



UNIVERSIDAD
POLITÉCNICA
DE MADRID

POLITÉCNICA

Universidad Politécnica de Madrid

Research, Innovation and Doctoral Studies at UPM

Doctoral Studies @ UPM

Prof. Asunción Gómez-Pérez
*Vice-Rector for Research, Innovation and
Doctoral Studies*



1. *Universidad Politécnica de Madrid (UPM)*
2. International Doctorate School
3. Doctoral Areas and Doctoral Programs
4. Doctorate at UPM
5. Transversal training activities for PhD candidates
6. *Programa Propio de Investigación*



1. *Universidad Politécnica de Madrid (UPM)*

Main Technological University in Spain

Specialized in engineering and architecture

nº 94 Ranking QS (2019)

2nd Spanish speaking university in QS ranking (2019)

nº 92 employability in QS ranking (2019)

Source of high impact knowledge

nº 1 in university patent applications

nº 1 in attracting R&D European funds

nº 1 in attracting R&D contracts with industry

nº 1 in new technology ventures creation

International Excellence Campus

CEI Moncloa (UPM-UCM)

Information Technology Campus-I2Tech (UPM)



UPM on the Map

Rectorate in Madrid

5 Campuses in Madrid area

2 International Excellence
Campus awarded by the
Ministry of Education (MEC-
MINECO)



- 15 Schools
- 1 Faculty (Sports)
- 1 Fashion Design Center
- 5 R&D&I Institutes
- 15 R&D&I Centers
- 1 Joint Technology Center
- 200 Research Groups
- 61 Departments

Budget (2019)

354.9 M€ Total funds

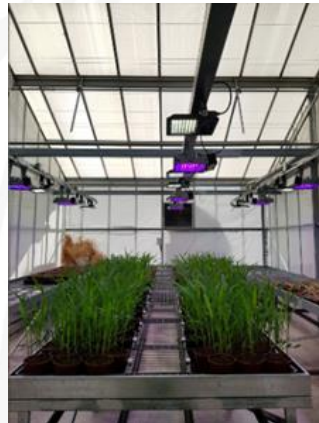


Research in 2018

- + 54 M€ in financed projects
 - ✓ 14.75 M€ Regional projects
 - ✓ 8.65 M€ National projects
 - ✓ 15.71 M€ International projects
 - ✓ 15.27 M€ Private projects and technical assistance to companies
- + 2,300 indexed publications

Technological Innovation

- 540 patents in force to date
- 40 patents currently in exploitation
- 38 priority patents filed in 2018
- 71 University-business chairs
- + 200 spin-offs created and coached from 1998
- >70% spin-off Survival rate (3rd year)
- + 60 M€ from investors (from 2007)



Fields of teaching and programmes

Higher education, research and innovation in all Engineering fields:

Aeronautics

Agronomy

Architecture

Biomedicine

Civil Engineering

Energy

Forestry

Industrial

Mining

Naval

Informatics

Telecommunication

Topography

+ Sports + Fashion Design + Music

41 Undergraduate degrees

78 University master degrees

46 PhD programmes

91 Double degree agreements

+300 permanent postgraduate
training qualifications

+75 master training qualifications

*High potential for increasing participation in
multidisciplinary engineering areas*

DIGITAL

1. **Information Processing and Telecommunications Center (IPTC)**
2. **Center for Supercomputation & Simulation (CCS)**
3. **Integral Domotics Center (CeDInt)**
4. **Centre on Software Technologies and Multimedia Systems for Sustainability (CITSEM)**

MOBILITY

5. **Transport Research Center (TRANSyT)**
6. **Institute for Automobile Research (INSIA)**

MATERIALS

7. **Institute for Optoelectronic Systems and Microtechnology (ISOM) (*Micronanofabs, ICTS*)**
8. **Structural Material Research Center (CIME)**
9. **Center for Advanced Materials and Devices for ICT (CEMDATIC)**

ENERGY

10. **Institute for Solar Energy (IES)**
11. **Institute for Nuclear Fusion (INFN)**

BIOTECHNOLOGY and HEALTH

12. **Research Center for Biotechnology and Plant Genomics (CBGP-INIA) (*Severo Ochoa award*)**
13. **Biomedical Technology Center (CTB)**
14. **Research Center for the Management of Agricultural and Environmental Risks (CEIGRAM)**

INDUSTRIAL ENGINEERING

15. **Center for Automation and Robotics (CAR, UPM-CSIC)**
16. **Laser Center**
17. **Center of Electronics for the Industry (CEI)**
18. **Institute for Microgravity “Ignacio da Riva” (IDR)**

INNOVATION

19. **Innovation and Technology for Development Centre (itdUPM)**
20. **Centre for Support for Technological Innovation (CAIT)**
21. **AI.nnovation space (UPM-Accenture)**

Human Resources & Students

Human Resources

- +2,800 Faculty academics
+380 Full professors
- 670 Contracted researchers
- +1,200 Administration and Service Staff
- +450 Students granted by projects

Students

- + 31,000 Undergraduate
- + 4,800 Master degree
- + 2,100 PhD Students
- + 1,300 International Erasmus mobility
- + 1,400 National Erasmus mobility
- + 5,900 Work practice in companies
- + 450 Associations
- + 120 Medals obtained in official competitions



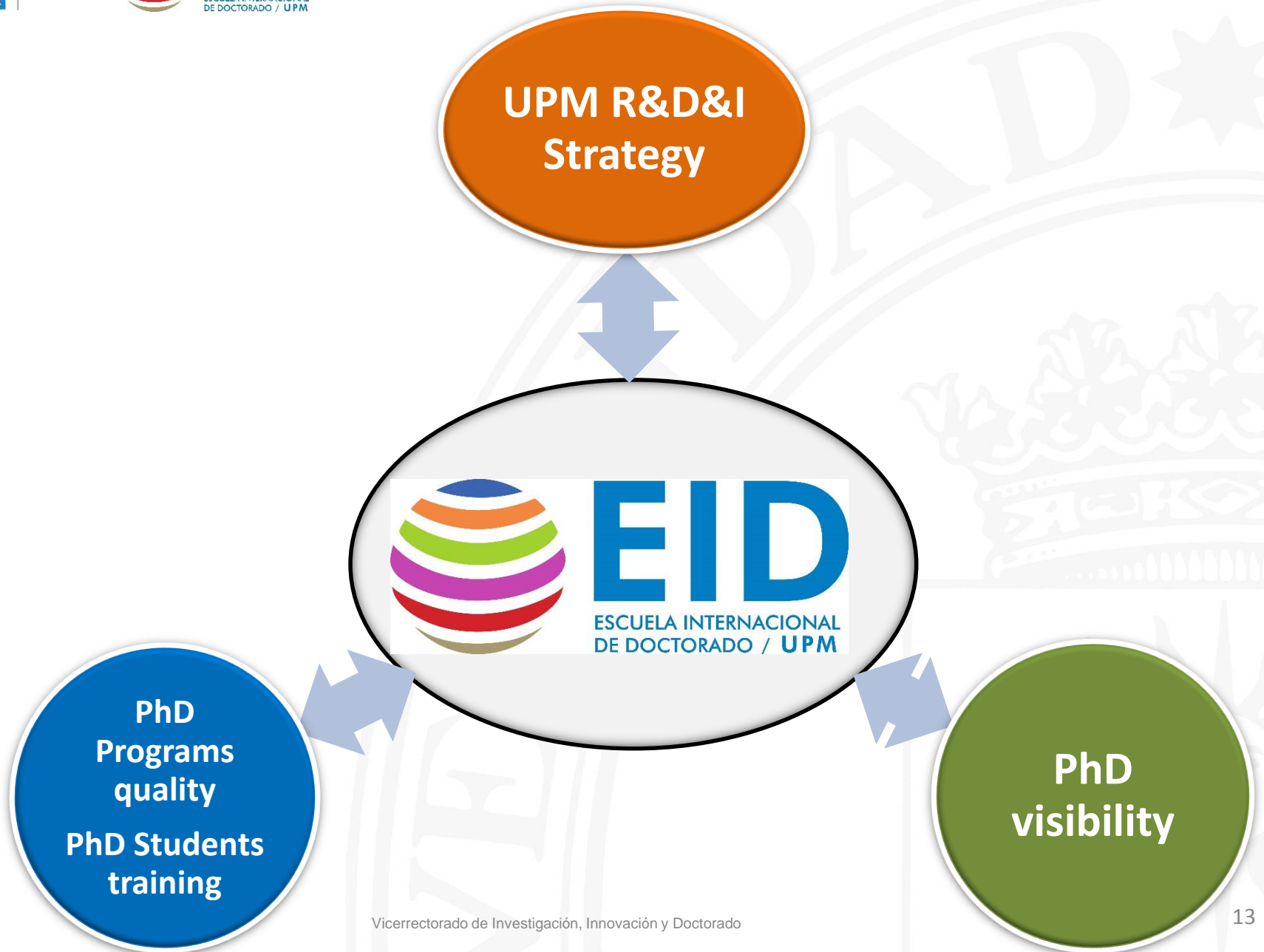
Connected to Research & Innovation networks



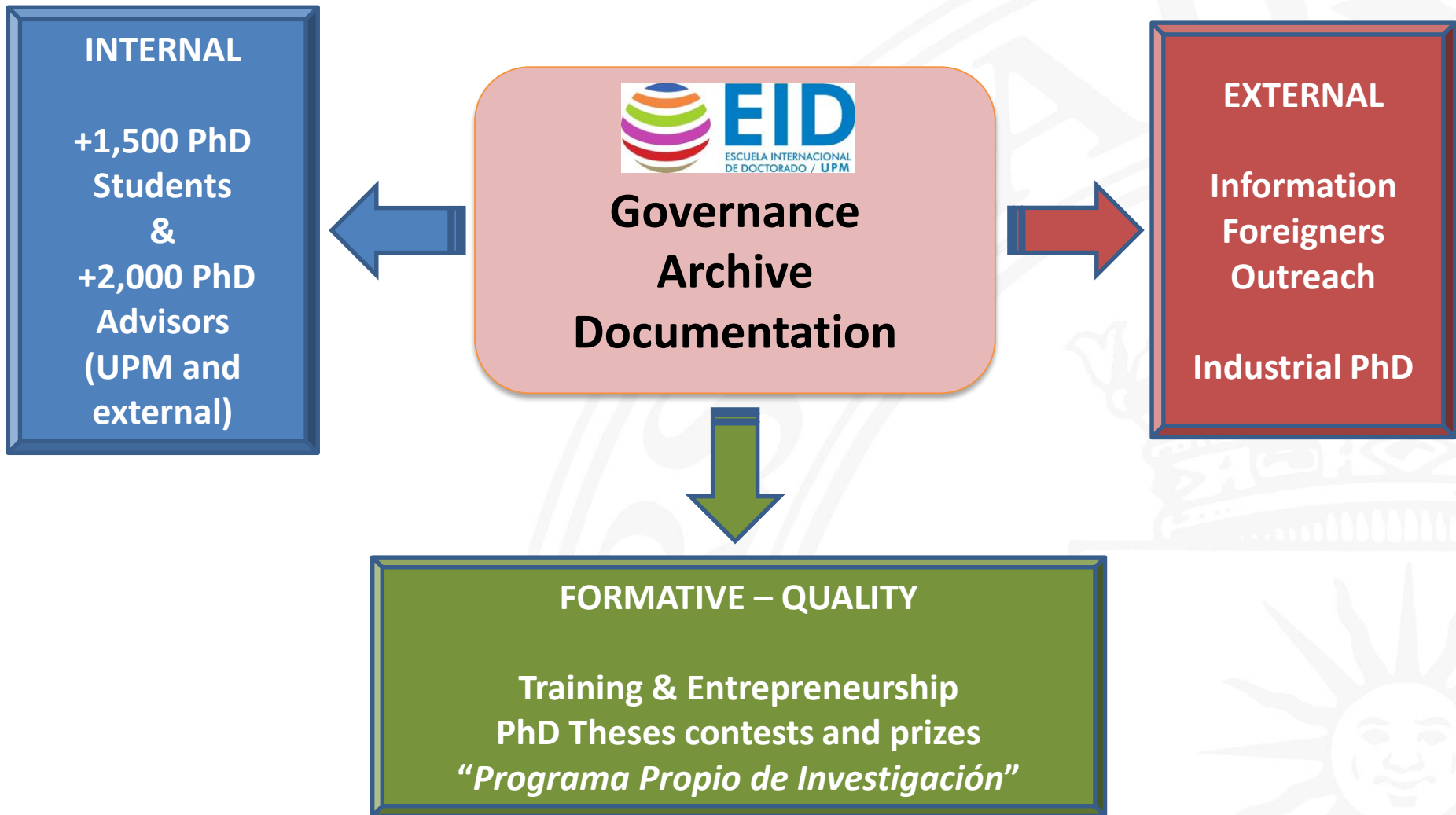
Human Brain Project
Unifying our understanding of the human brain.



2. International Doctorate School



International Doctoral School: Visibility and “School” model



3. Doctoral Areas and Doctoral Programs



MANUFACTURING & INDUSTRY

1. Aerospace Engineering
2. Automation and Robotics
3. Economy and Innovation Management
4. Engineering in Industrial Organization
5. Environmental, Chemical and Material Engineering
6. Electrical and Electronic Engineering
7. European Doctorate in Industrial Management
8. Fluid Mechanics
9. Mechanical Engineering
10. Production Engineering and Industrial Design
11. Research, Modeling and Risk Analysis in Environment
12. Sustainable, Nuclear and Renewable Energy

ICTs

1. Artificial Intelligence
2. Biomedical Engineering
3. Communication Systems and Technologies
4. Computation Science and Technology for Smart Cities
5. Electronic Systems Engineering
6. Mathematical Eng., Statistics and Operations Research
7. Photovoltaic Solar Energy
8. Systems and Services Engineering for the Information Society
9. Software, Systems and Computation
10. Telematic System Engineering

AGROFORESTRY & ENVIRONMENT

1. Advanced Forest Research
2. Agricultural Engineering
3. Biotechnology and Genetic Resources of Plants and Assoc. Microorganisms
4. Complex Systems
5. Engineering and Management of Environment
6. Environmental Technology for Sustainable Agriculture
7. Project Planning for Rural Development and Sustainable Management

CIVIL ENGINEERING

1. Earth Informatics Engineering
2. Civil Engineering Systems
3. Structural, Geotechnical and Material Engineering
4. Naval Architect, Marine and Ocean Engineering
5. Technological Innovation in Building Construction

ARCHITECTURE

1. Advanced Architectural Design
2. Architecture and Urban Planning
3. Architecture Heritage
4. Building and Architecture Technology
5. Edification Structures
6. Sustainability and Urban Regeneration

ARTS & SOCIAL SCI.

1. Architecture Communication
2. Architecture, Design, Fashion and Society
3. Physical Activity and Sport Sciences
4. Music and its Science and Technologies

4. Doctorate at UPM

Doctorate at UPM (RD 99/2011)

Eligibility
requirements
/criteria*

Admission
(Doctoral
Program)



Secondments

PhD Thesis Defense

Transversal training activities & Teaching collaborations

PhD
Degree

PhD Registration
(to be renewed
every year)

Year 1

Year 2

Year 3

Year 4

Year 5

Extension 1
(1 Year)

Extension 2
(1 Year)

**Candidates must have completed the studies that lead to an official Spanish (or from another country of the EHEA) university degree awarding 300 ECTS credits, of which at least 60 ECTS credits must correspond to master level. Or they must have completed a degree in a University not adapted to the EHEA that gives access to doctoral studies*

International Doctorate

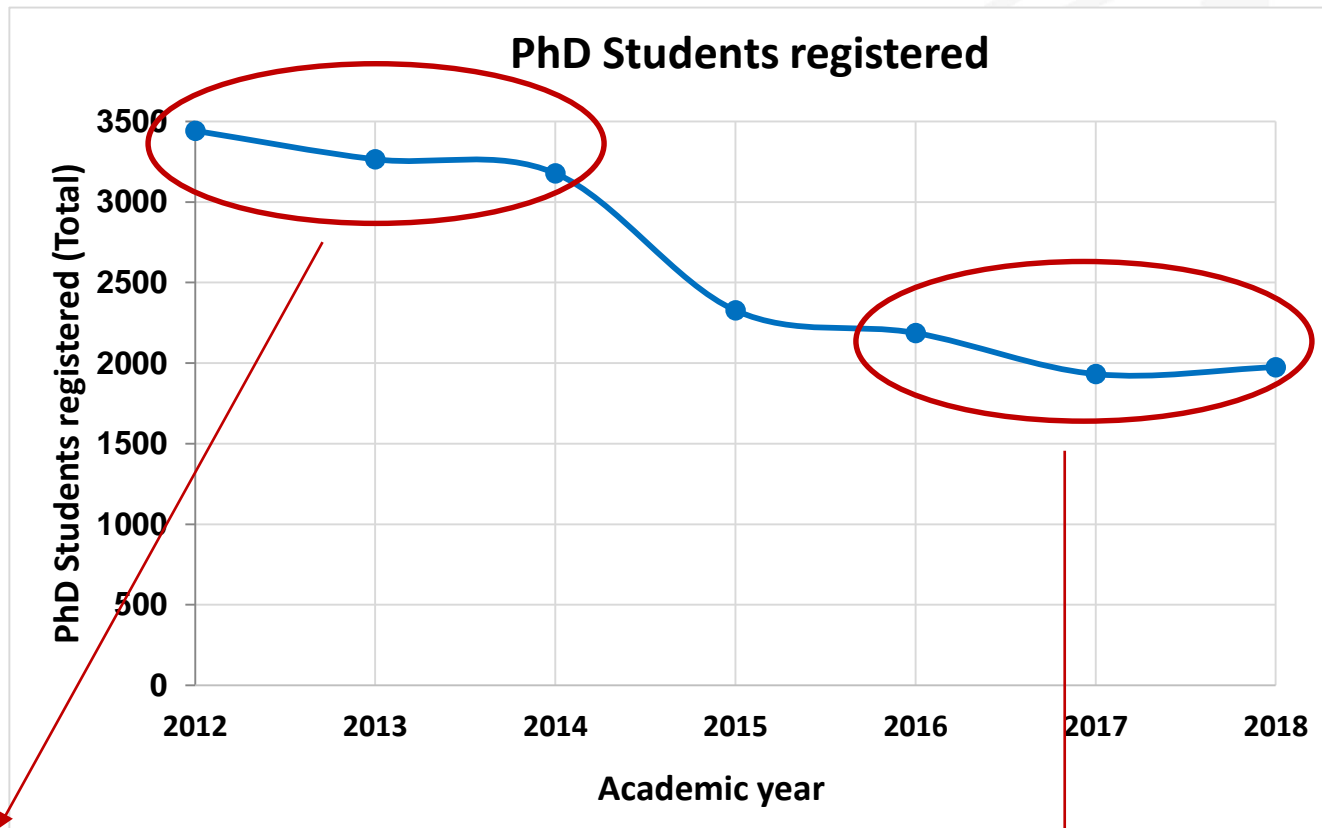
- ✓ Three months international secondment
- ✓ PhD thesis reviewed by international experts
- ✓ PhD thesis committee with international members
- ✓ PhD thesis and dissertation: Spanish and other language

Industrial Doctorate

- ✓ UPM-Industry collaboration agreement
- ✓ Industrial research project
- ✓ Industrial secondment

Co-tutelle

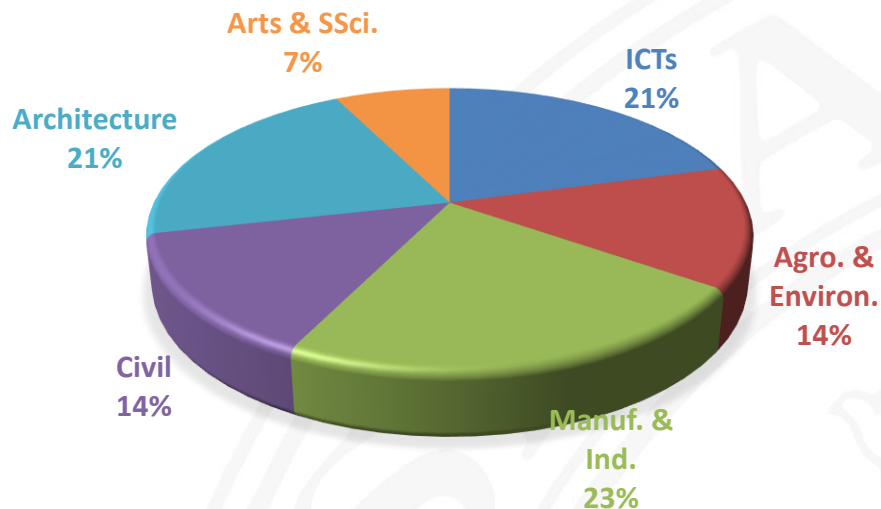
- ✓ Individual agreement for every PhD candidate.
- ✓ Two PhD certificates, one from each university
- ✓ At least 2 PhD advisors, one from each university
- ✓ Spend part of the PhD at each university (agreed by both universities)



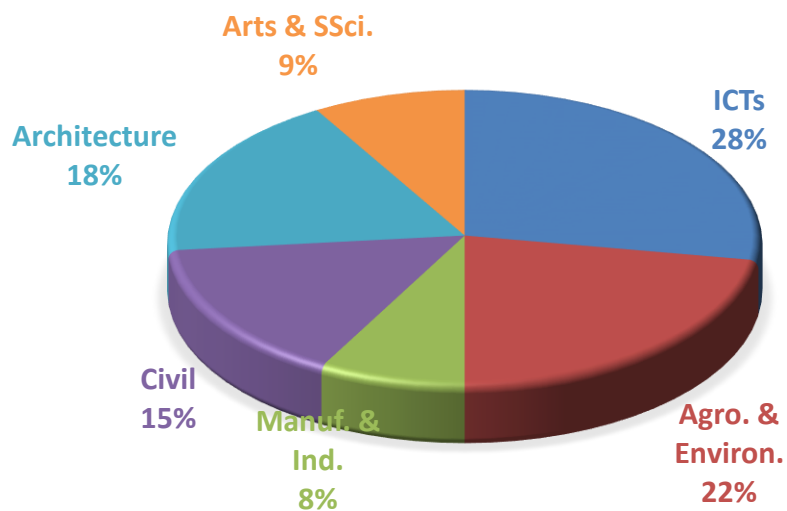
Extinction of former
Royal Decrees (RD 56,
RD 778 & RD 1393)

ca. 2,000 PhD students per year
on average

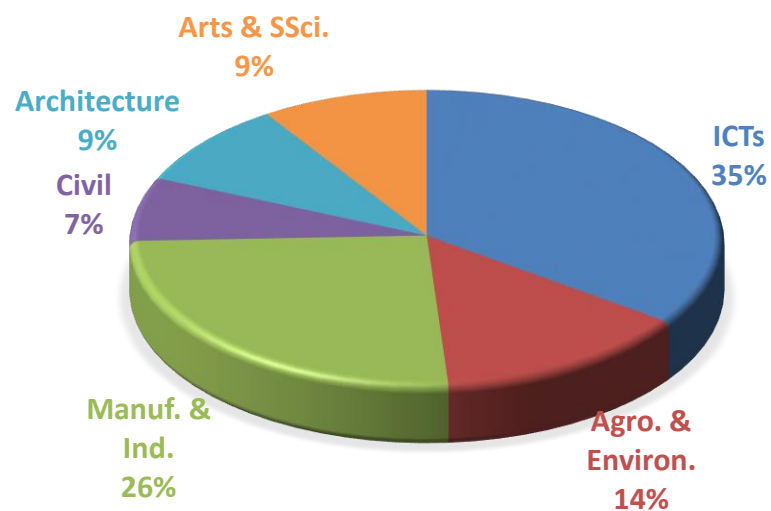
PhD Students registration (2018/2019)



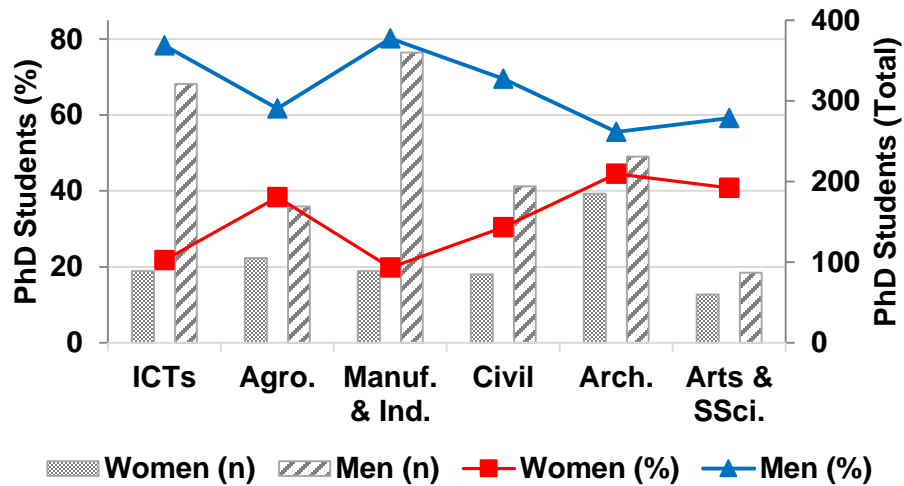
PhD Theses defended (2017/2018)



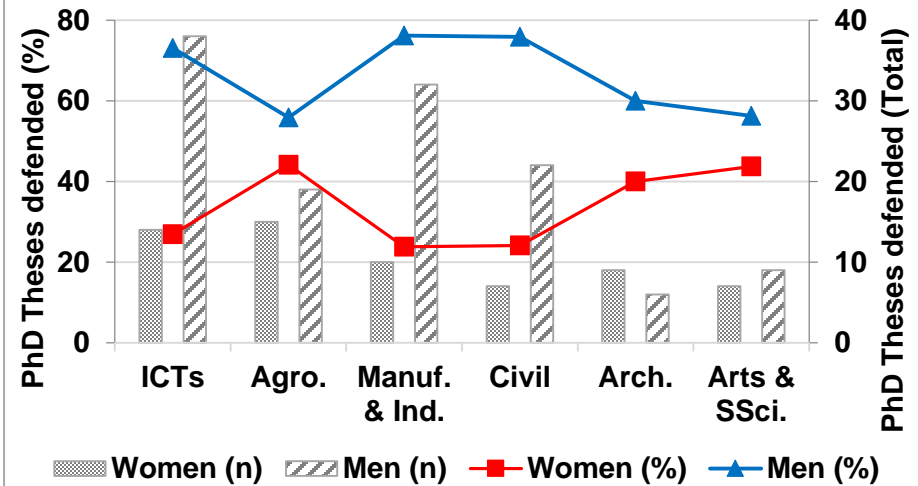
International Doctorate (2017/2018)



PhD Students registration (2018/2019)

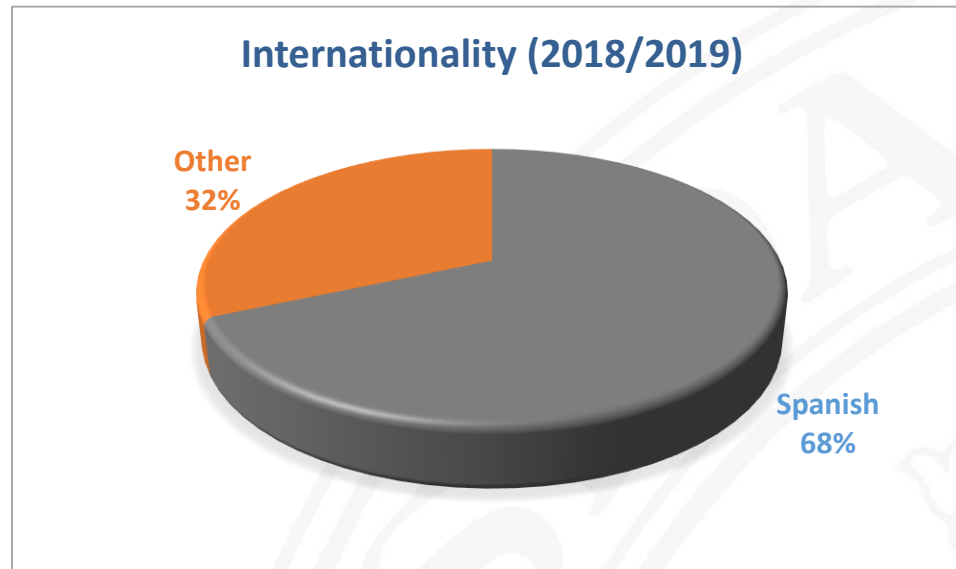


PhD Theses defended (2017/2018)

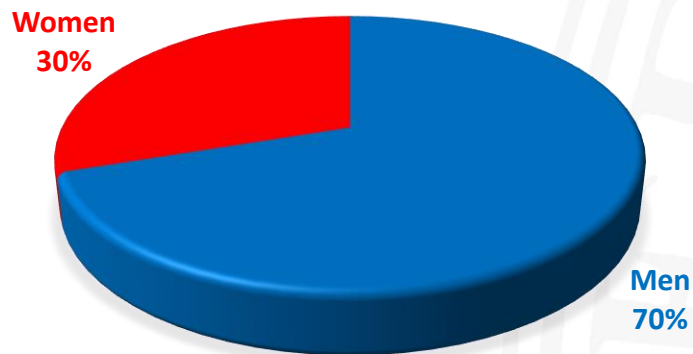


1. Registration & Defence: 30% women vs. 70% men (average)
2. Agroforestry & Environment: Chemical and biological approaches which are topics with a greater representation of women
3. Manufacturing & Industry: lower representation of women

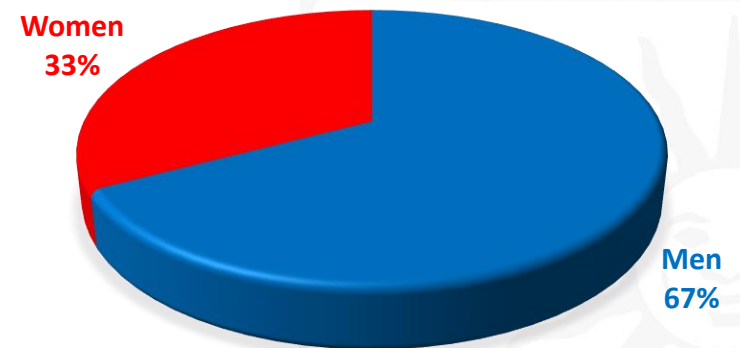
PhD Students registration: Internationality



Spanish PhD students (2018/2019)



Other PhD students (2018/2019)



Industrial Doctorate (2017 & 2018)

- ✓ **21 Industrial Doctorate contracts** granted by the Government of Madrid
- ✓ **Framework agreements** (UPM-company) to carry out Industrial Doctorates



AIRBUS

ALTER
TECHNOLOGY GROUP

LEAN  CALE

THE **WNB**

CEDRION 



CENER

CENTRO NACIONAL DE
ENERGÍAS RENOVABLES
NATIONAL RENEWABLE
ENERGY CENTRE



étulos

Silk
BIOMED


BIOTERRA, S.L.
Biología Aplicada de la Radiación

Aura
innovative robotics

servicio integral
de asesoría eólica

 **GEOLYDER**
Logística y Desarrollo para la Reducción de GeoRiesgos

QPV
Qualifying PhotoVoltaics

 **nutega**
Expertos en Nutrición



Solar Technology Advisors



UNIVERSITÉ
TOULOUSE III
PAUL SABATIER



Université
de Toulouse



UNIVERSITÀ
DEGLI STUDI
FIRENZE



Universidade Federal
de Campina Grande

U LISBOA

UNIVERSIDADE
DE LISBOA

Villard de Honnecourt framework agreement (Architecture)

I
- - -
U
- - -
A
- - -
V

Università Iuav
di Venezia

paris-belleville
école nationale supérieure d'architecture

TU Delft
Delft University of Technology
Faculty of Architecture
and the Built Environment
BK Bouwkunde

5. Transversal training activities for PhD candidates

Transversal training activities for PhD candidates

January-February

March-April

May-June

October-November

Teaching collaboration (up to 60h/year - max. 180h/PhD candidate)

- ✓ Innovation and entrepreneurship
- ✓ Introduction to business

- ✓ Patents and copyrights
- ✓ Science communication and dissemination
- ✓ Technology commercialization
- ✓ Methodology to support research I
- ✓ ERC Writing Days

- ✓ Postdoctoral career projection
- ✓ Symposium "Your thesis in a nutshell"
- ✓ Methodology to support research II
- ✓ Bibliographic resources
- ✓ MSCA-IF Writing Days

- ✓ Researchers' digital identity
- ✓ Normative aspects of the doctorate
- ✓ Making my research more responsible: Exploring RRI
- ✓ International R&D&I projects
- ✓ Writing in Engineering



GRECO Workshop

APPLYING RESPONSIBLE RESEARCH AND INNOVATION (RRI) CONCEPTS

UNIVERSIDAD POLITÉCNICA DE MADRID

EID ESCUELA INTERNACIONAL DE DOCTORADO / UPM



STRATEGIES FOR COMMUNICATION:
Presenting Your Thesis Effectively

6. *Programa Propio de Investigación*

Programa Propio de Investigación (Vice-Rectorate for Research, Innovation and Doctoral Studies funds)



**Specific calls for PhD candidates
(total budget: 1,690,000.00 €)**

- ✓ Pre-doctoral contracts (up to 4 years)
- ✓ International conferences
- ✓ Secondments (3-month international secondment to obtain the International Doctorate)

Thank you for your attention!

