

Course guide

330082 - GEF - Eolic and Photovoltaic Energy Generation

Last modified: 28/04/2025

Unit in charge: Manresa School of Engineering
Teaching unit: 709 - DEE - Department of Electrical Engineering.

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ICT SYSTEMS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, English

LECTURER

Coordinating lecturer: JOAN GABRIEL BERGAS JANE

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. (ENG) Capacitat per al càlcul i disseny de màquines elèctriques.

Transversal:

2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

4. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

5. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	45,0	30.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

(ENG) 1. Energía eólica. Principios y elementos básicos: viento, turbina, pitch, stall, multiplicador.

(ENG) 2. Máquinas eléctricas utilizadas en la generación eólica: generador de inducción, generadores de inducción doblemente alimentados, generadores síncronos.

(ENG) 3. Convertidores utilizados para la generación eléctrica.

(ENG) 4. Control de aerogeneradores.

(ENG) 5. Modelización y simulación de sistemas de generación eólica.

(ENG) 6. Energía Fotovoltaica.

(ENG) 7. Modelización y simulación de sistemas de generación fotovoltaicos.

(ENG) 8. Integración en la red eléctrica de las renovables.

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Lubosny, Zbigniew. Wind turbine operation in electric power systems: advanced modeling [on line]. Berlin: Springer, 2003 [Consultation: 07/10/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=6300737>. ISBN 354040340X.
- Quaschnig, Volker. Understanding renewable energy systems [on line]. London: Earthscan, 2005 [Consultation: 13/06/2022]. Available on: <https://www-taylorfrancis-com.recursos.biblioteca.upc.edu/books/mono/10.4324/9781315769431/understanding-renewable-energy-systems-volker-quaschnig>. ISBN 1844071286.

Complementary:

- Ackerman, T., ed. Wind power in power systems [on line]. Chichester: John Wiley & Sons, 2005 [Consultation: 10/06/2022]. Available on: <https://onlinelibrary-wiley-com.recursos.biblioteca.upc.edu/doi/book/10.1002/9781119941842>. ISBN 0470855088.