



MASTER IN CONTROL IN SMARTGRIDS AND DISTRIBUTED GENERATION

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INTRODUCTION & OBJECTIVES

This master's degree has been designed in conjunction with a large number of companies and several research centres in order to ensure a high placement rate.

The master's degree has several special features:

- 40 ECTS in collaboration with companies.
- Degree with international mention. The main language of instruction is English.
- Classes taught in 2 centres: Faculty of Engineering of Gipuzkoa (Donostia-San Sebastian and Eibar) and ESTIA Institute of Technology (Biarritz, 30 min from Donostia-San Sebastian).
- Dual programme in conjunction with the Ecole Supérieure des Technologies Industrielles Avancées (ESTIA Institute of Technology)

The aim of this master's degree is to train specialists to model, simulate, control, operate and manage smart grids and distributed generation.

This master's degree will allow students to:

- Acquire high-level skills, allowing them to be recruited quickly.
- Acquire practical experience thanks to the intensive collaboration with companies.
- Master English, which has become an essential language with which to grow professionally.
- Have the possibility of carrying out a PhD.
- Contribute to a sustainable economic and social development.

ENTRY PROFILE

The degrees that give access to the master's degree are:

- Degree in Renewable Energy Source Engineering
- Degree in Electrical Engineering
- Degree in Industrial Electronic Engineering & Automatics
- Degree in Industrial Technology Engineering
- Other equivalent university degrees (at the discretion of the academic committee).

CAREER OPPORTUNITIES

Graduates will be able to work as designers, project managers, researchers or maintenance managers in the sector of renewable energies and power systems, of course, but also in others sectors such as electro-mobility, machine tools, etc.

STUDY LOAD

<u>Compulsory subject courses</u> 51 ECTS credits	<u>Optional subject courses</u> 9 ECTS credits	<u>Internship and Master Thesis</u> 30 ECTS credits	<u>Total</u> 90 ECTS credits
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ABOUT THE COURSE

Teaching place:	Faculty of Engineering - Gipuzkoa Ecole Supérieure des Technologies Industrielles Avancées (ESTIA) (Biarritz, France)
Teaching type:	On-site.
Teaching language:	English. Spanish, Euskera and French are also possible in 36 ECTS
Approximate fees:	4.050-4.250 €.
Calendar:	First quarter: September to December Second quarter: January to April External Internships and Master Thesis Project: 6 to 8 months months between May and December

The schedule is adjusted each year taking into account all the important restrictions.

TRAINING SYLLABUS

Compulsory subjects:

• Introduction to Smart grids	3 ECTS
• Grids Operation and Control	3 ECTS
• Communications in Smart grids	3 ECTS
• Power Converters	3 ECTS
• Modelling and Control of Storage Systems and Associated Converters	3 ECTS
• Disturbances and Protections in Smart grids	3 ECTS
• Control of the Machine-Side Converter-Generator Set	4,5 ECTS
• Dynamic Modelling of Distributed Generation Sources	3 ECTS
• Management and Control of Smart grids and Microgrids	4,5 ECTS
• Component Connection to the Grid by DC/AC Converters	3 ECTS
• Demand Side Management (DSM)	3 ECTS
• Implementation of Smart grids Control Algorithms	3 ECTS
• Modelling and Control of Renewable Generation Farms and Participating with Ancillary Services	3 ECTS
• Seminars and Visits	3 ECTS
• Application to Concrete Projects	6 ECTS

Optional subjects:

• Research Methodology	3 ECTS
• Industrial Informatics	3 ECTS
• Introduction to the Electric Power System	3 ECTS
• Modelling and Control of Wind Turbines	3 ECTS
• Electric Vehicles	3 ECTS

Internship and Master Thesis:

• Internship	18 ECTS
• Master Thesis	12 ECTS

CONTACT

Academic information:

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PARTNERS

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| 1. Ikerlan | 18. Enargia |
| 2. Jema | 19. Enedis |
| 3. Vicomtech | 20. CAF |
| 4. Ariadna Instruments S.L. | 21. Nexeya France |
| 5. Irizar e-Mobility | 22. NAITEC |
| 6. CEIT | 23. Sonnedix |
| 7. Goiener | 24. Tekniker |
| 8. CENER | 25. Tecnalia |
| 9. ZIV Aplicaciones Tecnología, S.L. | 26. Instituto Tecnológico de Canarias (ITC) |
| 10. PcVue Solutions S.L. | 27. Ormazabal |
| 11. Ingeteam | 28. Fundación Hidrógeno Aragón |
| 12. Cidetec | 29. Epic Power Converters S.L. |
| 13. CIRCE | 30. National Instrument |
| 14. Cegasa Energia | 31. EDF Recherche et Developpement |
| 15. H2Gremm | 32. Total Solar |
| 16. Tecsol | 33. Vinci-energies |
| 17. I-Ener | 34. Pragma Industrie |
| | 35. Usurbilgo Lanbide Heziketa and Tknika |

