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CAREERS IN PHOTONICS

Students can develop their future profession in a very broad area given the interdisciplinary character and increasing relevance of PHOTONICS, both in science and research as well as in technology and medicine. Possible career:

- PhD in Photonics, Optics, Physics, Optical Engineering, Nanophotonics and Optical Materials, Biophotonics, Nonlinear Optics, Imaging, Quantum Optics and Quantum Technology, etc.
- Join education and high-level training in the field of Photonics at basic or applied Research Centers and Universities.
- Join R&D and innovation departments or perform an industrial PhD in companies.
- Join a company as a consultant or engineer on photonics-related issues, applications development engineer, commercial or laboratory technical professional.
- Freelance advisor and consultant in Photonics.
- High-level qualification technical positions for photonic applications like microscopy, x-ray diffraction, thin films, etc.
- Join or found spin-off or other technology-based small companies.

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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 and has been selected by the European Union as one of the five KET “Key-Enabling Technologies”.

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:

Basic Photonics

Laser systems

Quantum Optics and Technology

Nonlinear and Ultrafast Optics

Biophotonics and Imaging

Photonic Materials and Metamaterials

Nanophotonics

Photonics Circuits and Telecommunications

Optical Engineering

Photonics Technologies

The Master in Photonics aims at educating future researchers and also promoting entrepreneurial activity and technological applications in PHOTONICS.

The Master in Photonics is entirely hought in English and has a strong international character, being part of the the European Master Erasmus Mundus "Europhotonics" coordinated by the University Aix Marseille, France and offered jointly with Karlsruhe Institute of Technology, Germany, University of Tampere, Finland and University of Vilnius, Lithuania.

www.photonics.masters.upc.edu

EXCELLENT Accreditation
4313974-32865-22
AQU Catalunya registered on EQAR

Master in Photonics

www.photonics.masters.upc.edu

UNIVERSITAT POLITÈCNICA DE CATALUNYA

UAB Universitat Autònoma de Barcelona

Universitat de Barcelona

ICFO Institut de Ciències Fotòniques

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 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), located at Campus Nord of Universitat Politècnica de Catalunya (UPC), building B3, Barcelona).

Fees for the 60 ECTS master's degree, excluding other costs: 1660 € for EU residents and 4150€ for non-EU residents.

Interested students can send a message to **master.photonics@etsetb.upc.edu.**

More information can be found at: **www.photonics.masters.upc.edu**

MASTER'S EXECUTIVE COMMITTEE

Crina Cojocaru (Director of the Master, *crina.maria.cojocaru@upc.edu*)

Meritxell Vilaseca (UPC, *meritxell.vilaseca@upc.edu*)

Verònica Ahufinger (UAB, *veronica.ahufinger@uab.cat*)

Mario Montes (UB, *mario_montes@ub.edu*)

David Artigas (ICFO, *david.artigas@icfo.eu*)

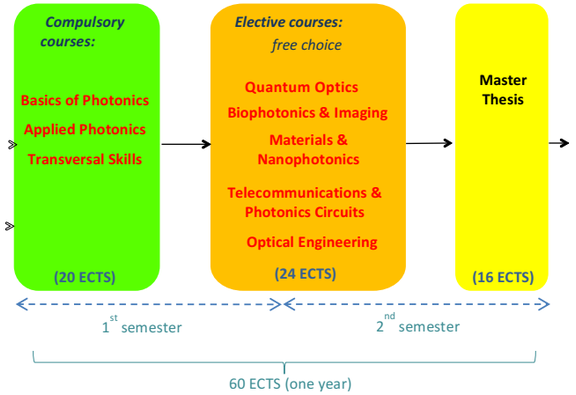
Individual mentoring

PROGRAM AND CALENDAR

This is a full-time, on-site, one year program (60 ECTS).

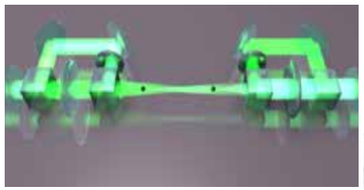
After 4 compulsory subjects (20 ECTS) providing a basic background and complementary skills, students can choose 8 subjects (24 ECTS from a variety of elective subjects to define their personal curriculum. Finally, 16 ECTS credits are obtained through the Master Thesis.

Entrepreneurial skills and employability are promoted through a specific course. The Master Thesis can be done in collaboration with external research centrers or company in Spain or abroad.

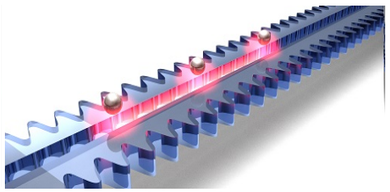


The master's degree starts in September. Lecture period ends at the beginning of April of subsequent year, and the Master Thesis can be presented in July or September.

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



Optical trapping

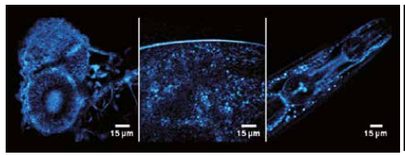


Quantum Optics

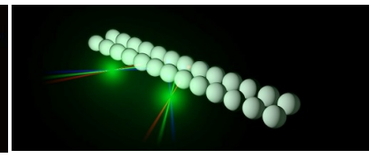
ACQUIRED COMPETENCES

- Understanding of the physical principles of optics and light-matter interaction, at classical and quantum levels.
- Capacity to perform basic experiments and to analyze and understand advanced experiments or calculations in photonics.
- 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 (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 problems of advanced research in photonics from conceptual planning and bibliographic search to oral and written communication of the results.
- 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.

Wide network (research labs and companies) for master theses and interships



High resolution microscopy



Nanophotonics