

## [MHK303] ENERGY TECHNOLOGY

### GENERAL INFORMATION

<b>Studies</b>	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING	<b>Subject</b>	?
<b>Semester</b>	2	<b>Course</b>	1
<b>Character</b>	COMPULSORY	<b>Mention / Field of specialisation</b>	
<b>Plan</b>	2025	<b>Modality</b>	Face-to-face
<b>Credits</b>	3	<b>Hours/week</b>	1.61
		<b>Language</b>	CASTELLANO
		<b>Total hours</b>	29 class hours + 46 non-class hours = <b>75 total hours</b>

### 2030 AGENDA GOALS



### PROFESSORS

MARZO ELGUERO, IOSU  
 ALBERDI ESUAIN, BORJA  
 BERISTAIN MUGICA, MAIALEN

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>MH2506</b> - Understanding, analyzing, exploiting and managing the various energy sources		x		2,4
<b>MH2525</b> - Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.		x		0,16
<b>MH2526</b> - Apply acquired knowledge and problem-solving skills in new, unfamiliar or changing environments within broader (or multidisciplinary) contexts related to their area of study.		x		0,08
<b>MH2527</b> - Demonstrate the ability to integrate knowledge and deal with the complexity of formulate judgments based on incomplete or limited information, including reflections on the SDGs, human rights and fundamental rights, and on social, health and safety, environmental, economic and industrial implications and responsibilities.		x		0,12
<b>MH2528</b> - Communicate its conclusions and the ultimate knowledge and rationale behind them to specialized and non-specialized audiences in a clear and unambiguous manner.		x		0,08
<b>MH2529</b> - Possess the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous.		x		0,08
<b>MH2530</b> - Work with people, involving them and leading them in a dynamic directed towards a common objective that includes reflection on their ethical and social responsibility, with a global vision of the work to be carried out and the characteristics required (quality, deadlines, etc.), assuming responsibility for the decisions taken.		x		0,08
<b>Total:</b>				<b>3</b>

KC: Knowledge or Content / SK: Skills / AB: Abilities

### SECONDARY LEARNING RESULTS

**RMH137** [!] *Selecciona y dimensiona las diferentes fuentes de energía renovables.*

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		3,5 h.	3,5 h.
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		10 h.	10 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.	3 h.	6 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams		4 h.	4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.		10 h.
Carrying out exercises and solving problems individually and/or in teams	1,5 h.	2,5 h.	4 h.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>	
Reports on the completion of exercises, case studies,	20%	Reports on the completion of exercises, case studies, computer	

computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems  
Individual written and/or oral tests or individual coding/programming tests

80%

exercises, simulation exercises, laboratory exercises, term projects, challenges and problems  
Individual written and/or oral tests or individual coding/programming tests

**CH - Class hours:** 14,5 h.  
**NCH - Non-class hours:** 23 h.  
**TH - Total hours:** 37,5 h.

**RMH136** [!] *Analiza las fuentes de energía tradicionales e identifica el proceso de transformación energética de cada una.*

**LEARNING ACTIVITIES**

**CH**

**NCH**

**TH**

Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		3,5 h.	3,5 h.
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		10 h.	10 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.	3 h.	6 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams		4 h.	4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.		10 h.
Carrying out exercises and solving problems individually and/or in teams	1,5 h.	2,5 h.	4 h.

**EVALUATION SYSTEM**

**W**

**MAKE-UP MECHANISMS**

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
Individual written and/or oral tests or individual coding/programming tests	80%	Individual written and/or oral tests or individual coding/programming tests

**CH - Class hours:** 14,5 h.  
**NCH - Non-class hours:** 23 h.  
**TH - Total hours:** 37,5 h.

**CONTENTS**

**I. Introduction**

**0. Introduction to Energy**

**1. National Electricity System and Electricity Balance**

**II. Conventional Thermal Generation**

**2. Thermal Power Generation (Coal and Combined Cycle)**

**3. Nuclear Energy**

**III. Renewable Generation**

**4. Solar Energy**

**5. Wind Energy**

**6. Hydropower**

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

Subject notes  
Moodle Platform  
Topic related web quires  
Slides of the subject

### Bibliography

International Energy Agency (IEA), World Energy Outlook 2025. Paris, France: IEA, Nov. 12, 2025.

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A. McEvoy, T. Markvart, and L. Castañer, Eds., Practical Handbook of Photovoltaics: Fundamentals and Applications, 2nd ed. Waltham, MA, USA: Academic Press, 2012.

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