

230206 - MAE - Matlab and Its Applications in Engineering

Coordinating unit:	230 - ETSETB - Barcelona School of Telecommunications Engineering		
Teaching unit:	749 - MAT - Department of Mathematics 739 - TSC - Department of Signal Theory and Communications		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)		
ECTS credits:	6	Teaching languages:	English

Teaching staff

Coordinator: Jorge Villar

Prior skills

Standard mathematical background, Basic programming, Signal Processing

Teaching methodology

In the first part of the course, lecture notes and collection of exercises are handed out to the students. Communication between students and with the teachers is performed by means of a forum for questions and answers. The second part of the course consists of developing a final work on the student's choice.

Learning objectives of the subject

Part I. Fundamentals.

1. Learn MATLAB programming language. Learn how to write efficient and reliable code in MATLAB.
2. Learn MATLAB standard libraries. Get familiar with the most commonly used MATLAB packages.

Part II. Applications.

3. Get more insight into MATLAB. Develop a whole project written in MATLAB.

Study load

Total learning time: 150h	Hours large group:	13h	8.67%
	Hours small group:	39h	26.00%
	Self study:	98h	65.33%

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Content

Unit 1. Matlab Fundamentals and Graphics	Learning time: 30h Guided activities: 30h
<p>Description: Understanding MATLAB programming language. Basic management of scalars, vectors and matrices. Basic 2-D and 3-D graphics. Basic mathematical functions, including linear algebra, complex numbers and polynomials.</p>	
Unit 2. M-files Programming	Learning time: 30h Guided activities: 30h
<p>Description: Learn structured MATLAB programming, including command files and function files. Learn how to write efficient MATLAB programs.</p>	
Unit 3. Toolboxes	Learning time: 24h Guided activities: 24h
<p>Description: Familiarize with the main MATLAB toolboxes.</p>	
Unit 4. Graphics User Interface	Learning time: 24h Guided activities: 24h
<p>Description: Learn how to build a GUI application in MATLAB.</p>	
Final Work	Learning time: 42h Guided activities: 42h
<p>Description: Develop an entire MATLAB application</p>	

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Qualification system

Final grade is computed according the following weights:

Part I (exercises): 30% of final grade

Part II (final work): 70% of final grade

Regulations for carrying out activities

In every unit in the first part of the course the student is asked to submit the solutions to the proposed exercises in the scheduled time.

The Final Work consists of

(1) A 12-page report containing a brief theoretical introduction about the chosen subject, a description of the work done and a description of the achieved goals, including the functionalities of the MATLAB code developed.

(2) The set of source MATLAB files.

(3) A demo file showing the functionalities implemented.

Bibliography

Basic:

Mathworks. Matlab toolboxes. Mathworks,

Dormido, S. I, II, III Congreso de usuarios de MATLAB. Madrid: UNED, 1995.