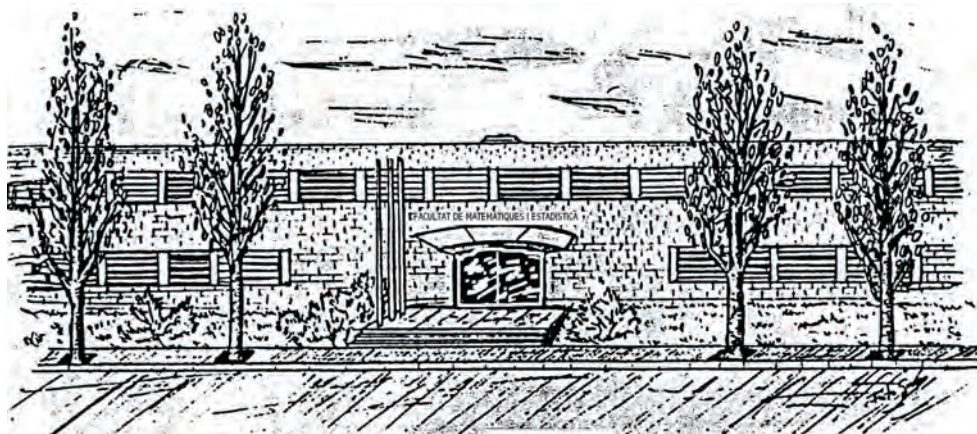# Mathematics at the Technical University of Catalonia

The mathematical community at UPC

The Technical University of Catalonia (Universitat Politècnica de Catalunya, UPC) employs over 300 mathematicians, for the most part associated with one of the four departments in Applied Mathematics, with the Department of Statistics and Operations Research or with the Department of Architechture Structures.

Their teaching covers the programs of the Faculty of Mathematics and Statistics, and the Mathematics/statistics of the Faculty of Informatics, of the Schools of Industrial Engineering (schools in Barcelona and in Terrassa, the latter including Aeronautical Engineering), Telecommunications Engineering (schools in Barcelona and in Castelldefels), Civil Engineering, and Architecture (schools in Barcelona and in Terrassa), and of the bachelor degrees offered by several "polytechnic schools".

With 37 established research groups, funded for Research and Technology Transfer Projects with over 3M Euro (2004), its "scientific production and impact factor" was ranked 3rd out of 40 in the "Report 2000" on mathematical production in Spain.[1]

Two Doctoral Programs are offered: *Applied Mathematics* and *Statistics and Operations Research*, both distinguished by the Quality Award of the Spanish Ministry of Education. They output an average of 6-7 and 3-4 PhD per year, respectively.

The FME
Founded in 1992, the UPC Faculty of Mathematics and Statistics (FME) offers degrees in Mathematics and in Statistics and Operations Research.

Mathematics degrees
The FME offers a variety of degrees to suit the widest range of interests and needs, from the most application-oriented to the most theory-oriented.

Higher degree in Mathematics. Students entering the university are offered a 5-year *Degree in Mathematics* (*Llicenciatura en Matemàtiques*), comparable to a BSc+MSc. It is limited to 50 students. The lowest mark for admission is 7/10 and the first year is selective (required to be passed in at most two academic years).

Double degrees. Students of the *Higher Degree in Mathematics* can opt to enrol in a special 6-year program to earn a double degree, the *Higher Degree in Mathematics* and a degree in Engineering (Industrial, Computer Science, Telecomunications or Civil Engineering). Enrolment in these special programs is about one in six of the students in the *Higher Degree in Mathematics* (to qualify, they have to take and pass a special examination).

Graduate courses. With an enrolment of 30 students, the FME offers a graduate course in *Mathematical Techniques for the Financial Markets.*

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[1] *La investigación matemática en España en el periodo 1990–1999.* Report prepared by the Spanish Committee for the World Mathematical Year (2000), under the coordination of C. Andradas and E. Zuazua. Edited by the Real Sociedad de Matemáticas (RSME), the Catalan Mathematical Society (SCM), the Spanish Society for Statistics and Operations Research (SEIO) and the Spanish Society for Applied Mathematics (S$\vec{e}$MA).

New master's programs. Starting in September 2006, and in the framework of the European Space for Higher Education (ESHE), the FME offers, in cooperation with the departments of Applied Mathematics, the following 2-year Master's degrees:

- *Applied Mathematics.*
- *Mathematical Engineering.*

Statistics and Operations Research degrees
The degrees offered by the FME in these areas grant students optimal flexibility in designing their careers.

Degree in Statistics. A 3-year degree in Statistics (*Diplomatura en Estadística*). It is a BSc degree totally adapted to the ESHE.

Higher Degree in Statistics. A 2-year degree in higher Statistics (*Llicenciatura en Ciències i Tècniques Estadístiques*). It is comparable to a MSc on "statistical sciences and techniques".

New master's program. Starting in September 2006, and in the framework of the ESHE, the FME offers, in cooperation with the Department of Statistics and Operations Research, a Master's degree in *Statistics and Operations Research.*

Graduate course. With an enrolment of 30 students, the FME offers, in cooperation with the Statistics and Operations Research Department, a graduate course in *Biostatistics.*

New organization
Starting in September 2006, the Doctoral Programs, and the double-degree special programs, are adapted to the new ESHE organization. This ensures that the degrees are valid across the European Union, that the students will have unprecedented mobility opportunities, and that they will be able to follow curricula that truly meet their individual scientific interests and needs.

Student mobility
About 20 students per year take the opportunity to study for some period in other universities. In exchange the FME receives about the same number of students. In general, these exchanges are regulated by a number of bilateral agreements with other universities in the framework of some global exchange program. At present, FME exchanges students with:

- Universities in Madrid, Santiago de Compostela, Sevilla, Cádiz, Granada, Tenerife, Murcia and Zaragoza, in the framework of the Spanish Sicue/Séneca program.
- European Universities in Finland, Norway, United Kingdom, France, Italy, Greece, the Netherlands, Belgium, Switzerland, Portugal and Germany, in the framework of the Socrates/Erasmus European program.

There are also exchanges with Latin-American universities and visitors from the Instituto Tecnológico Autónomo de México.

Cultural life
At the FME there is a rich range of activities beyond Mathematics: music, theatre, sports (including Go and Chess), creative writing, ...

With regard to the lectures' program, in each of the last three academic years it has been catalyzed by its association with a historical figure: Poincaré in 2003–2004, Einstein in 2004–2005 and Gauss in 2005–2006. The lectures can be found in the FME Web page (click at *Butlletí Digital FME*). Moreover, the intention is to publish in book form a selection of the lectures of each academic year, as it has been already the case with Poincaré and Einstein (*Conferències FME*, Volums I and II).

Key sources for further information
– UPC web page: www.upc.edu
– FME web page: www-fme.upc.edu
– FME masters's programs: mastersfme.upc.edu
– FME Office for Mathematics Research (OSRM): www-fme.upc.edu/osrm/

Sebastià Xambó
Dean of the FME[2]