GHENT UNIVERSITY

Study Programme

Academic year 2023-2024

Master of Science in Physics and Astronomy

Language of instruction: Dutch

Programme version 16

1 General Courses — 30 credits

Full-time standard learning track: Students can choose which of these course units will be taken in the first respectively the second year of study; together with the elective courses, a total of 60 credits is taken in the first and a total of 30 credits in the second year of study.

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 *Jan Ryckebusch -- 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

2 Elective Courses — 60 credits

Subscribe to 1 option from the following list. Subject to approval by the faculty.
Full-time standard learning track: Students can choose which of these course units will be taken in the first respectively the second year of study; together with the general courses, a total of 60 credits is taken in the first and a total of 30 credits in the second year of study.

2.1 Option Research — 60 credits

Subscribe to 60 credit units from the following list. Module 2.1.2. (mobility requirement) is obligatory.
It is legitimate to subscribe to 60 credit units of module 2.1.1. under the condition that one includes at least 2 courses with reference a.
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2.1.1 Minor Research

Subscribe to no less than 30 credit units from the following list.
Please note: some elective courses are offered every two years. Keep this in mind when choosing your minor courses.

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[a]	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 [en] *Luc Van Hoorebeke -- Department of Physics and Astronomy*	6			A:1	180
9	C002676	Continuum Mechanics [en] *Geert Verdoolaege -- Department of Applied Physics*	6			A:2	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)[d]	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 [en] *Henk Vrielinck -- Department of Solid State Sciences*	6		A:2	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] *Didar Dobur -- Department of Physics and Astronomy*	6		A:2	180
20	C003131	Observational Techniques in Astronomy [en] *Angelos Nersesian -- 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[a]	180
25	C003208	Luminescence [en] *Jonas Joos -- Department of Solid State Sciences*	6		A:2	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[a]	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)[d]	180
32	C004451	General Relativity [en] *Archisman Ghosh -- Department of Physics and Astronomy*	6		A:1	180
33	C003210	Advanced Field Theory [en] *Ben Craps -- Vrije Universiteit Brussel*	6	a	A:1	180
34	C003211	Electroweak and Strong Force [en] *Alexandre Sevrin -- Vrije Universiteit Brussel*	6	a	A:2	180
35	C003212	Extensions of the Standard Model [en] *Steven Lowette -- Vrije Universiteit Brussel*	6	a	A:1	180
36	C004453	Modeling Complex Systems [en] *Sophie De Buyl -- Vrije Universiteit Brussel*	6	a	A:2	180
37	C003214	Experimental Techniques in Particle Physics [en] *Steven Lowette -- Vrije Universiteit Brussel*	6	a	A:1	180

38	C003215	Object Oriented Programming (C++) for Physicists [en] *Olivier Devroede -- Vrije Universiteit Brussel*	6	a		A:2	180
39	C003829	Early Universe Cosmology [en] *Ben Craps -- Vrije Universiteit Brussel*	6	a		A:2	180
40	C004452	Evolution of Stars and Stellar Systems [en] *Dany Vanbeveren -- Vrije Universiteit Brussel*	6	a		A:2	180
41	C003219	Simulation of Physics Phenomena and Detectors in Modern Physics [en] *Steven Lowette -- Vrije Universiteit Brussel*	6	a		A:1	180

2.1.2 Mobility

Subscribe to courses with a mobility aspect for at least 10 credit units. This can be accomplished by following courses from another university (including VUB), or by doing an internship in a research-oriented organisation. For further guidance with regard to this mobility requirement please consult the promotor of your Master's Dissertation. An internship that is part of the Master's Dissertation can not be counted as extra credit units, but as mobility units (2 mobility units for one week of internship). An internship that is not directly connected with the Master's Dissertation counts for 2 credit units for one week of internship.
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2.1.3 Elective Courses UGent or other Universities

Subscribe to courses for no more than 20 credit units to be chosen from the courses of UGent including the Ghent University elective courses, or from an Erasmus+ partner university. No more than 12 credit units can be chosen from bachelor programmes.

2.2 Economics and Business Administration 60 credits

2.2.1 Minor Economics and Business Administration 30 credits

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

2.2.1.1 General Courses

Subscribe to no less than 24 and no more than 30 credit units from the following list, distributed over the first standard learning path as follows: no more than 24 credit units in year 1.
Dare to Venture can be chosen if you have already subscribed to Introduction to Entrepreneurship.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	F000758	Economics *Bruno Merlevede -- Department of Economics*	5			A:1	150
2	E076431	Introduction to Entrepreneurship [en] *Petra Andries -- Department of Marketing, Innovation and Organisation*	3			A:1	90
3	E076460	Dare to Venture [en] *Johan Verrue -- Department of Marketing, Innovation and Organisation*	4			A:2	120
4	F000845	Business Administration *Mirjam Knockaert -- Department of Marketing, Innovation and Organisation*	4			A:2	120
5	F000551	Business Skills [en] *Mieke Audenaert -- Department of Marketing, Innovation and Organisation*	4			C:2	120
6	F000768	Marketing Management *Maggie Geuens -- Department of Marketing, Innovation and Organisation*	6			A:1	180
7	F000855	Organization Theory [en] *Gosia Kozusznik -- Department of Marketing, Innovation and Organisation*	4			A:2	120
8	F000596	Business Cycles and Growth *Freddy Heylen -- Department of Economics*	6			A:1	180
9	F000446	Markets and Prices *Dirk Van de gaer -- Department of Economics*	6			A:1	180
10	F000093	Financial Markets and Institutions *Rudi Vander Vennet -- Department of Economics*	5			A:2	150
11	F000752	Environmental Economics and Policy *Brent Bleys -- Department of Economics*	4			B:2	120
12	F000859	Corporate Social Responsibility *Saskia Crucke -- Department of Marketing, Innovation and Organisation*	3			A:2	90

2.2.1.2 Elective Courses UGent or other Universities

Subscribe to no more than 6 credit units to be chosen from the study programmes of:
- UGent including the Ghent University elective courses,
- Other higher education of the Flemish Community,
- Erasmus+ partner universities including the ENLIGHT (online) elective courses.

2.2.2 Elective Courses Research

Subscribe to no less than 12 credit units from the list 2.1.1. A maximum of 3 credit units can be spent on an internship in a research-related environment.

2.2.3 Elective Courses UGent or other Universities

Subscribe to courses for no more than 18 credit units to be chosen from the courses of UGent including the Ghent University elective courses, or from an Erasmus+ partner university. No more than 12 credit units can be chosen from bachelor programmes (including courses from 2.2.1.2.).

3 Master's Dissertation 30 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C002315	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 2024-2025	f: annually, from 2025-2026	i: annually, from 2026-2027
b: tri-annually	d: bi-annually, from 2024-2025	g: bi-annually, from 2025-2026	j: bi-annually, from 2026-2027
	e: tri-annually, from 2024-2025	h: tri-annually, from 2025-2026	k: tri-annually, from 2026-2027