Teaching Guide				
Identifying Data				2022/23
Subject (*)	Mechanics		Code	730G03026
Study programme	Grao en Enxeñaría Mecánica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatory	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Lopez Diaz, Ana Jesus	E-mail	ana.xesus.lopez@udc.es	
Lecturers	Lopez Diaz, Ana Jesus	E-mail	ana.xesus.lopez@udc.es	
Web				
General description	The general objective is the development of the skills and attitudes necessary for the application of the fundamental principles of mechanics to the resolution of problems of interest in engineering. It addresses the static, kinematic and dynamic of the material point, the systems and the rigid solid from the Newtonian formulation and from the Lagrangian formulation. This subject will contribute to the improvement of the capacity for analysis and construction of mathematical models that describe the effects of forces and movements on a wide variety of structures and machines incorporating physical hypotheses and appropriate mathematical approaches.			

Study programme competences	
Code	Study programme competences
A13	CR7 - Coñecemento dos principios de teoría de máquinas e mecanismos.
B1	CB01 - Que os estudantes demostren posuír e comprender coñecementos nunha área de estudo que parte da base da educación secundaria xeral e adoita encontrarse a un nivel que, aínda que se apoia en libros de texto avanzados, inclúe tamén algúns aspectos que implican coñecementos procedentes da vangarda do seu campo de estudo
B2	CB02 - Que os estudantes saiban aplicar os seus coñecementos ao seu traballo ou vocación dunha forma profesional e posúan as competencias que adoitan demostrarse por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da súa área de estudo
B3	CB03 - Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitiren xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética
B6	B3 - Ser capaz de concibir, deseñar ou poñer en práctica e adoptar un proceso substancial de investigación con rigor científico para resolver calquera problema formulado, así como de comunicar as súas conclusións ?e os coñecementos e razóns últimas que as sustentan? a un público tanto especializados como leigo dun xeito claro e sen ambigüidades
B7	B5 - Ser capaz de realizar unha análise crítica, avaliación e síntese de ideas novas e complexas
B8	B7 - Deseñar e realizar investigacións en ámbitos novos ou pouco coñecidos, con aplicación de técnicas de investigación (con metodoloxías tanto cuantitativas como cualitativas) en distintos contextos (ámbito público ou privado, con equipos homoxéneos ou multidisciplinares etc.) para identificar problemas e necesidades
B9	B8 - Adquirir unha formación metodolóxica que garanta o desenvolvemento de proxectos de investigación (de carácter cuantitativo e/ou cualitativo) cunha finalidade estratéxica e que contribúan a situarnos na vangarda do coñecemento
C1	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.
C5	C7 - Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.

Learning outcomes	
Learning outcomes	Study programme competences

Know and understand the method of virtual works and the potential for their application in the resolution of static problems.	A13	B1 B2 B3 B6 B7 B8 B9	C1 C5
Know and understand the kinematics of the solid, being able to apply the composition of movements.	A13	B1 B2 B3 B6 B7 B8 B9	C1 C5
Know and understand the laws of dynamics, both in its vector and analytical formulation.	A13	B1 B2 B3 B6 B7 B8 B9	C1 C5

Contents	
Topic	**Sub-topic**
Kinematics of the rigid solid. Static Dynamic of systems.	Fundamental laws of dynamics Rigid body movement in 2D Rigid body movement 3D body Equilibrium, stability and oscillations
Estática: método dos traballos virtuais e do potencial.	
Dinámica de sistemas: formulación vectorial e analítica.	

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	21	42	63
Problem solving	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	21	42	63
Supervised projects	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	3	9	12
Mixed objective/subjective test	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	3	7	10
Personalized attention		2	0	2
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Guest lecture / keynote speech	Oral presentation complemented with the use of audio-visual media to develop the syllabus of the subject and make explanations and examples that allow the understanding of the principles of the subject to be able to apply them to practical examples.

Problem solving	Resolution of problems corresponding to the different subjects of the syllabus in order to understand the theoretical principles and know their practical application, comparing different methods highlighting the advantages of each.
Supervised projects	Individual student work designed to promote autonomous learning under the tutelage of the teacher. The theme is chosen to apply the knowledge developed in the subject but also includes aspects not addressed in the lectures to develop the capacity for research and self-learning.
Mixed objective/subjective test	They are written tests that consist of questions of different types (short answer, essay, exercises or problems) about the contents of the subject. The number of tests will be specified in the evaluation section.

Personalized attention	
Methodologies	**Description**
Mixed objective/subjective test Guest lecture / keynote speech Problem solving Supervised projects	All students are recommended to attend tutorials to clarify issues related to both theory and problem classes. In the case of problems, it is also recommended that they analyze in detail the problems solved and that they try to solve those that are left unsolved, consulting any questions or difficulties. In supervised work there is a duty to attend a minimum of interviews with the teacher. These interviews aim to define its content and scope, as well as check its progress. Students with academic exemption may request the tutoring at a different time from that published on the UDC website.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Mixed objective/subjective test	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	The four mixed tests will be of continuous evaluation, so the contents of all the previous ones will be included in each test. The weight of each test will be 10%, 20%, 30% and 40% of the total of the mixed test. The dates of these late-night tests appear on the course planning calendar published by the school.	90
Supervised projects	A13 B1 B2 B3 B6 B7 B8 B9 C1 C5	The work is of an individual nature, so originality will be rewarded and the copying of results or the method used will be penalized. Each student must deliver their report within the established period and attend the mandatory tutorials on the established calendar. If these conditions are not met, the work will be scored as 0. The delivery will be made through the UDC online training platform.	10
Others			

Assessment comments
Onlystudents who do not attend any of the mixed tests will be classified as NOTPRESENTED. Theacademic exemption is admitted in the terms established in point 5 of article 7of the "Norm that regulates the regime of dedication to study and thepermanence and progression of undergraduate and master's students at theUniversity of A Coruña", approved by the Social Council on 05/04/2017Therefore, students with academic dispensation late-night evaluated at thefirst opportunity using the same system as the rest of the students, that is,supervised work 20% + 80% mixed test. In the2nd opportunity, continuous evaluation will not be possible, so the grade ofthe work will be that of the 1st opportunities and the mixed test will be asingle mixed test on the date indicated for the final test in the exam calendarof the school.

Sources of information

Basic	- José María Bastero; Joaquín Casellas (1991). Curso de Mecánica (4ª Ed.). EUNSA - Carlos F. González Fernández (2003). Mecánica del sólido rígido. Ariel LIBROS DE PROBLEMAS:SPIEGEL, Murray R.: "Teoría y Problemas de Mecánica Teórica". McGraw-HillCARRIL, Roberto D., FANO, Javier.: "Mecánica. Problemas Explicados". Jucar (1987)MESHERSKI, I.: "Problemas de Mecánica Teórica". Mir 2ªed (1985)LUMBROSO, Hubert.: "Problemas resueltos de mecánica?". Reverté (1986)ESTELLÉS, Hermelando; BELMAR , Francisco, CERVERA, Francisco : "Problemas de Dinámica". UPV 2ªed (1989)SEELY, Fred B.; ENSIGN, Newton E. : "Mecánica Analítica para Ingenieros". UTEHA 3ªed (1992) KOTKIN G. L., SERBO V.G.: "Problemas de Mecánica Clásica". MIR 2ª ed (1988)
Complementary	- Prieto Alberca, Manuel (1986-1994). Curso de mecánica racional. Aula Documental de Investigación - Fernández-Rañada, Antonio (1990). Dinámica clásica. Alianza - Goldstein, Herbert (2002). Classical Mechanics. San Francisco : Addison Wesley

Recommendations
Subjects that it is recommended to have taken before
Calculus /730G03001 Physics I /730G03003 Linear Algebra/730G03006 Physics II/730G03009
Subjects that are recommended to be taken simultaneously
Diferential Equations/730G03011 Fundamentals of Electricity/730G03012 Thermodynamics /730G03014
Subjects that continue the syllabus
Strength of Materials/730G03013 Theory of Machines/730G03019 Machine Components/730G03029
Other comments

Coñecementos básicos para aboradr con éxito esta materia:Matemáticas

·
Vectores:
compoñentes dun vector, módulo dun
vector, operacións con vectores (produto escalar, produto vectorial, produto
mixto)

·
Trigonometría

·
Cálculo dun determinante

·
Derivar e integrar as funcións elementais

·
Ecuacións diferenciais de segunda orde con
coeficientes constantes

·
Calcular os
autovalores dunha matriz

Física

·
Diferenza entre magnitudes escalares e
vectoriais.

·
Coordenadas polares, cilíndricas e esféricas.

·
Vectores de posición, velocidade e aceleración
dun punto material.

·
Diagrama do sólido libre

·
Resultante e momento resultante dun sistema de
forzas

·
Centro de masas dun corpo xeométrico sinxelo

·
Forzas conservativas

·
Calcular o potencial a partir dunha forza e
viceversa

·
Oscilador harmónico libre, amortecido e forzado

·
Movemento relativo dunha masa puntual

·
Cálculo das magnitudes dinámicas (cantidade de
movemento, momento cinético, enerxía ?)
nunha masa puntual e un sistema de masas puntuais.Dimensión de Xénero- Segundo se recolle nas distintas normativas de aplicación para a docencia universitaria deberase incorporar a perspectiva de xénero nesta materia.- Traballaráse para identificar e modificar prexuízos e actitudes sexistas, e influirase na contorna para modificalos e fomentar valores de respecto e igualdade.- Deberanse detectar situacións de discriminación por razón de xénero e proporanse accións e medidas para corrixilas.- Facilitarase a plena integración do alumnado que por razón físicas, sensoriais, psíquicas ou socioculturais, experimenten dificultades a un acceso axeitado, igualitario e proveitoso á vida universitaria.

(*)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.