

# Erasmus Mundus master's degree in Bio and Pharmaceutical Materials Science (BIOPHAM)

The **Erasmus Mundus BIOPHAM master's degree** ([master's degree website](#)) is a two-year programme taught entirely in English. The aim of the programme is to meet international demand for qualified graduates with high-level theoretical and applied training in materials science, the physics and chemistry of materials and the application of these disciplines to pharmaceuticals. BIOPHAM was developed by a consortium of four renowned European universities, and it benefits from the involvement of an extensive international network of companies, large-scale facilities and associated universities.

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## GENERAL DETAILS

### Duration and start date

Two academic years, 120 ECTS credits

### Timetable and delivery

Face-to-face

### Language of instruction

English

Information on [language use in the classroom and students' language rights](#).

### Location

[Barcelona School of Telecommunications Engineering](#)

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## ADMISSION

### General requirements

[Academic requirements for admission to master's degrees](#)

### Places

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### Pre-enrolment

To enrol for an interuniversity master's degree coordinated by a university other than the UPC, you must enrol through the coordinating university:

[Université de Lille](#)

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## PROFESSIONAL OPPORTUNITIES

### Professional opportunities

The BIOPHAM master's degree will help address a severe shortage of human resources in the research-based pharmaceutical sector, which includes academic centres, large pharmaceutical companies, SMEs, spin-offs, start-ups, contract research organisations and drug manufacturers.

### Competencies

#### Generic competencies

Generic competencies are the skills that graduates acquire regardless of the specific course or field of study. The generic competencies established by the UPC are capacity for innovation and entrepreneurship, sustainability and social commitment, knowledge of a foreign language (preferably English), teamwork and proper use of information resources.

The BIOPHAM master's degree provide all students with various transversal skills such as competencies in entrepreneurship, project management, economic and strategic intelligence, marketing, bibliographical search and synthesis. Students also have opportunities to acquire other soft skills (intercultural communication, research experience and scientific communication, national language of their host universities) enabling them to easily adapt to their future international professional environment.

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## ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

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### European programme

Erasmus Mundus

### UPC school

Barcelona School of Telecommunications Engineering (ETSETB)

### Participating institutions

Universitat Politècnica de Catalunya (UPC)

Università di Pisa

Université de Lille - **coordinating** university

University of Silesia in Katowice

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## CURRICULUM

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Subjects	ECTS credits	Type
<b>FIRST SEMESTER</b>		
Biofluids and Materials Interactions	3	Optional
Biopham Short Internship	5	Compulsory
Biophysical and Materials Science Characterisation	4	Optional
Complexity in Biological Systems	4	Optional
Computational Material Science	6	Optional
Disorder and Off Equilibrium Systems	6	Compulsory
Green Chemistry for Materials and Processes	6	Optional
Introduction to Optical Spectroscopy	6	Optional
Large Facilities: Synchrotron and Neutron Sources	5	Compulsory
Machine Learning with Neural Networks	4	Optional
Manufacturing of Polymers and Nanocomposites for Biomedical Application	3	Optional
Materials Science of Drugs	4	Compulsory
Mechanical Behavior of Materials	6	Compulsory
Molecular and Soft Condensed Matter	4	Compulsory
Polymer Science and Engineering	6	Optional
Quantum Physics of Matter	6	Optional
Rheology	6	Optional
Solid State Physics 1	6	Optional
Stochastic Methods for Optimization and Simulation	4	Optional
Surface Physics	3	Optional

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
Transport Phenomena in Materials	6	Optional
<b>THIRD SEMESTER</b>		
Advanced Characterisation I	3	Optional
Advanced Characterisation II	3	Optional
Application of Vibrational Spectroscopy in Therapeutic Substance Studies	4	Optional
Atomic Scale Modeling	6	Optional
Computer Modeling	4	Optional
Drug Chemistry and Technology of Drug Forms	3	Optional
English/French Foreign Language	3	Optional
Fundamentals of Molecular Modeling	5	Optional
Health Entrepreneurship Program	9	Optional
Introduction to Drug Product Development and Pharmaceutical Technology	3	Optional
Introduction to Entrepreneurship	1	Optional
Language Course: Scientific English	4	Optional
Molecular Biophysics	5	Optional
Molecular Mobility in Amorphous Materials	3	Optional
Pharmacology and Pharmacognosy	5	Optional
Physical State Manipulation, Characterization and Formulation of Pharmaceuticals	6	Optional
Project Design Management	3	Optional
Protection of Intellectual Property, Health and Safety, Ergonomic	1	Optional
Scientific Writing	3	Optional
Selected Issues from Biomaterials Toxicology	2	Optional
Specialized Laboratory	2	Optional
Specialized Lecture: Dielectric Spectroscopy in the Study of Dynamics of Biological Systems	3	Optional
Subject in the Field of Humanities	3	Optional
Thermodynamics & Phase Transformation	3	Optional
<b>FOURTH SEMESTER</b>		
Master's Thesis	30	Compulsory
Master's Thesis	30	Compulsory
Master's Thesis	30	Compulsory
Master's Thesis	30	Project