamburgisches Hochschulgesetz, HmbHG) dated 18 July 2001 (HmbHVBl. p. 171) as amended on 17 June 2021 (HmbGVBl. p 468), the Executive University Board of Universität Hamburg ratified the Subject-Specific Provisions for the master's degree program in Atmospheric Science as a subject leading to the Master of Science (MSc) adopted on 18 January 2023 by the Faculty Council of the Faculty of Mathematics, Informatics and Natural Sciences in accordance with Section 91 subsection 2 number 1 HmbHG.

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Preamble

These Subject-Specific Provisions supplement the provisions of the Faculty of Mathematics, Informatics and Natural Sciences' (MIN) Examination Regulations For Master of Science Degree Programs dated 20 October 2021 as amended for the subject Atmospheric Science.

I. Supplementary provisions to the MSc Examination Regulations

Section 1 Program objectives

Section 1 subsection 1:

(1) The Master of Science in Atmospheric Science is a consecutive, research-based degree program that is taught in English.

(2) The Master of Science in Atmospheric Science follows the general program goals set out in Section 1 subsection 1 MSc Examination Regulations for the Faculty of Mathematics, Informatics and Natural Sciences. In addition to these general program goals, the study of meteorology at the master's level is designed to provide students with sound knowledge of atmospheric physics, prepare them specifically for weather and climate research, and give them the ability to

- a) independently apply and expand their scientific knowledge, methods, and skills;
- b) pursue independent continuing education; and
- c) act responsibly within their field in line with the rules of good scientific practice.

(3) The Degree Program prepares students for a career with a strong research focus. The first year of the program advances and expands knowledge of the subject through a semester of research-based learning in which students are assigned to a research group to prepare them for their research work. This is followed by six months to work on their master's theses to identify a solution to a complex issue from the field of meteorology or climate research.

After completion of the program, graduates of the Master of Science in Atmospheric Science will have acquired the following professional skills, knowledge, and abilities:

- a) ability to independently use standard numerical and experimental methods, generate observational and model data for critical analysis, academic interpretation, and implementation in prognoses

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- b) ability to further develop scientific methods, gain new insights, and present these in an appropriate manner—both in writing and orally
- c) ability to use mathematical and scientific observations, analysis, and predictions of climate and environmental changes in the atmosphere, as well as an awareness of the economic and/or political relevance of their statements
- d) preparedness to pursue a doctoral thesis in the field of meteorology or a related discipline or to assume a related, nonuniversity management position.

(4) Students may study components from the subject of meteorology as a supplementary subject.

Section 4 Program and examination structure, modules, and ECTS credits

Section 4 subsections 2 and 3:

(1) The atmospheric science degree program is a study of the physics of the atmosphere. The Master of Science in Atmospheric Science is thus already a specialist degree program. It includes required modules from the area of meteorology and climate research amounting to 69 ECTS credits, a required elective area amounting to 30 ECTS credits, and elective modules from the field of meteorology or other complementary subjects amounting to 21 ECTS credits (for a total of 120 ECTS credits).

(2) In terms of content, the modules can be assigned to the following four categories:

1. acquisition of special knowledge in the field of meteorology and climate research (24 ECTS credits)
2. obtaining of selected additional knowledge from the fields of meteorology and climate research (required elective area Advanced Core Electives) (30 ECTS credits)
3. obtaining of additional knowledge in supplementary subjects as chosen by the student (elective area) (21 ECTS credits)
4. preparation for and conduct of research work (45 ECTS credits)

(3) Detailed descriptions of all modules can be found in part II. Module descriptions of these subject-specific provisions. This description sets learning objectives, teaching methods, requirements, scope of work, and forms of examination. Application may be made to the examination board to study suitable modules in addition to those described in Appendix II as part of the required elective field Advanced Core Electives.

(4) Students may voluntarily complete modules in excess of the 120 ECTS credits. Upon submission of a request to the examinations board, the additional examination grades

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may be reflected in the academic transcript for the master's degree program. They will, however, not be used to calculate the overall final grade.

(5) Students pursuing a supplementary subject may enroll in individual modules in order to acquire knowledge from subareas of meteorology. The examination regulations applicable to the student's main subject will provide more information about the scope of the supplementary subject. The head of the examinations board determines which modules satisfy the substantive requirements prescribed within the framework of the main subject after the student pursuing a supplementary subject has consulted with the subject advisor for the subject of meteorology.

Section 5 Course types

Section 5 subsection 1:

Courses within the modules of the Degree Program will be held in English. Students wanting to take elective courses in German must possess the required proficiency in the German language.

Section 10 Deadlines for module examinations and repeat module examination attempts

Section 10 subsection 1:

Repeat examinations may be set as a different type of examination.

Section 13 Completed coursework and module examinations

Section 13 subsection 4:

The examination types are specified in Appendix II of the respective module descriptions. If multiple forms of examination are set for a module, the examiner will announce the specific type of examination at the start of the course.

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Section 13 subsection 10:

Examinations in elective areas are conducted in either German or English and in English for all other modules.

**Section 14
Master's thesis**

Section 14 subsection 1:

A mandatory component of the master's thesis is a colloquium consisting of a presentation and an academic discussion about the subject matter of the thesis. The presentation comprises one quarter of the grade for the master's thesis. The presentation must be given no later than six weeks after submission of the thesis.

Section 14 subsection 2:

Students who have earned at least 60 ECTS credits in total may be allowed to commence work on the master's thesis.

Section 14 subsection 4:

The master's thesis must be written in English.

Section 14 subsection 5 sentence 1:

The workload for the master's thesis amounts to 30 ECTS credits, which must be completed within six months.

**Section 15
Evaluation of examinations**

Section 15 subsection 3 sentence 5:

If a module examination is comprised of several course examinations, then the (overall) grade is calculated by averaging the grades from each course examination weighted according to the ECTS credits assigned to each part. The grade for master's thesis module is weighted at 75 percent for the master's thesis and 25 percent for the presentation and discussion.

Section 15 subsection 3 sentence 9:

The overall final grade for the master's degree program is calculated by averaging the grades from all modules weighted according to the ECTS credits assigned to each, whereby the master's thesis has twice the weight.

Section 15 subsection 3 sentence 10:

The Atmospheric Study Project and the Experimental Meteorology modules are not graded. In the required elective area, only the modules with the highest grades amounting to 30 ECTS credits in total are included in the grade calculation. Elective area examination grades are not used to calculate the overall final grade.

Section 15 subsection 4:

The overall final grade “pass with distinction” is awarded if a grade of 1.0 is earned for the master’s thesis in both assessments, the master-level colloquium is graded at least 1.3, the average overall grade is less than or equal to 1.30, and none of the module examinations were passed with grades lower than 2.3.

**Section 23
Effective date**

These Subject-Specific Provisions become effective on the day following official publication by Universität Hamburg. They first apply to students commencing their studies in Winter Semester 2023/24. Students who commenced their studies earlier may apply to change to these examination regulations.

Hamburg, 7 August 2023
Universität Hamburg

						Courses				Examinations			
Recommended semester	Frequency	Duration (1 or 2 semesters)	Module type: required (Req), required elective (RE), and	Module number/code	Module prerequisites	Module	Course title	Course type	SWS	Examination prerequisites	Type of examination	Graded	ECTS credits
1	Winter semester	1	Req.	MET-M-ADYN		Atmospheric Dynamics				successful completion of coursework in the form of term papers	oral examination	yes	6
						Atmospheric Dynamics		L	2				
						Atmospheric Dynamics		PC	2				
<p>Intended learning results: Students can explain increasingly complex atmospheric dynamics through comparisons and concepts and provide complex weather and climate models. Students learn to interpret complex atmospheric phenomena in observations and numerical models in relation to concepts and simplified models and to describe and mathematically solve the scales and relevant dynamic regimes.</p>													

2	Summer semester	1	Req.	MET-M-BLM		Boundary Layer Modeling				written examination	yes	6
						Boundary Layer Modeling	L	2				
						Boundary Layer Modeling	PC	2				
Intended learning results: Students know the properties and dominant processes in convective and stable regimes and are familiar with the surface effects, turbulences, and interference. Students are simultaneously familiar with different modeling approaches, such as mixed-layer models, RANS models, LES models, and direct numerical simulation (DNS).												
1	Winter semester	1	Req.	MET-M-RC		Radiation and Climate				written examination	yes	6
						Radiation and Climate	L	2				
						Radiation and Climate	PC	2				
Intended learning results: Students understand the theories of radiative transfer and can apply them to understand and predict the Earth's climate.												
2	Summer semester	1	Req.	MET-M- EXP	-	Experimental Meteorology				Conclusion of the project	no	6
						Experimental design	S	2				
						Experiment (field trip or lab experiment)	PC	3				

Intended learning results:

On conclusion of the module, students have knowledge and skills in the areas of planning experiments, the practical conduct of experiments, and the evaluation of large data sets. They are able to evaluate multivariate measurement data sets to test meteorological theories and can evaluate the significance of observations.

1-3		3	Required elective area	MET-M-ACE	-	Advanced core electives					yes	30
	Winter semester	1	RE			Atmospheric Physics	L/PC	4		written examination	yes	6
	Winter semester	1	RE			Urban Climatology	L/PC	2		written examination	yes	3
	Summer semester	1	RE			Climate Dynamics	L/PC	2		written examination	yes	3
	Summer semester	1	RE			Internal Waves and Instabilities	L/PC	4		written examination	yes	6
	Winter semester	1	RE			Atmospheric Remote Sensing	L/PC	4		oral examination	yes	6
	Winter semester	1	RE			Fluid Modeling of Atmospheric Flow and Dispersion	L/P	4		lab report	yes	6

	Summer semester	1	RE				Numerical Prediction of the Atmosphere and Ocean	L/PC	4		Conclusion of the project	yes	6
	Summer semester	1	RE				Tropical Clouds and Convection	L/PC	4		term paper	yes	6
	Winter semester / summer semester		RE				Additional advanced courses related to meteorology or climate research from the Masters of Science in Ocean and Climate Physics, Integrated Climate System Sciences (ICSS), and Geophysics as well as further advanced courses from the Master of Science in Atmospheric Science	L/PC	As offered		written examinations, oral examinations, and term papers	yes	As offered
<p>Learning results: Students obtain more profound insights into special meteorology and climate research topics, building on the knowledge gained in their previous studies, based on their own interests.</p>													
1+2+3	Winter semester	2	W	WF	-		Elective module				pursuant to the selected modules	no	21
<p>Learning results: In the elective modules, students expand the knowledge and skills acquired in their master's degree studies.</p>													
3	Winter semester	1	Req.	Subject semester	-		Atmospheric Study Project				Conclusion of the project	no	15
							joint seminar	S	2				

						working-group seminar	S	2					
						working-group practical exercise	Req.	6					

Learning results:

In-depth knowledge of the meteorological or climate specialist field in which they will later write their master's thesis.

4	Summer semester	6 months	Req.	master's thesis	—see Section 14.	Master's Thesis				master's thesis (75%) and colloquium (25%)	yes	30
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Learning results:

Ability to independently investigate and document a scientific question using scientific methods and pursuant to scientific standards.