UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2019/20
Subject (*)	Fields and Waves		Code	730G04047
Study programme	Grao en enxeñaría en Tecnoloxías Industriais			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatory	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Yañez Casal, Armando Jose	E-mail	armando.yanez@udc.es	
Lecturers	Yañez Casal, Armando Jose	E-mail	armando.yanez@udc.es	
Web				
General description	a			

Study programme competences	
Code	Study programme competences
B1	CB1 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	CB2 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	CB3 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 fundamentals and basic applications of stationary electric field and magnetic field. Know and understand the fundamentals and basic applications electromagnetic fields varying in time, electrodynamics and electromagnetic waves.	B1 B2 B3 B6 B7 B8 B9	C1 C5

Contents	
Topic	Sub-topic
The following blocks and themes develop the contents that are presented in the Proposal of the Studies	Fundamentals Electrostatics Magnetostatics Electrodynamics
Fundamentals	Vector analysis. Potential theory.
Electrostatics	Electric field calculation. Electric fields in matter. Work and energy in electrostatics. Electric current.
Magnetostatics	Magnetics fields produced by electric currents. Magnetics fields in matter
Electrodynamics	Electromagnetic induction. Electromagnetic waves.
Ondas electromagnéticas	Ondas electromagnéticas

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	B3 B7 B9 C5	28	36	64
Problem solving	B1 B2 B6 B8 C1	20	24	44
Mixed objective/subjective test	B1 B2 B7 C5	1	0	1
ICT practicals	B2 B3 B6 B7 B8 B9 C1	10	24	34
Mixed objective/subjective test	B1 B2 B7 C5	3	2	5
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	Theoretical classes on the blackboard.
Problem solving	Resolution by the teacher and the students of the exercises..
Mixed objective/subjective test	Half semester test.
ICT practicals	Numerical resolution of Electrostatic and Magnetostatic problems
Mixed objective/subjective test	Final exam

Personalized attention	
Methodologies	Description

Guest lecture / keynote speech Problem solving	For any aspect that students consider appropriate, in addition to small group tutoring, six hours per week of tutoring in the time published through the UDC website. Students who have an academic exemption will not be required to attend class but must submit the same works and, in general, on the same dates as the other students of the course.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Mixed objective/subjective test	B1 B2 B7 C5	Finale exam.	40
Mixed objective/subjective test	B1 B2 B7 C5	Half semester exam.	30
ICT practicals	B2 B3 B6 B7 B8 B9 C1	Memoria de prácticas	30
Others			

Assessment comments
There will be a maximum of two tests, your last of them coinciding with the date of the examination passed in Centre Board. The tests consist of practical problems and may include theoretical questions. In each test will be a maximum of 4 hours. In second chance assessed parties pending with the partial results to be as valid as the first opportunity. ICT practicals counts 25% of the qualification. Students with academic exemption will not have to attend, but they must pass the same tests as other students.

Sources of information	
Basic	- CHENG, D.K. Fundamentos de Electromagnetismo para Ingeniería. Addison-Wesley Iberoamericana (1997). - REITZ, MILFORD & CHRISTY: Fundamentos de Teoría Electromagnética, Addison Wesley Interamericana (1986). - P.LORRAIN Y D.R. CORSON. Campos y Ondas Electromagnéticas, Selecciones Científicas (1975). - WANGSNESS, R.K: Campos Electromagnéticos. Limusa-Noriega (1992).- D. GRIFFITHS. Introduction to Electrodynamics. Prentice Hall (1999).- Matthew N.O. Sadiku. Monte Carlo Methods for Electromagnetics. CRC Press (2009)
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
CÁLCULO/730G04001 FÍSICA I/730G04003 FÍSICA II/730G04009
Other comments

To help achieve a sustained immediate environment and meet the objective of action number 5: "Healthy and sustainable environmental and social teaching and research" of the "Green Campus Ferrol Action Plan":The delivery of the documentary works made in this subject:* They will be requested in virtual format and / or computer support* It will be done through Moodle, in digital format without the need to print themIf it is necessary to make them on paper:* Plastics will not be used* Double-sided prints will be made.* Recycled paper will be used.* The printing of drafts will be avoided.