REM master basic syllabus

Title:
NE6005 Ocean Energy

Credit value:
5 ECTS

Mandatory/Optional:
Mandatory

Semester:
1

Lecturer/s:
Gregorio Iglesias

University:
University College Cork

Department:
School of Engineering

Rationale:
This module aims to introduce students to wave and tidal energy.

Objectives:
On successful completion of this module, students should be able to:

- *Understand wave mechanics in the context of linear wave theory*
- *Apply mathematical tools to calculate wave propagation*
- *Understand wave spectra and ocean waves*
- *Discuss the hydrodynamics of a coastal area*
- *Characterise the wave and tidal resource of an area*
- *Discuss the main technologies in wave and tidal energy*
- *Calculate the power harnessed by a wave energy converter or tidal stream turbine*
- *Discuss the impacts of ocean energy*

Skills: *(according to the list of skills provided)*

Subject skills	**REM Master Skills**						
	L2.1	**L2.2**	**L2.3**	**L2.4**	**L2.5**	**L2.6**	**L2.7**
L3.1. Understand wave mechanics & ocean waves	X			X			
L3.2. Use mathematical tools to calculate propagation	X	X	X	X			X
L3.3. Explain environmental and social impacts of ocean energy		X			X	X	X
L3.4 Characterise wave and tidal resources	X		X				
L3.5 Assess technological options for different deployment sites			X		X		X

Teaching and learning methods:

The teaching method is based on a series of lectures where the lecturer explains the main concepts through power point presentations and worked out examples on the board. The students are also presented with a variety of issues of practical nature during the lectures. The module also includes a visit to the LIR/NOTF laboratory at Ringaskiddy, with a laboratory practical included in the visit.

Allocation of student time:

	Attendance (classroom, lab,…)	**Non attendance (lecture preparation, self study…)**
Lectures	24 hours	10 hours
Laboratory practical	3 hours	3 hours
Private study		41 hours

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Assessment:

The report of the laboratory practical and the final written exam test students' achievements of the learning outcomes.

Assessment Matrix:

Subject skills	**Assessment method**					
	Exam	**Class test**	**Coursework**	**Lab Report**	**…**	**…**
All	80%	-	-	20%		

Programme:

Lesson 1	***Introduction to ocean energy*** ***3h***
Lesson 2	***Fundamentals of wave mechanics*** ***3h***
Lesson 3	***Nearshore wave propagation*** ***3h***
Lesson 4	***Ocean waves*** ***3h***
Lesson 5	***Wave energy technologies*** ***3h***
Lesson 6	***Fundamentals of tidal hydrodynamics*** ***3h***
Lesson 7	***Tidal energy technologies*** ***3h***
Lesson 8	***Ocean energy impacts*** ***3h***

Resources:

A classroom, equipped with a blackboard and audio-visual resources (laptop/computer and Internet connection + projector), for the lectures.

LIR/NOTF laboratory, Ringaskiddy.

Bibliography:

Greaves and Iglesias (2018)
Wave and Tidal Energy
Wiley

McCormick,M.E. (1981, 2007)
Ocean Wave Energy Conversion
Dover Pub.

Cruz, J. (2008).
Ocean Wave Energy
Springer

Further comments: