ERCAMPU





Campus of Opportunities

Get to know the Technical University of Madrid (UPM), renowned for its teaching and research work in the area of technology



SUMMARY

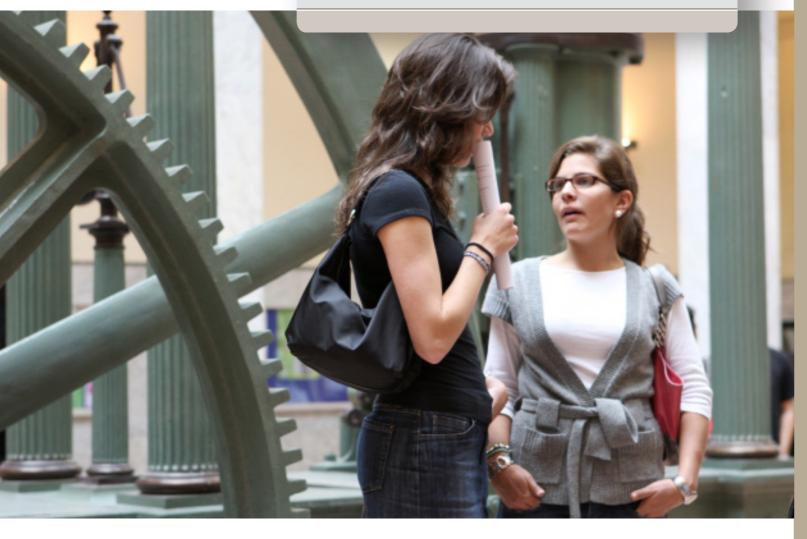








- Building the society of knowledge
- Graduates who establish the difference
- Graduated from the UPM: Among the best
- Open to the world
- Pioneering research
- Technology linked to the business sector
- In the Campus
- Social commitment





TECHNICAL UNIVERSITY OF MADRID

Renowned for its teaching, research and innovation

The Technical University of Madrid is the largest Spanish technological university as well as a renowned European institution. With two recognitions as Campus of International Excellence, it is outstanding in its research activity together with its training of highly-qualified professionals, competitive at an international level.



An elite institution at which more than 4,600 students specialise in Engineering, Sports Sciences, Architecture and Fashion Design. Other distinguishing features include training in languages, transversal skills, and professional recognition. Its demanding syllabuses encourage the insertion of its graduates into the labour market, supported by a close relationship with the business sector.

The UPM heads the Spanish participation in the 7th Framework Program of the European Union for research and technological development.

More than 2,400 researchers carry out their activity at the UPM, which is committed to transforming this knowledge into advances applied to the production sector.

Building the society of knowledge

Tradition and innovation





As a guarantee of the training of future generations, the UPM combines the four main functions of a modern superior education institution: teaching, the generation of knowledge, the transfer of this knowledge to the productive sectors and the dissemination of the scientific and technological knowledge as an exponent of the overall service that must be rendered to our society.

Located in the
Greater Madrid area
(Communidad de
Madrid), the UPM
offers its students an
exceptional scientific and
intellectual environment.

The UPM was founded in 1971 through the bringing together of all of the Superior Technical Schools (*Escuelas*

Técnicas Superiores)
which until then made up
the Superior Technical
Institute (Instituto
Politécnico Superior).
The University Schools
(Escuelas Universitarias)
were integrated in 1972.

However, the majority of its Centres have existed for more than two centuries. For this reason it is no exaggeration to state that a large part of the history of Spanish technology of more than one and a half centuries has been written by the Schools of Architecture and **Engineering of the UPM.** The majority of the greatest figures in Spanish teaching and research have passed through its lecture halls as students or teachers.

In teaching, research and public service, the UPM still continues to lead the way in standards of excellence.

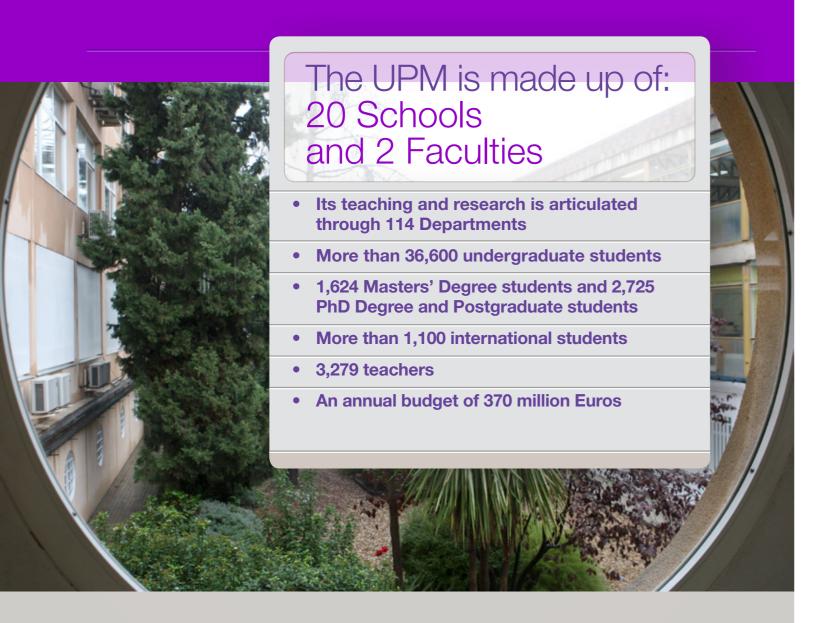






Diversity, participation and commitment

Four Campuses located in the Greater Madrid area



Centres that make up the Technical University of Madrid

■ If you want to access the Web page of the centre, click on the image



























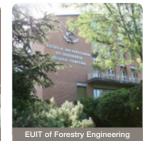










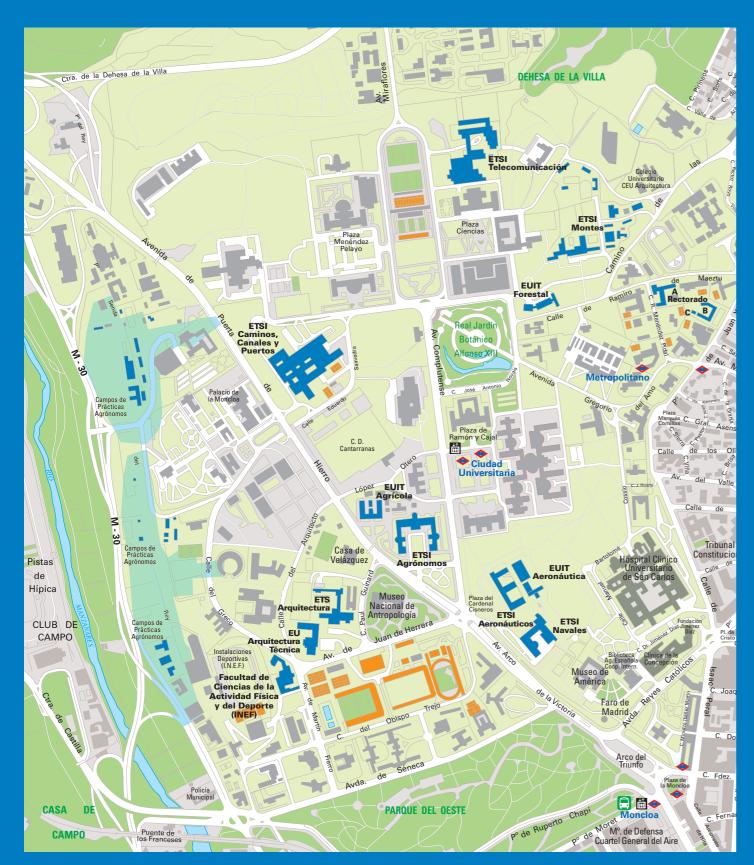












CAMPUS CIUDAD UNIVERSITARIA



CAMPUS DE MONTEGANCEDO





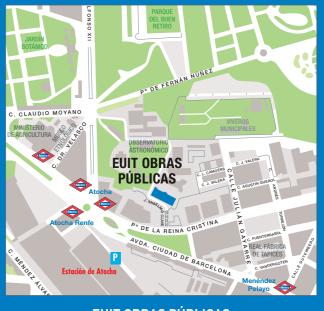
ETSI INDUSTRIALES



ETSI MINAS



EUIT INDUSTRIAL



EUIT OBRAS PÚBLICAS

INTERCAMPUS 8 INTERCAMPUS

Graduates who establish the difference



demanded by business for candidates for

high-level positions in multinationals













Renowned for the quality of its teaching, the Technical University of Madrid provides its students with a complete scientific/technological training. A program of professional practices with the encouragement and support of entrepreneurs characterise this superior education institution.

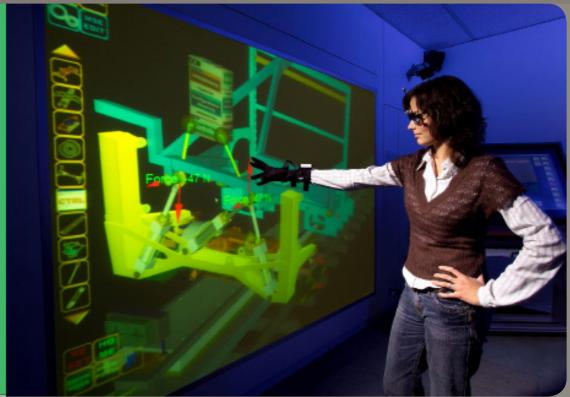
Its range of degree courses carries with it the excellence and experience of its Schools and Faculties. The UPM awards 39 undergraduate degrees designed from the knowledge of the students that access the University. These degrees comprise the areas of Architecture and Construction. Physical Activity and Sports, and Aerospace, Agriculture, Civil, Energy, Forestry, Industrial,

Computer Science, Materials, Mining, Naval and Telecommunications engineering.

The undergraduate degrees of the UPM maintain the high prestige of its graduates, improving transversal skills such as the mastering of the English language, team working, and public speaking skills. Its range of degrees has an immediate connection with Masters' and PhD Degree studies.

A new generation of degrees

The UPM awards 39 undergraduate degrees adapted to the European Higher Education Area







Architecture and Construction

Degree in the Fundaments of Architecture

Degree in Construction

Physical Activity and Sports

Degree in Sports Sciences

Aerospace Engineering

Degree in Aerospace Engineering

INTERCAMPUS 12

Agrarian Engineering

Degree in Food Engineering

Degree in Engineering and Agricultural Science

Degree in Agro-environmental Engineering

Degree in Agricultural Engineering

Degree in the Technology of the Agrarian and Food Industries

Biomedical and Biotechnological Engineering

Degree in Biomedical Engineering

Degree in Biotechnology

Civil Engineering

Degree in Civil and Territorial Engineering





Energy Engineering

Degree in Energy Engineering

Forestry Engineering

Degree in Forestry Engineering

Industrial Engineering

Degree in Electrical Engineering

Degree in Industrial and Automated Electronic Engineering

Degree in Industrial Design and Product Development Engineering

Degree in Mechanical Engineering

Degree in Chemical Engineering

Degree in Industrial Technology Engineering

Degree in Organizational Engineering

Computer Engineering

Degree in Computer Engineering

Degree in Mathematics and Computer Sciences

Degree in Computer Hardware Engineering

Degree in Software Engineering

Material Engineering

Degree in Material Engineering

Mining Engineering

Degree in Geological Engineering

Degree in Energy Resources, Fuel and Explosives Engineering

Degree in Mining Technology Engineering

Naval Engineering

Telecommunications Engineering

Degree in Telecommunications
Engineering Technologies and
Services

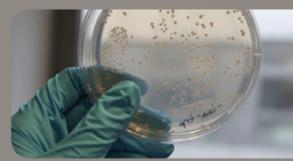
Degree in Communications Electronics Engineering

Degree in Sound and Image Engineering

Degree in Telecommunications Systems Engineering

Degree in Telematic Engineering

Superior Artistic Teaching in Design, specialisation in Fashion



INTERCAMPUS 13



Unique learning experience

As a continuation of its undergraduate degrees, the UPM has designed its Postgraduate studies to complement the training of the students and provide its graduates with a high level of specialization and professionalism.

Masters' Degrees that respond to the needs and demands of all the university students who wish to continue with their training. **Specialization facilitates** their access to the highest level of research and allows them to play a leading role in the modern knowledge society.

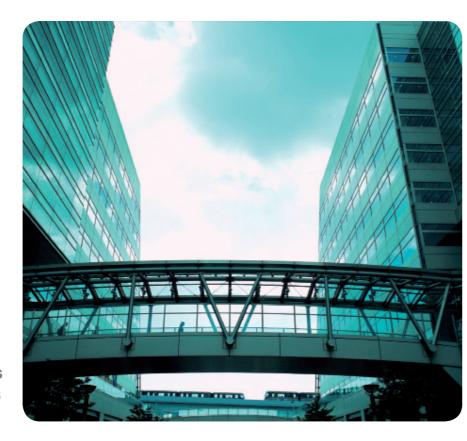


PhD DEGREE

Training without frontiers

- More than a third of the UPM's Masters' Degree students come from areas other than Greater Madrid.
- Another third corresponds to foreign students
- 208 PhD theses every year

The UPM has 40 European **University Masters'** Degree programs. Internationalization, quality and innovation characterise these multidisciplinary degrees, which integrate engineering with medicine, architecture, environment. nanoscience and space, always applying innovative teaching techniques and methods to assure the best access to the work market for its graduates.



INTERNATIONAL PROJECTION AND STRATEGIC ALLIANCES

With a marked technological orientation and closely linked to the professional sector, the **UPM** offers a specialised postgraduate training of academic quality and excellence. Its objective is to train graduates to a high professional level so as to successfully integrate them into the work market.

Internationalization is one of the pillars of the **UPM's postgraduate** program. It is designed to facilitate the incorporation of students and teachers from other countries and thus attract both student and scientific talent. In order to acquire this international orientation the Masters' and PhD Degree programs have foreign mobility and work experience

programs incorporated into its strategies.

The university cooperation policies define another axis of action in this model. which seek to unite efforts for the training and consolidation of alliances within a **UPM Postgraduate** internationalisation strategy.

Graduated from the UPM: Among the best

Professionals who have left their mark on society that have studied in the lecture halls of the UPM. From Technology and Architecture to Engineering and Science, all of them have made a significant contribution to the socio-economic transformation of our society.



Amable Liñán

He won the Principe de Asturias prize for Scientific and Technical Research in 1993. He is considered the best living combustion theoretician at a world level.



David del Val

A Telecommunications Engineer. He was co-founder of VWtreme, a technological company in Silicon Valley which was acquired by Microsoft.

Francisco García Olmedo

An Agricultural Engineer, he

engineering techniques. He is

the author of the first Spanish patents on transgenic plants.

has explored new genetic



Nuria Oliver



A Telecommunications Engineer of the UPM, and with a PhD from the prestigious MIT. She has been the Scientific **Director of Telefónica R&D** since November 2007. She is one of the "100 leaders of the future" (Revista Capital (Capital Magazine), 2009) and one of the "13 young women with the most influence in Spain" (Mujer Hoy (Woman Today), 2012).

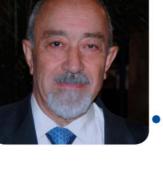


Pedro Duque



An Aeronautics Engineer, he is the first Spanish astronaut. He won the Príncipe de **Asturias prize for International** Cooperation in 1999.

Rafael Fernández Rubio



A Mining Engineer, hydro-geologist and environmentalist of world prestige. His trajectory has focused on the recovery of spaces affected by mining exploitation.



Manuel Elices



A Civil Engineer. He has developed notable and original work in structural materials, functional and biological, encouraging the transfer of results to the industrial sector.



María Peláez



An INEF graduate. **European champion** in the 200 metres butterfly (1997), and has participated in the **Olympic Games five times:** a legend in Spanish sport. She is currently working in the organization of the 15th FINA World **Swimming Championship** in Barcelona 2013.





One of the great contemporary Spanish architects. National Prize for Architecture. He also received the Arnold W. **Brunner Memorial Prize, and** the Pritzker and Mies van der Rohe Prizes.

Open to the world

The UPM places great importance to international education as a way of getting to know different cultures, a way of relating to other societies, definitively, completing the training of people and facilitating their integration into a multicultural environment.

A traditional destination for students and teachers from Latin American universities, today it is also in demand for students from the European Union and other places from the American continent. It is also a popular destination for young Asian people.



In recent years the UPM has signed almost a thousand agreements for academic and scientific collaboration with international universities, and signed more than 90 double-degree agreements with 55 international centres of excellence. It has an outstanding participation in the Erasmus Mundus Program and heads the Magalhães network, which encourages exchange between the most prestigious technical universities of the European Union, Latin America and the Caribbean.

Every academic year, more than a thousand UPM students complete their training in other countries, in many cases at more than one destination. In some of its Centres, up to 50% of the students have spent an average of two semesters of their university studies abroad in order to get international experience. Every year, the UPM also receives another thousand foreign students.

A UNIVERSITY WITH A STRONG INTERNATIONAL PRESENCE

- 90 double-degree agreements with 55 centres of international excellence
- 30 PhD Programs and 41 research and development agreements signed with Latin American universities
- More than a thousand UPM students carry out studies abroad every year



Pioneering research

One of the most important characteristics of the UPM is its culture of intensive research, which aspires to develop projects of excellence by means of a wide scientific basis.

At the same time, the intense collaboration with governmental bodies and industry guarantees that research at the UPM offers real solutions to real-world problems.

The dynamism of R&D&I activity at the Technical University of Madrid, together with the transfer of knowledge to society, is among its lines of strategy. These two commitments place it among the Spanish universities with the greatest research activity and first in the capture of external resources in a competitive regime.

From a total annual budget of around 370 million Euros, the UPM receives more than 130 million Euros from external sources: a figure which demonstrates its scientific and technological capacity. 20% of the external resources come from international sources. The participation in national and European R&D&I competitive programs provides 40% of these research funds, while the rest has its origins in research services and contracts with the industrial sector. These data situate the UPM as the Spanish university that obtains the greatest R&D&I funding from the European Union, with around 15% of the total number of projects financed by the EU through the 7th Framework Program, EUREKA and the European Space Agency (ESA).









Scientific and technological capacity

- Participation in more than 300 research projects
- Around 1,200 articles in journals and 2,000 conference communications
- 44 patent concessions, 35 international extensions, 9 software registers and 8 marked every year
- More than 70 contracts subscribed to annually at a national level



◆ The UPM participates in the development of the European bus of the future

The objective of the EBSF project is the design of a new generation of practically intelligent buses to make transport in European cities more efficient es el objetivo del proyecto EBSF.



Cliks against malaria

Crowdsourcing techniques and online games permit the tele-diagnosis of images of malaria through the Internet, as shown in a new research study at the UPM.



 Oncología: a new tool in intraoperatory radiotherapy

UPM researchers collaborate in the development of a tool to optimise intraoperatory radiotherapy in cancer.

R&D&I structure: Leader in Europe

It has 216 Research Groups, with more than 1,600 teachers and researchers, and 55 Laboratories.

Materials Science, biotechnology, telematics, software engineering, energy, robotics and industrial organization are some of the areas in which these groups work. With sophisticated equipment and facilities, it brings together a wide range of experience in applied research and the transfer of technology.

The UPM also has five University Research Institutes and ten R&D&I centres, in which around 750 researchers and 330 teachers work. National and international vanguard projects are developed in them. They maintain close relationships with businesses and institutions at the highest level in its fields of activity.



Science and Technology Park

Real-world research. The objective of the UPM Park is to support the creation of new R&D&I Centres with other public or private entities, and the creation and strengthening of new technology-based businesses.

BioTech: tomorrow's innovation

R&D in Biomedicine is a field that stands out in the activity of the UPM. Its Research Groups have acquired an international renown in areas such as telemedicine (e-health), biomaterials, medical image processing, magnetic nanoparticles, medical computing, hospital robotics and help to disable people. Of a multidisciplinary nature, the BioTech scientific-technological initiative has the international positioning of the biomedical sector of the UPM as one of its aims from the perspective of the development and use of technology.



The Technical University of Madrid is the only university in Madrid with two seals awarded as Campuses of International Excellence (CEI). The Moncloa Campus, a joint project of the Technical and Complutense universities of Madrid, brings together more than ten thousand researchers, who generate ten percent of the national scientific publications. It works in five areas in which the union of the teaching and research strengths of the two institutions gives rise to highly competitive configurations in a European environment: Global Climate Change and New Energies; Materials for the Future; Agro-food and health; Innovative Medicine; and Heritage.

2_Tech Montegancedo Campus

It focuses its specialisation in the area of Information and Communications Technologies – TICs. There are currently 3,500 students in the Campus and 200 teachers who carry out their teaching at the Faculty of Computer Sciences. Another 500 researchers, with more than 1,000 indexed articles, develop their activity at six research centres set up in the past five years. All of them are focused on large scientific-technological strategic lines in the development of knowledge in the 21st century. The Campus has modern R&D equipment, with Cross-beam microscopy and magneto-encephalography systems, as well as the first five-sided Virtual Cave in southern Europe.

• • • • • • • •









INTERCAMPUS 22

Route of innovative research

Every year, la UPM applies for around 40 patents and receives a similar number of concessions. These are some of the interventions developed by researchers at the UPM.

Automatic mechanism and procedure to establish the sex of those faces that appear in images

This patent allows the automatic classification of facial images according to gender in a simple way and using fewer computer resources. The industrial applications of this artificial intelligence technique are those of the market, the measuring of television audiences, the unblocking of access systems or terminals, the authentication of services, or interactive outlets.



Procedure for the treatment of waste water and contaminated waste based on convertible emerging macrophyte cultures

. . .

This is a treatment system based on the use of aquatic plants. The roots and microorganisms act as a filter that eliminates dissolved organic material as well as mineral compounds that are absorbed by the plants. The patented system, which is less expensive, has a much easier implementation, treatment capacity, and better use of the biomass formed for energy and industrial ends.

Ceramic brick with a

hexagonal hollow

This patent resolves the problem of the transmission of noise found in traditional ceramic bricks, with square or rectangular cells. The hexagonal hollows increase the acoustic absorption in the interior of the brick without altering its dimensions, making the brick muffle the sound more effectively and increasing its resistance.

MedivozCaptura

Management system based on patient data and the capturing of audio signals, electroglotography and laringoscopy with applications in the area of otolaryngology, otorhinolaryngology and speech training and therapy. This management tool includes a potent interface which allows the storage of clinical data relative to the patients, from the point of view of the treatment of vocal pathologies. The application allows the capture and digitalisation of the video and audio signals of a patient for their observation and later analysis and use as a digitalised

Equipment and process for the production of structural pieces of compound material by means of moulding through the transfer of resin

This production system, easy to implement, improves the productivity of the method of transferring resin applied to the manufacture of compound material components of a structural nature. The new system has applications in the aerospace, biomechanical (in particular, the implanting of prostheses into human beings) sector, and in high-level sports competitions.

INTERCAMPUS 24 INTERCAMPUS 25

Innovation linked to the business sector

The UPM is an institution committed to the transfer of knowledge generated through its research structures to society, and its transformation into advances and technological developments applied to the productive sector.

Its support and backing of the business sector is very close. It annually signs around 600 contracts with private businesses. This collaboration has allowed joint entities to be created with their own legal personalities, as well as the growing participation of the business sector in its postgraduate programs. Its graduates are characterised by their occupying management positions (CEOS) in the businesses and large multinationals of its sector.





UPM Business Creation - UPM Businesses



We have 127 UPM Businesses now

1998: Daedalus 1999: Ágora Systems 2000: Sistemas Integrales de Producción (SIP) 2001: Avatars VirtualTechnologies 2002: E-Intelligent Solutions Altiria Tic Aplicaciones y Proyectos TIC Orange Software LEQ Ingenieros Inventa Soluciones Global Aquafish 2003: Ártica Telemedicina Imix Ingeniería 5 Ingor Consultores 2004: RBZ Robot Design Tesis Medical Solutions Agnitio Stelae Isicu Soluciones Accesibles RPM Wireless Solutions Astewrix Factoría ETSIA 14 Inforeduca 2005: UROS Ingeniería Imagina Soluciones de Internet DINARQ Desarrollo Integral de Arquitectura Innopulse Selcon Proyectos Ecohidráulica 2006: Aquamobile SI GIRO Sistemas de Identificación Giro Micronics Thermal Microsystems Flaw Evaluation Tecnologies Noxvo DTEC Biometría 2007: Intelliglass Geo Research I+D+Art Visión Artificial Desarrollos I+D Zentym Solutions Teras Engineering Capital Certainty Eval-U Sequre Acktive ware sistema Ingeniería en cálculo de estructuras y modelado mecánico Maretec Moviendo Ficha Jatroil Samarco Ingeniería Web Ilke Wireless Solutions 2008: Plant Response Biotech Advanced Wireless Dynamics Policheese Signware Firma Digital Hogar Digital e Inmótica Ingenieros (HdI2) Quoriam Ingenieros Teambox Unmanned Solutions Intelect Software Open City Technology Traten Energía Global Food Quality 2009: Tekhimat WePlay TS Company DMS Group Datos, Metadatos y Servicios Artis Innovation Energe Eficiencia Energética Platypus Events A punto por Pulgada InkZee Ideas Musicales Pentagrom Bioenergía y Cultivos Agroenergéticos BIOECA 1 Day Price Adminia Sistemas Agrouniverso Mediumics 2010: Labscope SpeedUp Solutions Antenna Systems Solutions, ASYSOL B109 Hearthy Food Ecotactical Technologies Tourist Eye Jrodrigo Amplificadores Fontis Ingeniería South Wing Consulting Diagnóstico de Aislamiento Eléctrico DIAEL Cantera Digital BIOD Bio Optical Detection +Formados Advanced Radar Technologies 2011: Wasabi App Factory Dentared PemaGroup General Research Spain Cubo-3 Biometrosoft Geolmagine Baobab Soluciones Talketika G4M3 Servicios de Explotación y Gestión Hidroeléctrica Air Electronics Duermes y me olvidas Enigmedia Alise Devices Krilum Riflebird 2012: Secuenfil Solar Added Value Biicode Innovation adplann services click4sponsors Diagnoterra Netliga Sentisis TraitPerception EyeQoala mashme.tv Hiveplay Vascuzell Tecnología Tocarta Internacional iEnergy DTBio Desarrollo y Transferencia de Biotecnología_



THE STRENGTH OF COLLABORATION

A medium to establish a strategic and long-lasting collaboration between the UPM and business are the University-Business Chairs. They constitute a stable commitment in areas of common interest for the carrying out of different activities such as training programs, joint research projects, or the commercial exploitation of the results of this research. The UPM has 80 active University-Business Chairs.

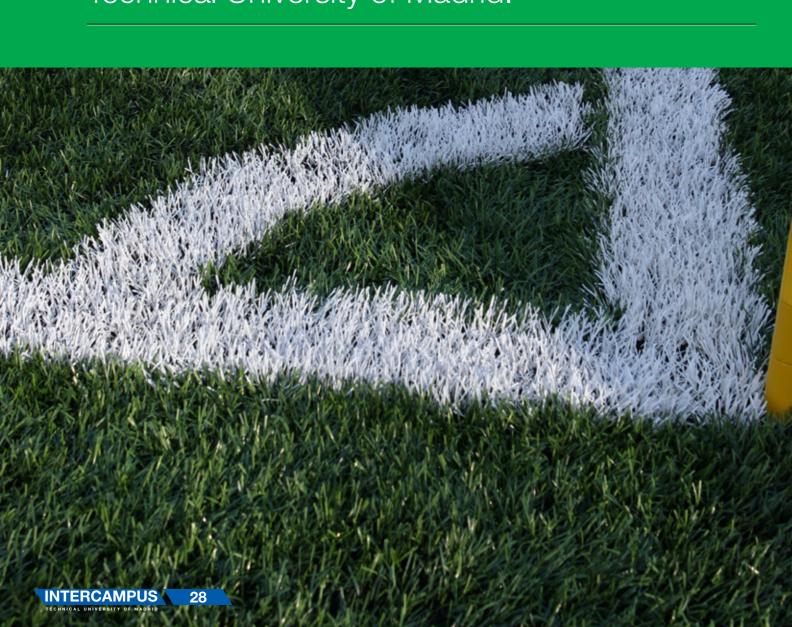


ADDED VALUE TO SOCIETY

Innovation, creativity, technology and the spirit of business converge in the Área de Creación de Empresas actúaupm (actúaupm Business Creation Area), a program that promotes the entrepreneurial culture in the university community. More than 1,300 business ideas, 112 technology-based businesses and around 23 million Euros of investment capital for these businesses, are just some of the figures that demonstrate the enormous potential of the university community of the UPM and its vocation to contribute to the generation of a new innovative entrepreneurial fabric. It is even more relevant to know that 80% of these businesses are still around three years after their creation.

In the campus

Living in the University is much more than simply studying. The UPM offers its alumni all kinds of activity to encourage culture, sports activities, the strength of team work the carrying out of extracurricular activities and a sound spirit, values all encapsulated by the Technical University of Madrid.















Cultural activities

The UPM develops an intense cultural activity, both of an institutional nature and at the initiative of the students. The organisation of the Cycle of Concerts at the Auditorio Nacional stands out in the programming, as does the Cycle of Music at its Centres together with Jazz Concerts. Other cultural events are the Cycle of Conferences on the Humanities, Engineering and Architecture, the

Culture Hall and the Program of Didactic Saturdays for the young. Every year the Theatre Festival is held, as are the competitions of *Tunas* (Minstrels), Painting and Drawing, and Theatre Texts.

The spirit of sports

The UPM also promotes sports practice and offers its teachers, researchers, students and administration

and service staff the possibility of carrying out multiple activities. It has sports facilities in the Montegancedo Campus and Campus Sur, adapted for those people with limited mobility. Its twenty sports clubs, one for each Centre, stimulates them to participate in sports. Every year the Technical University of Madrid has an outstanding participation in the Spanish University Championships, and is one of those which has the greatest number of successes in medals.

Social commitment

The concept of community extends beyond the UPM campuses. From the closest places to the distant regions, students, teachers and staff put their knowledge, ingenuity and creativity to work for good causes. Education, research and dissemination are just the start.



Education without barriers

To promote a university free from all kinds of barrier which quarantee equality of opportunity and non-discrimination of disabled people in access, belonging and progress in the university environment, is one of the lines of action of the UPM. With this vocation the Unit for **Attention to Disabled** people was created.

Another of the objectives of the UPM is to encourage policies of gender equality in the University. Its Equality Unit is in charge of promoting this equality.



Cooperation for development

The UPM maintains a sound and historic commitment to solidarity and the problems of development. Multiple cooperation programs and activities promote the commitment of the university community to less favoured countries.

Implicated with the world that surrounds us. By means of grants and the training of specialists in Cooperation for Development, the UPM breathes a generalised sensitisation into its students.

Promotion of volunteering and sensitising actions.

Travel grants are a fundamental instrument in encouraging the participation of the university community in cooperation activities. In the last eight years 441 travel grants have been awarded.

Research activities: The Cooperation Groups make up a significant instrument to tackle the problems of poverty. There are currently 28 Cooperation Groups at the UPM. In 2012, the UPM created the Centre for Innovation in Technology for Human Development to take advantage of the synergies between the different groups and thus tackle more and more complex problems and with greater scope

Sustainable ways

Within the essence proper to the Technical University of Madrid, there is a special sensibility in achieving an integrated sustainability from an economic, social and environmental perspective. This commitment in favour of energy saving and environmental sustainability impregnates all of the activities of the UPM: institutional, academic, research and business collaboration. In this way, the objective of the UPM is to encourage sustainable development through the training of responsible professionals, commitments with sustainability criteria and with the generation and dissemination of knowledge which helps society to be more sustainable.







Engineering the future

Find out more about the UPM Connect with us

www.upm.es



INTERCAMPUS

