

Faculty of Sciences

Master of Science in Mathematics

Language of instruction: Dutch

Programme version 9

## 1 Minors

30 credits

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>Hans Vernaëve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</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	6				180
2	C003017 Capita Selecta in Algebra [en]	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	6				165
6	C003688 Capita Selecta in Statistics	6				165
7	C003689 Capita Selecta in Numerical Mathematics	6				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	C002180 Polar Spaces <i>Hendrik Van Maldeghem -- Department of Mathematics, Computer Science and Statistics</i>	6			A:2	165
2	C003009 Galois Geometry <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6			A:1	165
3	C002677 Proof Theory <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6			A:1 <sup>a</sup>	165
4	C002999 Clifford Analysis	6				165
5	C001998 Infinitesimal Analysis	6				165

6	C000217	Coding Theory <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	165
7	C001026	Computer Algebra <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	165
8	C004109	Functional Analysis [en] <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1 <sup>a</sup>	180
9	C002337	Finite Geometry [en] <i>Bart De Bruyn -- Department of Mathematics, Computer Science and Statistics</i>	6	(A:2) <sup>d</sup>	165
10	C002676	Continuum Mechanics <i>Geert Verdoolaeye -- Department of Applied Physics</i>	6		180
11	C004451	General Relativity [en] <i>Archisman Ghosh -- Department of Physics and Astronomy</i>	6	A:1	180
12	C002512	Cosmology and Galaxy Formation <i>Sven De Rijcke -- Department of Physics and Astronomy</i>	6	A:1	180
13	C001427	Introduction to the Dynamics of Atmospheres <i>Piet Termonia -- Department of Physics and Astronomy</i>	6	A:1	180
14	C001747	Quantum Field Theory [en, nl] <i>Thomas Mertens -- Department of Physics and Astronomy</i>	6	A:1	180
15	C000819	Quantum Electrodynamics <i>Dimitri Van Neck -- Department of Physics and Astronomy</i>	6	(B:2) <sup>d</sup>	180
16	C004220	Statistical Physics <i>Jan Ryckebusch -- Department of Physics and Astronomy</i>	6	A:1	180
17	C000627	Computability and Complexity [en] <i>Giovanni Solda -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
18	C004370	Mathematical Modelling of Fuzziness <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1	165
19	C001719	Capita Selecta in Soft Computing <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2 <sup>a</sup>	165
20	C004011	Advanced Numerical Methods <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	180
21	C001497	Approximation Methods for Boundary Value Problems	6		165
22	C001307	Applied Functional Analysis	6		165
23	C001700	Representation Theory and Applications	6		165
24	C000242	Financial Mathematics: Discrete Stochastic Models <i>David Vyncke -- Department of Mathematics, Computer Science and Statistics</i>	6	A:1	165
25	C001814	Financial Mathematics: Continuous Stochastic Models <i>Michèle Vanmaele -- Department of Mathematics, Computer Science and Statistics</i>	6		165
26	C002678	Statistical Inference [en] <i>Oliver Dukes -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
27	C002679	Survival Analysis [en] <i>Els Goetghebeur -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165
28	C004413	Causal Machine Learning <i>Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics</i>	6		180
29	C004084	History and Philosophy of Sciences: Mathematics <i>Maarten Van Dyck -- Department of Philosophy and Moral Sciences</i>	6	A:1 <sup>a</sup>	165
30	C004214	Galaxies <i>Ilse De Looze -- Department of Physics and Astronomy</i>	6	A:2	180
31	C000802	Partial Differential Equations [en] <i>Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
32	C003824	Analytic Number Theory [en, nl] <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	165
33	C003011	Mathematical Logic II [en, nl] <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:2	165
34	C003012	Banach Spaces and Banach Algebras <i>Hans Vernaëve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	A:1	165
35	C003013	Linear Algebraic Groups [en] <i>Tom De Medts -- Department of Mathematics, Computer Science and Statistics</i>	6	A:2	165

36	C004221	Structure of the Universe <i>Arjen van der Wel -- Department of Physics and Astronomy</i>	6		A:1	180
37	E011320	Queueing Theory [en] <i>Joris Walraevens -- Department of Telecommunications and Information Processing</i>	6		A:1	180
38	C003668	Quantum Computing [en] <i>Frank Verstraete -- Department of Physics and Astronomy</i>	6		A:2	180
39	C003789	Computational Biology <i>Peter Dawyndt -- Department of Mathematics, Computer Science and Statistics</i>	6		A:2	180
40	C004071	Strongly Correlated Quantum Systems [en] <i>Jutho Haegeman -- Department of Physics and Astronomy</i>	6		A:2	180
41	C003349	Discrete Algorithms <i>Veerle Fack -- Department of Mathematics, Computer Science and Statistics</i>	6		A:2	165
42	C003758	Machine Learning [en] <i>Yvan Saeys -- Department of Mathematics, Computer Science and Statistics</i>	6		A:1	180
43	C003785	Automata, Computability and Complexity <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		A:2	180
44	C004421	Relativistic Hydrodynamics - from Quantum Field Theory to Black Holes [en] <i>Michal Heller -- Department of Physics and Astronomy</i>	6		A:1 <sup>a</sup>	180
45	C004222	Atomic and Molecular Physics <i>Jonas Joos -- Department of Solid State Sciences</i>	6		B:2	180
46	C004221	Structure of the Universe <i>Arjen van der Wel -- Department of Physics and Astronomy</i>	6		A:1	180

## 1.2 Minor Economics and Insurance

30 credits

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	6				180
2	F000758 Economics <i>Bruno Merlevede -- Department of Economics</i>	5			A:1	150
3	F000653 Insurances <i>Thomas Verheyen -- 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	F000683 Investment Analysis [en] <i>Michael Frömmel -- Department of Economics</i>	6			A:1	180
7	F000093 Financial Markets and Institutions	5				150
8	F000083 Macroeconomics <i>Freddy Heylen -- Department of Economics</i>	6			A:1	180
9	F000717 Financial Risk Management [en] <i>Frank De Jonghe -- Department of Economics</i>	6			A:1	180
10	E076431 Introduction to Entrepreneurship [en] <i>Petra Andries -- Department of Marketing, Innovation and Organisation</i>	3			A:1	90
11	E076460 Dare to Venture [en] <i>Johan Verrue -- Department of Marketing, Innovation and Organisation</i>	4			A:2	120
12	F000551 Business Skills [en] <i>Mieke Audenaert -- Department of Marketing, Innovation and Organisation</i>	4			C:2	120
13	F000804 Financial Mathematics <i>Arnaud Devos -- Department of Telecommunications and Information Processing</i>	6			A:2	180

## 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 Polar Spaces <i>Hendrik Van Maldeghem -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:2	165

2	C003009	Galois Geometry <i>Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:1	165
3	C004109	Functional Analysis [en] <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:1 <sup>a</sup>	180
4	C003011	Mathematical Logic II [en, nl] <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:2	165
5	C002999	Clifford Analysis	6	1		165
6	C000802	Partial Differential Equations [en] <i>Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:1	165
7	C003012	Banach Spaces and Banach Algebras <i>Hans Vernaëve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6	1	A:1	165
8	C003013	Linear Algebraic Groups [en] <i>Tom De Medts -- Department of Mathematics, Computer Science and Statistics</i>	6	1	A:2	165
9	C001700	Representation Theory and Applications	6	1		165

## 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 Partial Differential Equations [en] <i>Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1	165
2	C004109 Functional Analysis [en] <i>Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1 <sup>a</sup>	180
3	C001700 Representation Theory and Applications	6		1		165
4	C004451 General Relativity [en] <i>Archisman Ghosh -- Department of Physics and Astronomy</i>	6		1	A:1	180
5	C002999 Clifford Analysis	6		1		165
6	C001747 Quantum Field Theory [en, nl] <i>Thomas Mertens -- Department of Physics and Astronomy</i>	6		1	A:1	180
7	C003668 Quantum Computing [en] <i>Frank Verstraete -- Department of Physics and Astronomy</i>	6		1	A:2	180
8	C004220 Statistical Physics <i>Jan Ryckebusch -- Department of Physics and Astronomy</i>	6		1	A:1	180
9	C004222 Atomic and Molecular Physics <i>Jonas Joos -- Department of Solid State Sciences</i>	6		1	B:2	180
10	C004221 Structure of the Universe <i>Arjen van der Wel -- 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 Partial Differential Equations [en] <i>Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:1	165
2	C001026 Computer Algebra <i>Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics</i>	6		1	A:2	165
3	C004370 Mathematical Modelling of Fuzziness <i>Chris Cornelis -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1	165
4	C004011 Advanced Numerical Methods <i>Marnix Van Daele -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:2	180
5	C000242 Financial Mathematics: Discrete Stochastic Models <i>David Vyncke -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:1	165
6	C002678 Statistical Inference [en] <i>Oliver Dukes -- Department of Mathematics, Computer Science and Statistics</i>	6		1	A:2	165
7	E011320 Queueing Theory [en] <i>Joris Walraevens -- Department of Telecommunications and Information Processing</i>	6		1	A: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

### 3 Elective Courses 30 credits

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 or, [Erasmus+ partner universities](#) including the [ENLIGHT \(online\) elective courses](#). 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 N. N.	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 2025-2026	f: annually, from 2026-2027	i: annually, from 2027-2028
b: tri-annually	d: bi-annually, from 2025-2026	g: bi-annually, from 2026-2027	j: bi-annually, from 2027-2028
	e: tri-annually, from 2025-2026	h: tri-annually, from 2026-2027	k: tri-annually, from 2027-2028