



Teaching Guide				
Identifying Data				2017/18
Subject (*)	MARINE RENEWABLE ENERGIES	Code	730G02159	
Study programme	Grao en Enxeñaría en Propulsión e Servizos do Buque			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Fourth	Optativa	4.5
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Díaz Casás, Vicente	E-mail	vicente.diaz.casas@udc.es	
Lecturers	Díaz Casás, Vicente	E-mail	vicente.diaz.casas@udc.es	
Web				
General description	The main aspects about design of offshore renewable energies installations will be analysed.			

Study programme competences	
Code	Study programme competences
A35	Capacidade de selección de sistemas de captación e xeración de enerxía a partir do potencial enerxético marítimo da ondas, vento, mareas, etc. que sexan os máis adecuados segundo as características da enerxía a aproveitar e do lugar.
A36	Capacidade de selección dos equipos e maquinaria adecuada segundo o caso para a captación e xeración de enerxía.
A37	Coñecementos sobre a fabricación de compoñentes, equipos e sistemas para as instalacións de xeración de enerxías renovables mariñas en factorías de construción naval.
A38	Capacidade para realizar un proxecto de instalación e montaxe das instalacións de produción de enerxías renovables mariñas, incluída os seus equipos e previsión do mantemento e potenciais reparacións a realizar.
A39	Coñecemento e utilización de medios e embarcacións auxiliares axeitadas para a instalación, o mantemento e as reparacións necesarias.
A40	Coñecemento dos impactos ambientais negativos que se puidesen producir, das medidas permanentes a dispoñer para evitalos e dos medios e intervencións necesarias para contrarrestalos en caso de accidente.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Comportase con ética e responsabilidade social como cidadán e como profesional.
B6	Comunicarse de xeito efectivo nun ámbito de traballo.
B7	Actitude orientada ao traballo persoal intenso.
B11	Capacidade para encontrar e manexar a información.
B12	Capacidade de comunicación oral e escrita.
B14	Concepción espacial.
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.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.

Learning outcomes				
Learning outcomes			Study programme competences	
Development of conceptual projects in the field of offshore renewable energies			A35	B1
			A36	B2
			A37	B4
			A38	



Knowledge of the components, equipment and devices for offshore renewable energies	A35	B3	C3
	A36	B5	C6
	A37	B6	
	A38	B7	
	A39	B11	
	A40	B12	
		B14	

Contents	
Topic	Sub-topic
Chapter I: Generation systems of offshore renewable energies	Unit 1: Context Unit 2: Classification of offshore renewable energies Unit 3: Components of the offshore renewable energy systems Unit 4: Components of the offshore renewable energy farm
Chapter II: Environmental loads	Unit 5: Environmental loads (wind, waves, tides)
Chapter III: Design of the device	Unit 6: Energetic characterization Unit 7: Components of the device
Chapter IV: Strategic feasibility	Unit 8: Restrictions on location
Chapter V: Laws of offshore renewable energies	Unit 9: Laws of offshore renewable energies in the field of energy Unit 10: Other laws
Chapter VI: Economic feasibility of offshore renewable energies	Unit 11: Economic analysis Unit 12: Project evaluation criteria Unit 13: Sensitivity analysis of the main variables

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	A35 A36 A37 A38 A39 A40 B1 B2 B3	10	5	15
Supervised projects	A35 A36 A37 A38 A39 A40 B1 B2 B3 B4 B5 B6 B7 B11 B12 B14 C3 C6	6	63.5	69.5
Oral presentation	A35 A36 A37 A38 A39 A40 B1 B2 B3 B4 B5 B6 B7 B11 B12 B14 C3 C6	2	2	4
Case study	A35 A36 A37 A38 A39 A40 B1 B2 B3 B4 B5 B6 B7 B11 B12 B14 C3 C6	12	6	18
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
Guest lecture / keynote speech	Development of the basic concepts analysed in the subject
Supervised projects	Development of a conceptual project in some of the offshore renewable energy fields analysed in the subject
Oral presentation	Oral presentation of the project carried out



Case study	Resolution of typical cases of study
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### Personalized attention

Methodologies	Description
Case study Guest lecture / keynote speech Supervised projects	Resolution of the difficulties or doubts concerning the development of the project

### Assessment

Methodologies	Competencies	Description	Qualification
Oral presentation	A35 A36 A37 A38 A39 A40 B1 B2 B3 B4 B5 B6 B7 B11 B12 B14 C3 C6	Evaluation of the oral exposition of the project carried out	20
Supervised projects	A35 A36 A37 A38 A39 A40 B1 B2 B3 B4 B5 B6 B7 B11 B12 B14 C3 C6	Evaluation of the technical aspects of the project developed	80
Others			

### Assessment comments

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### Sources of information

<b>Basic</b>	<ul style="list-style-type: none"> <li>- Thomas Lamb (2004). Ship design and construction. Jersey</li> <li>- Ben C. Gerwick (2007). Construction of marine and offshore structures. CRC Press</li> <li>- ECN MARIN Windmaster, Lagerwey the TNO TUD MSC (2002). Study to feasibility of boundary conditions for floating offshore wind turbines.</li> <li>- Sclavounos, P D Lee, S DiPietro, J. (2010). Floating Offshore Wind Turbines: tension leg platform and taught leg buoy concepts supporting 3 - 5 MW wind turbines. European Wind Energy Conference (EWEC) 2010</li> <li>- The Crown State (2009). A Guide to an Offshore Wind Farm. The Crown State</li> <li>- Jonkman, J.; Matha, D. (2009). A Quantitative Comparison of the Responses of Three Floating Platforms. Proceedings of the European Offshore Wind 2009 Conference and Exhibition</li> <li>- European Wind Energy Association (EWEA) (2013). The European offshore wind industry - key trends and statistics 2012. European Wind Energy Association (EWEA)</li> </ul>
<b>Complementary</b>	

### Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments



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