

POLITÉCNICA

Universidad Politécnica de Madrid



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## Main figures

The Technical University of Madrid (UPM, *Universidad Politécnica de Madrid*) is the oldest and largest of the Spanish Technical Universities. UPM has more than three thousand faculty members, around thirty eight thousand undergraduate students, and around six thousand postgraduate students.

In the style of the french *Grandes Écoles*, UPM is made up of 21 Schools dealing with the different areas of technology. Twelve of them are Advanced Technical Schools awarding engineering degrees of either five or six years duration, and the rest are Technical Schools which award three years study degrees.

UPM's Schools cover most engineering disciplines, including Aeronautical, Agronomical, Chemical, Civil, Electrical, Electronic, Forestry, Industrial, Mechanical, Mining, Geology, Energy and Naval Engineering, as well as Architecture, Computer Science, Design of Fashion and Geodesy & Cartography. In addition, UPM includes a Center for Physical Education and Sports.



## Madrid

Madrid is the capital of Spain and the political and financial center of the country. It is a modern city with a vibrant economic and cultural life, and the prime European hub to Latin America.

The region of Madrid receives two thirds of foreign investment coming into Spain, and is also the source of two thirds of Spanish investment going abroad. Its dynamic economy has recently attracted an important foreign immigration from such diverse places as North Africa, Latin America, Eastern Europe and China. Immigration in turn has helped develop the economy of the region even more and at the same time has greatly enriched its cultural life. Actually, the current income per capita of the Madrid region is 20% higher than the European Union average.

Of some 44 million people living in Spain, close to 6 million live in the region of Madrid. Madrid is home to 13 universities of which 7 are public. UPM is the only public exclusively technical university among them.

## History of UPM

Although UPM is a young university, having been founded only in 1971, most of its Schools are over a hundred years old, dating back to the 18th and 19th centuries and existing independently until they were grouped together as UPM.

It is not an exaggeration to say that much of the history of Spanish technology for over one and half centuries was written by the Schools of Architecture and Engineering of this university, as for many years some of them were the only Technical Schools in existence in their fields in Spain. Almost all the leading Spanish educators and researchers have been involved with UPM either as students, teachers, or both.





Three of UPM Schools were founded in the eighteenth century. The School of Architecture, the oldest, was founded in 1752. The Naval and Mining Engineering Schools were established in 1772 and 1777 respectively.

The Civil Engineering School was the first UPM School to be founded in the nineteenth century, in the year 1802. Almost half a century later the School of Forestry Engineering was established in 1848 and shortly thereafter the School of Industrial Engineering was started in 1850. This School today covers numerous additional fields such as Mechanical, Chemical, Electrical and Nuclear Engineering. The School of Agronomical Engineering was set up in 1855.

The School of Telecommunication Engineering (started as the General School of Telegraphy) was the first of the three UPM Schools to be created in the twentieth century, in 1913. The School of Aeronautical Engineering was founded in 1928, the Center for Physical Education and Sports in 1961, and the School of Computer Science in 1977.

The latest UPM School to be created has been the School of Topography, Geodesy & Cartography, founded in 2005.

At about the same time that the Advanced Schools offering longer careers were created, corresponding Technical Schools offering three years course of studies were also founded for most of them.



## Student life

Most UPM Schools are located in the urban district of Madrid, at the Madrid University Campus, although some of them of more recent creation are spread throughout the metropolitan area. UPM offers 3 and 5/6 years degree-programs, covering all engineering areas and architecture. Graduate courses adapted to industrial needs are also offered which include both doctoral programs and postgraduate courses.

UPM graduates around 5,000 students every year, of whom 20% have participated in international mobility programs and have been trained in companies. There are more than 2,000 students enrolled in doctoral programs, and each year 200 of them attain their Ph.D degree.



## International Relations

UPM maintains that international education is an excellent way to open minds to other ways of living and working. It therefore gives high importance to international education in the belief that future peace and prosperity depend on the ability for people to integrate and work in a multi-cultural environment.

As a result UPM has international student exchanges with over 400 universities and higher education Centers in Europe and other parts of the world. Every academic year close to a thousand UPM students study abroad and a similar number of foreign students study at UPM. In some of UPM Schools almost 50% of the students already have an average of two semesters international experience in their careers. It is the goal of UPM to foster and further expand this international experience.

Toward this end, UPM has also signed over sixty Double Degree Agreements with different foreign universities. Students follow the last three or four semesters of their studies in a foreign university and in exchange receive two degrees, one from UPM and another from the foreign university.

In addition, UPM has an active role in the recent European Union Erasmus Mundus program, leading two Erasmus Mundus master network and participating in five more.

For cultural and historical reasons, UPM has especially strong relations with Latin American universities. Apart from many other activities, UPM has some thirty Ph.D. programs in cooperation with Latin America universities. UPM is also leading Magalhães, a new network developing an Erasmus-like program of engineering student exchanges between the European Union and Latin America and the Caribbean.

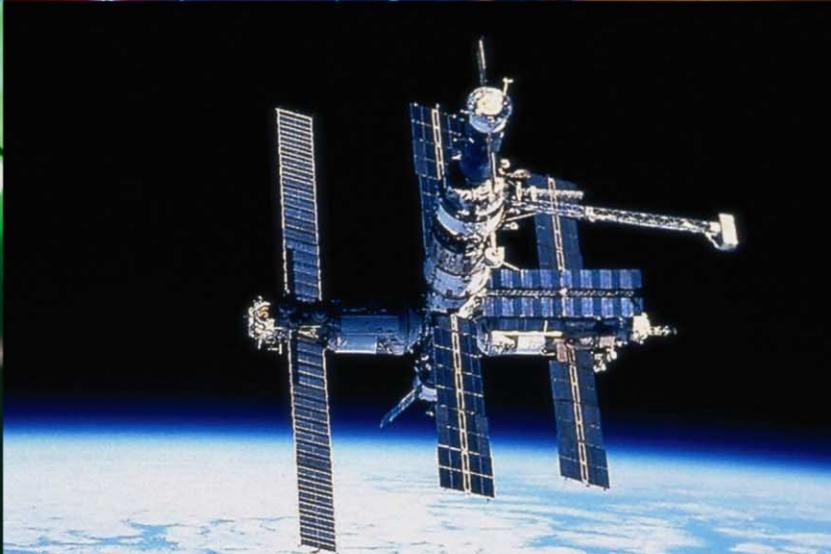
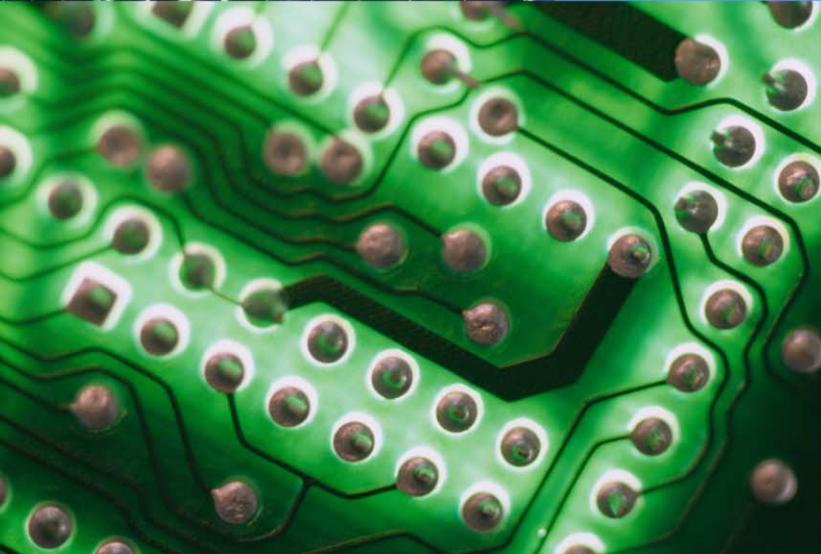
UPM is an active member of numerous international associations of universities and Centers of higher education including CESAER, TIME, EUA, Athens, EAIE, SEFI, GE4, IAU, LACCEI, EuroPace, and *Conference des Grandes Écoles*.

## Research

UPM has a strong commitment to R&D and Innovation. Of a total annual budget of around 360 million euro, UPM receives annually over 100 million euro support from external sources (research, consultancy, validation and certification, and others), clearly indicating its scientific and technological capabilities. 20% of external support comes from international sources. Participation in competitive European and national R&D programs provides 40% of the sponsored research funds, and research services and contracts with the industrial sector supply the rest.

UPM ranks first among Spanish universities in European Union R&D funding, having around 15% of the total number of European Union funded projects such as FP (Framework Program), EUREKA and ESA (European Space Agency). Its participation in FP6 is strongly focused on the IST (Information and Society Technology) program, which represents around half of the funded projects. In addition, UPM has implemented an entrepreneurship program to promote the creation of spin-off companies. Nineteen spin-offs have been created in the period 2002-2004.

The contribution of the university to knowledge creation through its scientific publications is also significant. Most relevant is the high number of papers published in scientific journals and presented at conferences. The annual average figures are 1,200 journal papers, 2,000 conference communications and 200 Ph.D. theses.



Most research is carried out within academic departments in research groups made up of faculty, graduate students, staff and technicians. Excellent research groups can be found in several domains such as materials science, biotechnology, telematics, software engineering, energy, robotics and industrial organization. These research groups make use of sophisticated equipment and facilities and they are experienced in applied research and technology transfer.

In addition, UPM has other different structures to handle research which complement the department units. Institutes, Centers and Laboratories, most of them well known in their areas of expertise, count on state-of-the-art facilities and provide key technical support to industry, both nationally and internationally. Some of the specialized R&D and technological innovation units at UPM are:

- Automobile Research Institute
- Institute of Nuclear Fusion
- Institute of Solar Energy
- Institute for Systems based on Opto and Microelectronics
- Institute for Microgravity
- Institute of Biotechnology and Plant Genomics
- Research Center for Transport
- Center for Smart Homes
- Laser Center



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