

Faculty of Sciences

Master of Science in Mathematics

Language of instruction: Dutch

Programme version 8

## 1 Minors

Subscribe to 1 minor from the following list. Subject to approval by the faculty.

### 1.1 Minor Research

30 credits

Subscribe to 12 credit units from the following list, with

- 6 credit units from the courses with reference a,
- 6 credit units from the courses with reference b.

Subscribe to no less than 1 and no more than 2 modules from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003683 Seminar <i>Hendrik Van Maldeghem -- Department of Mathematics: Algebra and Geometry</i>	6	a		A:J	165
2	C003684 Internship <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6	a		A:J	180
3	C003685 Literature Study <i>Joris Van der Jeugt -- Department of Mathematics, Computer Science and Statistics</i>	6	b		A:J	165

#### 1.1.1 Advanced Research Courses

Subscribe to no less than 6 and no more than 18 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C004119 Capita Selecta in Analysis [en] <i>Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6			(A:1) <sup>d</sup>	180
2	C003017 Capita Selecta in Algebra [en] <i>Tom De Medts -- Department of Mathematics: Algebra and Geometry</i>	6			(A:2) <sup>d</sup>	165
3	C004399 Capita Selecta in Incidence Geometry [en, nl] <i>Koen Thas -- Department of Mathematics: Algebra and Geometry</i>	6			(A:1) <sup>d</sup>	180
4	C004400 Capita Selecta in Galois Geometry [en] <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6			A:2 <sup>a</sup>	180
5	C003687 Capita Selecta in Logic <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6			(A:1) <sup>d</sup>	165
6	C003688 Capita Selecta in Statistics [en] <i>Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics</i>	6			A:2 <sup>a</sup>	165
7	C003689 Capita Selecta in Numerical Mathematics <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6			(A:2) <sup>d</sup>	165
8	C000145 Algorithmic Graph Theory <i>Gunnar Brinkmann -- Department of Mathematics, Computer Science and Statistics</i>	6			A:2	165
9	C002329 Astrophysical Simulations <i>Maarten Baes -- Department of Physics and Astronomy</i>	6			A:1	180
10	C003690 Quantum Black Holes and Holography [en, nl] <i>Michal Heller -- Department of Physics and Astronomy</i>	6			(A:2) <sup>d</sup>	180

#### 1.1.2 Elective Courses

Subscribe to no more than 12 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C002997 Algebraic Topology and Homological Algebra	6				165
2	C002180 Polar Spaces <i>Hendrik Van Maldeghem -- Department of Mathematics: Algebra and Geometry</i>	6			A:2	165

3	C003009	Galois Geometry <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
4	C002677	Proof Theory <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1 <sup>a</sup>	165
5	C002680	Transform Analysis <i>N. N.</i>	6		165
6	C002999	Clifford Analysis <i>Ali Guzmán Adán -- Department of Electronics and Information Systems</i>	6		165
7	C001998	Infinitesimal Analysis <i>Hans Vernaëve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2 <sup>a</sup>	165
8	C000217	Coding Theory <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1 <sup>a</sup>	165
9	C001026	Computer Algebra <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	165
10	C004109	Functional Analysis [en] <i>Jasson Vindas Díaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	180
11	C002337	Finite Geometry [en] <i>Bart De Bruyn -- Department of Mathematics: Algebra and Geometry</i>	6	(A:2) <sup>d</sup>	165
12	C002676	Continuum Mechanics [en] <i>Geert Verdoolaeye -- Department of Applied Physics</i>	6	A:2	180
13	C002462	Theory of Relativity <i>Karel Van Acoleyen -- Department of Physics and Astronomy</i>	6	A:1	180
14	C002512	Cosmology and Galaxy Formation <i>Sven De Rijcke -- Department of Physics and Astronomy</i>	6	A:1	180
15	C001427	Introduction to the Dynamics of Atmospheres <i>Piet Termonia -- Department of Physics and Astronomy</i>	6	A:1	180
16	C001747	Quantum Field Theory <i>Thomas Mertens -- Department of Physics and Astronomy</i>	6	A:1	180
17	C000819	Quantum Electrodynamics <i>Dimitri Van Neck -- Department of Physics and Astronomy</i>	6	(B:2) <sup>d</sup>	180
18	C004220	Statistical Physics <i>Jan Ryckebusch -- Department of Physics and Astronomy</i>	6	A:1	180
19	C000627	Computability and Complexity [en] <i>David Fernández-Duque -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
20	C004370	Mathematical Modelling of Fuzziness <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1	165
21	C001719	Capita Selecta in Soft Computing <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2 <sup>a</sup>	165
22	C004011	Advanced Numerical Methods <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1	180
23	C001497	Approximation Methods for Boundary Value Problems <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6	A:2 <sup>a</sup>	165
24	C001307	Applied Functional Analysis <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6	(A:2) <sup>d</sup>	165
25	C001700	Representation Theory and Applications <i>Joris Van der Jeugt -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1 <sup>a</sup>	165
26	C000242	Financial Mathematics: Discrete Stochastic Models <i>David Vyncke -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1	165
27	C001814	Financial Mathematics: Continuous Stochastic Models <i>Michèle Vanmaele -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
28	C002678	Statistical Inference [en] <i>Jing Zhou -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
29	C002679	Survival Analysis [en] <i>Els Goetghebeur -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
30	C004413	Causal Machine Learning [en] <i>Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics</i>	6	B:2	180
31	C004084	History and Philosophy of Sciences: Mathematics <i>Johan Braeckman -- Department of Philosophy and Moral Sciences</i>	6	A:1	165

32	C004214	Galaxies <i>Ilse De Looze -- Department of Physics and Astronomy</i>	6	A:2	180
33	C000802	Partial Differential Equations <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6	A:1	165
34	C003824	Analytic Number Theory <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1 <sup>a</sup>	165
35	C003011	Mathematical Logic II [en, nl] <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
36	C003012	Banach Spaces and Banach Algebras <i>Hans Vernaeve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
37	C003013	Linear Algebraic Groups [en] <i>Tom De Medts -- Department of Mathematics: Algebra and Geometry</i>	6	A:2	165
38	C004221	Structure of the Universe <i>Arjen van der Wel -- Department of Physics and Astronomy</i>	6	A:1	180
39	E011320	Queueing Theory [en] <i>Joris Walraevens -- Department of Telecommunications and Information Processing</i>	6	B:1	180
40	C003668	Quantum Computing [en] <i>Frank Verstraete -- Department of Physics and Astronomy</i>	6	A:2	180
41	C003715	Computational Biology <i>Peter Dawyndt -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
42	C004071	Strongly Correlated Quantum Systems [en] <i>Jutho Haegeman -- Department of Physics and Astronomy</i>	6	A:2	180
43	C004398	Combinatorial Algebraic Geometry [en] <i>Fatemeh Mohammadi -- Department of Mathematics: Algebra and Geometry</i>	6	(A:1) <sup>c</sup>	180

## 1.2 Minor Economics and Insurance

Subscribe to no less than 28 and no more than 32 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	F000446 Markets and Prices <i>Dirk Van de gaer -- Department of Economics</i>	6			A:1	180
2	F000758 Economics <i>Bruno Merlevede -- Department of Economics</i>	5			A:1	150
3	F000653 Insurances <i>Kristiaan Bernauw -- Department of Interdisciplinary Study of Law, Private Law and Business Law</i>	6			A:1	180
4	C000291 Commercial Law <i>Diederik Bruloot -- Department of Interdisciplinary Study of Law, Private Law and Business Law</i>	3			A:1	90
5	F000852 Taxation <i>Annelies Roggeman -- Department of Accounting, Corporate Finance and Taxation</i>	5			A:2	150
6	E076930 Financial and Cost Price Reporting in Companies <i>Sophie Maussen -- Department of Accounting, Corporate Finance and Taxation</i>	6			A:1	180
7	F000683 Investment Analysis [en] <i>Michael Frömmel -- Department of Economics</i>	6			A:1	180
8	F000093 Financial Markets and Institutions <i>Rudi Vander Vennet -- Department of Economics</i>	5			A:2	150
9	F000083 Macroeconomics <i>Freddy Heylen -- Department of Economics</i>	6			A:1	180
10	F000717 Financial Risk Management [en] <i>Frank De Jonghe -- Department of Economics</i>	6			A:1	180
11	E076431 Introduction to Entrepreneurship [en] <i>Petra Andries -- Department of Marketing, Innovation and Organisation</i>	3			A:1	90
12	E076460 Dare to Venture [en] <i>Johan Verrue -- Department of Marketing, Innovation and Organisation</i>	4			A:2	120
13	F000551 Business Skills [en] <i>Mieke Audenaert -- Department of Marketing, Innovation and Organisation</i>	4			C:2	120

## 2 Majors

30 credits

Subscribe to 30 credit units from 1 major from the following list. Subject to approval by the faculty.

### 2.1 Major Pure Mathematics

30 credits

[Subscribe to 30 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C002180 <b>Polar Spaces</b> <i>Hendrik Van Maldeghem -- Department of Mathematics: Algebra and Geometry</i>	6		1	A:2	165
2	C003009 <b>Galois Geometry</b> <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1	165
3	C004109 <b>Functional Analysis [en]</b> <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:2	180
4	C003011 <b>Mathematical Logic II [en, nl]</b> <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1	165
5	C002999 <b>Clifford Analysis</b> <i>Ali Guzmán Adán -- Department of Electronics and Information Systems</i>	6		1		165
6	C000802 <b>Partial Differential Equations</b> <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6		1	A:1	165
7	C003012 <b>Banach Spaces and Banach Algebras</b> <i>Hans Vernaëve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1	165
8	C003013 <b>Linear Algebraic Groups [en]</b> <i>Tom De Medts -- Department of Mathematics: Algebra and Geometry</i>	6		1	A:2	165
9	C001700 <b>Representation Theory and Applications</b> <i>Joris Van der Jeugt -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1 <sup>a</sup>	165
10	C004398 <b>Combinatorial Algebraic Geometry [en]</b> <i>Fatemeh Mohammadi -- Department of Mathematics: Algebra and Geometry</i>	6		1	(A:1) <sup>c</sup>	180

## 2.2 Major Mathematical Physics

30 credits

[Subscribe to 30 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C000802 <b>Partial Differential Equations</b> <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6		1	A:1	165
2	C004109 <b>Functional Analysis [en]</b> <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:2	180
3	C001700 <b>Representation Theory and Applications</b> <i>Joris Van der Jeugt -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1 <sup>a</sup>	165
4	C002462 <b>Theory of Relativity</b> <i>Karel Van Acoleyen -- Department of Physics and Astronomy</i>	6		1	A:1	180
5	C002999 <b>Clifford Analysis</b> <i>Ali Guzmán Adán -- Department of Electronics and Information Systems</i>	6		1		165
6	C001747 <b>Quantum Field Theory</b> <i>Thomas Mertens -- Department of Physics and Astronomy</i>	6		1	A:1	180
7	C003668 <b>Quantum Computing [en]</b> <i>Frank Verstraete -- Department of Physics and Astronomy</i>	6		1	A:2	180
8	C004220 <b>Statistical Physics</b> <i>Jan Ryckebusch -- Department of Physics and Astronomy</i>	6		1	A:1	180

## 2.3 Major Applied Mathematics and Computer Science

30 credits

[Subscribe to 30 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C000802 <b>Partial Differential Equations</b> <i>Marian Slodicka -- Department of Electronics and Information Systems</i>	6		1	A:1	165
2	C001026 <b>Computer Algebra</b> <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:2	165
3	C004370 <b>Mathematical Modelling of Fuzziness</b> <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1	165
4	C004011 <b>Advanced Numerical Methods</b> <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1	180
5	C000242 <b>Financial Mathematics: Discrete Stochastic Models</b> <i>David Vyncke -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1	165
6	C002678 <b>Statistical Inference [en]</b> <i>Jing Zhou -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:2	165
7	E011320 <b>Queueing Theory [en]</b> <i>Joris Walraevens -- Department of Telecommunications and Information Processing</i>	6		1	B:1	180

8	C003349	Discrete Algorithms <i>Veerle Fack -- Department of Mathematics, Computer Science and Statistics</i>	6	1	A:2	165
9	C003758	Machine Learning [en] <i>Yvan Saeys -- Department of Mathematics, Computer Science and Statistics</i>	6	1	A:1	180
10	C003785	Automata, Computability and Complexity <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:2	180

### 3 Elective Courses

Subscribe to no less than 28 and no more than 32 credit units from the study programmes of UGent including the Ghent University elective courses or from other universities of the Flemish and French Community. Subject to approval by the faculty.  
Subscribe to: no less than 18 credit units 'mathematical courses'.

### 4 Master's Dissertation 30 credits

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C002308 Master's Dissertation <i>N. N.</i>	30		2	A:J	825

#### Teaching

When a course is not taught (solely) in the programme's language of instruction, the effectively used languages are indicated in square brackets following the course name, using the following ISO codes:

bg: Bulgarian	de: German	es: Spanish	ja: Japanese	pl: Polish	sh: Croatian/Serbian	zh: Chinese
cs: Czech	el: Greek	fr: French	nl: Dutch	pt: Portuguese	sl: Slovene	
da: Danish	en: English	it: Italian	no: Norwegian	ru: Russian	sv: Swedish	

#### Semester

Semesters are indicated by their number (1 or 2); semester 3 represents the summer period and J indicates a course spanning semesters 1 and 2. When a capital letter precedes a semester number, the course has multiple offerings. The letter indicates the offering concerned. When a semester is shown in brackets, the course is not offered this year in the specific offering. The offering frequency and first year of offering are indicated by the following codes:

a: bi-annually	c: annually, from 2023-2024	f: annually, from 2024-2025	i: annually, from 2025-2026
b: tri-annually	d: bi-annually, from 2023-2024	g: bi-annually, from 2024-2025	j: bi-annually, from 2025-2026
	e: tri-annually, from 2023-2024	h: tri-annually, from 2024-2025	k: tri-annually, from 2025-2026