Appendix master's degree programme Mathematics 2012-2013

Appendix A Teaching outcomes of the degree programme (art. 1.3)

The degree programme aims to train the students in such a way that they acquire the insight, skills and knowledge that allows the recipient of the degree to establish a professional career in the field of Mathematics.

Appendix B Specializations of the degree programme (art. 2.2)

The degree programme has a P-variant and an M-variant with the following specializations: P-variant:

- Algebra and Geometry
- Dynamical Systems and Analysis
- Statistics and Probability

M-variant:

- Science, Business and Policy

Appendix C Content of the degree programme (art. 2.3)

P-variant

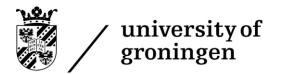
The P-variant of the degree programme has the following specializations:

- Algebra and Geometry
- Dynamical Systems and Analysis
- Statistics and Probability

The master programme comprises 120 ECTS.

The requirements on the programme are the following.

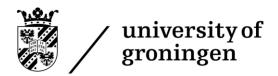
Parts	Constraints	ECTS
Student colloquium		5
At least five modules	Specialization Algebra and Geometry:	≥ 25
from the list of modules	- Caput Algebra and Geometry (annual)	
given at the University of		
Groningen, the modules		
in the specialization area	Specialization Dynamical Systems and Analysis:	
are compulsory	- Dynamical Systems and Chaos (annual)	
	- Caput Dynamical Systems (every two years,	



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	2012-2013)	
	- Caput Mathematical Physics (every two years,	
	2011-2012)	
	-Hamiltonian Mechanics (every two years, 2012-	
	2013)	
	Specialization Statistics and Probability:	
	- Contemporary Statistics with Applications	
	(every two years, 2012-2013)	
	- Statistical Genomics (every two years, 2011-	
	2012)	
	Specialization Computational Science and	
	Numerical Mathematics (Applied mathematics):	
	- Computational Fluid Dynamics (annual)	
	- Computational Engineering (every two years ,	
	2012-2013)	
	- Boundary Layers (every two years, 2011-2012)	
	Specialization Systems, Control and	
	Optimization (Applied mathematics):	
	- Robust Control (annual)	
	- Modeling and Identification (every two years,	
	2012-2013)	
	- Introduction to Optimization (every two years,	
	2011-2012)	
	- Modeling and Control of Complex Nonlinear	
	Engineering Systems (annual)	
At least three modules	From these modules at least two have to be in the	≥18
from the Mastermath	specialization area and at least one has to be	
programme	outside the specialization area.	
	For information on the modules of the	
	Mastermath programme see: www.mastermath.nl	
Advanced modules of	These modules have to be of at least third year	≤ 10
programmes taught at the	bachelor level, and have to be relevant for the	
University of Groningen	master Mathematics (at the discretion of the	
other than the master	exam committee).	
programmes		
mathematics and applied		
mathematics		
Free choice		≤ 5
Final Research Project	Research project in the specialization area.	50

M-variant

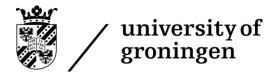


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The M-variant of the degree programme is called *Science, Business and Policy*. The master programme comprises 120 ECTS and consists of a mathematical component (60 ECTS) and a Business and Policy component (60 ECTS)

The requirements on the programme are the following.

Mathematical component (60 ECTS)				
Parts	Constraints			
At least three modules	Specialization Algebra and Geometry:			
from the list of modules	- Caput Algebra and Geometry (annual)			
given at the University				
of Groningen. At least	Specialization Dynamical Systems and Analysis:			
two modules have to be	- Dynamical Systems and Chaos (annual)			
chosen from the	- Caput Dynamical Systems (every two years, 2012-			
modules of the	2013)			
specialization area.	- Caput Mathematical Physics (every two years, 2011-2012)			
	- Hamiltonian Mechanics(every two years, 2012-2013)			
	Specialization Statistics and Probability:			
	- Contemporary Statistics with Applications (every two years, 2012-2013)			
	- Statistical Genomics (every two years, 2011-2012)			
	Specialization Computational Science and Numerical			
	Mathematics:			
	- Computational Fluid Dynamics (annual)			
	- Computational Engineering (every two years, 2012-2013)			
	- Boundary Layers (every two years, 2011-2012)			
	Specialization Systems, Control and Optimization: - Robust Control (annual)			
	- Modeling and Identification (every two years, 2012-2013)			
	- Introduction to Optimization (every two years, 2011-			
	2012)			
	- Modeling and Control of Complex Nonlinear			
At most three modules	Engineering Systems (annual) For information on the modules of the Mastermath	z 10		
from the Mastermath		≤ 18		
programme	programme see: www.mastermath.nl			
Advanced modules of	These modules have to be of at least third year bachelor	≤ 10		
programmes taught at	level, and have to be relevant for the master			
the University of	Mathematics (at the discretion of the exam committee).			
Groningen other than				
the master programmes				
mathematics and				

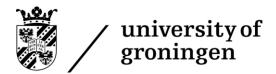


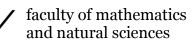
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applied mathematics						
Mathematical Research Project	Research project in the specialization area.	30				
Business and Policy component (60 ECTS)						
Parts	Constraints	ECTS				
Module Science, Business and Policy		20				
Internship Science, Business and Policy		40				

The Mathematics and Applied Mathematics modules given at the University of Groningen are

module	offered	ECTS	assessment	practical
Caput Algebra and Geometry	annual	5	Take home exam followed by an oral discussion of the problems	
Boundary Layers	every two years	5	Oral examination	X
Caput Dynamical Systems	every two years	5	Oral presentation, essay	
Caput Mathematical Physics	every two years	5	Oral presentation, essay	
Computational Engineering	every two years	5	Assignments, oral presentation	
Computational Fluid Dynamics	annual	5	Assignments, oral examination	X
Contemporary Statistics with	every two	5	Homework, final project,	
Applications	years		examination	
Dynamical Systems and Chaos	annual	5	Oral presentation, essay	
Hamiltonian Mechanics	every two years	5	Homework, Oral presentation, essay	
Final Research Project	annual	50	Assessment of performance, report, oral presentation	
Introduction to Optimization	every two years	5	Homework, oral examination	
Mathematical Research Project	annual	30	Assessment of performance, report, presentation	
Modeling and Identification	every two years	5	Take home exams followed by an oral discussion of the problems	
Modeling and Control of	annual	5	Homework, written examination	
Complex Nonlinear				
Engineering Systems				
Robust Control	annual	5	Take home exam followed by an oral discussion of the problems	
Statistical Genomics	every two	5	Homework, final project,	





	years		examination	
Student Colloquium	annual	5	Oral presentation, article	

The modules of the Business and Policy component are

module	offered	ECTS	assessment	practical
Science, Business and Policy	annual	20	Assignment, examination	
Internship Science, Business	annual	40	Assessment of performance,	
and Policy			reports	

For information on the modules of the Mastermath programme see http://www.mastermath.nl.

For information on the modules of programmes of the University of Groningen other than the master programmes mathematics and applied mathematics see the teaching and examination regulations of the corresponding programme.

Appendix D Optional modules (art. 2.4)

See Appendix C.

Appendix E Entry requirements and compulsory order of examinations (art. 3.2)

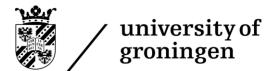
The entry requirement for the internship Science, Business and Policy is a successful completion of the module Science, Business and Policy (20 ECTS) and the mathematical research project (30 ECTS).

Appendix F Admission to the degree programme and different specializations (art. 4.1.1 + art. 4.2)

Holders of the following Bachelor's degree from the University of Groningen are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Mathematics on that basis:

- BSc Mathematics
- BSc Applied Mathematics

Appendix G Application deadlines for admission and deadlines for decision (art. 4.5.1 +4.5.3)



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Deadlines for application are:

- June 1st 2013 for EU student
- April 15^{th} 2013 for non-EU students

Deadlines for decision are:

- July 1st 2013 for EU student
- June 15^{th} 2013 for non-EU students