

## OFFICIAL TRANSLATION OF

**“Fachspezische Bestimmungen für den Masterstudiengang  
Molecular Plant Science vom 25.02.2015”  
(Amtliche Bekanntmachung Nr. 33 vom 15. Juni 2015)**

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

**Revised Subject-Specific Provisions for the Master of Science  
in Molecular Plant Science**

**dated 25 February 2015**

On 1 May 2015 in accordance with Section 108 subsection 1 of the Hamburg higher education act (Hamburgisches Hochschulgesetz, HmbHG) the Executive University Board of Universität Hamburg ratified the Subject-Specific Provisions that were adopted by the Faculty Council from the Faculty of Mathematics, Informatics and Natural Sciences on 25 February 2015 in accordance with Section 91 subsection 2 no. 1 HmbHG dated 18 July 2001 (HmbGVBl. p. 171) as amended on 2 December 2014 (HmbGVBl. p. 495, 500) for the Master of Science in Molecular Plant Science.

## Preamble

These Subject-Specific Provisions supplement the provisions of Universität Hamburg's Examination Regulations for Master of Science (MSc) degree programs from 26 October 2005 as amended (PO MSc) and provide a description of the modules for the subject of molecular plant science.

### I. Supplemental provisions

#### Section 1

##### Program and examination objectives, academic degree, and implementation of the degree program

###### Section 1 subsection 1:

(1) The Master of Science in Molecular Plant Science shall be set up as a consecutive and research-based degree program. Graduates will learn molecular biological, physiological, and histological methods and procedures and will be able to apply them in experiments. They will possess the ability to develop hypotheses through problem analysis and using methods learned be able to develop experiments to test these hypotheses. Graduates will be familiar with the current discourse on molecular biological methods and with their professional knowledge will be able to contribute to social debate. Consequently, they will be in a position to be able to assess the developments in the area of molecular biology including those within a socioeconomic context.

(2) The degree program shall build upon a bachelor's degree or an equivalent qualification earned in a discipline in the biosciences.

#### Section 4

##### Program and exam organization

###### Section 4 subsection 1:

The degree program is comprised of 72 ECTS credits from required courses and 48 ECTS credits from the required elective area. An overview of modules has been provided in a table attached as an appendix to the Subject-Specific Provisions.

Semester	Module	ECTS Credits	Required	Required Elective
1	Introduction to Molecular Plant Science	6	X	
	Introduction to Lab Methods A	8	X	

Semester	Module	ECTS Credits	Required	Required Elective
	Introduction to Lab Methods B	8	X	
	Introduction to Lab Methods C	8	X	
2	Ethics in Biology	6	X	
	Lab Course	24		X
3	Introduction to Job	6	X	
	Lab Course	24		X
4	Master's thesis	30	X	

Required elective modules may only be taken after first successfully completing the required modules Introduction to Lab Methods A through C and attending the seminar module Introduction to Molecular Plant Science. The Lab Courses must be completed in two different research groups.

#### **Section 4 subsection 4:**

The final module shall be comprised of the master's thesis (27 ECTS credits) and an oral examination (3 ECTS credits). The oral examination should be taken no later than six weeks after submission of the master's thesis.

### **Section 5 Course types**

Courses will be held in English. Any deviations will be announced at the beginning of the course.

Attendance is compulsory for seminars and practical training courses.

### **Section 13 Completed coursework and module examinations**

#### **Section 13 subsection 6:**

The examinations shall be held in English.

**Section 14**  
**Master's thesis**

**Section 14 subsection 4:**

The master's thesis must be written in English.

**Section 14 subsection 5:**

The work required in the final module amounts to 30 ECTS credits, which is comprised of a master's thesis (27 ECTS credits) and an oral examination (3 ECTS credits). The time period in which to complete the work shall be six months.

**Section 15**  
**Evaluation of examinations**

**Section 15 subsection 3 sentence 9:**

All modules shall be graded along a scale except for the module Introduction to Job. The module Introduction to Job shall be graded pass or fail. Both of the required elective modules shall each be weighted 15%, the module Ethics in Biology weighted 10%, the results of the examinations from the modules in the first semester weighted 10%, and the master's thesis weighted 50% in the overall final grade.

**Section 23**  
**Effective date**

These Subject-Specific Provisions shall become effective on the day following official publication by Universität Hamburg. They shall first apply to students commencing their studies in the Winter Semester 2015/16.

Hamburg, 1 May 2015

**Universität Hamburg**

Key for table:  
Lecture (L), Seminar (Sem.), Practical course (PC)  
and Internship (I)

Tabular Appendix to the Subject-Specific Provisions for the Master of Science in Molecular Plant Science													
						Courses				Examinations			
Recommended Semester	Frequency	Duration	Module Type: Required (Req.), Required Elective (RE), or Elective (E)	Module Number/Code	Module Prerequisites	Module	Course Title	Type of Course	Credit Hours per Week	Prerequisites for Admission to an Examination	Type of Examination	Graded	ECTS Credits
1	Winter semester	1	Req.	MoPS-01	None	<b>Introduction to Molecular Plant Science</b>				Presentation	Written examination or oral examination (100%)	Yes	6
							Introduction to Molecular Plant Science	L	2				
							Case Studies	Sem.	2				
<b>Intended learning objectives:</b> Students will become familiar with the current topics of molecular plant sciences, in particular plant physiology, developmental biology, genetics, and phytopathology.													
1	Winter semester	1	Req.	MoPS-02	None	<b>Introduction to Lab Methods A</b>					Field experiment (100%)	Yes	8
							Lab Methods in Molecular	I	8				

							Plant Science— Course A						
<b>Intended learning objectives:</b> Students will gain practical knowledge of the current research methods in infection biology and phytopathology. In addition, they will acquire the skills to develop hypothesis-based test concepts and to statistically analyze data sets. They will learn how to document and present their findings adequately.													
1	Winter semester	1	Req.	MoPS-03	None	<b>Introduction to Lab Methods B</b>					Field experiment (100%)	Yes	8
							Lab Methods in Molecular Plant Science— Course B	1	8				
<b>Intended learning objectives:</b> Students will gain practical knowledge of the current research methods in molecular plant physiology and developmental biology. In addition, they will acquire the skills to develop hypothesis-based test concepts and to statistically analyze data sets. They will learn how to document and present their findings adequately.													
1	Winter semester	1	Req.	MoPS-04	None	<b>Introduction to Lab Methods C</b>					Field experiment (100%)	Yes	8
							Lab Methods in Molecular Plant Science— Course C	1	8				

<p><b>Intended learning objectives:</b> Students will gain practical knowledge of the current research methods in crop biology and genetics. In addition, they will acquire the skills to develop hypothesis-based test concepts and to statistically analyze data sets. They will learn how to document and present their findings adequately.</p>													
2	Summer semester	1	Req.	MoPS-05	None	<b>Ethics in Biology</b>					Presentation (100%)	Yes	6
						Ethics in Biology	L	2					
						Ethics in Biology	Sem.	2					
<p><b>Intended learning objectives:</b> Students will become familiar with different ethical concepts as the key to understanding why people evaluate new scientific findings and technical innovations differently. They will be able to develop, justify, and represent their own position critically, reflectively, and responsibly. They will become aware of social governance procedures and opportunities in order to actively participate.</p>													
2/3	Summer and winter semesters	1	RE	MoPS-06	Students must have successfully completed the MoPS-02 through MoPS-04 modules and attended the seminar for module MoPS-01.	<b>Lab Course A—Molecular Plant Physiology</b>				Presentation	Presentation (100%)	Yes	24
						Seminar to Lab Course	Sem.	2					

							Lab Course	I	14				
<p><b>Intended learning objectives:</b> Students will gain deep insight into experimental methods and research processes as well as knowledge of how to apply these to scientific research. In general, they will possess advanced knowledge in molecular physiology and in plant sciences. They will be able to develop scientific questions, set up suitable hypotheses, and plan and carry out the necessary experiments for examining the hypotheses and solving the questions. They will be able to adequately document their work for experiments and actively present their scientific work.</p>													
2/3	Summer and winter semesters	1	RE	MoPS-07	Students must have successfully completed the MoPS-02 through MoPS-04 modules and attended the seminar for module MoPS-01.		<b>Lab Course B— Molecular Plant Genetics</b>			Presentation	Presentation (100%)	Yes	24
							Seminar to Lab Course	Sem.	2				
							Lab Course	I	14				
<p><b>Intended learning objectives:</b> Students will gain deeper insight into experimental methods and research processes and be able to apply their knowledge in scientific research. They will have acquired advanced knowledge of molecular biology and modern plant sciences and learned to recognize scientific problems, formulate hypotheses, and design appropriate experiments to test these hypotheses and ultimately solve the problems. Moreover, they will be able to adequately document and actively present their scientific work.</p>													
2/3	Summer and	1	RE	MoPS-08	Students must have successfully		<b>Lab Course C— Infection Biology</b>			Presentation	Presentation (100%)	Yes	24



	winter semesters				completed the MoPS-02 through MoPS-04 modules and attended the seminar for module MoPS-01.								
							Seminar to Lab Course	Sem.	2				
							Lab Course	I	14				
<p><b>Intended learning objectives:</b> Students will gain deeper insights into the latest experimental methods, research processes, and computer-assisted techniques, and will be able to apply their knowledge to scientific research questions. They will acquire advanced knowledge in various fields such as molecular biology, biochemistry, protein chemistry, applied bioinformatics, and modern plant sciences focusing on infection biology (plant-pathogen interactions). Students will learn to recognize scientific problems, set up hypotheses, and plan and carry out meaningful experiments. They will also be taught how to adequately document and actively present their scientific work.</p>													
2/3	Summer and winter semesters	1	RE	MoPS-09	Students must have successfully completed the MoPS-02 through MoPS-04 modules and attended the seminar for		<b>Lab Course D—Molecular Plant Pathology</b>			Presentation	Presentation (100%)	Yes	24

					module MoPS-01.								
						Seminar to Lab Course	Sem.	2					
						Lab Course	I	14					
<p><b>Intended learning objectives:</b> Students will have gained a deeper understanding of the molecular, physiological, and histological interactions of a pathogen with its host plant. They will be able to use different methods of molecular phytopathology and thus be able to examine the pathogen as well as the host. They will have a general overview of plant diseases and can design and perform their own experiments. They will be able to document their experiments and discuss them in a broader scientific context.</p>													
2/3	Summer and winter semesters	1	RE	MoPS-10	Students must have successfully completed the MoPS-02 through MoPS-04 modules and attended the seminar for module MoPS-01.	<b>Lab Course E— Developmental Biology</b>			Presentation	Presentation (100%)	Yes	24	
						Seminar to Lab Course	Sem.	2					
						Lab Course	I	14					
<p><b>Intended learning objectives:</b> Students will become familiar with current topics and questions from developmental biology using case studies from research projects. Students will learn different scientific approaches such as the construction and testing of hypotheses and undirected experimental approaches. They</p>													

will become familiar with the most modern techniques, applying them independently (e.g., genome editing through CRISPR/Cas and pyrosequencing). Thus students will have learned how to analytically partition scientific problems and how to design experiments. They will be able to document experiments and scientifically present the data obtained.

2/3	Summer and winter semesters	1	RE	MoPS-11	Students must have successfully completed the MoPS-02 through MoPS-04 modules and attended the seminar for module MoPS-01.	<b>Lab Course F— Biodiversity of Crop Plants</b>			Presentation	Presentation (100%)	Yes	24
						Seminar to Lab Course	Sem.	2				
						Lab Course	I	14				

**Intended learning objectives:** Students will gain an overview of the global diversity of crops focusing particularly on biochemical, ecological, and farming aspects of crops. Students will be able to critically examine the current scientific debate on biodiversity research in agrarian ecosystems, biochemical ecology, and the molecular mechanisms of interactions between plants. They will also learn to understand how these aspects correlate with the sustainable management of natural resources. Furthermore, they will possess methodological skills for analyzing the substances of crops.

3	Winter semester	1	Req.	MoPS-12	None	<b>Introduction to Job</b>				Practical examination	No	6
						Introduction to Job	L	2				

							Introduction to Job	PC	2				
<p><b>Intended learning objectives:</b> Students will be able to evaluate scientific literature as well as classify their own findings in a broader scientific context and develop them into a publishable scientific presentation. Using different media and techniques, they will be able to convincingly present their scientific findings. They will become familiar with how to apply for financial funding to support their research. They will gain a good overview of the molecular biology profession.</p>													
4	Summer semester	1	Req.	MoPS-13	Required elective courses must be successfully completed.	<b>Final module</b>					Master's thesis (90%) and oral examination (10%)	Yes	30
<p><b>Intended learning objectives:</b> Students will be able to autonomously compose a thesis in an area of study within the purview of a Master of Science in Molecular Plant Science. They will acquire practical experience in classifying and evaluating their own research against current research on the selected topic and will possess problem-solving skills.</p>													