Teaching Guide					
Identifying Data					2014/15
Subject (*)	Mecánica de Materiais			Code	631480205
Study programme	Mestrado Universitario en Enxeñaría Mariña				
Descriptors					
Cycle	Period	Year		Type	Credits
Official Master's Degree	2nd four-month period	First		Optativa	3
Language	SpanishGalicianEnglish				
Prerequisites					
Department	Enerxía e Propulsión Mariña				
Coordinador	Miguel Catoira, Alberto De		E-mail	alberto.demiguel@udc.es	
Lecturers	Miguel Catoira, Alberto De		E-mail	alberto.demiguel@udc.es	
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General description					

Study programme competences	
Code	Study programme competences
A2	Detectar e definir a causa dos defectos de funcionamento das máquinas e reparalas, a nivel de xestión.
A4	Elaborar plans de emerxencias e de control de avarías, e actuar eficazmente en tales situacións, a nivel de xestión.
A13	Planificar e programar as operacións, a nivel de xestión.
A20	Capacidade para desenrolar tarefas de análise e síntese de problemas teórico-prácticos en base a conceptos adquiridos noutras disciplinas do ámbito marítimo, mediante fundamentos físico-matemáticos.
A21	Operar, reparar, manter, reformar, deseñar e optimizar a nivel de xestión as instalacións industriais relacionadas coa enxeñaría mariña.
A22	Capacidade para desenrolar métodos e procedementos para gañar competitividade na industria marítima.
A23	Capacidade de autoformación, creatividade e investigación en temas de interese científico e tecnolóxico.
A25	Correcta utilización do idioma Inglés na elaboración de informes técnicos e correspondencia comercial.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Comunicarse de maneira efectiva nun entorno de traballo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar de forma colaborativa.
B6	Comportarse con ética e responsabilidade social como cidadán e como profesional.
B7	Capacidade para interpretar, seleccionar e valorar conceptos adquiridos noutras disciplinas do ámbito marítimo, mediante fundamentos físico-matemáticos.
B8	Versatilidade.
B9	Capacidade para a aprendizaxe de novos métodos e teorías, que lle doten dunha gran versatilidade para adaptarse a novas situacións.
B10	Comunicar por escrito e oralmente os coñecementos procedentes da linguaxe científica.
B11	Capacidade para resolver problemas con iniciativa, toma de decisións, creatividade, razoamento crítico e de comunicar e transmitir coñecementos, habilidades e destrezas.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes			
Subject competencies (Learning outcomes)	Study programme competences		
-No training to theoretical or scientists, training technicians with adequate proportion of concepts, principles and generalizations to act with expertise in industrial processes and technical constructions.		BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8 BC9 BC10 BC11	CC1 CC2 CC3 CC4 CC5 CC6 CC7 CC8
-Critical sense and suitable training to improve the mechanical elements currently operating in industrial processes.		BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8 BC9	CC1 CC2 CC3 CC4 CC5 CC6 CC7 CC8
-Facing new situations and tasks specific to distinguish essential from the accessory.		BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8 BC9 BC10 BC11	CC1 CC2 CC3 CC4 CC5 CC6 CC7 CC8
Be able to analyze the stress of machine and structural elements under complex stress states.	AC2 AC4 AC13 AC20 AC21 AC22 AC23 AC25		
Be able to analyze the strains of machine and structural elements under complex stress states.	AC2 AC4 AC13 AC20 AC21 AC22 AC23 AC25		

Be able to use finite element method (FEM) software applied to solid elements.	AC2 AC4 AC13 AC20 AC21 AC22 AC23 AC25		
Use the concepts and skills learned to manage and plan the specific marine engineering projects.	AC2 AC4 AC13 AC20 AC21 AC22 AC23 AC25		

Contents	
Topic	**Sub-topic**
Introduction	2D stress and strains 2D rectangular coordinates problems. 2D polar coordinates problems.
3D stress and strains.	Métodos eslasto-energéticos Teoremas generales Problemas elementales de elasticidad tridimensional
Case studies	Torsion Bending of prismatic elements Stress distribution in a rotating shaft Thermal stress

Planning			
Methodologies / tests	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Problem solving	12	16	28
Mixed objective/subjective test	4	0	4
Seminar	0	16	16
Guest lecture / keynote speech	10	10	20
Personalized attention	7	0	7
(*)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	1.-Approach of real problems in machine elements that are familiar to the student. 2.-Good drawing, diagrams and graphs for the correct interpretation of the problem. 3.-View data and number of variables. 4.- Apply specific theorems. 5.-Use appropriate mathematical technique and possibly accompanied by graphical methods.
Mixed objective/subjective test	1.-40% by theory 2.-40% by problems 3.-20 % by questions related with the lectures and practices.

Seminar	1.- reduced and medium groups in those raised theoretical and practical assumptions in order for students to relate theoretical formation with practical application.
Guest lecture / keynote speech	1.-Solve questions of lectures before. 2.-Highlight the importance of the subject of today and quote machine in which it is applied. 3.-Short review of basics mechanics and strength of materials related to the subject to be treated. 4.-specific topic explanation, with graphics and mathematical support itself.

Personalized attention	
Methodologies	**Description**
Mixed objective/subjective test Seminar Guest lecture / keynote speech Problem solving	1.-During the lecture only short question are attended. 2.-Demostrations and long question are attended during tutoring time. 3.-Test and assignment review during tutoring time or by appointment.

Assessment		
Methodologies	**Description**	**Qualification**
Mixed objective/subjective test	Theory, problems and issues seen in class and in the practices of the subject.	60
Seminar	Is presented and solved practical theoretical assumptions developed in class students. It will assess the students' active participation.	20
Problem solving	Resolution the problems posed	20

Assessment comments
In this subject 2 midterms exam will be made, to attend them it is needed to satisfy the following to conditions: Perform at least 80% of practice of the subject.Get at least 4 on the practice of the subject.Failure to meet any of the above conditions it is not possible to attend the midterm exams. In case of attend to midterm exams the mark will be found as a 60% average rating of the 2 tests, and the remaining 40% of the practical mark. For this it is necessary to obtain at least 4 in each of the two exams.If do not attend to midterm exams, will attend to the final exam, the grade will be the grade earned.

Sources of information	
Basic	- D. S. Dugdale,C. Ruiz (). Elasticidad para técnicos. - James Gere,Barry Goodno (). MecÁnica de Materiales. - S. Timoshenko y J. N. Goodier (1981). TEORÍA DE LA ELASTICIDAD. - Landau, L. D.; Lifshitz, E. M.; Berestetskii, V. B.; Pitaevskii, L. P. (). TEORIA DE LA ELASTICIDAD.
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Instalacións de Propulsión/631480101 Deseño de Intercambiadores de Calor/631480216
Subjects that continue the syllabus
Other comments

It is not necessary to have attended any course prior to this postgrade. It is highly recommended to have completed some technical degree (or similar) which include a mechanical topics such as mechanical vibrations, streght of materials or fundamental mechanics.

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.