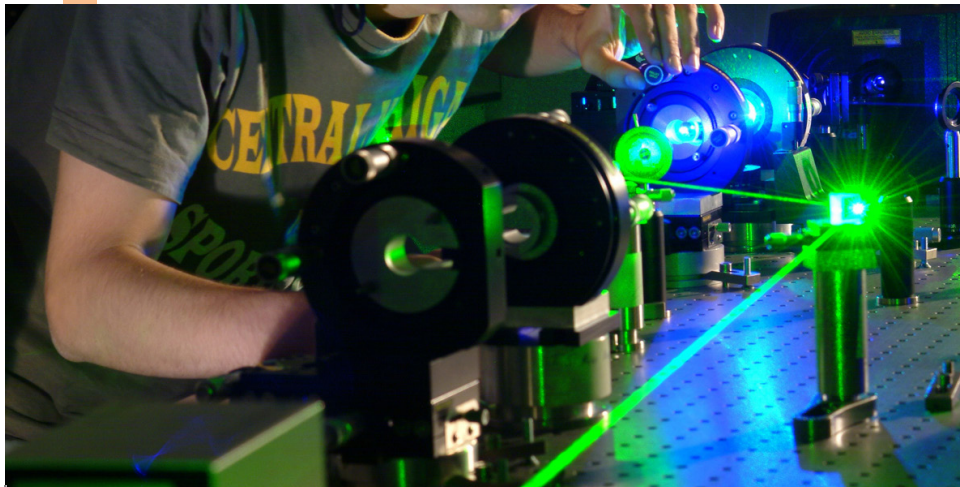


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## CAREER

The sectors in which students can develop their profession are becoming very broad, given the interdisciplinary character and increasing relevance of PHOTONICS (photonics has been selected by the European Union as one of the five KET -“Key-Enabling Technologies”- for the future of the Union). Possible career issues include:

- Doing a PhD in Photonics, Optics, Physics, Optical Engineering, Nanophotonics, Biophotonics, Telecommunications, Electronics, Imaging, Quantum Information, etc.
- Joining, after PhD, R&D and innovation programs in companies, basic or applied research centers, and universities.
- Joining a large company as a consultant or engineer on photonics-related issues, as applications development engineer, or as commercial or laboratory technical professional.
- Freelance professional acting as advisor and consultant in photonics-related subjects.
- Incorporation to the professional world of photonics in high-level qualification technical positions for control of services like microscopy, x-ray diffraction, thin films, etc.
- Joining (and promoting) spin-off or other technology-based small companies.
- Joining education and high-level training in the field of photonics.



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# PHOTONICS BCN

PHOTONICS, the science and technology of LIGHT, is one of the disciplines that plays a key role in the 21st century technological development.

Four leading research and academic institutions in the BARCELONA area joined their efforts and experience to offer a comprehensive MSc in PHOTONICS program as a combination of basic and advanced elective courses covering the main branches of PHOTONICS:

Basics of Photonics

Applied Photonics

Quantum Optics

Quantum Optics and Quantum Technology

Nonlinear Optics

Biophotonics and Imaging

Photonic Materials

Nanophotonics

Telecommunications and Photonics Circuits

Optical Engineering

Optical Technologies

The Master aims at educating future researchers in this field and also promoting entrepreneurial activity in PHOTONICS amongst its students

The Master in Photonics has a strong international character and it is thought entirely in English. There is also a strong collaboration with the European Erasmus Mundus Master Europhotonics offered jointly with France and Germany.

[www.photonics.masters.upc.edu](http://www.photonics.masters.upc.edu)



# Master in Photonics

More information at: [www.photonics.masters.upc.edu](http://www.photonics.masters.upc.edu)



## ADMISSION REQUIREMENTS AND PROFILES

Admission requirements include a bachelor's degree in Science or Engineering that entitles the holder to seek admission to a master's degree in the country in which it was awarded.

- Bachelor degree in Physics, or in Engineering Physics.
- Bachelor degree in Electronics and/or Electrical Engineering.
- Bachelor degree in Telecommunications Engineering.
- Bachelor degree in Industrial Engineering (Mechanics, Automatics etc.)
- Bachelor degree in Nanoscience and Nanotechnology.
- Bachelor degree in Aeronautics Engineering.
- Bachelor degree in Optics and Optometry.
- Other scientific or technical bachelor degrees (Chemistry, Materials, Biology, etc.), with some training complements required (bridging courses).

## ENROLMENT AND FEES

Student's registration is taken care by ETSETB (Escola Tècnica Superior d'Enginyeria de Telecomunicacions de Barcelona, at Campus Nord of UPC university, building B3, Barcelona).

**Fees:** €50 per ECTS credit (aprox.). For non-resident foreign students who are not EU nationals, the fee is 1.5 the amount stated.

Interested students can send a message to [master.photonics@etsetb.upc.edu](mailto:master.photonics@etsetb.upc.edu).

More information can be found at: [www.photonics.masters.upc.edu](http://www.photonics.masters.upc.edu)

## MASTER'S EXECUTIVE COMMITTEE

R. Vilaseca (Director of the Master, [ramon.vilaseca@upc.edu](mailto:ramon.vilaseca@upc.edu))

C. M. Cojocaru (UPC, [crina.maria.cojocaru@upc.edu](mailto:crina.maria.cojocaru@upc.edu))

M. Vilaseca (UPC, [meritxell.vilaseca@upc.edu](mailto:meritxell.vilaseca@upc.edu))

J. Mompert (UAB, [jordi.mompert@uab.es](mailto:jordi.mompert@uab.es))

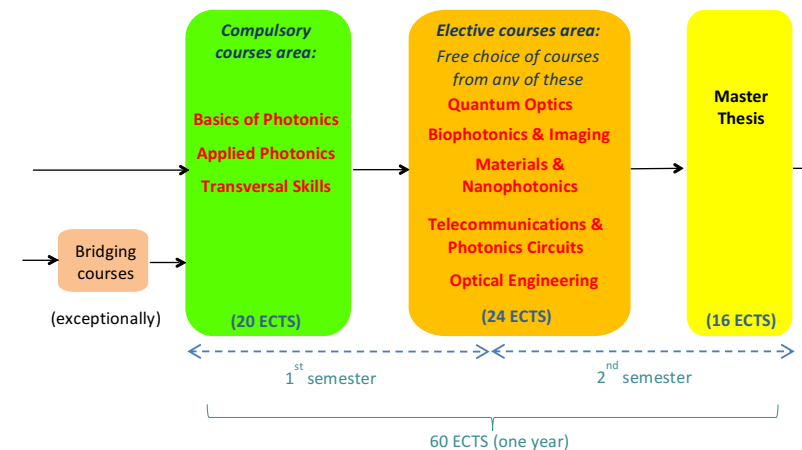
S. Bosch (UB, [sbosch@ub.edu](mailto:sbosch@ub.edu))

D. Artigas (ICFO, [david.artigas@icfo.es](mailto:david.artigas@icfo.es))

## PROGRAMME AND CALENDAR

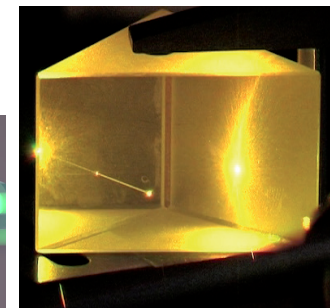
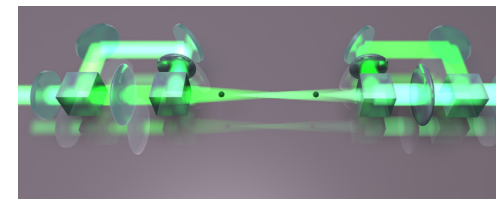
This is a full-time, one-year program (60 ECTS credits) which covers two semesters.

After a few compulsory subjects (20 ECTS credits) providing a basic background and complementary skills in PHOTONICS, students can choose from a variety of elective subjects (24 ECTS credits) to define their personal curriculum. Finally, 16 ECTS credits are obtained through the Master Thesis. Entrepreneurial skills and employability are promoted through a specific course and through the possibility to do the Master Thesis work in collaboration with a company or a research centre.



Students typically start the master's degree in September. Lecture period ends at the beginning of April of subsequent year, and the Master Thesis can be presented in July or September of that year.

The master's degree can be taken on a full- or part-time basis. Lectures are mostly given in the afternoons.



## COMPETENCES ACQUIRED

The Master in Photonics will ensure students acquire the following abilities:

- Understanding of the physical principles of optics and light-matter interaction, at classical and quantum levels.
- Capacity to perform basic experiments in photonics and to analyze and understand advanced experiments or calculations in the fields chosen by the student.
- Understanding of laser physics and knowledge of the variety of laser types and main related applications.
- Knowledge of image formation fundamentals, light propagation through different class of media, and Fourier optics.
- For the photonics field(s) chosen by the student through elective courses (quantum optics, biophotonics and imaging, nanophotonics, telecomm, optical engineering, etc.), knowledge of the main concepts, underlying phenomena and most recent applications.
- Ability to deal with a problem of advanced research in photonics from start to finish; i.e., from conceptual planning and bibliographic search to oral and written communication of the results, according to the procedures and conventions of scientific presentations in English.
- Ability to understand optical engineering as an economic and business activity considering, among others, social, ethical and sustainability aspects.
- Awareness of the importance of patents, and ability to understand and write a patent in the field of photonics.

