Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2023 / 2024 - Course planning

[GBH203] CONTROL TECHNOLOGY AND ROBOTICS

GENERAL INFORMATION

Studies	DEGREE IN BIOMEDICAL ENGINEERING			**Subject**	?
Semester	1	**Course**	3	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2022	**Modality**	Face-to-face	**Language**	ENGLISH
Credits	6	**Hours/week**	5.54	**Total hours**	99.65 class hours + 50.35 non-class hours = **150 total hours**

PROFESSORS

AZKARATE FERNANDEZ, IGOR

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GBR304 - To develop automation systems in the field of medical equipment		x		5,08
G-RTR1 - 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		0,44
G-RTR2 - 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		0,48
			Total:	**6**

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

SECONDARY LEARNING RESULTS

RGB390 [!] *Definir y gestionar los objetivos y la planificación de un proyecto que le 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 estrate*

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	2,75 h.	1,25 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	100%	Observation (technical capacity, attitude and participation)

CH - Class hours: 2,75 h.
NCH - Non-class hours: 1,25 h.
TH - Total hours: 4 h.

RGB391 [!] *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
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2,5 h.	1,5 h.	4 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Self-assessment	25%	Observation (technical capacity, attitude and participation)
Co-assessment	25%	
Observation (technical capacity, attitude and participation)	50%	

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Goi Eskola
Politeknikoa
Escuela Politécnica
Superior

CH - Class hours: 2,5 h.
NCH - Non-class hours: 1,5 h.
TH - Total hours: 4 h.

RGB392 **[!]** *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	1,9 h.	1,1 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	100%	Observation (technical capacity, attitude and participation)

CH - Class hours: 1,9 h.
NCH - Non-class hours: 1,1 h.
TH - Total hours: 3 h.

RGB393 **[!]** *Elabora la memoria del proyecto, aportando argumentos elaborados y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.*

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	3,75 h.	2,25 h.	6 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	100%	Observation (technical capacity, attitude and participation)

CH - Class hours: 3,75 h.
NCH - Non-class hours: 2,25 h.
TH - Total hours: 6 h.

RGB394 **[!]** *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
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	3,75 h.	2,25 h.	6 h.

EVALUATION SYSTEM	W	MAKE-UP 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	100%	Observation (technical capacity, attitude and participation)

CH - Class hours: 3,75 h.
NCH - Non-class hours: 2,25 h.
TH - Total hours: 6 h.

RGB311 [!] *Diseña y dimensiona los procesos de automatización de equipamientos médicos*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.		3 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	24 h.	15 h.	39 h.
Computer simulation exercises, individually and/or in teams	13 h.	13 h.	26 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	17 h.		17 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	46%
Individual written and/or oral tests or individual coding/programming tests	54%

Comments: It is mandatory to have previously submitted the requested exercises to be allowed to take the test. A grade lower than 3.5 in one of the assessment systems will lock the sub-competence to that value, and the average will not be applied.

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

Observation (technical capacity, attitude and participation)

Comments: It will be mandatory to retake those individual tests that at the first attempt have a grade lower than 5. The final grade will be 25% of the first test and 75% of its retake.

CH - Class hours: 57 h.
NCH - Non-class hours: 28 h.
TH - Total hours: 85 h.

RGB312 [!] *Comprende y aplica los principios de la robótica en el diseño de equipamientos médicos*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.		3 h.
Computer simulation exercises, individually and/or in teams	13 h.	14 h.	27 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	12 h.		12 h.

EVALUATION SYSTEM	W
Individual written and/or oral tests or individual coding/programming tests	100%

Comments: It is mandatory to have previously submitted the requested exercises to be allowed to take the test.

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

Comments: It will be mandatory to retake those individual tests that at the first attempt have a grade lower than 5. The final grade will be 25% of the first test and 75% of its retake.

CH - Class hours: 28 h.
NCH - Non-class hours: 14 h.
TH - Total hours: 42 h.

CONTENTS

ROBOT PROGRAMMING:

Introduction to robotics.

Introduction to RobotStudio (ABB).

Definition of points and paths. Work objects.

Complex geometries.

RAPID programming: procedures, offset, variables, digital inputs and outputs.

Tools and smart components for simulation.

AUTOMATION:

Introduction to industrial automation.

Introduction to PLC.

Programming in structured text and ladder diagrams.

Virtual commissioning.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	Robot Modeling and Control - Mark W. Spong, Seth Hutchinson, M. Vidyasagar - Wiley - 2005
Topic related web quires	
Class presentations	Autómatas programables SIEMENS Grafcet y Guía Gemma con TIA Portal - R. Yuste, V. Guerrero - Marcombo - 2017
Video projections	