GHENT UNIVERSITY

Study Programme

Academic year 2024-2025

Faculty of Sciences,Faculty of Psychology and Educational Sciences

Master of Science in Teaching in Science and Technology -- Physics and Astronomy

Language of instruction: Dutch

Programme version 5

1 Domain Component 54 credits

For courses without indication of the standard learning path, the student can choose whether to take the course in the first or second year, depending on the rest of his/her curriculum.

1.1 General Courses 24 credits

Subscribe to 24 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C001747	Quantum Field Theory [en, nl] *Thomas Mertens -- Department of Physics and Astronomy*	6			A:1	180
2	C002329	Astrophysical Simulations *Maarten Baes -- Department of Physics and Astronomy*	6			A:1	180
3	C001827	Computational Physics *Toon Verstraelen -- Department of Physics and Astronomy*	6			A:1	180
4	C001213	Solid State and Nano Physics *Christophe Detavernier -- Department of Solid State Sciences*	6			A:1	180
5	C003119	Subatomic Physics II *Didar Dobur -- Department of Physics and Astronomy*	6			A:1	180

1.2 Elective Courses 30 credits

Subscribe to 30 credit units from no less than 1 and no more than 2 modules from the following list. Subject to approval by the faculty.

1.2.1 Elective Course List

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

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003120	Physics and Chemistry of Nanostructures [en] *Zeger Hens -- Department of Chemistry*	6			B:2	180
2	E006800	Modelling and Engineering of Nanoscale Materials [en] *Louis Vanduyfhuys -- Department of Applied Physics*	6			A:1	180
3	C004106	Complexity and Criticality [en] *Jan Ryckebusch -- Department of Physics and Astronomy*	6			A:2	180
4	C000819	Quantum Electrodynamics *Dimitri Van Neck -- Department of Physics and Astronomy*	6			(B:2)[d]	180
5	C003122	Nuclear Methods in Material Research [en] *Stefaan Cottenier -- Department of Electromechanical, Systems and Metal Engineering*	6			A:2	180
6	C001759	Many-body Physics *Dimitri Van Neck -- Department of Physics and Astronomy*	6			A:2	180
7	C001678	Structural Analysis Techniques in Solid State Physics *Jolien Dendooven -- Department of Solid State Sciences*	6			A:2	180
8	C003123	Nuclear Instrumentation *Luc Van Hoorebeke -- Department of Physics and Astronomy*	6				180
9	C002676	Continuum Mechanics *Geert Verdoolaege -- Department of Applied Physics*	6				180
10	E026221	Plasma Physics [en] *Geert Verdoolaege -- Department of Applied Physics*	6			A:1	180

11	E006900	Plasma Technology and Fusion Technology [en] *Rino Morent -- Department of Applied Physics*	6		A:1	180
12	C000064	Nuclear Astrophysics *Natalie Jachowicz -- Department of Physics and Astronomy*	6		A:2	180
13	C003793	Hadrons and Nuclei from a Theoretical Perspective [en] *Jan Ryckebusch -- Department of Physics and Astronomy*	6		A:2[a]	180
14	C004450	Medical Radiation Physics and Dosimetry [en] *Klaus Bacher -- Department of Human Structure and Repair*	6		A:2	180
15	C001427	Introduction to the Dynamics of Atmospheres *Piet Termonia -- Department of Physics and Astronomy*	6		A:1	180
16	C003127	Capita Selecta Solid-state Physics *Henk Vrielinck -- Department of Solid State Sciences*	6			180
17	C002349	Astroparticle Physics [en] *Archisman Ghosh -- Department of Physics and Astronomy*	6		A:2	180
18	C003128	Optical Spectroscopy of Materials [en] *Dirk Poelman -- Department of Solid State Sciences*	4		A:1	120
19	C003129	Capita Selecta Particle Physics [en] *Joscha Knolle -- Department of Physics and Astronomy*	6		A:2	180
20	C003131	Observational Techniques in Astronomy [en] *Arjen van der Wel -- Department of Physics and Astronomy*	6		A:2	180
21	C002512	Cosmology and Galaxy Formation *Sven De Rijcke -- Department of Physics and Astronomy*	6		A:1	180
22	C003940	History and Philosophy of Sciences: Physics and Astronomy *Maarten Van Dyck -- Department of Philosophy and Moral Sciences*	6		A:1	180
23	C004105	Nanomagnetism [en] *Bartel Van Waeyenberge -- Department of Solid State Sciences*	6		A:1, B:2	180
24	C003939	Radiative Transfer Simulations in Astrophysics [en] *Maarten Baes -- Department of Physics and Astronomy*	6		(A:2)[d]	180
25	C003208	Luminescence *Jonas Joos -- Department of Solid State Sciences*	6			180
26	E024122	Computational Materials Physics [en] *Stefaan Cottenier -- Department of Electromechanical, Systems and Metal Engineering*	6		B:1	180
27	C003668	Quantum Computing [en] *Frank Verstraete -- Department of Physics and Astronomy*	6		A:2	180
28	C003690	Quantum Black Holes and Holography [en, nl] *Michal Heller -- Department of Physics and Astronomy*	6		(A:2)[d]	180
29	C004071	Strongly Correlated Quantum Systems [en] *Jutho Haegeman -- Department of Physics and Astronomy*	6		A:2	180
30	C003758	Machine Learning [en] *Yvan Saeys -- Department of Mathematics, Computer Science and Statistics*	6		A:1	180
31	C004421	Relativistic Hydrodynamics - from Quantum Field Theory to Black Holes [en] *Michal Heller -- Department of Physics and Astronomy*	6		A:1[a]	180
32	C004451	General Relativity [en] *Archisman Ghosh -- Department of Physics and Astronomy*	6		A:1	180
33	C003210	Advanced Field Theory [en] *Vrije Universiteit Brussel, Ben Craps*	6	a	A:1	180
34	C003211	Electroweak and Strong Force [en] *Vrije Universiteit Brussel, Alexandre Sevrin*	6	a	A:2	180
35	C003212	Extensions of the Standard Model [en] *Vrije Universiteit Brussel, Steven Lowette*	6	a	A:1	180
36	C004453	Modeling Complex Systems [en] *Vrije Universiteit Brussel, Sophie De Buyl*	6	a	A:2	180
37	C003214	Experimental Techniques in Particle Physics [en] *Vrije Universiteit Brussel, Steven Lowette*	6	a	A:1	180
38	C003215	Object Oriented Programming (C++) for Physicists [en] *Vrije Universiteit Brussel, Olivier Devroede*	6	a	A:2	180

39	C003829	Early Universe Cosmology [en] *Vrije Universiteit Brussel, Ben Craps*	6	a		A:2	180
40	C004452	Evolution of Stars and Stellar Systems [en] *Vrije Universiteit Brussel, Dany Vanbeveren*	6	a		A:2	180
41	C003219	Simulation of Physics Phenomena and Detectors in Modern Physics *Vrije Universiteit Brussel, Steven Lowette*	6	a			180

1.2.2 Elective Courses UGent and other Universities

Select courses for a total amount of credit units not exceeding 12. These courses can be taken from all UGent programs including the Ghent University elective courses, and/or from the study programmes of Erasmus+ partner universities. A maximum of 3 credit units can be spent on an internship in a research-related environment.

2 Teaching Component — 36 credits

For courses without indication of the standard learning path, the student can choose whether to take the course in the first or second year, depending on the rest of his/her curriculum. Students must complete the corresponding teaching methodology course before entering into an internship, or at least take the teaching methodology course simultaneously.

2.1 Programme Pathway Theoretical Education — 12 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H002197	The Teacher within School and Society *Melissa Tuytens -- Department of Educational Studies*	4			A:1	120
2	H002196	Classroom Management and Reflection *Tijs Rotsaert -- Department of Educational Studies*	4			A:2	120
3	H002198	Psychology of Adolescence *Wim Beyers -- Department of Developmental, Personality and Social Psychology*	4			A:1	120

2.2 Programme Pathway Teaching Methodology — 6 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H002224	Teaching Methodology Physics *Stefaan Cottenier -- Department of Electromechanical, Systems and Metal Engineering*	6			C:J	180

2.3 Programme Pathway Internship — 12 credits

Subscribe to 12 credit units from the following list, with
- 4 credit units from the courses with reference a, if no additional Teaching Methodology Course is taken in Module 2 of the Elective Courses
- 4 credit units from the courses with reference b, if an additional Teaching Methodology Course is taken in Module 2 of the Elective Courses

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H002299	Internship A: STEM *Katrien Strubbe -- Department of Chemistry*	4			A:J	100
2	H002316	Internship B: Physics *Philippe Smet -- Department of Solid State Sciences*	4			A:J	100
3	H002335	Internship C: Physics *Philippe Smet -- Department of Solid State Sciences*	4	a		A:J	100
4	H002336	Internship C: Mathematics *Hendrik Van Maldeghem -- Department of Mathematics, Computer Science and Statistics*	4	b		A:J	100

2.4 Elective Courses — 6 credits

Subscribe to 6 credit units from one or different modules from the following list. Subject to approval by the faculty.

2.4.1 Module 1: List of Elective Courses

The courses with reference b can only be chosen if the course with reference a has been passed.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H001608	Movement and Sports: Now and Later *Veerle Segers -- Department of Movement and Sports Sciences*	4	UKV		A:2	120
2	H001838	Culture, Media and Education *Kris Rutten -- Department of Educational Studies*	4			A:2	120
3	H002128	Methods to Facilitate Socratic Group Discussions in the Educational Context *Veerle Provoost -- Department of Philosophy and Moral Sciences*	4			A:2	120
4	H002213	Motivational Psychology *Joachim Waterschoot -- Department of Developmental, Personality and Social Psychology*	5			A:1	150
5	H002344	Linguistic Proficiency in Content and Language Integrated Learning: Dutch	3	b	2	A:2	90

		Bart Deygers -- Department of Translation, Interpreting and Communication					
6	H002247	Linguistic Proficiency in Content and Language Integrated Learning: English [en] *June Eyckmans -- Department of Translation, Interpreting and Communication*	3	b	2	A:2	90
7	H002248	Linguistic Proficiency in Content and Language Integrated Learning: French [fr] *Pascale Hadermann -- Department of Linguistics*	3	b	2	A:2	90
8	H002249	Linguistic Proficiency in Content and Language Integrated Learning: German [de] *Gunther Martens -- Department of Literary Studies*	3	b	2	A:2	90
9	H002246	Theory and Practice of Content and Language Integrated Learning *Ulrike Vogl -- Department of Linguistics*	3	a	1	A:1	90
10	H002283	Teaching Methodology: General Subjects for Technical and Vocational Education, including Internship *Katrien Strubbe -- Department of Chemistry*	6			A:2	160

2.4.2 Module 2: Additional Course Teaching Methodology

Taking an additional Teaching Methodology Course implies taking the corresponding Internship in the Programme Pathway Internship. Students who are able to demonstrate that they have acquired at least 30 academic credits in another specific domain (60 credits if it concerns a language), can submit a request to the Curriculum Manager for the Master of Education to take the corresponding teaching methodology course. If the Curriculum Manager agrees, the Programme Pathway Internship needs to be revised allowing a student to follow an "Internship C" in this additional teaching methodology.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H002226	Teaching Methodology: Mathematics I *Hendrik Van Maldeghem -- Department of Mathematics, Computer Science and Statistics*	6			A:J	180

2.4.3 Module 3: Additional Internship

Nr	Course		CRDT	Ref	MT1	Session	Study
1	H002332	Short Additional Internship *Katrien Strubbe -- Department of Chemistry*	3			A:J	80
2	H002333	Extended Additonal Internship *Katrien Strubbe -- Department of Chemistry*	6			A:J	160

2.4.4 Module 4: an Elective Course related to Education

Subscribe to a course of no less than 6 credit units, related to education, and lectured at a university belonging to the Flemish Community (see also: Enlight Elective Courses), subject to approval by the faculty.

3 Master's Dissertation 30 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004107	Master's Dissertation *N. N.*	30		2	A:J	900

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