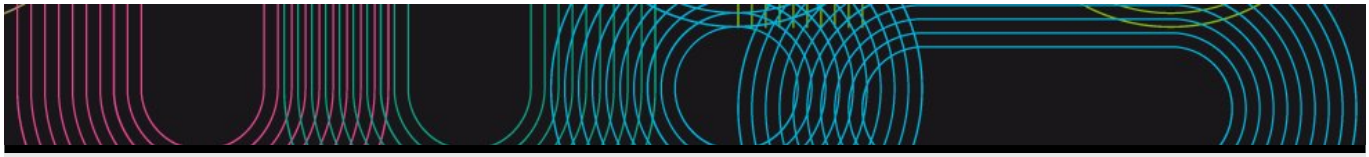

IDENTIFYING DATA				
Computer-Aided Mechanical Design				
Subject	Computer-Aided Mechanical Design			
Code	V04M141V01316			
Study programme	(*)Máster Universitario en Enxeñaría Industrial			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	2nd	1st
Teaching language	English			
Department				
Coordinator	López Campos, José Ángel			
Lecturers	López Campos, José Ángel Segade Robleda, Abraham			
E-mail	joseangellopezcampos@uvigo.es			
Web	http://moovi.uvigo.gal/			
General description	Machinery design and calculation by the finite element method			

Training and Learning Results	
Code	
A2	That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
A3	That students are able to integrate knowledge and handle complexity and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments.
C1	CET1. Project, calculate and design products, processes, facilities and plants.
C14	CTI3. Ability to design and test machines.

Expected results from this subject	Training and Learning Results
- Integration of components in the design of machines.	A2
- Know and apply the computational technicians of modelling 2D and 3D to the mechanical design.	A3
- Complement the classical calculation of elements of machines, and the cinematic and dynamic calculations of mechanisms with computational technicians.	C1 C14

Contents	
Topic	
Introduction to the finite element method	Discretisation, meshing, quality of mesh, boundary conditions. Pre and post processing
Preparation of geometry	Generation of geometry by means of direct modelling. Repair and modification of geometry. Dimensional parameterisation
Static analysis. Linear and no linear	Methodologies for solving nonlinear equilibrium equations. Sources of non linearity, theory of large deformations. Non-linearity caused by material and contacts. Failure criteria, yielding and damage laws
Dynamic analysis in the frequency domain	Modal, harmonic load, PSD and spectral analysis.
Dynamic analysis in the time domain	Rigid body dynamics Implicit and explicit dynamics.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	12	20	32
Practices through ICT	24	45	69
Problem solving	12	20	32
Problem and/or exercise solving	0	30	30

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

Methodologies

	Description
Lecturing	Introduction and desripion of the different concepts and techniques related with the subject
Practices through ICT	Resolution of problems of calculation of mechanical components using simulation software
Problem solving	Put the knowledges achieved in the subject into practice applying them to the resolution of common problems in engineering

Personalized assistance

Methodologies	Description
Lecturing	Personalised attention of all the doubts posed by the students
Practices through ICT	Group or individual tutorials will be held during office hours to strengthen the acquired knowledge and to guide and assess the proposed works/papers.
Problem solving	Group or individual tutorials will be held during office hours to strengthen the acquired knowledge and to guide and assess the proposed works/papers.

Assessment

	Description	Qualification	Training and Learning Results	
Practices through ICT	Resolution of practical problems with support of software. It will value the delivery of several reports along the course, any of which will take an upper value to 40% of the total note of the matter.	70	A2 A3	C1 C14
Problem and/or exercise solving	Resolution and delivery of exercises along the course, in regard to the specific contents developed in the theoretical sessions.	30	A2 A3	C1

Other comments on the Evaluation

In this matter will evaluate the work related with:Practical of laboratory. It will value :The assistance to the practices of laboratory, the qualification of the reports delivered in each practice and the works supervised. Will have a maximum assessment of 7 points *osbre the final note. To be evaluated in this section, the student has to assist to a minimum of 75% of the practical classes.For the students that request renunciation to continuous evaluation and accept it officially, will be able to not assisting to practices but will have to complete of the same form the works proposed for his evaluation.Examination. It will make an examination whose value will be like minimum 3 points gives final note.Ethical commitment: it expects that the present student a suitable ethical behaviour. In case to detect a *nbsp;behaviour&no ethical (copy, plagiarism, utilisation of unauthorised electronic devices, and others) will consider that the&*nbsp;student does not gather the necessary requirements to surpass the matter. In this case the global qualification in the present course&*nbsp;academician will be of suspense (0.0).Will not allow the utilisation of any electronic device during the proofs of evaluation except permission expresses.&*nbsp;The fact to enter an unauthorised electronic device in the classroom of the examination will be considered reason of no&*nbsp;*superación of the matter in the present academic course and the global qualification will be of suspense (0.0).

Sources of information

Basic Bibliography

Olek C. Zienkiewicz, Robert L. Taylor, J. Z. Zhu, **The Finite Element Method: Its Basis and Fundamentals**, 7ª, Butterworth-Heinemann, 2013

Javier Bonet, Richard D. Wood, **Nonlinear Continuum Mechanics for Finite Element Analysis**, 2nd, Cambridge, 2008

Roy R. Craig, Andrew J. Kurdila, **Fundamentals of Structural Dynamics**, 2nd, Wiley, 2003

Complementary Bibliography

Garcia de Jalon, Javier; Bayo, Eduardo, **Kinematic and Dynamic Simulation of Multibody Systems**, Springer, 1994

Singiresu S. Rao, **Mechanical Vibrations**, 5th, Prentice Hall, 2010

Recommendations

Subjects that it is recommended to have taken before

Mechanical Engineering Design/V04M141V01114