Subject-specific guidelines for the Master's Program Atmospheric Science (M.Sc.)

From XXX

On YYY, the Executive Board of the University of Hamburg has approved the new version of the subject-specific guidelines for the study program "Atmospheric Science" as a study program leading to the degree "Master of Science" (M.Sc.) according to § 108 paragraph 1 of the Hamburg Higher Education Act (HmbHG), as approved by the Faculty Council of the Faculty of Mathematics, Informatics and Natural Sciences on ZZZ on the basis of § 91 paragraph 2 number 1 HmbHG of July 18, 2001 (HmbGVBI. p. 171) in the version of June 17, 2021 (HmbGVBI. p. 468).

Preamble

These subject-specific guidelines supplement the regulations of the examination code of the Faculty of Mathematics, Informatics and Natural Sciences for study programs leading to the degree "Master of Science" (MSc) dated October 20, 2021, as amended (PO M.Sc.) for the subject "Atmospheric Science".

I. Supplementary regulations to the examination code (PO MSc)

To § 1 Study goal

To § 1 Paragraph 1:

(1) The Master's program "Atmospheric Science" is a consecutive, research-oriented, degree program taught in English.

(2) The Master's program "Atmospheric Science" pursues the general study objectives according to § 1 paragraph 1 PO MSc of the MIN Faculty. In addition to these general study objectives, the study of meteorology at the Master's level is intended to provide students with in-depth knowledge in the field of atmospheric physics, to prepare them specifically for weather and climate research, and to give them the skills

- to independently apply and expand scientific knowledge, methods and abilities,
- for independent advanced training and
- to act responsibly in their field of expertise, following the rules of good scientific

(3) The program prepares students for a career with a strong research orientation. The first year, which serves to further deepen and broaden their knowledge, is therefore

followed by a semester of research-based learning, in which students, embedded in a research group, are being prepared for their research work. Afterwards, they begin their six-month master's thesis, in which a complex problem from meteorology or climate research is to be solved.

Upon completion of the program, graduates of the Master's degree program in Atmospheric Science will have acquired the following subject-specific competencies, knowledge, and skills:

- They can independently apply the numerical and experimental methods commonly used in meteorology and climate research, generate observational or model data, critically examine it, interpret it scientifically, and translate it into forecasts.
- They have learned to further develop methods and to present new findings in an appropriate manner, both orally and in writing.
- They have acquired the ability to view, analyze, and predict climate and environmental changes in the atmosphere from a mathematical and scientific perspective and have developed an awareness of the economic and/or political relevance of the statements.
- They are prepared to pursue a doctoral degree in the field of meteorology or in a related field, or to take up a managerial position outside the university.

(4) Complementary subject students are provided with knowledge from sub-fields of the subject meteorology.

To § 4 Study and examination structure, modules and credits

To § 4 Paragraphs 2 and 3:

(1) "Atmospheric Science" studies physics of the atmosphere. The Master's program "Atmospheric Science" is thus an already specialized degree program. It comprises compulsory modules from the field of meteorology and climate research amounting to 69 CP, a compulsory elective area of 30 CP and elective modules from meteorology or other complementary subjects amounting to 21 CP (total = 120 CP).

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

- 1. Acquiring specialized knowledge in the field of meteorology and climate research (24 CP),
- 2. Acquiring additional knowledge in the fields of meteorology and climate research of the student's choice ("Advanced Core Electives") (30 CP),

- 3. Acquiring additional knowledge in supplementary subject areas of the student's choice (elective area) (21 CP),
- 4. Preparation for and execution of the research (45 CP).

(3) A compact description of all modules can be found under II. Module Descriptions of these subject specific guidelines. This description specifies learning objectives, teaching methods, prerequisite, scope of work and the examination modalities. In addition to the modules described in Appendix II, further suitable modules can be applied for in the elective area "Advanced Core Electives" to the examination board.

(4) Additional modules beyond the scope of 120 LP can be completed voluntarily. Upon application to the examination board, the grades of additionally completed examinations will be included in the Master's certificate. However, they do not contribute to the overall grade.

(5) Complementary subject students take individual modules and acquire knowledge from sub-areas of meteorology. The scope of the complementary subject studies is specified for the students by the examination regulations of their major subject. The modules that fill the frame given by the major subject are determined by the chairperson of the examination board after consultation between the complementary subject student and the study advisor for the subject meteorology.

To § 5 Lecture types

To § 5 Paragraph 1:

The teaching language of the degree program is English. If students want to take courses in the elective area in which the teaching language is German, they must meet the required German language proficiency.

To § 10

Deadlines for module examinations and retaking of module examinations

To § 10 Paragraph 1:

For re-examinations, a type of examination that differs from the initial examination may be established.

To § 13

Study performance and module examinations

To § 13 Paragraph 4:

The types of examinations are specified in the respective module descriptions in Appendix II. If several types of examinations are foreseen in a module, the specific type

of examination will be determined and announced by the examiner at the beginning of the course.

To § 13 Paragraph 10:

Examinations in the elective area are conducted in German or English while examinations in the other modules of the program are conducted in English.

To § 14

Master's thesis

To § 14 Paragraph 1:

An obligatory part of the Master's thesis is a colloquium consisting of an oral presentation and a scientific discussion on the contents of the thesis. The presentation is considered in the evaluation of the master thesis to a share of 1/4. The presentation should have been given no later than 6 weeks after submission of the written thesis.

To § 14 Paragraph 2:

Students who have earned at least 60 credit points can be allowed to write their Master's thesis.

To § 14 Paragraph 4:

The Master's thesis is written in English.

To § 14 Paragraph 5 Sentence 1:

The workload for the Master's thesis corresponds to 30 credit points, the duration of the work is 6 months.

To § 15 Evaluation of the examination performance

To § 15 Paragraph 3 Sentence 5:

If a module examination consists of several partial examinations, the (overall) grade is calculated as an average of the grades for the partial examinations based on credit points. In the module "Master's thesis" the grade of the thesis counts for 75 % and the grade of the presentation and discussion for 25 % in the evaluation of the module.

To § 15 Paragraph 3 Sentence 9:

The overall grade of the Master's examination is calculated as a mean of all module grades weighted by credit points, with the module "Master's thesis" counting double.

To § 15 Paragraph 3 Sentence 10:

No grades are awarded for the modules "Atmospheric Study Project" and "Experimental Meteorology". Examination performances from the elective area are not included in the overall grade. For the module "Advanced Core Electives" the following applies: only the best graded examinations with a total of 30 CP will be taken into account for the overall grade.

To § 15 Paragraph 4:

The overall grade "Passed with distinction" is awarded if the Master's thesis is graded with 1.0 by both reviewers, the Master's colloquium was graded with at least 1.3, the overall average grade is at least 1.3, and no module exam was graded with less than 2.3.

To § 23 Entry into force

These subject-specific guidelines come into force after being published in the Official Announcements of the University of Hamburg. They apply for the first time to students who begin their studies in the winter semester 2023/24. Students who have started their studies earlier can change to these examination regulations upon application.

Hamburg, XXX University of Hamburg

						Cou	rses			Exams	Exams			
Recommended semester	Offered at	Duration (1 or 2 semesters)	Module type: compulsory (C), Ad- vanced Core Electives (ACE) or elec- tive (E)	Module number/abbreviation	Module requirements	Module title	Course title	Course type: Lecture (L), Exercise (E), Seminar (S)	Semester hours per week	Pre-requisite for examination	Exam type	graded	Credit points	
1	WS	1	C	MET-M- ADYN	-	Atm	nospheric Dynamics			Success- fully com- pleted homework	Oral examination	yes	6	
							Atmospheric Dynamics	L	2					
							Atmospheric Dynamics	E	2					
mode	ls. Stude es that	ents wi	ill learn to inte solved mathe	erpret comp ematically.	•	nena	ric dynamics through equations and concepts of in in observations and numerical models in terms of co	•	•	-	hat describe scales, and relev	ant dynai	nical	
-	SS	1	C	MET-M-		Bou	ndary Layer Modeling				Written examination	yes	6	
2				BLM										
2				BLW			Boundary Layer Modelling	L	2					

1	WS	1	С	MET-M- RC		Rad	iation and Climate			Written examination yes 6
							Radiation and Climate	L	2	
							Radiation and Climate	E	2	
Inten	ded lear	ning o	utcomes: Stud	dents will co	omprehend radiative tra	nsfer	theory and be able to apply it to understand and p	redict the E	arth's	climate.
2	SS	1	С	MET-M- EXP	-	Ехр	erimental Meteorology			Project completion no 6
							Experimental Design	s	2	
							Experiment (Field trip or Lab experiment)	E	3	
			ible to evalua	te multivari		ets t	o test meteorological theories. They can correctly a			
1-3		3	ACE	MET-M- ACE	-	Adv	anced core electives			Partial examinations ac- yes 30 cording to the chosen course of the respective ad- vanced core elective mod- ule
		1	ACE				Atmospheric Physics	L/E	4	Written examination yes 6
	WS	1	ACE				Urban Climatology	L/E	2	Written examination yes 3
	SS	1	ACE				Climate Dynamics	L/E	2	Written examination yes 3
	SS	1	ACE				Internal Waves and Instabilities	L/E	4	Written examination yes 6
	WS	1	ACE				Atmospheric Remote Sensing	L/E	4	Oral examination yes 6
		1	ACE				Fluid Modelling of atmospheric flow and disper- sion	L/P	4	Internship completion yes 6

	SS	1	ACE				Numerical Prediction of the Atmosphere and Ocean	L/E	4	Project completion yes 6
		1	ACE				Tropical Clouds and Convection	L/E	4	Homework yes 6
	W&S		ACE				Minor courses related to meteorology or climate research of the MSc OCP, ICSS and Geophysics as well as further specialization courses of the MSc Atmospheric Science after approval by the exam- ination board.	L/E	As of- fer ed	According to the study pro- gram of- fer ed
Learn	ing outc	omes:	Building on th	ie basic kno	owledge of their previou	us stu	dies, students acquire deeper insights into special t	opics of m	eteorol	ogy and climate research according to their interests.
1+2+ 3	WS	2 E WF - Elective				tive			According to the chosen no 21 subjects	
Learn	ing outc	comes:	In the elective	e module, st	tudents broaden their c	ompe	tencies and knowledge acquired in the Master's pro	ogram.		
3	WS	1	С	FS	-	Atm	nospheric Study Project			Written report or presen- no 15 tation
							Joint seminar	s	2	
							Working group seminar	s	2	
							Working group internship	Р	6	
Learn	ing outc	comes:	In-depth knov	vledge in tł	ne special meteorologic	al or c	limatological field in which the master's thesis will	later be w	ritten.	
4	SS	6 Mon	С	MA	-see §14	Mas	ster Thesis			Master's thesis (75%) with yes 30 colloquium (25%)
Learn	ing outc	comes:	Ability to inde	pendently	address a scientific que	stion	using scientific methods and document according t	o scientif	ic stand	lards.