

## [GOK202] ENVIRONMENTAL ENGINEERING

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING		<b>Subject</b>	Sustainability
<b>Semester</b>	2	<b>Course</b>	3	<b>Mention / Field of specialisation</b>
<b>Character</b>	COMPULSORY		<b>Language</b>	CASTELLANO
<b>Plan</b>	2017	<b>Modality</b>	Adapted Face-to-face	<b>Total hours</b>
<b>Credits</b>	6	<b>Hours/week</b>	3.89	70 class hours + 80 non-class hours = <b>150 total hours</b>

### PROFESSORS

EGUREN EGUIGUREN, JOSE ALBERTO
GORROÑO ALBIZU, LEIRE

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
<i>(No specific previous subjects required)</i>	<i>(No previous knowledge required)</i>

### SKILLS

#### VERIFICA SKILLS

##### SPECIFIC

**GOC301** - To identify, be familiar with and select different existing sources of energy and to design the transformation process with energy efficiency in mind.

**GOC302** - To identify and know how to efficiently reduce the environmental impact of products throughout their life cycle

**GOC309** - To solve problems and analyse the implications of the solution proposed by defining actions which hinder the reappearance of problems (stable solution) and taking part in various work teams.

**GOC310** - To draft different types of documents, arguing and justifying the conclusions and solutions presented therein and to communicate, present and share the information appropriately.

##### GENERAL

**GOCT01** - To suggest the launch of new products, identifying the suitable actions for adequate planning, manufacture and management and minimising their environmental impact throughout their life cycle.

##### BASIC

**G\_CB4** - To be able to communicate information, ideas, problems and solutions to both expert and lay audiences

#### ENAEE LEARNING RESULTS

	ECTS
<b>ENAE02</b> - Knowledge and understanding: A systematic understanding of the key aspects and concepts of their branch of engineering.	2,4
<b>ENAE06</b> - Analysis in engineering: Ability to apply their knowledge and understanding in analysing product, process and method engineering.	0,6
<b>ENAE08</b> - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,36
<b>ENAE09</b> - Engineering projects: Understanding of the different methods and ability to use them.	0,36
<b>ENAE15</b> - Practical application of engineering: Understanding of applicable methods and techniques and their limitations.	1,2
<b>ENAE17</b> - Transversal competences: To work effectively, both individually and in a team.	0,36
<b>ENAE18</b> - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general.	0,36
<b>ENAE19</b> - Transversal competences: Demonstrate that they are aware of the responsibility implied in the practical application of engineering, the social and environmental impact, and show commitment with professional ethics, responsibility and regulations of the practical application of engineering.	0,36

**Total:** 6

### LEARNING RESULTS

**RG301** Assumes responsibilities in the work team, organizing and planning the tasks to be developed, facing the contingencies and encouraging the participation of its members.

#### LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams		6 h.	6 h.

#### EVALUATION SYSTEM

	W
Technical skills, involvement in the project, finished work,	50%

#### MAKE-UP MECHANISMS

*(No mechanisms)*

obtained results, handed documentation, presentation and technical defence  
 Team oral tests for the evaluation of technical skills of the subject 50%

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 6 h.  
**TH - Total hours:** 6 h.

**RG302** Analyze the intervening variables in the problem and propose actions for a stable situation.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams			5 h.	5 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices		50%	(No mechanisms)	
Team oral tests for the evaluation of technical skills of the subject		50%		

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 5 h.  
**TH - Total hours:** 5 h.

**RG304** Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in writing.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams			6 h.	6 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence		50%	(No mechanisms)	
Team oral tests for the evaluation of technical skills of the subject		50%		

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 6 h.  
**TH - Total hours:** 6 h.

**RG305** Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in spoken form.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams			6 h.	6 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence		50%	(No mechanisms)	

Team oral tests for the evaluation of technical skills of the subject 50%

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 6 h.  
**TH - Total hours:** 6 h.

**RG0303** [!] *Analiza, evalúa y propone mejoras en todo el ciclo de vida de un producto*

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams	10 h.	15 h.	25 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.	15 h.	25 h.

**EVALUATION SYSTEM**

*W*

Individual written and oral tests to assess technical skills of the subject	50%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	50%

**MAKE-UP MECHANISMS**

Individual written and oral tests to assess technical skills of the subject  
 Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**CH - Class hours:** 20 h.  
**NCH - Non-class hours:** 30 h.  
**TH - Total hours:** 50 h.

**RG0305** [!] *Identifica y describe cómo tratar los vertidos, residuos y emisiones generados por una empresa y propone buenas prácticas para reducir el impacto generado, cumpliendo la ley.*

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Individual study and work, tests and evaluations and check points	4 h.	9 h.	13 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	35 h.	18 h.	53 h.
Individual and team exercises	6 h.		6 h.
Visits to laboratories, companies and/or Technology Centers	5 h.		5 h.

**EVALUATION SYSTEM**

*W*

Individual written and oral tests to assess technical skills of the subject	50%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	50%

**MAKE-UP MECHANISMS**

Individual written and oral tests to assess technical skills of the subject  
 Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

**CH - Class hours:** 50 h.  
**NCH - Non-class hours:** 27 h.  
**TH - Total hours:** 77 h.

**CONTENTS**

1 Basic environmental concepts  
 2. Management and treatment of drinking water  
 3. Management and treatment of wastewater  
 4. Waste management  
 5. Atmospheric pollution

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

Subject notes  
Moodle Platform  
Slides of the subject  
Video projections

### Bibliography

OSCAR, C., ALEXANDRA, M. & IVÁN, M. Alternativas para la gestión ambiental en el siglo XXI, enfoque: iniciativa de investigación en cero emisiones. Memorias del Primer Congreso Internacional Ambiental del Caribe-Concaribe, 2002.

NIETO, J. & SANTAMARTA, J. 2007. Evolución de las emisiones de gases de efecto invernadero en España (1990-2006). CCOO, Madrid.

RODRÍGUEZ, J. J. & IRABIEN, A. 1999. Los residuos peligrosos. Caracterización, tratamiento y gestión. Editorial Síntesis SA, Madrid (Spain), 211-226.

[http://campus.usal.es/~retribucionesysalud/ssalud/calid\\_amb/manual.htm](http://campus.usal.es/~retribucionesysalud/ssalud/calid_amb/manual.htm)

Manual Práctico de Tramitaciones Administrativas Ambientales para la Industria Vasca.

Manual práctico de legislación industrial para la industria vasca 2007.

KIELY, G. 1999. Ingeniería ambiental: fundamentos, entornos, tecnologías y sistemas de gestión, McGraw-Hill.

IHOBE: SOCIEDAD PÚBLICA DE GESTIÓN AMBIENTAL:  
<http://www.ihobe.net> lhobeline: 900.15.08.64.

DEPARTAMENTO DE MEDIO AMBIENTE Y ORDENACIÓN DEL TERRITORIO; DEL GOBIERNO VASCO: <http://www.ingurumena.ejgv.euskadi.net/r49-387/es>

GOMELLA, C. & GUERRÉE, H. 1977. Tratamiento de aguas para abastecimiento público, Reverte.