

## 820075 - DSS - Dynamic Systems and Simulations

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering

Teaching unit: 749 - MAT - Department of Mathematics

Academic year: 2015

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 6 Teaching languages: English

### Teaching staff

Coordinator: GISELA PUJOL VAZQUEZ

Others: Leonardo Acho

### Degree competences to which the subject contributes

Transversal:

2. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

### Teaching methodology

Magistral class.

### Learning objectives of the subject

Obtain extended mathematical tools.



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### Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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### Content

(ENG) - Complex Variable	Learning time: 31h 30m Theory classes: 9h Laboratory classes: 3h Self study : 19h 30m
Description: Complex variable.	
(ENG) -Modelling	Learning time: 35h 40m Theory classes: 6h Laboratory classes: 3h Self study : 26h 40m
Description: Mathematical models.	
(ENG) -Z Transform	Learning time: 38h Theory classes: 15h Laboratory classes: 3h Self study : 20h
Description: Z transform.	
(ENG) -Fourier Transform	Learning time: 44h 50m Theory classes: 15h Laboratory classes: 6h Self study : 23h 50m
Description: Fourier series.	

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### Planning of activities

(ENG) VARIABLE COMPLEXA

(ENG) MODELAT

(ENG) TRANSFORMADA Z

(ENG) FOURIER

### Qualification system

Partial exams.

### Bibliography

Basic:

James, G. [et al.]. Matemáticas avanzadas para ingeniería. 2ª ed. México: Pearson Educación, 2002. ISBN 9702602092.

Kreyszig, E. Matemáticas avanzadas para ingeniería. 3ª ed. México, D.F. [etc.]: Limusa, 2000. ISBN 9789681853105.

Lynch, S. Dynamical systems with applications using Matlab. Boston [etc.]: Birkhäuser, 2004. ISBN 0817643214.

Puig Montada, A.; Fernández Rodríguez, J. Transformada de Laplace. Barcelona: Edicions UPC, 1993. ISBN 8476533225.

Complementary:

Boyce, W. E.; DiPrima, R. C. Ecuaciones diferenciales : y problemas con valores en la frontera. 5ª ed. México [etc.]: Limusa Wiley, 2010. ISBN 9786070501517.