MASTER OF SCIENCE IN PHOTONICS ENGINEERING

PROGRAMME JOINTLY OFFERED BY GHENT UNIVERSITY, VRIJE UNIVERSITEIT BRUSSEL

120 ECTS CREDITS - LANGUAGE: ENGLISH

WHAT

Photonics is now widely recognised as a major innovation-enabling discipline for the 21st century. It can be defined as the field of science and technology where the fundamental properties of light and its interaction with matter are studied and applied. For several decades now, photonics has been finding its way into more and more applications and household appliances. At the moment, photonics is a key discipline in industrial sectors such as tele- and data communication, display and camera industry, biotechnology, solar energy, medical instrumentation, laser material processing, etc. The European Master of Science in Photonics is a multidisciplinary programme covering basic physics, material technologies, electronics and applications in different fields. Students will be trained to become specialists in the field. Key features of this programme are the extensive student mobility opportunities and the multidisciplinary engineering modules in Electronics & Information Technology, Physics & Materials or Life Sciences.

STRUCTURE

The Master of Science in Photonics is a two-year (120 credits) English-taught programme, based on four cornerstones: a strong backbone of core photonics course units, specialisation in a broad spectrum of advanced photonics course units, a secondary specialisation in a related field (multidisciplinary engineering modules) and a Master's dissertation. During the first year, the focus is on course units covering the fundamentals of photonics: light propagation in complex media, basic understanding of the properties of optical materials and lasers. In that context, we address theoretical knowledge as well as practical skills. During the second year there is room for advanced photonics electives, multidisciplinary engineering course units, and the Master's dissertation..

Engineering Modules

As photonics engineers mostly work in multidisciplinary environments where the knowledge and skills in other engineering domains are important assets, students can, besides further taking up specialised photonics electives, broaden their horizon by taking up one of the Engineering Modules. The modules on offer are: Electronics & Information Technology, Physics & Materials, Life Sciences and Business Engineering & Entrepreneurship.

Mobility Opportunities

Students have a broad range of options for engaging in international mobility: taking course units (30 credits) at a partner institution; carrying out their Master's dissertation fully or partly at a partner institution (30 credits); course units (30 credits) and the Master's dissertation (30 credits) at a partner institution; carrying out a long work placement (>10 weeks, 10 credits) at a company or research institute abroad.

About our partnes

The programme has set up collaborations with a number of European universities and research institutes offering high-quality Photonics programmes. Some of these partner institutions offer a full programme (course units + dissertation) while others offer only course units or only a dissertation. For the partner institutions offering course units, the programme board has preselected a number of specialised photonics course units and multidisciplinary course units, from which the student can easily compile a curriculum that meets the requirements. The partner institutions are located all across Europe. They each have their own specific profile allowing the student to specialise in virtually any subdiscipline of photonics. At the end of the Master's programme, we organise a summer symposium, bringing together all students at a single location. At this symposium the graduating students present their Master's dissertation, and leading international experts in photonics hold guest lectures.

Master's Dissertation

The Master's dissertation is an original piece of work on a specific topic in photonics. In general it consists of a literature review combined with practical work in the form of simulation, modelling, fabrication and/or measurements of photonic components. The completion of the Master's dissertation is a requirement to obtain the degree of Master of Science in Photonics Engineering.

LABOUR MARKET

The aim of this Master's programme is to deliver engineers and scientists with solid basic knowledge in the field of photonics, and with the skills to apply this knowledge to the design, realisation and the management of photonic systems for a broad range of application domains. Furthermore, graduates will have the opportunity to broaden their knowledge and skills in other domains such as ICT, biosciences, physics and chemistry of materials, industrial

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management etc. For these reasons, our graduates can expect a broad range of future opportunities, including: research at high-technology companies, in particular photonics-related companies; research in academic laboratories and research institutes (possibly in a PhD context); development of new photonic products in the industry; technical support in a company for its products or services; technical marketing and sales.

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TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

1 **Rechtstreeks:**

a opleidingen nieuwe structuur:

- Bachelor in de ingenieurswetenschappen, afstudeerrichting: elektronica en informatietechnologie
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: elektrotechniek
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: toegepaste natuurkunde
- Bachelor in de ingenieurswetenschappen: elektrotechniek
- Bachelor in de ingenieurswetenschappen: toegepaste natuurkunde
- Een diploma van een opleiding 'Master of Bioscience Engineering' leidend tot de titel van 'bio-ingenieur'
- Een diploma van een opleiding 'Master of Science in de bio-ingenieurswetenschappen' leidend tot de titel van 'bio-ingenieur'
- Een diploma van een opleiding 'Master of Science in de ingenieurswetenschappen' leidend tot de titel van 'burgerlijk ingenieur' (met uitzondering van architectuur)
- Een diploma van een opleiding 'Master of Science in Engineering' leidend tot de titel van 'burgerlijk ingenieur' (met uitzondering van Architecture)
- Master in de fysica
- Master in de fysica en de sterrenkunde
- Master of Materials Engineering
- Master of Nanophysics
- Master of Nuclear Engineering
- Master of Physics
- Master of Physics and Astronomy

b opleidingen oude structuur:

- Een diploma van 'Bio-ingenieur'
- Een diploma van 'Burgerlijk Ingenieur' (met uitzondering van 'Burgerlijk Ingenieur-Architect')
- Licentiaat in de natuurkunde

2 **Na het met succes voltooien van een voorbereidingsprogramma:**

MIN 30 SP - MAX 90 SP

- Bachelor in de bio-ingenieurswetenschappen
- Bachelor in de biochemie en de biotechnologie
- Bachelor in de chemie
- Bachelor in de fysica
- Bachelor in de fysica en de sterrenkunde
- Bachelor in de industriële wetenschappen, afstudeerrichting: elektronica-ICT
- Bachelor in de industriële wetenschappen: elektronica-ICT
- Bachelor in de ingenieurswetenschappen (KMS)
- Een diploma van een opleiding 'Bachelor of Science in de ingenieurswetenschappen' (met inbegrip van 'architectuur')

aantal studiepunten te bepalen door de faculteit

- Bachelor of Engineering Technology, afstudeerrichting: Electronics Engineering
- Master in de bio-ingenieurswetenschappen: biosysteemtechniek
- Master of Bioscience Engineering: Agro- and Ecosystems Engineering
- Master of Bioscience Engineering: Human Health Engineering
- Master of Nanoscience, Nanotechnology and Nanoengineering
- Master of Water Resources Engineering

3 **Rechtstreekse toelating voor het volgen van een brugprogramma (horizontale instroom):**

a opleidingen nieuwe structuur:

- Master in de industriële wetenschappen: elektronica en ICT: elektronica
- Master in de industriële wetenschappen: elektronica en ICT: ICT
- Master in de biochemie
- Master in de biochemie en de biotechnologie
- Master in de chemie
- Master in de industriële wetenschappen: chemie
- Master in de industriële wetenschappen: elektromechanica
- Master in de industriële wetenschappen: elektronica-ICT (zonder afstudeerrichting)
- Master in de industriële wetenschappen: elektronica-ICT, afstudeerrichting: ingebedde systemen
- Master in de industriële wetenschappen: elektrotechniek
- Master in de industriële wetenschappen: energie
- Master in de industriële wetenschappen: industriële kunststofverwerking
- Master in de industriële wetenschappen: kunststofverwerking

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- Master in de nanowetenschappen en de nanotechnologie
- Master in de nanowetenschappen, nanotechnologie en nano-engineering
- Master of Biochemistry and Biotechnology
- Master of Chemical Engineering Technology
- Master of Chemistry
- Master of Electromechanical Engineering Technology
- Master of Electronics and ICT Engineering Technology

b opleidingen oude structuur:

- Industrieel ingenieur in chemie
- Industrieel ingenieur in elektromechanica
- Industrieel ingenieur in elektronica
- Licentiaat in de biochemie
- Licentiaat in de biotechnologie
- Licentiaat in de scheikunde

ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

Information on admission requirements and the administrative procedure for admission on the basis of a diploma obtained abroad, can be found on the following page: www.ugent.be/prospect/en/administration/enrolment-or-registration.

LANGUAGE REQUIREMENTS

Language requirements Dutch: no language requirements

Language requirements for this study programme differ from the required standard level for English taught study programmes as specified in the Ghent University Education and Examination Code:

English: TOEFL 570 (paper-based) - TOEFL 87 (internet-based) - TOEFL 213 (computer-based) - IELTS: 6.5 (minimum 6.0 for each part) - Cambridge Certificate of Advanced English (CAE): grade B - Cambridge Certificate of Proficiency in English (CPE): grade C - Certificate B2 from a university language centre

PRACTICAL INFORMATION

Study programme

studiekiezer.ugent.be/master-of-science-in-photonics-engineering-EMPHOE-en/programma

Information sessions

EVOLV

evolv.gent/en/students/further-studies

Open Days

Each spring the graduation fair **EVOLV** organised by the UGent Association, offers the opportunity to discover all possible options to continue studying or to start looking for a job (with more than 200 different companies).
For some programmes, there is a specific **Open Day**. If so, it will be announced here (at the latest Feb 15th).15th).

23 April 2026 15u00 - 17u00 - Campus UFO, Ufo, Sint-Pietersnieuwstraat 33, 9000 Gent

Enrolling institution

Ghent University, Vrije Universiteit Brussel

Information on enrolment at Ghent University.

Application Deadline (for International degree students)

The international master has a specific application procedure.

Tuition fee

More information is to be found on: www.ugent.be/tuitionfee

Contact
Nicolas le Thomas
nicolas.lethomas@ugent.be

Contact (for international degree students)
International Relations Officer
32 9 264 36 99
international.ea@ugent.be

www.studyphotonics.com