Erasmus Mundus master's degree in Coastal and Marine Engineering and Management (CoMEM)

The Erasmus Mundus master's degree in Coastal and Marine Engineering and Management (CoMEM), coordinated by the Norwegian University of Science and Technology and with the UPC as a participant, is designed to provide advanced training to future scientists and engineers with responsibilities in coastal, harbour and offshore projects, including management and administration roles in sea-related engineering firms. During the programme, students familiarise themselves with key issues for providing sustainable, environmentally friendly, legally and economically acceptable solutions to various problems in the fields covered by CoMEM.

The programme offers a well-designed combination of topics, theory and practice within five different tracks, giving the students the added value of mobility within the consortium’s universities, promoting students’ social integration and taking advantage of the distinctive skills offered by the five partner institutions. The tracks are Arctic Marine Coastal Engineering; Marine Operations and Management; Environment and Management; Coastal Engineering; and Engineering and Environment.

Specialisations
- Arctic Marine Coastal Engineering (NTNU)
- Marine Operations and Management (City)
- Environment and Management (Soton)
- Coastal Engineering (TUD)
- Engineering and Environment (UPC)

GENERAL DETAILS

Duration and start date
Two academic years, 120 ECTS credits. Starting August

Timetable and delivery
Mornings and afternoons. Face-to-face

Language of instruction
English

Location
First semester
All students attend the Norwegian University of Science and Technology, Faculty of Engineering Science and Technology, Department of Civil and Transport Engineering, Trondheim, Norway

Second semester
Students attend according to the chosen track: Delft University of Technology, Faculty of Civil Engineering and Geosciences, Department of Hydraulic Engineering, Delft, the Netherlands or Universitat Politècnica de Catalunya, Barcelona School of Civil Engineering.

Third semester
Students attend according to the chosen track: Delft University of Technology, Faculty of Civil Engineering and Geosciences, Department of Hydraulic Engineering, Delft, the Netherlands or University of Southampton, School of Civil Engineering and the Environment and the School of Ocean and Earth Science, Southampton, United Kingdom or City University, School of Engineering and Mathematical Sciences, London, United Kingdom
Fourth semester
Students attend one of the five universities within the consortium and one in which they have studied according to the chosen track.

Official degree
Recorded in the Ministry of Education's degree register

ADMISSION

General requirements
Academic requirements for admission to master's degrees

Places
15

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:
Norwegian University of Science and Technology (Norway)

PROFESSIONAL OPPORTUNITIES

Professional opportunities
Students will specialise in environmental engineering, environmental management and business management. Thus, they will be able to work in almost any area related to coastal, harbour and offshore engineering and management in both the private and public sectors. They will also develop research skills that will equip them to pursue PhDs or work on specialised topics in industry.

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 students will develop both general skills (ethics, philosophy, integrated approach, multidisciplinary work) and more specific marine and coastal engineering skills in their first common year, and then will be able to specialise and further develop those skills in the broad areas of environmental/engineering education (Barcelona), environmental/management education (Southampton) or business/management education (London), with each partner offering specific pathways. The final semester can be taken at one of the two or three institutions visited in the previous three semesters according to track chosen before. This needs to be revised as the new CoMEM only the first semester is common then the students are divided into TU Delft and UPC for the second semester and then TUD, City and SOTON for semester three.

Trondheim: marine physical environment, coastal, port and marine engineering with a tidal and high-wave energy emphasis (applicable also to rocky coast conditions), spreading of pollution in the coastal zone, arctic offshore engineering.

Delft: integrated coastal zone management, shore protection, project work, ethics and philosophy, port engineering with a meso-tidal and medium to high-wave energy emphasis.

Barcelona: coastal engineering and oceanography with a Mediterranean "emphasis" (microtidal conditions, torrential
climatic conditions, intense tourist development).

Southampton: environmental coastal engineering with an emphasis on new approaches to shoreline (flood and erosion) management, including beaches, cliffs, and estuaries and management tools such as GIS and EIA.

City, London: maritime environmental management, maritime operations, maritime law and insurance, maritime technology, finance, accounting and economics.

**Intellectual competencies:**
Graduates of this master's degree will be able to:

a) Develop, model and analyse complex coastal and marine engineering and management systems, processes and products using scientific principles

b) Demonstrate innovation in the design of new coastal and marine systems including new processes and products

c) Understand the capabilities of computer based and experimental methods for problem solving

d) Understand the limitations of the range of methods employed in coastal and marine engineering and management

e) Integrate knowledge of mathematics, science, information technology, design, business context and engineering practice to solve a wide range of problems in the subject applying understanding to novel and challenging solutions

f) Evaluate technical and financial risks, through an understanding of the basis of such risks

g) Have an extensive knowledge and understanding of management and business practices and their limitations

h) Have an understanding of the ethical issues in coastal and marine engineering and management.

**Specific competencies:**
Graduates of this master's degree will be able to:

a) Use appropriate mathematical and computational techniques (supplemented by hydraulic models if required) for simulating and analysing coastal and marine specific problems

b) Design sustainable coastal or marine systems, components or processes, with technical analysis and critical evaluation of results

c) Use learning resources effectively for independent research

d) Conduct independent analysis of the economic, technical, environmental and managerial factors influencing the decision making process surrounding a coastal or marine problem.

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**ORGANISATION**

**European programme**
Erasmus Mundus

**UPC school**
Barcelona School of Civil Engineering (ETSECCPB)

**Participating institutions**
Universitat Politècnica de Catalunya (UPC)
City University of London (United Kingdom)
Norwegian University of Science and Technology (Norway) - Coordinating university
Technische Universiteit Delft (Nederland)
University of Southampton (United Kingdom)

**Academic coordinator**
Agustín Sánchez-Arcilla

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**CURRICULUM**

March 2019. **UPC, Universitat Politècnica de Catalunya · BarcelonaTech**