Study Programme

Academic year 2025-2026

Programme jointly offered by Ghent University, Vrije Universiteit Brussel

Master of Science in Photonics Engineering

Language of instruction: English

Programme version 6

1 General Courses — 52 credits

These general courses are taught in parallel at Ghent University and at Vrije Universiteit Brussel (with lecturers from both universities).

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E024800	Optical Materials	6		1	A:1	180
		Jeroen Beeckman -- Department of Electronics and Information Systems					
2	E030761	Microphotonics	6		1	A:1	180
		Dries Van Thourhout -- Department of Information Technology					
3	E030660	Lasers	4		1	A:1	120
		Geert Morthier -- Department of Information Technology					
4	E002640	Mathematics in Photonics	4		1	A:1	120
		Peter Bienstman -- Department of Information Technology					
5	E012420	Optical Communication Systems	6		1	A:2	180
		Geert Morthier -- Department of Information Technology					
6	E008446	Sensors, Actuators and Electronic Microsystems	6		1	A:2	180
		Herbert De Smet -- Department of Electronics and Information Systems					
7	E031521	Physics of Semiconductor Technologies and Devices	4		1	A:2	120
		Geert Van Steenberge -- Department of Electronics and Information Systems					
8	E030721	Laboratories in Photonics Research	6		1	A:2	180
		Alberto Curto -- Department of Information Technology					
9	E030740	Recent Trends in Photonics	4		2	A:1	120
		Wim Bogaerts -- Department of Information Technology					

1.1 General Courses: Entrepreneurship — 6 credits

Subscribe to 6 credit units from the following list. Subject to approval by the faculty.
Subscribe to:
• either 6 credit units courses with reference a,
• either 3 credit units courses with reference b and 3 credit units courses with reference c

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E076951	Engineering Economy	6	a	1	A:1	180
		Sofie Verbrugge -- Department of Information Technology					
2	F000892	Innovation Management	3	b	1	A:2	90
		Katrien Verleye -- Department of Marketing, Innovation and Organisation					
3	F001020	Introduction to Entrepreneurship	3	c	1	A:1	90
		Petra Andries -- Department of Marketing, Innovation and Organisation					
4	E900660	Business Management and Entrepreneurship	3	c	1	O:1	90
		Kevin De Moortel -- Vrije Universiteit Brussel					

2 Elective Courses — 38 credits

Subscribe to no less than 38 credit units from 2 modules from the following list. Subject to approval by the faculty.
Divided as:
• first year: 12 credits
• second year: 26 credits

2.1 Elective Photonics Courses

Subscribe to no less than 16 and no more than 20 credit units from no less than 1 and no more than 3 module(s) from the following list.
Subject to approval by the faculty.

2.1.1 Basic Photonics

Depending on the previous degree of the student and subject to approval by the faculty.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E030620	Photonics	4	1		A:1	120
		Günther Roelkens -- Department of Information Technology					

2.1.2 Advanced Courses Photonics

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E030961	Design of Refractive and Diffractive Optical Imaging Systems	4			A:1	120
		Michael Vervaeke -- Vrije Universiteit Brussel					
2	C003128	Optical Spectroscopy of Materials	4			A:1	120
		Dirk Poelman -- Department of Solid State Sciences					
3	E032411	Display Technology	4				120
4	E030920	Optical Sensors	4			A:1	120
		Thomas Geernaert -- Vrije Universiteit Brussel					
5	E900132	Photovoltaic Energy Conversion	4				120
6	E030630	High Speed Photonic Components	4				120
7	E099221	Short Internship in Photonics	5			A:J, B:1	150
		Geert Morthier -- Department of Information Technology					
8	E099232	Long Internship in Photonics	10			A:J, B:1	300
		Jeroen Beeckman -- Department of Electronics and Information Systems					
9	E030930	Biophotonics	4			A:1	120
		Nicolas Le Thomas -- Department of Information Technology					
10	E030881	Optical Design of Non-Imaging Systems with Ray-tracing Software	4			A:1	120
		Wendy Meulebroeck -- Vrije Universiteit Brussel					
11	E030890	Technological Processes for Photonics and Electronics: Laboratory	4			A:J	120
		Günther Roelkens -- Department of Information Technology					
12	E023930	Quantum Optics	4			A:2	120
		Guy Van Der Sande -- Vrije Universiteit Brussel					
13	E023940	Non-linear Optics	4			A:1	120
		Bart Kuyken -- Department of Information Technology					
14	E030782	Micro- and Nanophotonic Semiconductor Devices	4			A:2	120
		Dries Van Thourhout -- Department of Information Technology					
15	E901176	Introduction to Quantum Physics for Electrical Engineering	4			A:1	120
		Guy Van Der Sande -- Vrije Universiteit Brussel					
16	E030790	Photonic Integrated Circuits	4			A:2	120
		Wim Bogaerts -- Department of Information Technology					
17	E030730	Lighting Technology	4			A:2	120
		Lien Smeesters -- Vrije Universiteit Brussel					
18	E030710	Research in Photonics	6			A:1, B:2	150
		Yanlu Li -- Department of Information Technology					
19	E901130	Machine Learning in Photonics	4			A:2	120
		Francesco Ferranti -- Vrije Universiteit Brussel					

2.2 Multidisciplinary Engineering Electives

Subscribe to no less than 18 and no more than 22 credit units from no less than 1 and no more than 5 module(s) from the following list.
Subject to approval by the faculty.
The clusters below list multidisciplinary engineering electives. The student can choose the electives across the different clusters.
Students may also suggest other elective courses, possibly but not necessarily linked to the thematic clusters below. Subject to approval by the faculty.

2.2.1 Cluster Electronics and Information Technology

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E022230	Antennas and Propagation	6			A:1	180
		Hendrik Rogier -- Department of Information Technology					
2	E031440	VLSI Technology and Design	6			A:1	180
		Jan Doutreloigne -- Department of Electronics and Information Systems					
3	E003600	Information Theory	6			B:2	180
		Heidi Steendam -- Department of Telecommunications and Information Processing					

4	E033640	High-speed Electronics	6			A:2	180

Johan Bauwelinck -- Department of Information Technology

5	E061330	Machine Learning	6			B:1	180

Joni Dambre -- Department of Electronics and Information Systems

6	E012130	Modulation and Detection	6			B:1	180

Nele Noels -- Department of Telecommunications and Information Processing

7	E033021	Electromagnetic-aware High Frequency Design	6			A:1	180

Hendrik Rogier -- Department of Information Technology

2.2.2 Cluster Physics and Materials

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E024641	Physics of Semiconductor Devices	6			B:2	180

Benoit Bakeroot -- Department of Electronics and Information Systems

2	E066170	Physical Materials Science	6			C:1	180

Leo Kestens -- Department of Electromechanical, Systems and Metal Engineering

3	E029040	Physical Chemistry	6			B:2	180

Iwan Moreels -- Department of Chemistry

4	E025010	Atomic and Molecular Physics	6			A:1	180

Veronique Van Speybroeck -- Department of Applied Physics

5	C003120	Physics and Chemistry of Nanostructures	6			B:2	180

Zeger Hens -- Department of Chemistry

2.2.3 Cluster Life Sciences

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092623	Modelling of Physiological Systems	5			A:2	150

Patrick Segers -- Department of Electronics and Information Systems

2	E092662	From Genome to Organism	3			A:1	90

Fransiska Malfait -- Department of Biomolecular Medicine

3	E074011	Quantitative Cell and Tissue Analysis	6			A:1	180

An Hendrix -- Department of Human Structure and Repair

4	E063671	Biomaterials and Tissue Engineering	5			A:1	150

Ruslan Dmitriev -- Department of Human Structure and Repair

5	E063682	Biomechanics	6			A:1	180

Charlotte Debbaut -- Department of Electronics and Information Systems

6	E010371	Medical Imaging	6			A:1	180

Stefaan Vandenberghe -- Department of Electronics and Information Systems

2.2.4 Cluster Operations Management

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E076951	Engineering Economy	6			A:1	180

Sofie Verbrugge -- Department of Information Technology

2	E004153	Heuristics and Search Methods	3			A:2	90

Sidharta Gautama -- Department of Industrial Systems Engineering and Product Design

3	E060240	Quality Engineering and Industrial Statistics	6			A:2	180

Stijn De Vuyst -- Department of Industrial Systems Engineering and Product Design

4	E076221	Manufacturing Planning and Control	6			A:1	180

Birger Raa -- Department of Industrial Systems Engineering and Product Design

5	E003422	Fundamentals of Statistical Sensor Processing	6			A:1	180

Hiep Luong -- Department of Telecommunications and Information Processing

2.2.5 Elective Courses Ghent University/VUB

Choose other multidisciplinary engineering courses from the programmes of the Faculty of Engineering and Architecture (Ghent University) or the Faculty of Engineering (VUB), possibly but not necessarily linked to the thematic clusters above. Subject to approval by the faculty.

3 Master's Dissertation   30 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E091106	Master's Dissertation	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 2026-2027	f: annually, from 2027-2028	i: annually, from 2028-2029
b: tri-annually	d: bi-annually, from 2026-2027	g: bi-annually, from 2027-2028	j: bi-annually, from 2028-2029
	e: tri-annually, from 2026-2027	h: tri-annually, from 2027-2028	k: tri-annually, from 2028-2029