

[GAHH05] PROCESS CONTROL

GENERAL INFORMATION

Studies	DEGREE IN ENERGY ENGINEERING	Subject	INSTRUMENTATION, AUTOMATION AND CONTROL
Semester	1	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2013	Language	ENGLISH
Credits	4,5	Hours/week	2.94
		Total hours	53 class hours + 59.5 non-class hours = 112.5 total hours

FACULTY

EGEA CACERES, ARITZ IMANOL

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
ADVANCED MATHEMATICS	(No previous knowledge required)
CONTROL AND INSTRUMENTATION	

SKILLS

SKILLS	ECTS
G1A303 - To understand the automatic adjustment and control techniques and their application to industrial automation. To be able to design control systems and industrial automation	4,12
G1A313 - To be able to work in multidisciplinary, multilingual environments, and to effectively communicate knowledge, procedures, results and ideas about energy both verbally and in writing.	0,36
Total:	4,48

LEARNING RESULTS

RG306 [!] *Define la técnica de control adecuada argumentando técnicamente la solución adoptada.*

LEARNING ACTIVITIES

	CH	NCH	TH
Classroom presentations of relevant concepts and procedures in participatory environments.	40 h.		40 h.
Individual and/or team computer simulation practice.	4 h.	4 h.	8 h.
Individual study and work, tests and evaluations.	4 h.	8,5 h.	12,5 h.
Individual and group exercises.	5 h.	2 h.	7 h.

EVALUATION SYSTEM

Individual written and oral tests to assess technical skills in the subject.	80%
undefined	20%

Comments:

MAKE-UP MECHANISMS

Written exam

Comments:

CH - Class hours: 53 h.

NCH - Non-class hours: 14,5 h.

TH - Total hours: 67,5 h.

RG307 [!] *Aplica conocimiento de regulación automática y control en un entorno real o simulado*

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of group projects and/or POPBL.		36 h.	36 h.

EVALUATION SYSTEM

Project assessment. The following will be taken into account:	100%
(a) Throughout the project, continuous assessment of both the individual student and the team, regarding task performance; (b) On completion of the project, the solution provided by the team of students and the corresponding report; (c) Lastly, the oral defence of the project, taking into account both the knowledge acquired and the quality of the presentation, the reasoned justification of the principals and the ultimate reasons for proposing the chosen solution.	

Comments:

MAKE-UP MECHANISMS

[!] *Evaluación continua*

Comments:

CH - Class hours: 0 h.

NCH - Non-class hours: 36 h.

TH - Total hours: 36 h.

RG337 [!] *Define los objetivos, realiza la planificación para su consecución y su seguimiento sistemático coordinando su trabajo con los demás miembros del equipo.*

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of group projects and/or POPBL.

2 h.

2 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Project assessment. The following will be taken into account: 100%

[!] *Evaluación continua*

(a) Throughout the project, continuous assessment of both the individual student and the team, regarding task performance; (b) On completion of the project, the solution provided by the team of students and the corresponding report; (c) Lastly, the oral defence of the project, taking into account both the knowledge acquired and the quality of the presentation, the reasoned justification of the principals and the ultimate reasons for proposing the chosen solution.

Comments:

CH - Class hours: 0 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 2 h.

RG338 [!] *Argumenta la selección de las teorías, métodos y/o tecnologías más relevantes que permitan definir y/o solucionar un problema utilizando bibliografía de calidad*

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of group projects and/or POPBL.

2 h.

2 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Project assessment. The following will be taken into account: 100%

[!] *Evaluación continua*

(a) Throughout the project, continuous assessment of both the individual student and the team, regarding task performance; (b) On completion of the project, the solution provided by the team of students and the corresponding report; (c) Lastly, the oral defence of the project, taking into account both the knowledge acquired and the quality of the presentation, the reasoned justification of the principals and the ultimate reasons for proposing the chosen solution.

Comments:

CH - Class hours: 0 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 2 h.

RG339 [!] *Redacta informes técnicos de forma clara, concisa y estructurada siguiendo las especificaciones establecidas haciendo énfasis en la coherencias entre los distintos apartados .*

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of group projects and/or POPBL.

3 h.

3 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Project assessment. The following will be taken into account: 100%

[!] *Evaluación continua*

(a) Throughout the project, continuous assessment of both the individual student and the team, regarding task performance; (b) On completion of the project, the solution provided by the team of students and the corresponding report; (c) Lastly, the oral defence of the project, taking into account both the knowledge acquired and the quality of the presentation, the reasoned justification of the principals and the ultimate reasons for proposing the chosen solution.

Comments:

CH - Class hours: 0 h.
NCH - Non-class hours: 3 h.
TH - Total hours: 3 h.

RG340 [!] *Presenta y defiende el trabajo en público de forma clara, concisa y estructurada mediante el uso apropiado de soporte visual según las especificaciones establecidas.*

LEARNING ACTIVITIES

Development, writing and presentation of group projects and/or POPBL.

CH

NCH

TH

2 h.

2 h.

EVALUATION SYSTEM

W

Project assessment. The following will be taken into account: 100%
(a) Throughout the project, continuous assessment of both the individual student and the team, regarding task performance; (b) On completion of the project, the solution provided by the team of students and the corresponding report; (c) Lastly, the oral defence of the project, taking into account both the knowledge acquired and the quality of the presentation, the reasoned justification of the principals and the ultimate reasons for proposing the chosen solution.

Comments:

MAKE-UP MECHANISMS

[!] *Evaluación continua*

Comments:

CH - Class hours: 0 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 2 h.

CONTENTS

- Stability of linear systems (Routh)
- Duality frequency response/time response
- Analysis of a controlled system
- Relative stability
- Accuracy
- Drivers design using frequency methods
- Discretization of analog controllers
- Implementation of a digital controller

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Labs
Lab practical training
Slides of the subject
Moodle Platform
Specific Master Software

Bibliography

 Ogata, Katsuhiko. Modern Control Engineering (5th Edition), 2009. ISBN-13: 978-0136156734
 Ogata, Katsuhiko. Matlab for Control Engineers., 2007
 Gene F. Franklin, J. David Powel, Abbas Emani-Naeini. Feedback Control of Dynamic Systems. 7th edition 2014. ISBN-13: 978-0133496598
Joseph Distefano III , Allen R. Stubberud, Ivan J. Williams , " Schaum's Outline of Feedback and Control Systems", 2nd Edition (Schaum's Outlines) 2013 ISBN-13: 978-0071829489