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 taught 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.
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 ETSIB (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@etsib.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)

Verónica Ahufinger (UAB, veronica.ahufinger@uab.cat)

Mario Montes (UB, mario.montes@ub.edu)

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

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 centers or company in Spain or abroad.

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.

Finally, 16 ECTS credits are obtained through the Master Thesis.

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.