GHENT UNIVERSITY

Study Programme

Academic year 2024-2025

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 *Hendrik Van Maldeghem -- Department of Mathematics: Algebra and Geometry*	6	a		A:J	165
2	C003684	Internship *Marnix Van Daele -- Department of Applied Mathematics and Computer Science*	6	a		A:J	180
3	C003685	Literature Study *Hans Vernaeve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	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)[d]	165
3	C004399	Capita Selecta in Incidence Geometry [en, nl] *Koen Thas -- Department of Mathematics: Algebra and Geometry*	6			(A:1)[d]	180
4	C004400	Capita Selecta in Galois Geometry [en] *Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6			A:2[a]	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 *Gunnar Brinkmann -- Department of Applied Mathematics and Computer Science*	6			A:2	165
9	C002329	Astrophysical Simulations *Maarten Baes -- Department of Physics and Astronomy*	6			A:1	180
10	C003690	Quantum Black Holes and Holography [en, nl] *Michal Heller -- Department of Physics and Astronomy*	6			(A:2)[d]	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 *Hendrik Van Maldeghem -- Department of Applied Mathematics and Computer Science*	6			A:2	165
2	C003009	Galois Geometry *Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6			A:1	165
3	C002677	Proof Theory *Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6			A:1[a]	165
4	C002999	Clifford Analysis	6				165
5	C001998	Infinitesimal Analysis	6				165

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

36	C004221	Structure of the Universe *Arjen van der Wel -- Department of Physics and Astronomy*	6		A:1	180
37	E011320	Queueing Theory [en] *Joris Walraevens -- Department of Telecommunications and Information Processing*	6		A:1	180
38	C003668	Quantum Computing [en] *Frank Verstraete -- Department of Physics and Astronomy*	6		A:2	180
39	C003789	Computational Biology *Peter Dawyndt -- Department of Applied Mathematics and Computer Science*	6		A:2	180
40	C004071	Strongly Correlated Quantum Systems [en] *Jutho Haegeman -- Department of Physics and Astronomy*	6		A:2	180
41	C003349	Discrete Algorithms *Veerle Fack -- Department of Applied Mathematics and Computer Science*	6		A:2	165
42	C003758	Machine Learning [en] *Yvan Saeys -- Department of Applied Mathematics and Computer Science*	6		A:1	180
43	C003785	Automata, Computability and Complexity *Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		A:2	180
44	C004421	Relativistic Hydrodynamics - from Quantum Field Theory to Black Holes [en] *Michal Heller -- Department of Physics and Astronomy*	6		A:1[a]	180
45	C004222	Atomic and Molecular Physics *Jonas Joos -- Department of Solid State Sciences*	6		B:2	180
46	C004221	Structure of the Universe *Arjen van der Wel -- Department of Physics and Astronomy*	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 *Bruno Merlevede -- Department of Economics*	5			A:1	150
3	F000653	Insurances *Thomas Verheyen -- Department of Interdisciplinary Study of Law, Private Law and Business Law*	6			A:1	180
4	C000291	Commercial Law *Diederik Bruloot -- Department of Interdisciplinary Study of Law, Private Law and Business Law*	3			A:1	90
5	F000852	Taxation *Annelies Roggeman -- Department of Accounting, Corporate Finance and Taxation*	5			A:2	150
6	F000683	Investment Analysis [en] *Michael Frömmel -- Department of Economics*	6			A:1	180
7	F000093	Financial Markets and Institutions	5				150
8	F000083	Macroeconomics *Freddy Heylen -- Department of Economics*	6			A:1	180
9	F000717	Financial Risk Management [en] *Frank De Jonghe -- Department of Economics*	6			A:1	180
10	E076431	Introduction to Entrepreneurship [en] *Petra Andries -- Department of Marketing, Innovation and Organisation*	3			A:1	90
11	E076460	Dare to Venture [en] *Johan Verrue -- Department of Marketing, Innovation and Organisation*	4			A:2	120
12	F000551	Business Skills [en] *Mieke Audenaert -- Department of Marketing, Innovation and Organisation*	4			C:2	120
13	F000804	Financial Mathematics *Arnaud Devos -- Department of Telecommunications and Information Processing*	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 *Hendrik Van Maldeghem -- Department of Applied Mathematics and Computer Science*	6		1	A:2	165

2	C003009	Galois Geometry *Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1	165
3	C004109	Functional Analysis [en] *Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1[a]	180
4	C003011	Mathematical Logic II [en, nl] *Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:2	165
5	C002999	Clifford Analysis	6		1		165
6	C000802	Partial Differential Equations [en] *Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1	165
7	C003012	Banach Spaces and Banach Algebras *Hans Vernaeve -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1	165
8	C003013	Linear Algebraic Groups [en] *Tom De Medts -- Department of Applied Mathematics and Computer Science*	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] *Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1	165
2	C004109	Functional Analysis [en] *Jasson Vindas Diaz -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1[a]	180
3	C001700	Representation Theory and Applications	6		1		165
4	C004451	General Relativity [en] *Archisman Ghosh -- Department of Physics and Astronomy*	6		1	A:1	180
5	C002999	Clifford Analysis	6		1		165
6	C001747	Quantum Field Theory [en, nl] *Thomas Mertens -- Department of Physics and Astronomy*	6		1	A:1	180
7	C003668	Quantum Computing [en] *Frank Verstraete -- Department of Physics and Astronomy*	6		1	A:2	180
8	C004220	Statistical Physics *Jan Ryckebusch -- Department of Physics and Astronomy*	6		1	A:1	180
9	C004222	Atomic and Molecular Physics *Jonas Joos -- Department of Solid State Sciences*	6		1	B:2	180
10	C004221	Structure of the Universe *Arjen van der Wel -- Department of Physics and Astronomy*	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] *Michael Ruzhansky -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:1	165
2	C001026	Computer Algebra *Andreas Weiermann -- Department of Mathematics: Analysis, Logic and Discrete Mathematics*	6		1	A:2	165
3	C004370	Mathematical Modelling of Fuzziness *Chris Cornelis -- Department of Applied Mathematics and Computer Science*	6		1	A:1	165
4	C004011	Advanced Numerical Methods *Marnix Van Daele -- Department of Applied Mathematics and Computer Science*	6		1	A:2	180
5	C000242	Financial Mathematics: Discrete Stochastic Models *David Vyncke -- Department of Applied Mathematics and Computer Science*	6		1	A:1	165
6	C002678	Statistical Inference [en] *Oliver Dukes -- Department of Applied Mathematics and Computer Science*	6		1	A:2	165
7	E011320	Queueing Theory [en] *Joris Walraevens -- Department of Telecommunications and Information Processing*	6		1	A:1	180
8	C003349	Discrete Algorithms *Veerle Fack -- Department of Applied Mathematics and Computer Science*	6		1	A:2	165
9	C003758	Machine Learning [en] *Yvan Saeys -- Department of Applied Mathematics and Computer Science*	6		1	A:1	180

10	C003785	Automata, Computability and Complexity	6	1	A:2	180
		Leo Storme -- Department of Mathematics: Analysis, Logic and Discrete Mathematics				

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	30		2	A:J	825
		N. N.					

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 cours name, using the following ISO codes:

bg: Bulgarian	de: German	es: Spanish	ja: Japanese	pl: Polish	sh: Kroatian/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 in 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