

Subject-specific regulations for the Master of Science Integrated Climate System Sciences

Dated May 2, 2012

On May 14, 2012, the Executive Committee of the University of Hamburg approved the specific requirements for the Master in Integrated Climate System Science as a study course with the degree of Master of Science (M.Sc.) in accordance with §108 paragraph 1 HmbHG, the Faculty Council of the Faculty of Mathematics, Computer Science and Natural Sciences on 2 May 2012 on the basis of § 91, paragraph 2, point 1 of the Hamburg Higher Education Act (HmbHG) of 18 July 2001 (HmbGVBl. p. 171) as amended on the 20 December 2011 (HmbGVBl. p. 550).

Preamble

These subject-specific regulations supplement the current version of the examination regulations of the Faculty of Mathematics, Computer Science and Natural Sciences for courses with the degree of Master of Science (M.Sc.) dated 26 October, 2005, and describe the modules for the study program “Integrated Climate System Sciences”.

I. Supplementary Regulations

§1 Study objective, purpose of the exams, academic degree, implementation of the study program

§1 Paragraph 1:

- (1) The master's program, Integrated Climate System Sciences (M.Sc. ICSS), is a consecutive, English-taught, interdisciplinary and research-oriented degree program with specializations "Physics of the climate system“, "Biogeochemistry of the climate system," and "Climate-related economics and social sciences."
- (2) The M.Sc. ICSS pursues the general study objectives according to §1 paragraph 1 PO M.Sc. MIN-Faculty. In addition to these general study objectives, the goal of the ICSS is to deepen the student's prior knowledge in the fields of meteorology, oceanography, geophysics and other geosciences, as well as climate-relevant economic and social sciences at the master's level. Graduates will be prepared for a career in climate system research and related occupational areas.

- (3) The program imparts expertise in the following areas: (a) independent application and extension of scientific knowledge, methods and skills to investigate the climate system, (b) continuing education and training in the climate system sciences, and (c) application of climate-system-related knowledge in a responsible way and in accordance with the rules of good scientific practice.
- (4) The program prepares students for a career in research on the different aspects of the climate system and is based on the needs of research institutions, business and administration. To strengthen the professional specialization, and as an extension of knowledge from previous lectures and tutorials, part of the third semester consists of a research-group based training. The following 6-month master thesis in the 4th semester will address a complex topic of climate-related basic research or applied climate system analysis.

§1 Paragraph 4:

The primary responsibility for the implementation of the study program lies with the School of Integrated Climate System Sciences (SICSS) at the Faculty of Mathematics, Computer Science and Natural Sciences, aided by the Faculty of Economics and Social Sciences.

§4 Study and examination structure, modules and credits

§4 Paragraphs 2 and 3:

- (1) The M.Sc. ICSS includes the specializations "Physics of the climate system," "Biogeochemistry of the climate system" and "Climate-related economics and social sciences" and therefore allows concentration on one of the three. The study program amounts to 120 credit points which include interdisciplinary, compulsory modules of 30 CP, optional modules from the specialization for 51 CP, elective modules to gain the research and writing skills of 9 CP, and a master thesis of 30 CP.
- (2) The modules belong to the following categories: After an introduction unit (6 CP), students become familiar with the basic components and processes of the climate system (27 CP). Already in the 1st semester an initial orientation regarding the specialization is possible. In the 2nd semester, the students further specialize in at least two of the following 3 areas (a) Physics of the climate system, (b) Biogeochemistry of the climate system and (c) Climate-related economics and social sciences. In addition the 2nd semester imparts technical skills. In the 3rd semester the students deepen their knowledge in one of the three possible areas of specialization in the M.Sc. ICSS. The modules in the 2nd and 3rd semester include skills such as (i) observation, (ii) analysis, (iii) modeling and (iv) application (45 CP). The master's thesis work (30 CP) in the 4th Semester will be performed within one of three specializations.

- (3) Detailed descriptions of all modules can be found in the module handbook.
- (4) Paragraphs (1) to (3) are notwithstanding for students who are admitted according to §3 paragraph 3 of the PhD regulations of the Faculty of Mathematics, Computer Science and Natural Sciences of December 1, 2010 to continue their studies towards a doctorate (the so-called “fast-track” doctorate procedure). In consultation with to be determined advisors of the doctoral procedure a binding individual study plan is laid out, which specifies the modules to be taken and includes their description. This curriculum must ensure the achievement of the outcomes of the Masters Course as specified in §1 (120 CP). The study plan may also contain modules that are not listed under II. "Overview of modules and recommended course of study“. The study plan must be approved by the ICSS examination board.
- (5) Additional modules and courses which then exceed the 120 CP can be taken voluntarily. Upon application to the examination board, the additional examinations are included in the Master's certificate; however, they are not used to calculate the final grade.
- (6) The M.Sc. ICSS offers modules and courses with climate-relevant content also for other study programs. The amount of the supplementary course workload is defined by the examination regulations of the principal study program. This definition requires an agreement between the student and the examination board of the ICSS (after consultation with the ICSS student advisor).
- (7) Students from other study programs can attend individual courses or entire modules and acquire knowledge from areas of the M.Sc. ICSS. The module descriptions in the module handbook indicate the applicability and suitability for other study programs under the heading "Use of module."

§ 4 Paragraph 5:

The study program can be completed as a part-time study subject to the following rules:

- (1) Part-time students must immediately notify the Office of Academic Affairs of any change in student status (certificate of the Center for Students). The changed status will be noted by the examining body.
- (2) As a general rule, in a part-time study, students are required to complete the specific regulations provided for specific modules and credits (30 credits) for one semester of the full-time study in two academic semesters. In general, the full-time study binding sequence of modules must be followed.
- (3) Courses offered only on an annual basis should be completed at the first opportunity.
- (4) In very special cases of hardship or in atypical study progression, part-time students can make a binding, individual study arrangement with consultation from the respective discipline and with the approval of the examination board.

§ 5 Types of Courses

§ 5 Clause 2:

All course types listed under § 5 PO M.Sc. are possible within this study program.

§6 Restriction of attendance for individual courses

The number of participants is limited for specific modules or courses due to capacity restrictions. This restriction is already taken into account in the approval by the examination board. Criteria for the selection of participants will be disclosed by the examination board.

§13 Coursework and module examinations

§13 Paragraph 4:

The following examination type can be used for module and course examinations: *Report*. (A description summarizing a topic that has been covered within the respective module/course.)

§13 Paragraph 5:

As a general rule, examinations are held in the English language. If examiner and examinee agree, an examination language can be used that differs from the taught course language.

§14 Master Thesis

§ 14 Paragraph 1:

Part of the thesis is a presentation given at a scientific seminar. The presentation represents 1/5 of the grade for the thesis. The presentation is to be held no later than 6 weeks after submission of the written thesis.

§ 14 Paragraph 2:

The master thesis work can only commence after obtaining at least 60 CP.

§ 14 Paragraph 6:

The master thesis is to be written in English.

§ 14 Paragraph 7 Clause 2:

The workload for the master thesis is 30 CP and the total time must not exceed 6 months.

§15 Review of Examinations

§15 Paragraph 3 Clause 5:

If the module exam is a combination of course exams, the score is calculated as a CP-weighted average of the grades for the individual examinations.

§ 15 Paragraph 3 Clause 9:

The final grade for the Master's examination is calculated as the CP-weighted average of all module grades, wherein the master thesis grade counts double.

§15 Paragraph 4:

The designation, „With Distinction“ („Mit Auszeichnung bestanden“), is given if the master's thesis is graded with a 1.0, the average of the final grades from the modules is less than or equal to 1.3 and no module examination is graded less than 2.3.

II. Overview of the modules and recommended course of study M.Sc. Integrated Climate System Sciences

The following summary provides an overview of the modules and a structural scheme, but does not include an overview of the specializations "Physics of the climate system," "Biogeochemistry of the climate system" and "Economics and social sciences of the climate system".

The abbreviations are defined as follows: CP = Credit Points, WCH = Weekly Course Hours, C = Compulsory, CE = Compulsory elective, L = Lecture, P = Practical Training, S = Seminar, E = Excursion

Module-No.	Semester, Module Type und Teaching Format	Workload	WCH	CP
1. Semester (Winter semester = WS)				
1.1	Basic Scientific Skills, C; L, P	180	4	6
1.2	The Climate System, C; L, S, P	270	6	9
1.3	Climate and Society, C; L, S, P	270	6	9
1.4	Climate Science Specialization, CE; L, S, P	180	4	6
	Sum	900	20	30
2. Semester (Summer semester = SS)				
2.1	Climate Dynamics, C; L, S	270	6	9
2.2	Climate Science Track Physics, CE; L, S, P	≤270	≤6	≤9
2.3	Climate Science Track Biogeochemistry, CE; L, S, P	≤270	≤6	≤9
2.4	Climate Science Track Economics and Social Science, CE; L, S, P	≤270	≤6	≤9
2.5	Technical Skills, WP; L, P	90	2	3
	Sum	900	20	30
3. Semester (Winter semester = WS)				
3.1	ICSS Seminar, C; S	90	2	3
3.2	Climate Study Project, CE; L, S, E, P	540	12	18
3.3	Climate Science Additional, CE; L, S, P	270	6	9
	Sum	900	20	30
4. Semester (Summer semester = SS)				
4.0	Master Thesis „Integrated Climate System Sciences“ with Exames, C	900	20	30
	Sum	900	20	30
Total sum for the M.Sc. ICSS		3600	80	120

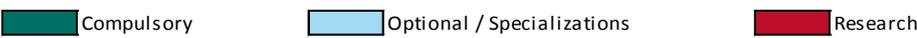
Master of Science Integrated Climate System Sciences (M.Sc. ICSS) Specialization tracks: Physics of the climate system ICSS-P. Biogeochemistry of the climate system ICSS-B. Climate related economics and social sciences ICSS-ES.			
Term 4	4.0 M.Sc. Thesis "Integrated Climate System Sciences" with examination CP 30		
Term 3	3.1 ICSS Seminar CP 3	3.2 Climate Study Project CP 18	3.3 Climate Science Additional CP 9
Term 2	2.1 Climate Dynamics CP 9	2.2, 2.3, 2.4 Climate Science Tracks 18 CP	2.5 Technical Skills CP 3
Term 1	1.1 Basic Scientific Skills CP 6	1.2 The Climate System CP 9	1.3 Climate and Society CP 9
			1.4 Climate Science Specialization CP 6
			

Figure 1. Structure of the M.Sc. Integrated Climate System Sciences with three specializations; 3 CP are equivalent to 90 hours of work, typically 2 weekly course hours (WCH) of campus study.

III. Short description of the modules in M.Sc. Integrated Climate System Sciences

The module numbers correspond to the entries shown in the structural scheme of the program „M.Sc. Integrated Climate System Sciences“.

Semester 1

Module 1.1 Basic Scientific Skills

Symbol	CLIBASICS	
Title	Basic Scientific Skills	
Learning outcomes	Students have been introduced to the concept of integrated climate system sciences; they have learned the fundamentals of mathematics, statistics, numerics and physics that are necessary for climate research.	
Formal requirements for participation	None	
Grading framework (possibly including examinations)	Type:	Joint module examination, as a rule: written exam. Deviations will be announced during registration for the module or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Maximum 90 minutes
	Possibly weighted by the credits for the module grade:	
Credits	6.0	
Module type	Compulsory	
Semester	Semester 1 of the M.Sc. ICSS; reference semester 1	
Frequency of offer	Annually in winter semester	
Duration	1 semester, including a one-week block course in the first week of the semester	

Module 1.2 Climate System

Symbol	CLISYS	
Title	The Climate System	
Learning outcomes	Students are familiar with the fundamental components of the physical and biogeochemical aspects of the climate system.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Joint module examination, as a rule: exercise. Deviations will be announced during registration for the module or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Maximum 90 minutes
	Possibly weighted by the credits for the module grade:	
Credits	9.0	
Module Type	Compulsory	
Semester	Semester 1 of M.Sc. ICSS; reference semester 1	
Frequency of offer	Annually in winter semester	
Duration	1 semester	

Module 1.3 Climate and Society

Symbol	CLISOC	
Title	Climate and Society	
Learning outcomes	Students are familiar with the economic and social science basics and are able to apply this knowledge to climate related problems.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Joint module examination. Written or oral exam, or oral or written report; overall test or component testing. The type of examination will be announced during registration for or at the beginning of the course
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Max. 120 minutes written or 45 minutes oral
	Possibly weighted by the credits for the module grade:	
Credits	9.0	
Module Type	Compulsory	
Semester	Semester 1 of M.Sc. ICSS; reference semester 1	
Frequency of offer	Annually in winter semester	
Duration	1 semester	

Module 1.4 Climate Science Specialization

Symbol	CLISPEC	
Title	Climate Science Specialization	
Learning outcomes	Students have gained disciplinary knowledge in two of the three tracks of climate science.	
Didactic concept	Students choose from a range of module courses in the value of 6.0 CP	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Course specific examination: Written or oral exam, or oral or written report; overall test or component testing. The type of examination will be announced during registration for or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Course-specific
	Possibly weighted by the credits for the module grade:	The average note of two course-related exams
Credits	6.0	
Module Type	Compulsory elective	
Semester and reference semester	Semester 1 of M.Sc. ICSS; reference semester 1	
Frequency of offer	Annually in winter semester	
Duration	1 semester	

Semester 2

Module 2.1 Climate Dynamics

Symbol	CLISDYN	
Title	Climate Dynamics	
Learning outcomes	Students have gained in-depth knowledge in the dynamics of geophysical fluids, in particular the variability on various time scales.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Joint module examination, as a rule: written exam. Deviations will be announced during registration for the module or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Max. 120 minutes written or 45 minutes oral
	Possibly weighted by the credits for the module grade:	
Credits	9.0	
Module type	Compulsory	
Semester	Semester 2 of M.Sc. ICSS; reference semester 2	
Frequency of offer	Annually in summer semester	
Duration	1 semester	

Module 2.2 Climate Science Track Physics

Symbol	CLISTRAC-P	
Title	Climate Science Track Physics	
Learning outcomes	Students have gained detailed experience and are specialized in questions, methods and results in physical climate sciences.	
Didactic concept	Students choose from a range of module courses in the value of max. 9 CP.	
Formal requirements for participation	See course-specific announcements.	
Module exams - framework (possibly including examinations)	Type:	Module exam, as a rule: oral. Changes in the type of examination will be announced during registration for or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	45 minutes (oral exam)
	Possibly weighted by the credits for the module grade:	
Credits	Max. 9.0, also possible 6.0 or 3.0	
Module type	Compulsory elective	
Semester	Semester 2 of M.Sc. ICSS; reference semester 2	
Frequency of offer	Annually in the summer semester	
Duration	1 semester	

Module 2.3 Climate Science Track Biogeochemistry

Symbol	CLITRAC-B	
Title	Climate Science Track Biogeochemistry	
Learning outcomes	Students have gained detailed experience and are specialized in questions, methods and results in biogeochemical climate sciences.	
Didactic concept	Students choose from a range of module courses in the value of max. 9 CP.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Module exam, as a rule: oral. Changes in the type of examination will be announced during registration for or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	45 minutes (oral exam)
	Possibly weighted by the credits for the module grade:	
Credits	Max. 9.0, also possible 6.0 or 3.0	
Course type	Compulsory elective	
Semester	Semester 2 of M.Sc. ICSS; reference semester 2	
Frequency of offer	Annually in summer semester	
Duration	1 semester	

Module 2.4 Climate Science Track Economic and Social Sciences

Symbol	–CLITRAC-ES	
Title	Climate Science Track of Economic and Social Sciences	
Learning outcomes	Students have gained detailed experience and are specialized in questions, methods and results in economic and social climate sciences.	
Didactic concept	Students choose from a range of module courses in the value of max. 9 CP.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Module exam, as a rule: oral. Changes in the type of examination will be announced during registration for or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	45 minutes (oral exam)
	Possibly weighted by the credits for the module grade:	
Credits	Max. 9.0, also possible 6.0 or 3.0	
Course type	Compulsory elective	
Semester	Semester 2 of M.Sc. ICSS; reference semester 2	
Frequency of offer	Annually in summer semester	
Duration	1 Semester or block	

Module 2.5 Technical Skills

Symbol	CLITECH	
Title	Technical Skills	
Learning outcomes	Students have gained working knowledge in tools used for scientific programming and data analysis or software development.	
Didactic concept	Students choose from a range of module courses in the value of 3 CP.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	None
	Requirements for registration for examination:	Course specific examination (pass/fail), as a rule: practicals. Deviations will be announced during registration for the module or at the beginning of the courses
	Language:	English
	Duration / size:	
	Possibly weighted by the credits for the module grade:	No grading
Credits	3.0	
Module type	Compulsory elective	
Semester	Semester 2 of M.Sc. ICSS; reference semester 2	
Frequency of offer	Annually in summer semester	
Duration	1 semester or block	

Semester 3

Module 3.1 Integrated Climate System Sciences Seminar

Symbol	CLISEM	
Title	Integrated Climate System Sciences Seminar	
Learning outcomes	Students are able to present aspects of their work in the study project to an audience with similar background but different specialization. Students have an overview of current topics and the state-of-the-art in integrated climate system sciences.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Presentation and report.
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Presentation of 10 to 20 minutes, report of 3 to 5 pages (1000 to 1500 words)
	Possibly weighted by the credits for the module grade:	Average grade from the presentation (75%) and report (25%)
Credits	3.0	
Module type	Compulsory	
Semester	Semester 3 of M.Sc. ICSS; reference semester 3	
Frequency of offer	Annually in the winter semester	
Duration	Seminar event	

Module 3.2 Climate Study Project

Symbol	CLISTUDY	
Title	Climate Study Projects	
Learning outcomes	Students have gained the necessary background knowledge, as well as methodological, technical and writing skills to begin a master thesis in one of the three tracks.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Report
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	
	Possibly weighted by the credits for the module grade:	
Credits	18.0	
Module type	Compulsory	
Semester	Semester 3 of M.Sc. ICSS; reference semester 3	
Frequency of offer	Annually in the winter semester	
Duration	1 semester	

Module 3.3 Climate Science Additional

Symbol	CLIADD	
Title	Climate Science Additional	
Learning outcomes	Students have sufficient specialization in one of the 3 tracks.	
Didactic concept	Students choose from a range of module courses in the value of 9 CP.	
Formal requirements for participation	None	
Module exams - framework (possibly including examinations)	Type:	Course specific examination: Written or oral exam, or oral or written report; overall test or component testing. The type of examination will be announced during registration for or at the beginning of the courses
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	Course-specific
	possibly weighted by the credits for the module grade:	Weighted average grade (based on the number of credits) of up to 3 sub-tests
Credits	9.0	
Module type	Compulsory elective	
Semester	Semester 3 of M.Sc. ICSS; reference semester 3	
Frequency of offer	Annually in the winter semester	
Duration	1 Semester	

Semester 4

Module 4.0 M.Sc. Thesis

Symbol	CLITHESIS	
Title	M.Sc. Thesis “Integrated Climate System Sciences“	
Learning outcomes	The graduate has demonstrated the ability to prepare and to present an innovative M.Sc. Thesis in a specific field of climate system sciences	
Formal requirements for participation	Completion of 60 CP of the M.Sc. ICSS	
Module exams - framework (possibly including examinations)	Type:	M.Sc. Thesis and oral presentation
	Requirements for registration for examination:	None
	Language:	English
	Duration / size:	
	Possibly weighted by the credits for the module grade:	Thesis 80% and oral presentation including discussion 20%
Credits	30.0	
Course type	Compulsory	
Semester	Semester 4 of M.Sc. ICSS; reference semester 4	
Frequency of offer	Annually	
Duration	1 Semester	

§23 Entry into force

These subject-specific regulations come into effect the day after the approval by the Executive Committee of the university. They apply to students who begin their studies in the winter semester 2012/2013

Hamburg, May 14, 2012

Universität Hamburg