



Teaching Guide				
Identifying Data				2018/19
Subject (*)	Professional software in finance	Code	614855218	
Study programme	Mestrado Universitario en Matemática Industrial (2013)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Optional	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Matemáticas			
Coordinador	Vazquez Cendon, Carlos	E-mail	carlos.vazquez.cendon@udc.es	
Lecturers	Calvo Garrido, María Del Carmen Vazquez Cendon, Carlos	E-mail	carmen.calvo.garrido@udc.es carlos.vazquez.cendon@udc.es	
Web	www.m2i.es			
General description	Preténdese que o alumno coñeza as ferramentas de software máis empregadas en relación cos contidos estudados na asignatura de modelos, así como que sexa capaz de elaborar software propio.			

Study programme competences / results	
Code	Study programme competences / results
A1	Alcanzar un conocimiento básico en un área de Ingeniería/Ciencias Aplicadas, como punto de partida para un adecuado modelado matemático, tanto en contextos bien establecidos como en entornos nuevos o poco conocidos dentro de contextos más amplios y multidisciplinares.
A2	Modelar ingredientes específicos y realizar las simplificaciones adecuadas en el modelo que faciliten su tratamiento numérico, manteniendo el grado de precisión, de acuerdo con requisitos previamente establecidos.
A4	Ser capaz de seleccionar un conjunto de técnicas numéricas, lenguajes y herramientas informáticas, adecuadas para resolver un modelo matemático.
A5	Ser capaz de validar e interpretar los resultados obtenidos, comparando con visualizaciones, medidas experimentales y/o requisitos funcionales del correspondiente sistema físico/de ingeniería.
A8	Saber adaptar, modificar e implementar herramientas de software de simulación numérica.
A9	Conocer, saber seleccionar y saber manejar las herramientas de software profesional (tanto comercial como libre) más adecuadas para la simulación de procesos en el sector industrial y empresarial.
B1	Saber aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios, incluyendo la capacidad de integrarse en equipos multidisciplinares de I+D+i en el entorno empresarial.
B2	Poseer conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación, sabiendo traducir necesidades industriales en términos de proyectos de I+D+i en el campo de la Matemática Industrial
B3	Ser capaz de integrar conocimientos para enfrentarse a la formulación de juicios a partir de información que, aun siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos.
B4	Saber comunicar las conclusiones, junto con los conocimientos y razones últimas que las sustentan, a públicos especializados y no especializados de un modo claro y sin ambigüedades.
B5	Poseer las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo, y poder emprender con éxito estudios de doctorado.

Learning outcomes			
Learning outcomes			Study programme competences / results
Having an overview of the existing range of financial software on the market	AC4	BC1	
	AC8	BR1	



To handle Excel for usage in the efficient resolution of some financial problems studied in the course of models	AC1 AC4 AC5 AC8 AC9	BC1 BC2 BR1
Knowing some Matlab specific tools for evaluating products and financial situations	AC2 AC4 AC8 AC9	BC1 BC2 BC3 BR1
Be able to produce original financial software in Matlab programming environment using appropriate financial toolboxes if necessary	AC4 AC5 AC8 AC9	BJ1 BC1 BC2 BC3 BR1
Be able to develop financial software that requires interaction between Matlab and Excel,also using the tool ExcelLink when suitable	AC4 AC5 AC8 AC9	BJ1 BC1 BC2 BC3 BR1

Contents	
Topic	Sub-topic
1. An overview of the current professional financial software toolboxes	
2. Introduction to Excell with its usage in finance in view	
3. Specific Matlab toolboxes for finance	
4. Excel - VBA - Matlab Interaction: Excel Link	
5. Software development for financial pricing in Excel and Matlab	
6. Software development for financial pricing in Python	
7. Specific financial toolboxes in Python	

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Problem solving	A4 A5 A9 A8 B2 B5 B3	0	22	22
Guest lecture / keynote speech	A1 A2 A4 A5 A9 A8 B2 B5 B1 B4	21	0	21
Supervised projects	A4 A5 A9 A8 B5 B3	0	30	30
Problem solving	A4 A5 A9 A8 B2 B5 B3	4	4	8
ICT practicals	A9 A8 B4	21	42	63
Personalized attention		6	0	6

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Problem solving	The student must solve some of the issues and problems that allow practice using software tools



Guest lecture / keynote speech	The use of software tools (Excel, Matlab, etc) for the solution of models and financial problems will be described, some of them studied in the course of mathematical models in finance
Supervised projects	Works or projects to solve financial problems using various software toolboxes that have been discussed will be posed to the students
Problem solving	Financial valuation issues to be solved by software tools as classroom exercises will be posed
ICT practicals	Financial examples to be solved with the computer will be posed and the commands of the different software tools will be trained

### Personalized attention

Methodologies	Description
ICT practicals Problem solving	Additionally to classroom questions, all questions posed by students through e-mail or during personal appointments with the professor will be individually assessed

### Assessment

Methodologies	Competencies / Results	Description	Qualification
Supervised projects	A4 A5 A9 A8 B5 B3	Works or project will be posed to students, mainly consisting of solving financial problems by using the different software tools that have been presented during lectures	75
Problem solving	A4 A5 A9 A8 B2 B5 B3	Problems about financial pricing by using the described software toolboxes will be posed to be solved in classroom	25

### Assessment comments

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### Sources of information

<b>Basic</b>	<ul style="list-style-type: none"> <li>- The Math Works Inc. (2005). Financial Derivatives Toolbox User's Guide .</li> <li>- The Math Works Inc. (2005). Financial Toolbox User's Guide.</li> <li>- (). www.mathworks.com.</li> </ul>
<b>Complementary</b>	

### Recommendations

#### Subjects that it is recommended to have taken before

Numerical methods and programming/614855201

Mathematical modeling in finance/614855211

Stochastic numerical methods/614855226

#### Subjects that are recommended to be taken simultaneously

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#### Subjects that continue the syllabus

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#### Other comments

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