

## [GIF304] HUMAN-MACHINE INTERFACE

### GENERAL INFORMATION

<b>Studies</b> DEGREE IN COMPUTER ENGINEERING	<b>Subject</b> ?	
<b>Semester</b> 2	<b>Course</b> 3	<b>Mention / Field of specialisation</b>
<b>Character</b> COMPULSORY		
<b>Plan</b> 2022	<b>Modality</b> Face-to-face	<b>Language</b> CASTELLANO/EUSKARA
<b>Credits</b> 4,5	<b>Hours/week</b> 4.06	<b>Total hours</b> 73 class hours + 39.5 non-class hours = <b>112.5 total hours</b>

### PROFESSORS

VALENCIA PARAFITA, XABIER

### REQUIRED PREVIOUS KNOWLEDGE

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

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>GIR308</b> - To evaluate human-computer interfaces that guarantee the accessibility and usability of computer systems, services and applications			x	3,78
<b>G-RTR1</b> - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and /or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		0,4
<b>G-RTR2</b> - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		0,32
<b>Total:</b>				4,5

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

### SECONDARY LEARNING RESULTS

**RG1390** [!] *Definir y gestionar los objetivos y la planificación de un proyecto que permita adquirir y/o reforzar los conocimientos de tecnologías específicas de su especialidad,- que en ocasiones llegan a la vanguardia del conocimiento- y definir una estrategia*

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	3 h.	1 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%	(No mechanisms)
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	50%	
Prototype / Product	30%	
<b>Comments:</b> Continuous assessment.		

**CH - Class hours:** 3 h.  
**NCH - Non-class hours:** 1 h.  
**TH - Total hours:** 4 h.

**RG1391** [!] *Coordinar el equipo de trabajo, estimulando la cohesión y buen clima para lograr la integración de todas las personas y su contribución para alcanzar un rendimiento apropiado, tanto a nivel individual como grupal, para el desarrollo del proyecto en*

LEARNING ACTIVITIES	CH	NCH	TH
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Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

2 h.

1 h.

3 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%

(No mechanisms)

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

50%

Prototype / Product

30%

**Comments:** Continuous assessment.

**CH - Class hours:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**RG1392** [!] *Identificar y argumentar de forma precisa los ODS en los que incide el proyecto realizado, aportando posibles acciones para la mejora*

**LEARNING ACTIVITIES**

**CH**

**NCH**

**TH**

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

2 h.

1 h.

3 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%

(No mechanisms)

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

50%

Prototype / Product

30%

**Comments:** Continuous assessment.

**CH - Class hours:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**RG1393** [!] *Elabora la memoria del proyecto, aportando argumentos elaborados y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje*

**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 h.

1 h.

4 h.

**Comments:** Continuous assessment. It may be asked to redo the document.

**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%

(No mechanisms)

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

50%

Prototype / Product

30%

**CH - Class hours:** 3 h.  
**NCH - Non-class hours:** 1 h.  
**TH - Total hours:** 4 h.

**RG394** [!] *Realiza una presentación oral del proyecto, justificando las soluciones propuestas con argumentos elaborados y precisos, y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje*

**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 h.	1 h.	4 h.

**Comments:** Continuous assessment.

**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%	(No mechanisms)	
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	50%		
Prototype / Product	30%		

**CH - Class hours:** 3 h.  
**NCH - Non-class hours:** 1 h.  
**TH - Total hours:** 4 h.

**RG315** [!] *Sabe diseñar y desarrollar interfaces multidispositivo para visualización e interacción de datos, basados en técnicas de UCD (User centered design) y DDD (Data-driven design)*

**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 h.	,8 h.	3,8 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.		2 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	28 h.	18,2 h.	46,2 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	3 h.	8 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	6%	Individual written and/or oral tests or individual coding/programming tests	
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	15%	<b>Comments:</b> Students with less than 5 in the Control point must retake the exam. Control point value will be 25% and retake 75%. Project: There will not be any retake of the individual defense.	
Individual written and/or oral tests or individual coding/programming tests	70%		
Prototype / Product	9%		

**Comments:** Minimum grade: 5 Project evaluation based on technical rubric

**CH - Class hours:** 38 h.  
**NCH - Non-class hours:** 22 h.  
**TH - Total hours:** 60 h.

**RG1316** [!] *Evalua interfaces multidispositivo basandonos en principios de usabilidad y estándares de accesibilidad*

**LEARNING ACTIVITIES**

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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	2 h.		2 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.		2 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	15 h.	11,5 h.	26,5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	3 h.	1 h.	4 h.

**EVALUATION SYSTEM**

*W*

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	6%
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	15%
Individual written and/or oral tests or individual coding/programming tests	70%
Prototype / Product	9%

**MAKE-UP MECHANISMS**

Individual written and/or oral tests or individual coding/programming tests  
**Comments:** Students with less than 5 in the Control point must retake the exam. Control point value will be 25% and retake 75%.  
 Project: There will not be any retake of the individual defense.

**Comments:** Minimum grade: 5 Project evaluation based on technical rubric

**CH - Class hours:** 22 h.  
**NCH - Non-class hours:** 12,5 h.  
**TH - Total hours:** 34,5 h.

**CONTENTS**

1. Introduction to interactive systems    1.1 Web interaction    1.2 Multi-device interaction    1.3 New interaction paradigms (AR/VR/XR, etc.)  
 2. User Centric Design (UCD)    2.1 UCD for interface design    2.2 Interface prototyping    2.2 Interface evaluation  
 3. User interface design    3.1 Principles of user interface design    3.2 Interface design rules and guidelines  
 4. Usability    4.1 Usability concepts    4.2 User experience  
 5. Accessibility    5.1 Accessibility concepts    5.2 Accessibility rules and standards (WACG)    5.3 Accessibility evaluation    5.4 Accessibility and SDGs  
 6. Data design and visualisation    6.1 Data Visualisation    6.2 Data Driven Design    6.3 User behaviour

**LEARNING RESOURCES AND BIBLIOGRAPHY**

<b>Learning resources</b>	<b>Bibliography</b>
Subject notes Moodle Platform Specific Master Software	<a href="https://labur.eus/biblio-GIF304">https://labur.eus/biblio-GIF304</a>