



Universidad de Jaén

School of Engineering of Jaén

Electric generation with renewable energies

2024-2025

Grado en Ingeniería eléctrica (E.P.S. Jaén)

Doble Grado en Ingeniería eléctrica e Ingeniería mecánica (E.P.S. Jaén)

Doble Grado en Ingeniería eléctrica e Ingeniería electrónica industrial (E.P.S. Jaén)



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Guías docentes UJA

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P.O.D.

Solicitud bilingüismo

Syllabus 2024-25 - 13513005 - Electric Generation with Renewable Energies (Generación de energía eléctrica con energías renovables)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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Full version (Spanish)

English

DEGREE: Grado en Ingeniería eléctrica (13513005)

FACULTY: SCHOOL OF ENGINEERING OF JAÉN

DEGREE: Doble grado en Ingeniería eléctrica e Ingeniería mecánica (13613006)

FACULTY: SCHOOL OF ENGINEERING OF JAÉN

DEGREE: Doble grado en Ingeniería eléctrica e Ingeniería electrónica industrial (13713006)

FACULTY: SCHOOL OF ENGINEERING OF JAÉN

ACADEMIC YEAR: 2024-25

COURSE: Electric Generation with Renewable Energies

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Electric Generation with Renewable Energies

CODE: 13513005 (*)

ACADEMIC YEAR: 2024-25

LANGUAGE: English

LEVEL: 0

ECTS CREDITS: 6.0

YEAR: 3

SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: MEDINA QUESADA, M^a ÁNGELES

DEPARTMENT: U120 - INGENIERÍA ELÉCTRICA

FIELD OF STUDY: 535 - INGENIERÍA ELÉCTRICA

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P: 953212335

WEBSITE: <http://blogs.ujaen.es/aquesada/>ORCID: <https://orcid.org/0000-0003-3924-7986>

LANGUAGE: English

LEVEL: 3

3. CONTENT DESCRIPTION

Wind Power Plants.

Concentrating solar technology.

Biomass Power Plants.

Other Power plants based on renewable energies.

Theoretical lessons

CHAPTER 1. Background of distributed generation with renewable energy. Grid connection. Evaluation of benefits of DG. . Institutional framework of renewable energies.

CHAPTER 2. Wind energy: the wind; wind turbines; aerodynamic of wind turbines; power and energy from wind turbines; parts of a wind turbine; regulation of wind turbine; economics; environmental impact; commercial development and wind energy potential; Offshore wind energy.

CHAPTER 3.- Solar thermal electric: Stirling dish technology; cylindrical-parabolic collector technology; technology of central tower receiver and heliostats.

CHAPTER 4.- Biomass Power Plants.

CHAPTER 5.- Others technologies : Photovoltaic Solar Power Plant.

Practical lessons.

- Laboratory lessons: online free software calculator for connected to the grid systems and plants.
- Power Plant's Technical Visits.
- Proposal projects.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

Face-to-face 100% Theory and practices ().** The Center may establish rotating attendance depending on the number of students and capacity of the classroom / laboratory (class in the schedule and classroom / laboratory assigned to one part of the group and broadcast by videoconference to the rest, with periodic rotation of students , as determined by the Center).

Class to all the students of the group in the assigned time and classroom.

Methodology: Participation during regular classes (theoretical or practical lessons, technical visits, and through Ilias Platform (University of Jaén virtual campus-online) will be taken into account. At the beginning of our course, students must incorporate into a team group (3 or 4 persons per group) and argue with professor the aim of their personal or team work, of course refers to one of the topic of our course. Finally, students will expose their own research and team work. One final exam will be done at the end of the semester about theoretical and practical aspect defined. Besides, during the semester are arranged several technical visits. In order to enroll the students in this course, all students must be register inside PLATEA Platform as soon as possible.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

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Student participation will make up to 20% of the final mark. Participation in asynchronous forums through PLATEA platform is considered as well as the development of some collaborative tasks through Google DOCs.

- Final exam will be about theoretical and practical aspect defined during the course and will make up to 40 % of the final mark. It will be mandatory to get at least 1 point over 4p to add the scores of the continuous evaluation.
- Two written works (.docx) and their oral presentations (pptx) will be worth up to 40% of the mark (two different tasks will be proposed: a personal work (20%) and a team-work (20%) that they must be defended during or at the end of our first semester respectively.

6. BOOKLIST ([Access the bibliography in the Library catalog](#))

MAIN BOOKLIST:

- Integration of distributed generation in the power system. Edition: -. Author: Bollen, Math H. J.. Publisher: Hoboken, N.J. : IEEE Press, 2011 ([Library](#))
- Renewable and efficient electric power systems [Recurso electrónico]. Edition: -. Author: Masters, Gilbert M.. Publisher: Hoboken, NJ : John Wiley & Sons, 2004. ([Library](#))

ADDITIONAL BOOKLIST:

- Fundamentals of renewable energy processes. Edition: 3rd ed.. Author: Rosa, Aldo Vieira da. Publisher: Amsterdam : Elsevier Academic Press, 2013 ([Library](#))
- Elementa of tidal-electric engineering. Edition: -. Author: Clark, Robert H.. Publisher: Hoboken : John Wiley and Sons, 2007 ([Library](#))
- Biomass for renewable energy, fuels, and chemicals [Recurso electrónico]. Edition: -. Author: Klass, Donald L. Publisher: San Diego : Academic Press, c1998 ([Library](#))
- Geothermal power plants [Recurso electrónico] : principles, applications, case studies and environme. Edition: 2nd ed.. Author: DiPippo, Ronald. Publisher: Amsterdam ; Boston ; London : Butterworth-Heinemann, 2008. ([Library](#))
- Handbook of photovoltaic science and engineering. Edition: Reprinted. Author: -. Publisher: Chichester: John Wiley & Sons, 2008 ([Library](#))
- Large-scale solar thermal power: technologies, costs and development. Edition: -. Author: Vogel, Werner. Publisher: Weinheim : Wiley-VCH, 2010 ([Library](#))
- Ocean Energy [Recurso electrónico] : Tide and Tidal Power. Edition: -. Author: Charlier, Roger H.. Publisher: Berlin, Heidelberg : Springer Berlin Heidelberg, 2009. ([Library](#))
- Photovoltaic systems engineering. Edition: 3rd ed.. Author: Messenger, Roger A.. Publisher: Boca Raton : Taylor & Francis, 2010 ([Library](#))
- Renewable energy: its physics, engineering, use, environmental impacts, economy and planning aspects. Edition: 2nd ed. Author: Sorensen, Bent. Publisher: San Diego [etc.]: Academic Press, cop. 2000 ([Library](#))
- Electricity production from renewable energies [Recurso electrónico]. Edition: -. Author: -. Publisher: London : ISTE ; Hoboken, N.J. : John Wiley & Sons, c2012 ([Library](#))
- Solar electricity: engineering of photovoltaic systems. Edition: -. Author: Lorenzo, Eduardo. Publisher: Sevilla: Promotora General de Estudios, 1994 ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Energía asequible y no contaminante

Industria, innovación e infraestructura

Producción y consumo responsables
Acción por el clima

DETAILED INFORMATION

Goal 7. Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable, and modern energy for all. By 2030, significantly increase the share of renewable energy in all energy sources, double the global rate of improvement in energy efficiency.

Goal 9. Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. By 2030, modernize infrastructure and convert industries to be sustainable, using resources more efficiently and promoting the adoption of clean and environmentally sound technologies and industrial processes, and ensuring that all countries take action in accordance with their respective capabilities.

Goal 12. Responsible Consumption and Production: Ensure sustainable consumption and production patterns. By 2030, achieve sustainable management and efficient use of natural resources, significantly reduce waste generation through prevention, reduction, recycling and reuse activities, help developing countries strengthen their scientific and technological capacity to move towards more sustainable consumption and production patterns.

Goal 13. Climate Action: Take urgent action to combat climate change and its impacts. Improve education, awareness and human and institutional capacity regarding climate change mitigation, adaptation, reduction of its effects and early warning.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

METHODOLOGY. The percentages assigned are the same established in the regular scenario (face-to-face) .

**The Center may vary the attendance percentage depending on the number of students and the capacity of the classroom / laboratory. In the case of less than 100% attendance, there will be periodic rotation of students as determined by the Center.*

Training Activities	Format (classroom /online)	Teaching methodology Description
5 practical sessions in specialized laboratories	Face -to-face 100%	Development of 5 practical sessions, each lasting two hours: UNIVER and , VISUALAB into our labs and PVGIS EXCEL CALCULATION SHEET, RETSCREEN online
15 +15 Theory sessions on the contents	Face-to-face 100%	15 +15 Theory sessions on the contents of the 100% face-to-face program 15 sessions of participatory master classes, lasting two hours each, conducted in the classroom and 15 sessions of participatory master classes, lasting one hour each, made in the classroom.
Tutorial lesson	Face-to-face100%	The tutoring sessions will be into the teacher office in regular way.

ASSESEMENT. The assigned evaluation criteria are the same as in the face-to-face scenario for both convocatories.

Ordinary call

Assessment test	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage

PLATEA TEST	On-site 100%	PLATEA TEST Randomly selected test type test (true / false, option multiple, short answers, etc.), platform PLATEA- Obligatory to obtain at least 1 point / 4 points	40%
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Extraordinary call

Assessment test	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage
PLATEA TEST	On-site 100%	PLATEA TEST Randomly selected test type test (true / false, option multiple, short answers, etc.), platform PLATEA- Obligatory to obtain at least 1 point / 4 points	40%

RESOURCES

Since the group has been below 15 students, the theory classes can be taught in a classroom with sufficient capacity where there are means to make videoconferences through GOOGLE MEET for theory classes and guided practical sessions if necessary due to an increase in the number of students or other more severe distancing conditions (in previous courses theory and guided sessions were taught in the D264 laboratory of the A3 -room with a capacity up to 30 people-. The practical sessions called TECHNICAL VISITS will depend on the possibility of conducting them on site and in Your case will be replaced by other guided work and sessions recorded by the teacher on site.

In format non face-to-face it will be offered not only the tools integrated into the UJA platform PLATEA in synchronous or asynchronous way (content, forums, delivery of work and / or practices) will be offered as well as the possibility of using the Google DOCs tool.

The electronic bibliographic resources will be those available in the BUJA and on others web pages of interest for the matter that concerns us.

9. VIRTUAL TEACHING SCENARIO

METHODOLOGY. The percentages assigned are the same established in the regular scenario (face-to-face) .

Training Activities	Format (online)	Teaching methodology Description
5 Practical sessions	Online 100%	Development of 5 practical sessions, each lasting two hours: UNIVER, PVGIS, VISUALAB, EXCEL CALCULATION SHEET, RETSCREEN.
15 +15 Theory sessions on the contents	Online 100%	15 sessions of participatory master classes, lasting two hours each and 15 sessions of participatory master classes, lasting one hour each via GOOGLE MEET videoconference.
Tutorial lesson	Online 100%	The tutoring will be done online via GOOGLE MEET upon request by the student via email.

ASSESEMENT .The assigned evaluation criteria are the same as in the face-to-face scenario for both convocatories.

Ordinary call

Assessment test	Format (face-to-face / online)	Description	Percentage
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	synchronous or asynchronous)		
PLATEA TEST	On-line synchronous /	PLATEA TEST Randomly selected test type test (true / false, option multiple, short answers, etc.), platform PLATEA- Obligatory to obtain at least 1 point / 4 points	40%

Extraordinary call

Assessment test	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage
PLATEA TEST	On-line synchronous /	PLATEA TEST Randomly selected test type test (true / false, option multiple, short answers, etc.), platform PLATEA- Obligatory to obtain at least 1 point / 4 points	40%

RESOURCES

Since the group has been below 15 students, the electronic resources in the non-classroom setting will be offered by PLATEA platform (contents, forums, delivery of works and / or practices, etc.). The theory classes will be taught by GOOGLE MEET videoconferences for both classes theory and guided practical sessions.

The practical sessions called TECHNICAL VISITS will be replaced by other guided work and sessions recorded by the teacher on site in case it would be let.

The electronic bibliographic resources will be those available in the BUJA website as well as others web pages of interest for the matter that concerns us.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es

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