



Faculty of Sciences

Master of Science in Physics and Astronomy

Language of instruction: English

Programme version 1

1 General Courses

36 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	C004503 Solid State and Nano Physics <i>Christophe Detavernier -- Department of Solid State Sciences</i> Indicative price: € 0	6			A:1	180
2	C004504 Computational Physics <i>Toon Verstraelen -- Department of Physics and Astronomy</i> Indicative price: € 63	6			A:1	180
3	C004502 Subatomic Physics <i>Ben Page -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:1	180
4	C004505 Theoretical and Numerical Astrophysics <i>Maarten Baes -- Department of Physics and Astronomy</i> Indicative price: € 15	6			A:1	180
5	C004506 Quantum Field Theory <i>Thomas Mertens -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:1	180
6	C004451 General Relativity <i>Archisman Ghosh -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:1	180

2 Elective Courses

54 credits

Subscribe to 54 credit units, with:

- at least 30 credit units from 2.1-2.5
- at least 6 credit units from 2.6-2.7, including at least 4 credits from 2.6, subject to approval by the faculty.

Courses with reference a are taught at VUB.

Please note: some elective courses are offered only every two years or require specific initial competences. Keep this in mind when choosing your elective courses.

2.1 Astronomy

Subscribe to no more than 36 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C002349 Astroparticle Physics <i>Archisman Ghosh -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:2	180
2	C002512 Cosmology and Galaxy Formation [nl] <i>Sven De Rijcke -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:1	180
3	C004452 Evolution of Stars and Stellar Systems <i>Dany Vanbeveren -- Vrije Universiteit Brussel</i> Indicative price: unknown	6	a		A:2	180
4	C003131 Observational Techniques in Astronomy <i>Arjen van der Wel -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:2	180
5	C004507 Nuclei: Structure, Synthesis and Interactions <i>Natalie Jachowicz -- Department of Physics and Astronomy</i>	6			A:2	180

[Indicative price: € 0](#)

6	C003939	Radiative Transfer Simulations in Astrophysics <i>Maarten Baes -- Department of Physics and Astronomy</i> Indicative price: € 0	6		(A:2) ^d	180
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2.2 Solid State Physics

Subscribe to no more than 48 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003120	Physics and Chemistry of Nanostructures <i>Zeger Hens -- Department of Chemistry</i> Indicative price: € 0	6			A:2	180
2	E006800	Modelling and Engineering of Nanoscale Materials <i>Louis Vanduyfhuys -- Department of Applied Physics</i> Indicative price: € 0	6			A:1	180
3	C003122	Nuclear Methods in Material Research <i>Stefaan Cottetier -- Department of Electromechanical, Systems and Metal Engineering</i> Indicative price: € 0	6			A:2	180
4	C004508	Structure Analysis of Solids <i>Jolien Dendooven -- Department of Solid State Sciences</i> Indicative price: € 0	6			A:2	180
5	C003128	Optical Spectroscopy of Materials <i>Dirk Poelman -- Department of Solid State Sciences</i> Indicative price: € 0	4			A:1	120
6	C003208	Luminescence <i>Jonas Joos -- Department of Solid State Sciences</i> Indicative price: € 0	6			(A:1) ^d	180
7	C004509	Nanomagnetism <i>BarTEL Van Waeyenberge -- Department of Solid State Sciences</i> Indicative price: € 60	5			A:2	150
8	E024122	Computational Materials Physics <i>Stefaan Cottetier -- Department of Electromechanical, Systems and Metal Engineering</i> Indicative price: unknown	6			B:1	180
9	C004523	Materials for Energy Applications <i>Christophe Detavernier -- Department of Solid State Sciences</i> Indicative price: unknown	6			(A:1) ^c	180
10	C004511	Thin Films: Physics and Analysis <i>Jolien Dendooven -- Department of Solid State Sciences</i> Indicative price: € 0	6			A:1	180
11	C004512	Thin Films: Atomic Scale Processing and Analysis <i>Jolien Dendooven -- Department of Solid State Sciences</i> Indicative price: € 0	3			A:1	90
12	C004513	The Theory of Metals: from Path Integrals to Experiment <i>Nick Bultinck -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:1	180

2.3 Nuclear and Particle Physics

Subscribe to no more than 48 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004507	Nuclei: Structure, Synthesis and Interactions <i>Natalie Jachowicz -- Department of Physics and Astronomy</i> Indicative price: € 0	6			A:2	180
2	C004560	Particle Radiation Detection and Measurement Indicative price: unknown	6	a		A:1	180
3	C004450	Medical Radiation Physics and Dosimetry <i>Klaus Bacher -- Department of Human Structure and Repair</i> Indicative price: € 10	6			A:2	180
4	C003129	Capita Selecta Particle Physics <i>Joscha Knolle -- Department of Physics and Astronomy</i> Indicative price: € 5	6			A:2	180
5	C003212	Extensions of the Standard Model <i>Steven Lowette -- Vrije Universiteit Brussel</i>	6	a		A:1	180

Indicative price: unknown

6	C003211	Electroweak and Strong Force <i>Alexandre Sevrin -- Vrije Universiteit Brussel</i> <u>Indicative price: unknown</u>	6	a	A:2	180
7	C003214	Experimental Techniques in Particle Physics <i>Steven Lowette -- Vrije Universiteit Brussel</i> <u>Indicative price: unknown</u>	6	a	A:1	180
8	C002349	Astroparticle Physics <i>Archisman Ghosh -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6		A:2	180

2.4 Theoretical Physics

Subscribe to no more than 48 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004514	Quantum Electrodynamics <i>Dimitri Van Neck -- Department of Physics and Astronomy</i> <u>Indicative price: € 101</u>	6			(A:2) ^d	180
2	C004515	Many-body Physics <i>Dimitri Van Neck -- Department of Physics and Astronomy</i> <u>Indicative price: € 10</u>	6			A:2	180
3	C003668	Quantum Computing <i>Frank Verstraete -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:2	180
4	C004516	Holography <i>Michal Heller -- Department of Physics and Astronomy</i> <u>Indicative price: unknown</u>	6			(A:2) ^d	180
5	C004561	Quantum Black Holes <i>Thomas Mertens -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:2 ^a	180
6	C004071	Strongly Correlated Quantum Systems <i>Jutho Haegeman -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:2	180
7	C004421	Relativistic Hydrodynamics - from Quantum Field Theory to Black Holes <i>Michal Heller -- Department of Physics and Astronomy</i> <u>Indicative price: unknown</u>	6			A:1 ^a	180
8	C004517	Dynamics: from Newton to Schrödinger <i>Sven De Rijcke -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:1	180
9	C004513	The Theory of Metals: from Path Integrals to Experiment <i>Nick Bultinck -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:1	180
10	C004518	Field Theory for Statistical Mechanics <i>Nick Bultinck -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			(A:2) ^d	180
11	C004106	Complexity and Criticality <i>Jan Ryckebusch -- Department of Physics and Astronomy</i> <u>Indicative price: € 0</u>	6			A:2	180

2.5 Interdisciplinary Elective Courses

Subscribe to no more than 48 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E006900	Plasma Technology and Fusion Technology <i>Rino Morent -- Department of Applied Physics</i> <u>Indicative price: unknown</u>	6			A:1	180
2	E026260	Magnetohydrodynamics of Plasmas <i>Roger Jaspers -- Department of Applied Physics</i> <u>Indicative price: € 0</u>	6			A:2	180
3	C003940	History and Philosophy of Sciences: Physics and Astronomy [nl] <i>Maarten Van Dyck -- Department of Philosophy and Moral Sciences</i> <u>Indicative price: € 0</u>	6			A:1	180

4	C003758	Machine Learning <i>Yvan Saeys -- Department of Mathematics, Computer Science and Statistics</i> Indicative price: € 0	6		A:1	180
5	C001427	Introduction to the Dynamics of Atmospheres [nl] <i>Piet Termonia -- Department of Physics and Astronomy</i> Indicative price: € 10	6		A:1	180
6	E040430	Continuum Mechanics <i>Geert Verdoolege -- Department of Applied Physics</i> Indicative price: € 0	6		A:2	180
7	E006500	Quantum Optics <i>Bart Kuyken -- Department of Information Technology</i> Indicative price: € 0	6		A:1	180
8	E024641	Physics of Semiconductor Devices <i>Benoit Bakeroet -- Department of Electronics and Information Systems</i> Indicative price: € 10	6		B:2	180
9	E029040	Physical Chemistry <i>Iwan Moreels -- Department of Chemistry</i> Indicative price: € 0	6		B:2	180
10	C004453	Modeling Complex Systems <i>Sophie De Buyl -- Vrije Universiteit Brussel</i> Indicative price: unknown	6	a	A:2	180
11	E006400	Wave Physics in Living Matter <i>Wout Joseph -- Department of Information Technology</i> Indicative price: € 0	6		A:2	180
12	C004106	Complexity and Criticality <i>Jan Ryckebusch -- Department of Physics and Astronomy</i> Indicative price: € 0	6		A:2	180
13	C004517	Dynamics: from Newton to Schrödinger <i>Sven De Rijcke -- Department of Physics and Astronomy</i> Indicative price: € 0	6		A:1	180
14	F000920	Networks in Socio-Economic Systems <i>Luis Enrique Correa da Rocha -- Department of Economics</i> Indicative price: € 110	6		A:2	180

2.6 Professional Skills and Internships

Subscribe to at least 4 and no more than 24 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004519	Professional Skills for Scientists [en, nl] <i>Philippe Smet -- Department of Solid State Sciences</i> Indicative price: € 5	4			(A:J) ^c	120
2	E076471	Dare to Start <i>Wouter Haerick -- Department of Information Technology</i> Indicative price: unknown	3			A:2	90
3	E076460	Dare to Venture <i>Johan Verrue -- Department of Marketing, Innovation and Organisation</i> Indicative price: unknown	4			A:2	120
4	C004520	Internship A <i>Matthieu Boone -- Department of Physics and Astronomy</i> Indicative price: unknown	4			A:J	120
5	C004521	Internship B <i>Matthieu Boone -- Department of Physics and Astronomy</i> Indicative price: unknown	6			A:J	180
6	C004522	Project Work <i>Christophe Detavernier -- Department of Solid State Sciences</i> Indicative price: unknown	4			A:J	120

2.7 Social and Economic Elective Courses

Subscribe to no more than 20 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004523	Materials for Energy Applications <i>Christophe Detavernier -- Department of Solid State Sciences</i>	6			(A:1) ^c	180

Indicative price: unknown

2	E039060	Sustainable Energy and Rational Use of Energy <i>Jeroen Beeckman -- Department of Electronics and Information Systems</i>	4	A:2	120	
3	E065460	Rational Use of Materials <i>Tom Depover -- Department of Materials, Textiles and Chemical Engineering</i>	5	A:1	150	
4	E076320	The Information Society and ICT [nl] <i>Erik Mannens -- Department of Electronics and Information Systems</i>	3	A:2	90	
5	F000551	Business Skills <i>Mieke Audenaert -- Department of Marketing, Innovation and Organisation</i>	4	C:2	120	
6	A001900	Introduction to Psychology [nl] <i>Wim Notebaert -- Department of Experimental Psychology</i>	3	A:1	90	
7	H001977	Coaching and Diversity [nl] <i>Elisabeth De Schauwer -- Department of Special Education</i>	3	UKV	A:J	90
8	E076450	Basic Entrepreneurship [nl] <i>Yannick Dillen -- Department of Marketing, Innovation and Organisation</i>	3	UKV	A:1	90
9	E078010	Technology and Environment <i>Luc Martens -- Department of Information Technology</i>	3	A:1	90	
10	F000982	Complexity Economics and Agent-Based Modelling <i>Luis Enrique Correa da Rocha -- Department of Economics</i>	6	A:2	180	
		<u>Indicative price: € 0</u>				
		<u>Indicative price: € 55</u>				

2.8 Elective Courses UGent or other Universities

Subscribe to maximum 18 credit units from UGent courses, including the [Ghent University elective courses](#), courses from other Flemish Universities or an [Erasmus+ Partner University](#). Maximum 12 credit units can be chosen from Bachelor programmes. Subject to approval by the faculty.

3 Master's Dissertation

30 credits

Subscribe for the Master's Dissertation in year 2 of the full-time standard learning track.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C004524 Master's Dissertation <i>Philippe Smet -- Department of Solid State Sciences</i>	30	2	A:J	900	

Programme related study costs

Type: Laptop

Name: Laptop

Indicative price: € 700

Optional: No

Fulltime standard learning track year: 1

Additional information: <https://www.ugent.be/we/nl/voor-nieuwe-studenten/laptop>

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

Learning materials

The prices stated are indicative and subject to fluctuations.

The list of learning materials per course unit can be found in the course sheets.