

Descripción de áreas y asignaturas	ECTS	Sem.	Dept. (*)	Profesores
<b>1. Resource and marine environment</b>				
Resource assessment monitoring				
Ocean wave energy and offshore wind energy assessment	4,5	2	INMF	Gabriel Ibarra, Ganix Esnaola, Alain Ulazia / Jon Saéñz
<b>ECTS Module 1:</b>	<b>4,5</b>			
<b>2. Theoretical foundations: early marine energy conversion</b>				
Aerodynamics				
Advanced fluid dynamics modeling for marine engineering applications	4,5	2	INMF	Jesús María Blanco, Gustavo Esteban, Alberto Peña, Unai Fernández
Theoretical and numerical aspects in fluid dynamics and turbulent flow	3	2	M	Luis Vega / Francisco de la Hoz, Carlos Gorría
Computational fluid dynamics for turbulent flow	3	2	M (BCAM)	Johan Janson, Goran Stipch, Ali Ramezani
Electrical principles: electrical and electronic equipment				
Modelling of wind/marine current turbine-driven electric generators	3	2	EE / TE	Pablo Eguia / Inigo Martinez de Alegria
Control principles				
Wave to wire control	4,5	2	AC & SE	Eider Robles, Margarita Marcos, Nagore Iriondo, Asier Zubizarreta
<b>ECTS Module 2:</b>	<b>18</b>			
<b>3. Conversion technologies</b>				
Marine renewable energy wave energy converters	4,5		INVITED	Aurélien Babarit, Antoine Ducoin, Jean-C. Gilloteaux; Derrick Holliday; Max Parker
<b>ECTS Module 3:</b>	<b>4,5</b>			
<b>4. Connection and integration into the electricity grid</b>				
502150 Integration of renewable energy into the electricity system (**)	3	2	EE	Pablo Eguia
502153 Operation of transmission and distribution networks (**)	3	2	EE	Marene Larruskain, Oihane Abarategi
Power electronics in offshore power systems	3	2	TE	Inigo Martinez de Alegria, Jon Andreu, Inigo Kortabarria
<b>ECTS Module 4:</b>	<b>9</b>			
<b>5. Engineering, development and management of offshore parks</b>				
Design of parks				
Environmental conditions for marine renewable concepts	3	2	TE (IH)	Iñigo Losada, César Vidal, Raul Guanche
Operation and maintenance				
Operations and maintenance of marine energy arrays	3	2	AC & SE (TECN)	Jose Luis Villate, Pablo Ruiz Minguela, Germán Pérez, Vincenzo Nava, Raul Rodriguez
Development				
The international environment, overall views on the international business	3	2	TE (CCG)	Amaia Ferro
<b>ECTS Module 5:</b>	<b>9</b>			
<b>TOTAL ECTS (lectures): 45</b>				
<b>6. MSc Thesis</b>				
<b>ECTS (MSc Thesis):</b>	<b>15</b>	2	(All Dpts.)	All the PhD lecturers involved + others TBD

(\*) INMF = Nuclear Engineering and Fluid Mechanics; APII: Applied Physics II; BCAM = Basque Centre for Applied Mathematics; TE = Electronic Technology; AC&SE = Automatic Control and Systems Engineering;

TECN = TECNALIA; EE = Electrical Engineering; AM = Applied Mathematics; IH = Instituto Hidrográfico (Cantabria); INVITED: Lecturers from our partners Ecole Centrale de Nantes and Univ. of Strathclyde,

CCG: Chamber of commerce of Guipuzcoa.

(\*\*) Subjects shared with the Máster: "Máster Universitario en Integración de las Energías Renovables en el Sistema Eléctrico"