IMPRESO SOLICITUD PARA VERIFICACIÓN DE TITULOS OFICIALES

1. DATOS DE LA UNIVERSIDAD, CENTRO Y TÍTULO QUE PRESENTA LA SOLICITUD

De conformidad con el Real Decreto 1393/2007, por el que se establece la ordenación de las Enseñanzas Universitarias Oficiales

UNIVERSIDAD SOLICITANTE	CENTRO	CÓDIGO CENTRO
Universidad de Cádiz	Facultad de Ciencias del Mar y Ambientales (PUERTO REAL)	11009104
	Instituto de Posgrado, Especialización y Actualización (CÁDIZ)	11011184
NIVEL	**DENOMINACIÓN CORTA**	
Máster	Gestión de Agua y Costas/ in Water and Coastal Management (WACOMA)	
DENOMINACIÓN ESPECÍFICA		
Máster Universitario Erasmus Mundus en Gestión de Agua y Costas/ in Water and Coastal Management (WACOMA) por la Universidad de Cádiz; Ningbo University(China); Russian State Hydrometeorological University (RSHU)(Rusia); Universidade Santa Cecilia(Brasil); Universidade do Algarve(Portugal) y Università di Bologna(Italia)		
RAMA DE CONOCIMIENTO		
Ciencias		
CONJUNTO	**CONVENIO**	
Internacional	WACOMA. Convenio Internacional entre las Universidades del Consorcio. Universidad de Cádiz, Universidad de Bolonia, Universidad de Algarve, RSHU, NINGBO UNIVERSITY y Universidade Santa Cecilia	
HABILITA PARA EL EJERCICIO DE PROFESIONES REGULADAS	**NORMA HABILITACIÓN**	
No		
SOLICITANTE		
NOMBRE Y APELLIDOS	**CARGO**	
TOMAS ANGEL DEL VALLS CASILLAS	Coordinador de Programas Erasmus Mundus	
Tipo Documento	**Número Documento**	
NIF	04168544R	
REPRESENTANTE LEGAL		
NOMBRE Y APELLIDOS	**CARGO**	
EDUARDO SANTIAGO GONZALEZ MAZO	Rector	
Tipo Documento	**Número Documento**	
NIF	31247791Z	
RESPONSABLE DEL TÍTULO		
NOMBRE Y APELLIDOS	**CARGO**	
TOMAS ANGEL DEL VALLS CASILLAS	Coordinador de Programas Erasmus Mundus	
Tipo Documento	**Número Documento**	
NIF	04168544R	

2. DIRECCIÓN A EFECTOS DE NOTIFICACIÓN

A los efectos de la práctica de la NOTIFICACIÓN de todos los procedimientos relativos a la presente solicitud, las comunicaciones se dirigirán a la dirección que figure en el presente apartado.

DOMICILIO	CÓDIGO POSTAL	MUNICIPIO	TELÉFONO
Rectorado. C/ Ancha, nº 16	11001	Cádiz	956015027
E-MAIL	**PROVINCIA**		**FAX**
rector@uca.es	Cádiz		956015026

3. PROTECCIÓN DE DATOS PERSONALES

De acuerdo con lo previsto en la Ley Orgánica 5/1999 de 13 de diciembre, de Protección de Datos de Carácter Personal, se informa que los datos solicitados en este impreso son necesarios para la tramitación de la solicitud y podrán ser objeto de tratamiento automatizado. La responsabilidad del fichero automatizado corresponde al Consejo de Universidades. Los solicitantes, como cedentes de los datos podrán ejercer ante el Consejo de Universidades los derechos de información, acceso, rectificación y cancelación a los que se refiere el Título III de la citada Ley 5-1999, sin perjuicio de lo dispuesto en otra normativa que ampare los derechos como cedentes de los datos de carácter personal.

El solicitante declara conocer los términos de la convocatoria y se compromete a cumplir los requisitos de la misma, consintiendo expresamente la notificación por medios telemáticos a los efectos de lo dispuesto en el artículo 59 de la 30/1992, de 26 de noviembre, de Régimen Jurídico de las Administraciones Públicas y del Procedimiento Administrativo Común, en su versión dada por la Ley 4/1999 de 13 de enero.

	En: Cádiz, a ___ de _____ de 2011
	Firma: Representante legal de la Universidad

1. DESCRIPCIÓN DEL TÍTULO

1.1. DATOS BÁSICOS

NIVEL	DENOMINACIÓN ESPECIFICA	CONJUNTO	CONVENIO	CONV. ADJUNTO
Máster	Máster Universitario Erasmus Mundus en Gestión de Agua y Costas/ in Water and Coastal Management (WACOMA) por la Universidad de Cádiz; Ningbo University(China); Russian State Hydrometeorological University (RSHU)(Rusia); Universidade Santa Cecilia(Brasil); Universidade do Algarve(Portugal) y Università di Bologna(Italia)	Internacional		Ver anexos. Apartado 1.

LISTADO DE ESPECIALIDADES
No existen datos

ERASMUS	NOMBRE DEL CONSORCIO INTERNACIONAL
Sí	189|WACOMA - Erasmus Mundus Master in Water and Coastal Management

NOTIFICACIÓN DE OBTENCIÓN DEL SELLO ERASMUS MUNDUS
Ver anexos. Apartado 1.1

RAMA	ISCED 1	ISCED 2
Ciencias	Ciencias del medio ambiente	Ciencias Físicas, quimicas, geológicas

NO HABILITA O ESTÁ VINCULADO CON PROFESIÓN REGULADA ALGUNA
AGENCIA EVALUADORA

UNIVERSIDAD SOLICITANTE
Universidad de Cádiz

LISTADO DE UNIVERSIDADES	
CÓDIGO	**UNIVERSIDAD**
005	Universidad de Cádiz

LISTADO DE UNIVERSIDADES EXTRANJERAS	
CÓDIGO	**UNIVERSIDAD**
ORG00030201	Università di Bologna
ORG00030454	Universidade do Algarve
ORG00054902	Russian State Hydrometeorological University (RSHU)
ORG00055098	Ningbo University
ORG00055104	Universidade Santa Cecilia

LISTADO DE INSTITUCIONES PARTICIPANTES
ABENGOA, Inabensa, S.A. (Spain)
ENVIRONMENT CANADA (Canada)
GOLDER ASSOCIATES (Canada)
IPIMAR (Portugal)
LOICZ (Germany)
Ministerio de Medio Ambiente y Medio Rural y Marino
UNESCO (France)
Universidad del País Vasco

1.2. DISTRIBUCIÓN DE CRÉDITOS EN EL TÍTULO

CRÉDITOS TOTALES	CRÉDITOS DE COMPLEMENTOS FORMATIVOS	CRÉDITOS EN PRÁCTICAS EXTERNAS
120	0	0
CRÉDITOS OPTATIVOS	**CRÉDITOS OBLIGATORIOS**	**CRÉDITOS TRABAJO FIN GRADO/MÁSTER**
30	60	30

LISTADO DE ESPECIALIDADES	
ESPECIALIDAD	**CRÉDITOS OPTATIVOS**
No existen datos	

1.3. Universidad de Cádiz

1.3.1. CENTROS EN LOS QUE SE IMPARTE

LISTADO DE CENTROS	
CÓDIGO	**CENTRO**
11009104	Facultad de Ciencias del Mar y Ambientales (PUERTO REAL)
11011184	Instituto de Posgrado, Especialización y Actualización (CÁDIZ)

1.3.2. Facultad de Ciencias del Mar y Ambientales (PUERTO REAL)

1.3.2.1. Datos asociados al centro

TIPOS DE ENSEÑANZA QUE SE IMPARTEN EN EL CENTRO		
PRESENCIAL	**SEMIPRESENCIAL**	**VIRTUAL**
Si	No	No
PLAZAS DE NUEVO INGRESO OFERTADAS		
PRIMER AÑO IMPLANTACIÓN	**SEGUNDO AÑO IMPLANTACIÓN**	
60	60	
	TIEMPO COMPLETO	
	ECTS MATRÍCULA MÍNIMA	**ECTS MATRÍCULA MÁXIMA**
PRIMER AÑO	60.0	0.0
RESTO DE AÑOS	60.0	0.0
	TIEMPO PARCIAL	
	ECTS MATRÍCULA MÍNIMA	**ECTS MATRÍCULA MÁXIMA**
PRIMER AÑO	0.0	0.0
RESTO DE AÑOS	0.0	0.0
NORMAS DE PERMANENCIA		
http://www.uca.es/secretaria/normativa/disposiciones-generales/alumnos/reglamento-permanencia-uca		
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	

1.3.2. Instituto de Posgrado, Especialización y Actualización (CÁDIZ)

1.3.2.1. Datos asociados al centro

TIPOS DE ENSEÑANZA QUE SE IMPARTEN EN EL CENTRO		
PRESENCIAL	**SEMIPRESENCIAL**	**VIRTUAL**
Si	No	No
PLAZAS DE NUEVO INGRESO OFERTADAS		
PRIMER AÑO IMPLANTACIÓN	**SEGUNDO AÑO IMPLANTACIÓN**	
60	60	
	TIEMPO COMPLETO	
	ECTS MATRÍCULA MÍNIMA	**ECTS MATRÍCULA MÁXIMA**
PRIMER AÑO	60.0	0.0
RESTO DE AÑOS	60.0	0.0
	TIEMPO PARCIAL	
	ECTS MATRÍCULA MÍNIMA	**ECTS MATRÍCULA MÁXIMA**
PRIMER AÑO	0.0	0.0
RESTO DE AÑOS	0.0	0.0
NORMAS DE PERMANENCIA		
http://www.uca.es/secretaria/normativa/disposiciones-generales/alumnos/reglamento-permanencia-uca		
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	

2. JUSTIFICACIÓN, ADECUACIÓN DE LA PROPUESTA Y PROCEDIMIENTOS

Ver anexos, apartado 2.

3. COMPETENCIAS

3.1 COMPETENCIAS BÁSICAS Y GENERALES

BÁSICAS

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones ¿y los conocimientos y razones últimas que las sustentan¿ a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

GENERALES

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

3.2 COMPETENCIAS TRANSVERSALES

No existen datos

3.3 COMPETENCIAS ESPECÍFICAS

CB12 - Todos los módulos se agrupan en tres disciplinas principales: la Gestión de Agua, Gestión Costera y Gestión de Medio Ambiente. Las competencias específicas y traversales que se proporciona a los alumnos son necesarias, tanto durante sus estudios y también en su vida profesional, por ejemplo, el módulo titulado “communication science” ofrece enfoques de gestión e interpretación de los datos de las ciencias naturales, económicas y sociales. El enfoque de Training Trough Research se muestra a través tanto de las clases como del estudio de campo, donde se establece el marco fundamental para el agua y el manejo multidisciplinario del sistema costero. Este fue el principal resultado de las anteriores ediciones WACOMA y los estudiantes se mostraron satisfechos y éxito en sus carreras profesionales y/o de investigación. Esto permitirá a los futuros estudiantes a aprender los mecanismos para la integración de la información necesaria para la gestión del agua y los sistemas costeros.

4. ACCESO Y ADMISIÓN DE ESTUDIANTES

4.1 SISTEMAS DE INFORMACIÓN PREVIO

Ver anexos. Apartado 3.

4.2 REQUISITOS DE ACCESO Y CRITERIOS DE ADMISIÓN

Pueden participar los poseedores de una titulación de Grado Superior de Educación de cualquier Universidad Europea o de terceros países o poseedores de experiencia profesional relevante en el campo de la gestión marina, del agua y de la costa. En la Universidad de Cádiz y para los programas de máster, el órgano responsable de la admisión es el Instituto de Posgrado de la Universidad a petición del Coordinador del programa y toda vez que sea seleccionado según los criterios anteriores. La selección de los alumnos se hará en función de la calidad de los estudios previos y/o experiencia profesional. El proceso de selección se basa en los dictámenes del “Marie-Curie European Integration Fellowships”. El umbral para cada criterio se evalúa sobre un máximo de 5, y éstos son:

- Titulación y expediente académico que se revisa con las universidades del consorcio mediante la base ENIC-NARIC (Quality of Previous Qualifications: Appropriate background such as Ocean Sciences, Environmental Sciences, Hydrology, Geographical Sciences, Biological Sciences and related Master degrees). Se precisa que se envíen por correo electrónicos tanto el justificante del título de Licenciado como la certificación académica de los estudios realizados.

- Nivel de Idioma. Justificación de idioma Inglés con algunos de los siguientes certificados: GCSE, AS Level, A Level, IB, TOEFL, Cambridge Proficiency, Oxford Higher Certificate, Internacional Certificate Conference (ICC nivel 3 técnico), IELTS (con nota 6.5). El nivel de otros idiomas asociados al consorcio como español, italiano, portugués, ruso o chino, son también evaluados en este criterio.
- Motivación y potencial. Los solicitantes deberán adjuntar en la solicitud tanto su tarjeta de identidad nacional como la tarjeta de residencia, en casos de solicitantes extranjeros o nº de pasaporte, además del CV, y otras evidencias que quieran aportar. El potencial de los solicitantes se basará en la descripción y motivación que muestre en el desarrollo de sus objetivos para la realización del máster. Se evaluarán dichas destrezas previas del solicitante con respecto a las ofrecidas por el programa de máster.
- Idoneidad (Suitability): se evaluará la correspondencia entre el perfil del candidato y el programa de máster basada en la idoneidad de las habilidades de los solicitantes que se muestren en el CV y su declaración personal para avalar que el interés y experiencia profesional sean adecuados.
- Cartas de recomendación. Se necesitan al menos dos cartas de recomendación por cada solicitante.

Los criterios para el reconocimiento y la convalidación de los aprendizajes previos, incluyendo títulos y/o créditos se establecerán anualmente por el comité coordinador formado por los representantes de las 3 universidades europeas que conforman el Consorcio. El Instituto de Posgrado decidirá sobre los reconocimientos y convalidaciones que procedan, a la vista del informe personalizado y motivado que realice en cada caso la Comisión Académica del Posgrado. Corresponde también a la Comisión de Estudios de Posgrado dar instrucciones generales a las Comisiones de cada Posgrado de modo que se armonicen los criterios de reconocimiento y convalidació

4.3 APOYO A ESTUDIANTES

Es importante que el programa de máster esté plenamente integrado en cada una de las instituciones del consorcio y que todos los socios cooperen plenamente para facilitar tanto las labores de administración y de gestión de dicho programa. Un importante mecanismo para asegurar que esto funciona es la asignación formal de funciones y responsabilidades de cada uno de los socios expuestas en el Acuerdo de Consorcio para desarrollar la ejecución del programa correctamente. La Universidad de Cádiz ha incluido en su sitio web (http://www2.uca.es/serv/catedra-unesco/) toda la información referente a la estructura del programa para los estudiantes. En ese documento se explica tanto la estructura, la movilidad entre las instituciones del consorcio y un folleto de información de cómo llegar a Cádiz a su llegada, incluidas las instrucciones para obtener los visados, alojamiento, seguro médico, etc. Los estudiantes también encontrarán información sobre el programa de máster en la página web de cada miembro del consorcio de: Universidad de Algarve, http://www.ualg.pt/index.php?option=com_content&task=blogcategory&id=449&Itemid=2402&lang=pt, Universidad de Bolonia , http://www.unibo.it/Portale/default.htm; El papel de cada una de las instituciones asociadas en las tareas de ejecución se resume en la siguiente tabla:

Implementation Tasks	Coordinator (UCA)	Partner 2 (UNIBO)	Partner 3 (UALG)	Partner 4 (RSHU)	Partner 5 (UNISANTA)	Partner 6 (NIGBO)
Financial Management	ü					
Application Procedure	ü					
Selection & Evaluation of Candidates	ü	ü	ü	ü	ü	ü
Admission Procedure	ü					
Evaluation of Student Performance	ü	ü	ü	ü	ü	ü

Supervision of Students	ü	ü	ü	ü	ü	ü
Student Support (including visas & mobility issues, accommodation advice, other information)	ü	ü	ü	ü	ü	ü
Programme Management (Semester 1 *)*		ü				
Programme Management (Semester 2)	ü					
Dissertation Allocation	ü	ü	ü	ü	ü	ü
Quality Assurance	ü	ü	ü			
Programme Promotion & Marketing	ü	ü	ü	ü	ü	ü
Certification	ü					

Fases de implantación del programa e información de los estudiantes.
Fase 0 = antes de iniciar los cursos de 1 - Después de la aprobación de la propuesta hasta la fecha límite de solicitud en línea: Promoción y comercialización, apoyo a los estudiantes y la recopilación de las aplicaciones. 2 - Reunión del comité de selección, la selección de candidatos y la admisión a los estudiantes
Fase 1 = 1er semestre (meses 1-6):

- La inscripción en la Universidad de Cádiz,
- Llegada de los estudiantes y dar la bienvenida en la Universidad de Bolonia:. Cursos de enseñanza, transferencia de información

Fase 2 = 2 º semestre (meses 7-12): la llegada de los estudiantes y dar la bienvenida en la Universidad de Cádiz, la enseñanza de cursos y exámenes, la selección de temas de tesis y Universidades (9 meses) y Transferencia de la información

Fase 3 = 3er semestre (13-18 meses): la llegada de los estudiantes y dar la bienvenida en las universidades seleccionadas; periodo de tesis y la evaluación, transferencia de información
Fase 4 = 4 º semestre (19-24 meses): la llegada de los estudiantes y dar la bienvenida en las universidades seleccionadas; periodo de tesis y la evaluación, transferencia de información
Fase final = tesis Tesis, Diploma y Diploma suplemento

4.4 SISTEMA DE TRANSFERENCIA Y RECONOCIMIENTO DE CRÉDITOS

Reconocimiento de Créditos Cursados en Enseñanzas Superiores Oficiales no Universitarias

MÍNIMO	MÁXIMO
30	90

Reconocimiento de Créditos Cursados en Títulos Propios

MÍNIMO	MÁXIMO
30	90

Adjuntar Título Propio

Ver anexos. Apartado 4.

Reconocimiento de Créditos Cursados por Acreditación de Experiencia Laboral y Profesional

MÍNIMO	MÁXIMO
0	

El título del Master Erasmus Mundus in Water and Coastal Management fue oficial en el curso académico 2006-07 por el Ministerio de Educación Español. En las dos ediciones anteriores, cursos académicos 2004-2006 y 2005-2007, los títulos del master fueron considerados como títulos propios internacionales de la Universidad de Cádiz, por lo tanto con esta nueva verificación del programa oficial se precisa reconocer a los estudiantes del master de las dos convocatorias de 2004-05 y 2005-06 dicha oficialidad del programa.

4.6 COMPLEMENTOS FORMATIVOS

No procede. El programa de master tiene tanto cursos obligatorios como opcionales que completan el curso formativo necesario para realizar la tesis de master.

5. PLANIFICACIÓN DE LAS ENSEÑANZAS

5.1 DESCRIPCIÓN DEL PLAN DE ESTUDIOS

Ver anexos. Apartado 5.

5.2 ACTIVIDADES FORMATIVAS

Primer año académico. Disciplina Freshwater and Environmental Modules: 1 º Semestre (septiembre de 2012 a febrero de 2013), en la Universidad de Bolonia (Italia). Se llevará a cabo diferentes módulos obligatorios centrados en la gestión del agua dulce, economía ambiental, y de las ciencias sociales hasta un total de 30 créditos ECTS. En este período se tratarán los aspectos en la investigación del agua y economía ambiental.

Primer año académico. Disciplina Coastal and Environmental Modules: 2 º Semestre (febrero 2013 a agosto 2014) en la Universidad de Cádiz (España). Se compone de módulos opcionales para ser seleccionados por los alumnos. Se ofrece un máximo de 100 ECTS que los alumnos pueden seleccionar dentro de los tres temas generales incluidos en el máster: Medio Ambiental y las zonas costeras. Deben completar 30ECTS requeridos en este período.

Segundo año académico. Desde septiembre 2013- agosto 2014. Se lleva a cabo el periodo de investigación en cualquiera de las 6 instituciones asociadas: Universidad de Algarve (Portugal), Universidad de Bolonia (Italia), la Universidad de Cádiz (España), la Universidad de Ningbo (China), la Universidad de Santa Cecilia (Brasil) y la Universidad de Hidrometeorología (Rusia). Además, los estudiantes pueden realizar su período de tesis en colaboración con alguno de los socios asociados, siempre en colaboración y co-supervisado por un supervisor de alguna de las Universidades del Consorcio.

5.3 METODOLOGÍAS DOCENTES
No existen datos
5.4 SISTEMAS DE EVALUACIÓN
Criterios de evaluación: El Acuerdo entre las universidades contempla los criterios de evaluación para el programa de máster. La mayoría de las evaluaciones de los estudiantes se basan en la respuesta de los estudiantes y en lugar de exámenes o pruebas, dichos estudiantes deben presentar tanto trabajos como realizar presentaciones orales, charlas específicas y superar las prácticas tanto de laboratorio como de salidas de campo. Los criterios se describen en detalle en cada descriptor del módulo y la clasificación se basa en el sistema de créditos ECTS. Una gama de distintos métodos de evaluación se utilizan, tales como informes de laboratorio, revisión de la literatura, presentaciones de seminarios, afiches, comunicados de prensa, folletos de información pública.
5.5 NIVEL 1: FRESHWATER MODULES
5.5.1 Datos Básicos del Módulo
NIVEL 2: Bioasessment of freshwater ecosystems (6 ECTS)

5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OBLIGATORIA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
6		
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		
5.5.1.3 CONTENIDOS		

Module Description - The Purpose or Aims:

To develop understanding of the relationship between biota and the abiotic factors in freshwater lotic and lentic ecosystems

To develop knowledge of the main taxonomic and functional groups of freshwater organisms, skills in the sampling of freshwater organisms and in the identification of freshwater organisms at a basic level

To develop understanding of the principles of the assessment of the environmental quality, using biological methods

To develop knowledge of some methods and indexes used within and outside EU to assess the ecological state of freshwater ecosystems
To develop skills in the application of statistical multivariate methods to ecological datasets
To develop skills in the application of bioassessment methods and in the interpretation of the results

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES

Seleccione un valor

5.5.1.5.3 ESPECÍFICAS

Seleccione un valor

5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
Seleccione un valor		

5.5.1.7 METODOLOGÍAS DOCENTES

Seleccione un valor

5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
Seleccione un valor	0.0	0.0

NIVEL 2: The Hydrological Cycle and Climate Change (6 ECTS)

5.5.1.1 Datos Básicos del Nivel 2

CARÁCTER	OBLIGATORIA	
ECTS MATERIA	6	

DESPLIEGUE TEMPORAL: Semestral

ECTS Semestral 1	ECTS Semestral 2	ECTS Semestral 3
6		

ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
NO CONSTAN ELEMENTOS DE NIVEL 3		

5.5.1.2 RESULTADOS DE APRENDIZAJE

The components of the hydrological cycle: evaporation transpiration precipitation etc.
Measurement methods of precipitation, evapotranspiration etc. Surplus and Deficit and natural recharge of aquifers. Spatial as well as temporal variations in the components of the water budget. For example a mountainous area versus a coastal area, North Europe versus Mediterranean. Existing databases of hydrological and meteorological data. The interaction between soil, vegetation and water with the help of soil water balance models (CROPWAT). Case studies: the water budget of a Pine forest and the water budget of a drained irrigated agricultural area. Climate change scenarios. How climate change affects the hydrological cycle. Case study: future water budget of an agricultural water shed near Ravenna. River hydrology. Runoff and stream flow. Hydrograph and separation. Determining groundwater recharge from base flow. Water residence time. Principles of groundwater flow. Groundwater flow equation. Diffusion-Dispersion-advection and transport of pollutants

5.5.1.3 CONTENIDOS

The course has three different objectives:
To be able to manage water efficiently one needs to know the magnitude of the components of the water budget of the area under consideration. This course aims to develop a quantitative understanding of components of the hydrological cycle and how these components are measured or calculated and influence each other in general and for a particular area. In addition this course is about how climate change may influence the hydrological cycle.
In order to understand how climate changes may affect processes of water pollution, the course will provide the students with an understanding of the driving forces of surface and ground water flow and of the quantities of water involved. Special emphasis will be on the interaction between surface- and groundwater flow. This is the basis to understand the transport of pollutants and other chemical components with groundwater and surface waters by means of advection, diffusion and dispersion.

Climate Change and sea level rise in coastal areas may also have adverse effects on water, nature, and soil resources. In many coastal areas salt water intrusion is becoming a serious problem, because of intense use of the coastal fresh water supplies, droughts, coastal erosion and more. This course will discuss the physics of the equilibrium between salt and fresh water along the coast, the factors that influence salt water intrusion such as river encroachment or sea level rise. The effects of salt water intrusion on agriculture and natural areas are discussed as well as possible countermeasures.

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

5.5.1.5.2 TRANSVERSALES

No existen datos

5.5.1.5.3 ESPECÍFICAS

No existen datos

5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES

No existen datos

5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
No existen datos		

NIVEL 2: Biology of aquatic organisms (3 modules to be selected = 6 ECTS)

5.5.1.1 Datos Básicos del Nivel 2

CARÁCTER	OPTATIVA	
ECTS MATERIA	6	

DESPLIEGUE TEMPORAL: Semestral

ECTS Semestral 1	ECTS Semestral 2	ECTS Semestral 3
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**

LENGUAS EN LAS QUE SE IMPARTE

CASTELLANO	CATALÁN	EUSKERA
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No

ITALIANO	OTRAS
No	No

LISTADO DE ESPECIALIDADES
No existen datos
NO CONSTAN ELEMENTOS DE NIVEL 3

5.5.1.2 RESULTADOS DE APRENDIZAJE

5.5.1.3 CONTENIDOS

1. Microbial potential for the natural attenuation of contaminants in the aquatic ecosystems and its application in bioremediation
Module Description - The Purpose or Aims:
This Module describes the microbial metabolic strategies that make them capable to degrade a wide range of contaminants and xenobiotic compounds. This capability, when used in the environment, is called attenuation of the environmental contamination. The knowledge of the basis of the attenuation process is crucial to use microorganisms in remediation of polluted coastal areas.
Summary of Course Content:
Widespread pollution in coastal areas has many categories of sources such as nutrients, sediments, pesticides, sewage outfalls, coastal development, heavy metals, farming of aquatic organisms, and toxic hydrocarbons. Microorganisms play an essential role in the degradation of these compounds in aquatic ecosystems, being microbial degradation the main process in natural decontamination, also called natural attenuation. Enhancement of this phenomenon is the basis of bioremediation technologies used to restore contaminated ecosystems by biological processes. New microorganisms with new degrading properties are daily being discovered. Also, old known microorganisms previously believed to perform only a limited number of transformation processes are now found to use much broader ranges of substrates. All these new microbial features can be used for a deeper development of the current environmental biotechnology.

2. Models for aquaculture sitting
Have (co-)supervised/am (co-)supervising master students in themes like:
Priorities between use and protection in coastal zone management
Assessing impacts from sea ranching on bird sanctuaries – status of knowledge and methods
Assessment of salmon spawning grounds by GIS
Modelling impacts of nutrient reductions in North Sea basin

Modelling climate impacts on biological production in Barents Sea system
Last years research has been limited, but focused on models for nutrient dynamics and pelagic primary production.

3. Alien Species
This module relates to both river basin and coastal zone management
This module links up with almost all other modules:
establishment and spread of invasive species depend on the abiotic and biotic characteristics of their new environment
impacts on ecology and economy
After completing this module you should know:
how to assess bioinvasions: a threat or a new resource?
linkages between recent and historical biodiversity *vs.* the history of European cultural and economic expansion since the 15th century
bioinvasions as a part of Global Change

4. Marine reserves: rationale, case studies and scientific monitoring
Module Description - The Purpose or Aims:
- introduce students to the principles of marine reserves
- provide rationale in the understanding of marine reserves management.
- establish the basis for a correct scientific monitoring of this ecosystem
- Provide description of several cases studies

Summary of Course Content:
This module will introduce students to concepts of management of marine reserve ecosystems. It will explore the scientific basis for marine reserve management including its rationale and correct scientific monitoring. Finally by studying different cases studies the student will be able to improve their skills in the management in this singular ecosystem such as marine reserves

5. Freshwater systems of the world
Module Description - The Purpose or Aims:
The *Freshwater systems of the world*module provides the students with a global overview on Freshwater systems including major lakes, rivers and wetlands. The aim is to provide an understanding of the different types of freshwater systems within a societal and global framework. Worldwide case histories are presented.
Students learn to gather material, prepare a presentation, deliver a presentation and prepare a report.
The module is relevant to the freshwater component of the Masters course.
Summary of Course Content:
The topics covered in the Freshwater systems of the wor module include:

- Case Histories: various case studies from around the world
- Geographical location
- General characteristics
- Habitats and Ecology
- Uses and stakeholders, socio-economics
- Threats and problems, global change
- Management
- Bibliography: . Information sources on a coastal zones of the world. Key references, links

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES

No existen datos

5.5.1.5.3 ESPECÍFICAS

No existen datos

5.5.1.6 ACTIVIDADES FORMATIVAS		
ACTIVIDAD FORMATIVA	**HORAS**	**PRESENCIALIDAD**
No existen datos		
5.5.1.7 METODOLOGÍAS DOCENTES		
No existen datos		
5.5.1.8 SISTEMAS DE EVALUACIÓN		
SISTEMA DE EVALUACIÓN	**PONDERACIÓN MÍNIMA**	**PONDERACIÓN MÁXIMA**
No existen datos		

5.5 NIVEL 1: GENERAL ENVIRONMENTAL MODULES		
5.5.1 Datos Básicos del Módulo		
NIVEL 2: Environmental economics and resource Management in water policy making (6 ECTS)		
5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OBLIGATORIA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
6		
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		

Providing an understanding of the concept of sustainability;
Providing an understanding of the concept of strategic environmental assessment (SEA);
Addressing the institutional acknowledgement of sustainability at the international level
Providing an understanding of the sustainability measure;
Critically reviewing a sustainability index
Learning how to embody strategic and risk assessment into sustainability assessment

Highlighting a sustainability assessment process referring to water and coastal management

5.5.1.3 CONTENIDOS

Summary of course content:

Definition of sustainability, conceptual models (SPS 10)
Sustainability in EU and extra EU policies (IUS 10, IUS 14)
Sustainability measure: index and indicators; (FIS/07)
Indicators for the social dimensions (SPS 10)
Multi-criteria analysis and models, alternative and project ranking (FIS/07)
Strategic assessment and strategic environmental assessment (SEA) (FIS/07)
Sustainability assessment process: case studies (FIS/07)

Description:

Providing an understanding of the pricing and evaluation of the common goods in water, Policy making; Providing an understanding of the role of water in economics; Being able to evaluate costs of alternative actions and inactions
Environmental economics and environmental policy (SECS P/01)
Total economic value of natural resources (SECS P/01)
Cost-benefit analysis and the management of the environment (SECS P/01)
Damage and benefit estimation (SECS P/01)
Economic appraisal: indirect and direct methods (SECS P/01)

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.
CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES
No existen datos

5.5.1.5.3 ESPECÍFICAS
No existen datos

5.5.1.6 ACTIVIDADES FORMATIVAS		
ACTIVIDAD FORMATIVA	**HORAS**	**PRESENCIALIDAD**
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES
No existen datos

5.5.1.8 SISTEMAS DE EVALUACIÓN		
SISTEMA DE EVALUACIÓN	**PONDERACIÓN MÍNIMA**	**PONDERACIÓN MÁXIMA**
No existen datos		

NIVEL 2: Physiology applied to the environment (3 modules to be selected = 6 ECTS)		
5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OPTATIVA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
LISTADO DE ESPECIALIDADES		
No existen datos		
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		
5.5.1.3 CONTENIDOS		

1. Eutrophication and Hypoxia. Description of the module: The Eutrophication module provides the students with a historical and conceptual background on Eutrophication in both freshwater and marine waters. The aim is to provide an understanding of the alterations in the nutrient cycles of aquatic ecosystems within a societal and global framework.The module is relevant to both the freshwater and marine water components of the Masters course.
2. Bioavailability and bioaccumulation: Keys for the quality of ecosystems. **Module Description:** Develop skills to determine the bioaccumulation of trace metals in key species in coastal and estuarine ecosystems; Establishment of the operational fractions for the bioavailability of sediments. Design biomonitoring programs in coastal and estuarine ecosystems; Selection of environmental compartments; Bioaccumulation and bioavailability, integration in environmental risk assessment.
3. Biomarkers. Module Description. The described module aims to introduce the students the use of biomarkers in ecotoxicology for the assessment of environmental quality of contaminated ecosystems. This module concretely addresses and describes different cases of study where biomarkers have been successfully used to determine Environmental Risk Assessment of new emerging contaminants in the aquatic environment.
4. Integrated tools to determine environmental quality. Module Description: - introduce to general techniques for integration of different tools in environmental quality assessment; - Develop methods to quality control of complex set of data: chemical, biological, ecological, etc.; - Improve skills based on the multivariate analysis for a correct integration of results; Calculation of index of pollution integration contamination and its effects (biological and ecological) set of data
5. Distinct tools for freshwater quality determination and management. Module Description: Introduce to general techniques for water analysis in fresh water ecosystems; introduce to general analytical techniques for sediment quality analysis fresh water ecosystems; Develop techniques and skills for quality assurance/quality control of water and sediment quality data in fresh water ecosystems; Interpretation of analytical results in water and sediment in fresh water ecosystems.
6. Seagrass management tools in human impacted areas. Module Description: To acknowledge the importance of seagrass beds in coastal ecosystems; To identify impact sources on seagrass beds;
To foster management measures for seagrass conservation and restoration; To instruct on existing procedures and methodologies for the study of seagrass population dynamics.
7. Tools for general environmental quality assessment. Module Description: introduce to basic chemical techniques for environmental quality assessment; introduce to basic biological/ecological techniques for environmental quality assessment; Introduce to basic ecotoxicological techniques under laboratory and field conditions for environmental quality assessment; develop techniques and skills for quality assurance/quality control of the chemical, ecotoxicological, biological, ecological and other related measures for environmental quality assessment
8. General methodology to assess coastal area quality. Module Description: introduce to general techniques for water analysis in coastal area; introduce to general analytical techniques for sediment quality analysis in coastal areas; Develop techniques and skills for quality assurance/quality control of water and sediment quality data in coastal areas;
Interpretation of analytical results in water and sediment in coastal areas.
9. Coasts of the world. Module Description: The *Coasts of the World* module provides the students with a global overview on coastal systems. The aim is to provide an understanding of the different types of coasts within a societal and global framework. Worldwide case histories are presented. Students learn

to gather material, prepare a presentation, deliver a presentation and prepare a report. The module is relevant to the coastal component of the Masters course.

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES

No existen datos

5.5.1.5.3 ESPECÍFICAS

No existen datos

5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES

No existen datos

5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
No existen datos		

NIVEL 2: Renewable energies and resource management (3 modules to be selected = 6 ECTS)

5.5.1.1 Datos Básicos del Nivel 2

CARÁCTER	OPTATIVA	
ECTS MATERIA	6	

DESPLIEGUE TEMPORAL: Semestral

ECTS Semestral 1	ECTS Semestral 2	ECTS Semestral 3
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**

LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
LISTADO DE ESPECIALIDADES		
No existen datos		
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		
5.5.1.3 CONTENIDOS		

1. Marine Renewable Energy
Module Description - The Purpose or Aims:
To provide students a practical overview about the state of the art of marine renewable technologies and last developments. Its level of implementation in different countries and the future perspectives. This module will focus on the positive and negative impacts of the deployment of these new technologies.
Summary of Course Content:
Introduction: Technology
1.1 Ocean renewable Energy
1.1.1 Wave Energy
1.1.2 Tidal&Current Energy
1.1.3 Thermal Energy
1.1.4
1.2 Offshore Wind
Environmental Impacts
2.1 Abiotic System
2.2 Biotic System
2.3 Socio-economic System

3- Research/Job Opportunities

2. Modeling physical-biological processes
Objectives: processing a 2D physical-biological model adapted to compute the water quality dynamics in a coastal lagoon, relating to wind-induced hydrodynamics, biological processes and continental nitrogen inputs
- Water quality dynamics and adapted modelling tools
- The Thau lagoon: natural site; human activities; water quality dynamics.
-The physical processes: 2D transport model; wind-induced hydrodynamic structures (current, bottom stress and kinetic energy); advection-dispersion of inorganic nitrogen concentrations.
-The biological processes: 4 state variables biological model; interactions between physical and biological processes; seasonal variability of forcing conditions.
-The continental inputs: impacts of continental nitrogen inputs on water quality; hydrodynamic connection vs. geographic proximity.
Modelling practicals:
Processing the 2D transport model in the Thau lagoon, in order to quantify the respective impacts of : (a) wind-induced hydrodynamic structures ; (b) biological processes; and (c) continental inputs management, on the water quality within the lagoon, according to the prevailing wind directions : NW-325° ; W-290° and SE-110°.
Step 1 on the first day: Impact of wind-induced hydrodynamics on the water quality
Step 2 on the second day: Impact of biological processes on the water quality
Step 3 on the third day: Impact of continental nitrogen inputs on the water quality

3. Techniques for the diagnosis on ICZM process
Module Description - The Purpose or Aims:
1. To develop an understanding of ICZM processes
2. To describe a methodology for the integrated diagnosis of coastal areas

3. To explain a methodology for the integrated analysis of coastal stakeholders

Summary of Course Content:

Brief introduction to ICZM.
Methodology for integrated diagnosis of factors affecting the sustainable development, reported by Rosado-May, 2001.
Methodology for the stakeholder analysis, reported by Le Tissier, 2003.
Case of study: North-western Coast of Cadiz.

4. Water for Food and Rural Development

Module Description - The Purpose or Aims:

This module addresses the important role of Water Resources Management in the economy, ecological situation, and human well-being in semi-arid regions.
The aim is to highlight the impact of human activities on water recources and natural environments, necessity of integrative approaches for planning of water resources use, a number of lessons regarding the interaction of various processes within the context of nature-society relations, “upstream-downstream” conflicts, problems solution suggested by local and international organizations. Also there will be highlighted the importance of assessment of water resources and some aspects of hydrology application in water resources management, ranging from regional basin wide plans to small scale studies.

Summary of course content:

Methods and approaches for water resources assessment;
Data analysis and interpretation;
Water Balance Methods;

5. Simulation tools for the management of different processes in aquatic ecosystems

Module Description – Purposes and aims.

Supply the students simulation tools and knowledge to assess different processes carried out in the coastal areas owing to the importance of the these zones on the global cycles of environmental relevance elements.

Summary of course content:

Introduction to the Simulation: concept, evolution and possible applications.
The coastal zone as a transitional environment: the influence on the biogeochemical global cycles and the anthropogenic influence.
Simulation as a “warning” tool concerning to coastal areas: use in the Environmental Risk Assessment (ERA), Ecological Accident Assessment, Global Climate Change
Case of study. The use of a dynamic mixing simulator. The use of a microcosm.

6. Integrated coastal zone management
Module Description - The Purpose or Aims:
- introduce problems in developing coastal terrestrial and marine regions.
- evaluate strategies and obstacles in implementing EU regulations on integrated coastal zone management and water management regarding case studies and recent processes of public participation.

- evaluate whether the European regulations can be transferred to non-European regions or new approaches must be designed in order to meet the specific demands of sustainable regional development.
Summary of Course Content:
This modules introduces modern transnational regulations promoting future sustainable development of coastal zones. Guiding principles of the EU recommendations on integrative coastal zone management and the water framework directive are discussed. These legal settings are evaluated whether they are (i) ready to be implemented at national, regional or local scales (ii) to be transferred to non-European countries or regions. Case studies and thematic foci (exploitation of bio-resources and flood management schemes) are considered in that exercise. Opportunities and limitations of public participation are evaluated. Methods in order to measure (i) the progress in implementing ICZM and (ii) the sustainability of the coast are applied and results discussed.

7. Global warming and the role of the littoral ecosystems
Summary of the content:
Chapter 1: OCEANS AND CLIMATE CHANGE

Chapter 2: THERMODYMAMIC OF INORGANIC CARBON IN SEAWATER
Chapter 3: THE IMPORTANCE OF BENTHIC FLUXES IN THE BIOGEOCHEMICAL CYCLE OF CARBON IN LITTORAL SYSTEMS
Chapter 4: AIR-SEA INTERFACE

8. Complex satellite monitoring of coastal zones (see attached DVD)
Module Description - The Purpose or Aims:
To show main physical processes in the coastal zones of the ocean and seas.
To describe typical mesoscale water dynamics and structure in the coastal zone.
To show main problems related to the coastal zone pollution.
To present modern satellite remote sensing systems.
To show principles of organization of satellite monitoring of the ecological state of the coastal zone.
To demonstrate the results of a complex satellite monitoring of ecological state of the coastal zones (The Baltic, Black, Caspian seas).
Summary of Course Content: The Module will include a set of 10 lectures given in two weeks (about 10 hours).
Lectures will:
--- be logically organized in correspondence with the objectives of the Module;
--- be based on the scientific reports (presentations) made at symposiums and conferences during the last five years;
--- present state of the art in the coastal physical oceanography, environmental sciences, ecology and coastal zone management;
--- be widely popular for non-specialists in the field of the Module to gain a better understanding of students and postgraduate students.

5.5.1.4 OBSERVACIONES
NINGUNA
5.5.1.5 COMPETENCIAS
5.5.1.5.1 BÁSICAS Y GENERALES
CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación
CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio
CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios
CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades
CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.
CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).
5.5.1.5.2 TRANSVERSALES
No existen datos
5.5.1.5.3 ESPECÍFICAS
No existen datos
5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES
No existen datos
5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
No existen datos		

5.5 NIVEL 1: COASTAL MODULES
5.5.1 Datos Básicos del Módulo
NIVEL 2: Environmental impact and risk assessment for the society in water and coastal management (6 ECTS)

5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OBLIGATORIA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
6		
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**

LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
NO CONSTAN ELEMENTOS DE NIVEL 3		

5.5.1.2 RESULTADOS DE APRENDIZAJE

EIA concept, process (FIS 07)
Application of the EIA directive: procedure and legal requirement (IUS 10)
EIA of ports, settlements, tourism and recreative activities; (FIS/07)
EIA of fishing areas and acquaculture facilities (FIS/07)
Public participation and communication in decisional processes (SPS 10)
Public participation in EU regulations, policy instruments (IUS 10, IUS 14)
Stakeholders mapping (SPS 10)
Communication and management of the uncertainty (FIS/07)
Conceptual models and techniques to support public participation (SPS 10)
Conceptual models of public environmental information systems (SPS 10)

5.5.1.3 CONTENIDOS

Description:

With reference to water and coastal management: Providing an understanding of the environmental impact assessment (EIA) process and procedure; Providing an understanding of risk assessment (public health risk assessment, epidemiological studies, precautionary principle); Highlighting a sustainability assessment process

Providing an understanding of the concept of public participation and communication in decisional processes; Addressing the institutional acknowledgement of public participation in the EU policies and strategies; Providing an understanding of a communication and participation process; Learning how to communicate the uncertainty about environmental impacts into decision making processes; Addressing the public access to environmental information; Providing an understanding of environmental information architecture (environmental informatics)

5.5.1.4 OBSERVACIONES
NINGUNA
5.5.1.5 COMPETENCIAS
5.5.1.5.1 BÁSICAS Y GENERALES
CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación
CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio
CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios
CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades
CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.
CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).
5.5.1.5.2 TRANSVERSALES
Seleccione un valor
5.5.1.5.3 ESPECÍFICAS
No existen datos
5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES
No existen datos
5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
No existen datos		

NIVEL 2: Chemical analysis of environmental quality (3 modules to be selected = 6 ECTS)		
5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OPTATIVA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**

No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	

LISTADO DE ESPECIALIDADES

No existen datos

NO CONSTAN ELEMENTOS DE NIVEL 3

5.5.1.2 RESULTADOS DE APRENDIZAJE

5.5.1.3 CONTENIDOS

1. Weight of Evidence Assessment of Chemical Contamination in Aquatic Environments. Module Description . Develop skills to integrate different sets of data: from contamination to biological effects to quantify pollution. Establishment of the model to integrate the contamination and its effects. Design of different models for each case study. Determine the pollution index. Understood as quantification of the effects associated with the contamination. Detect those contaminants of concern. Derive sediment quality guidelines and their use for the integrated coastal area management. 2. Chemical and ecotoxicological guidelines for the management of dredged material: regulation of disposal in open waters. Module Description: Develop skills to derive chemical guidelines for regulation of dredged material; Design sediment toxicity test for dredged material management; Derive ecotoxicological guidelines for dredged material disposal; Establish a tier testing approach using chemical and biological guidelines for dredgedm material disposal in open waster; Determine sediment quality values for dredged material management; Management tools for dredged material using chemical and ecotoxicological guidelines; Understanding case studies. 3. Sensitive tools for the assessment of Environmental and Human risk. Module Description : Training the student in the use of different sensitive tools such as biomarkers of exposure (methallotioneins, EROD) and effects (histopathology) and their linkage with chemical residues in different species for the assessment of the quality of the water ecosystems. It will be specially assessed their use with commercial species to establish the human risk associated with the contaminants. 4. Environmental Assessment and management of accidental spill in fresh water ecosystems. Module Description: It consists of two different modules for fluvial and ocean ecosystems covering aspects from scientific assessment to the management related to the impact of accidental spills in aquatic ecosystems. This first module describes the different steps to be carried out while a crisis provoked by an accidental spill in fluvial and estuarine ecosystems. The aim of the module is to learn from the previous catastrophes such as two main spills in Spain, a mining spill (Aznalcóllar, 1998, first module) and an oil spill (tanker Prestige, 2002, second part of the module) how to improve the scientific assessment aspects and how it will help for a rapid and effective management of the impact associated with accidental spills in the aquatic ecosystem. Other related spills around the world are also studied specially those related to the nationality of the different students involved in the module. 5. Environmental Assessment and management of accidental spill in littoral ecosystems. Module Description: It consists of two different modules for fluvial and ocean ecosystems covering aspects from scientific assessment to the management related to the impact of accidental spills in aquatic ecosystems. This second module describes the different steps to be carried out while a crisis provoked by an accidental spill in marine and coastal ecosystems. The aim of the module is to learn from the previous catastrophes such as two main spills in Spain, a mining spill (Aznalcóllar, 1998, first module) and an oil spill (tanker Prestige, 2002, second part of the module) how to improve the scientific assessment aspects and how it will help for a rapid and effective management of the impact associated with accidental spills in the aquatic ecosystem. Other related spills around the world are also studied specially those related to the nationality of the different students involved in the module. 6.- Tools for hazards assessment of chemical and complex environmental media

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES		
No existen datos		
5.5.1.5.3 ESPECÍFICAS		
No existen datos		
5.5.1.6 ACTIVIDADES FORMATIVAS		
ACTIVIDAD FORMATIVA	**HORAS**	**PRESENCIALIDAD**
No existen datos		
5.5.1.7 METODOLOGÍAS DOCENTES		
No existen datos		
5.5.1.8 SISTEMAS DE EVALUACIÓN		
SISTEMA DE EVALUACIÓN	**PONDERACIÓN MÍNIMA**	**PONDERACIÓN MÁXIMA**
No existen datos		

NIVEL 2: Geochemistry of sediments (3 modules to be selected = 6 ECTS)		
5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OPTATIVA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
LISTADO DE ESPECIALIDADES		
No existen datos		
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		
5.5.1.3 CONTENIDOS		

1. Basis for sediments and dredged material management. Module Description - The Purpose or Aims:

1.- INTRODUCTION:

- Sustainability and knowledge management

- Sediments life cycle

2.- LEGAL FRAMEWORK. Decision-making framework for sediment contamination. Sediment Quality Guidelines (SQGs) and Action Levels (ALs). Legal framework related to the dredged material management. Wastes management strategy. Wastes management technologies.

3.- SEDIMENTS MANAGEMENT

- Introduction: Criteria and considerations, Constraints
- Management options: Decision criteria and treatment chains

4.- SEDIMENTS MANAGEMENTS OPTIONS

2. Integrative assessment of sediment quality in aquatic ecosystems

Module Description - The Purpose or Aims:

Develop skills to integrate different sets of data: from contamination to biological effects to quantify pollution.

Establishment of the model to integrate the contamination and its effects.

Design of different models for each case study.

Determine the pollution index.

Understood as quantification of the effects associated with the contamination.

Detect those contaminants of concern.

Derive sediment quality guidelines and their use for the integrated coastal area management.

Summary of course content:

Interpretation and quality control of set of data related to sediment contamination, sediment toxicity and ecological effects

Integration of different set of data from chemical measurements, to ecological data and using toxicity tests

Design and conduct integrative assessment defined by multiple lines of evidence (sediment quality triad concept)

Determine sediment quality by quantifying pollution

Derive sediment quality guidelines

Propose a protocol of use of SQGs for the integrated coastal area management and its use in fresh water management

Join work group among students, teacher and potential employers invited to the sessions

3. Water quality in mining areas

This module describes the case of river basing management in catchment's areas with sulphide or coal mining. The module has close links with other modules in "Water and Aquatic Chemistry" and "Aquatic Pollution" because it deals with water characterization, assessment and remediation of freshwater bodies affected by acid mine drainage (AMD). After completing this module the student will know the processes leading to the formation of AMD and the main strategies for remediation, and will be able to identify AMD processes in the field and define the most suitable treatment strategy. Also, the student will improve his/her knowledge in field based studies of river pollution, and his/her capability to interact with transversal disciplines (geology, chemistry, engineering) in the evaluation of environmental effects of mining.

4. Scientific and technical strategies for CO2 mitigation in coastal ecosystems

Module Description - The Purpose or Aims:It consists of two different modules for fluvial and ocean ecosystems covering sources of CO2, the technical specifics of capturing, transporting and storing it in geological formations, the ocean, or minerals, or utilizing it in industrial processes. It also assesses the costs and potential of CCS, the environmental impacts, risks and safety, its implications for greenhouse gas inventories and accounting, public perception, and legal issues. In this second module of a set of two each of the major storage options is then addressed: geological storage, ocean storage, and mineral carbonation and industrial uses. Also, the overall costs and economic potential of CCS are discussed, followed by an examination of the implications of CCS for greenhouse gas inventories and emissions accounting.

Summary of Course Content: They are several questions that are studied during this module to define the course content: What are the costs for CCS and what is the technical and economic potential? What are the local health, safety and environment risks of CCS? Will physical leakage of stored CO2 compromise CCS as a climate change mitigation option? What are the legal and regulatory issues for implementing CO2 storage? What are the implications of CCS for emission inventories and accounting?The module summarize the next items:

1. Geological storage
2. Ocean storage
3. Mineral carbonation and industrial uses
4. Costs and economic potential
5. Emission inventories and accounting

5. Integrated concepts for water and coastal management.

6. Coastal flooding hazard

Module Description – The Purpose or Aims:This module focuses on the natural processes that may produce flooding of coastal lowlands: their occurrence, general dynamics and hazard evaluation.

It includes the analysis of coastal flooding related to energetic marine processes like tsunamis and storm surges, fluvio-marine processes like bore waves and fluvial avulsion episodes, and other related phenomena like extreme tidal flooding or coastal subsidence. The module also introduces management procedures for defining set-back lines on low coasts and for elaborating flooding hazard maps. Summary of course content:Definitions: risk, hazard, flooding, recurrence interval and other related terms. Types of flooding in coastal environments. Tsunamis. Generation, wave propagationn and breaking. Coastal effects. Indicators of historical tsunami effects. Main criteria for defining maximum tsunami wave run-up on coastal lowlands. Case study: the effects of the 1755 tsunami on the Cadiz coast. Storm surges. Generation and physical factors involved. Coastal effects. Surge prediction and modelling. Methods for defining maximum flooding areas and surge set-back lines. Case study: flooding hazard in Valdelagrana littoral spit (Bay of Cadiz) due to storm surges. Tidal flooding. Nature and variability of tides. Extreme events and synergy factors. Maximum tide prediction. Definition of tidal set-back lines. Case study: the “aqua alta” phenomenon at Venice. Flooding in estuarine environments. Methods for predicting hydrological behaviour of rivers. Calculation of recurrence intervals for fluvial flooding phenomena. Avulsion processes. Definiton of maximum water flood levels for hazard mapping Interaction between waves, tides and fluvial currents on big estuaries: tidal bores. Case study: the “pororoca” phenomenon at the Amazon estuary. Other related processes. Coastal subsidence: causes and consequences on coastal flooding hazard. Sea level rise: present trends and definition of vulnerable coastal lowlands. Synthesis: General methodology for elaborating coastal flooding hazard maps on coastal lowlands. Presentation and interpretation. Applications in coastal management.
7. Coastal lagoons. Module Description - The Purpose or Aims:An introduction to coastal lagoons, lagoon ecosystem function, anthropogenic pressures and how to this scientific understanding for effective management. Summary of Course Content: *Case studies*; provide diversity of in depth case studies to develop a more expansive view of environmental management. *Practitioner perspectives*; provide an exchange that allows students to engage with people that have very different perspectives. *Student projects*; develop specific recommendations on developing best practice environmental management using synthesis and science communication skills. *Lectures*; focus on coastal management tools and techniques, based on experience.

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.
CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES
No existen datos

5.5.1.5.3 ESPECÍFICAS
No existen datos

5.5.1.6 ACTIVIDADES FORMATIVAS		
ACTIVIDAD FORMATIVA	**HORAS**	**PRESENCIALIDAD**
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES
No existen datos

5.5.1.8 SISTEMAS DE EVALUACIÓN		
SISTEMA DE EVALUACIÓN	**PONDERACIÓN MÍNIMA**	**PONDERACIÓN MÁXIMA**
No existen datos		

NIVEL 2: Environmental legislation (3 modules to be selected = 6 ECTS)		
5.5.1.1 Datos Básicos del Nivel 2		
CARÁCTER	OPTATIVA	
ECTS MATERIA	6	
DESPLIEGUE TEMPORAL: Semestral		
ECTS Semestral 1	**ECTS Semestral 2**	**ECTS Semestral 3**
	6	
ECTS Semestral 4	**ECTS Semestral 5**	**ECTS Semestral 6**
ECTS Semestral 7	**ECTS Semestral 8**	**ECTS Semestral 9**
ECTS Semestral 10	**ECTS Semestral 11**	**ECTS Semestral 12**
LENGUAS EN LAS QUE SE IMPARTE		
CASTELLANO	**CATALÁN**	**EUSKERA**
No	No	No
GALLEGO	**VALENCIANO**	**INGLÉS**
No	No	Si
FRANCÉS	**ALEMÁN**	**PORTUGUÉS**
No	No	No
ITALIANO	**OTRAS**	
No	No	
LISTADO DE ESPECIALIDADES		
No existen datos		
NO CONSTAN ELEMENTOS DE NIVEL 3		
5.5.1.2 RESULTADOS DE APRENDIZAJE		
5.5.1.3 CONTENIDOS		

1. Marine Strategy Directive
Module Description - The Purpose or Aims:
Recently (2005) The European Commission has proposed an ambitious strategy to protect more effectively the marine environment across Europe. The Thematic Strategy on the Protection and Conservation of the Marine Environment aims to achieve good environmental status of the EU's marine waters by 2021 and to protect the resource base upon which marine-related economic and social activities depend. The Marine Strategy will constitute the environmental pillar of the future maritime policy the European Commission is working on, designed to achieve the full economic potential of oceans and seas in harmony with the marine environment. The aim of this module is to discuss the feasibility details of the proposed strategy for a correct coastal management
Summary of Course Content:
Establish the status of Each Member State role to develop Marine Strategies for its marine waters.
Discuss the contain and the assessment of the state of the environment in each proposed item
Discussing the programme of cost-effective measures from the member states that have proposed it and that include: Impact assessments, including detailed cost-benefit analysis of the measures proposed,
Discuss the measurements proposed in the directive to establish the good quality status of the environment.
Determine and relate this strategy with the water framework directive from 2000
Assess the timetable proposed the EU commission for its implementation.

2. Conflict Resolution
Module Description - The Purpose or Aims: Give students an insight into the potential causes of conflict centred round fresh water, and how such conflicts might be resolved
Summary of Course Content:
Studies of how and where conflicts over water arise
Study of conflict resolution techniques
Role plays applying these techniques to lifelike situations

3. Communication Science
Summary of course content:

This module is not taught as a unit but runs throughout the course.
Students may already have some of the skills described prior to attending the programme.
In this module students will be given the opportunity to learn and/or demonstrate that they have acquired and know how to utilise these skills.
Module Description - The Purpose or Aims:
In this module you will learn about:
Preparing a Poster Presentation
Preparing and Delivering an Oral Presentation
Preparing Material for Informing the Public, such as Leaflets and Press Releases
Preparing and Attending a Conference
Writing up Materials and Methods
Submitting a Paper to a Journal
Designing and Maintaining a Website

4. Beach management guidelines
Module Description - The Purpose or Aims:
To indicate the philosophy and theory of beach management.
To illustrate new techniques now available to a beach manager.
Summary of course content:
Beach management is essentially practical in nature but a vacuum exists with respect to theory. Any management problem has to have clearly defined dimensions and limits, and there are primarily five dimensional elements to any problem. These are substantive, spatial, temporal, quantitative and qualitative. They assess factors such as whether something being done should be stopped or modified; something should be introduced; assess boundary problems; consider whether the problem is long/short term; has single or multiple causes and should investigate philosophy, worth and values.
As a result of a recently EC funded ELOISE project co-ordinated by the applicant, dune management checklists are a new innovation. Training will be given in the main root management checklist.
Functional analysis is concerned with assessing the main components of resort/urban and conservation areas and plotting them on a matrix for conflict resolution. Coastal scenery can now be assessed by

powerful mathematical tools. Beach certification is a thorny issue and many such schemes will be introduced, analysed and discussed. Fieldwork will provide examples of all the above.

5. Wetland management guidelines
Module Description - The Purpose or Aims:
Give an European and international overview of the status of wetlands
Introduce ecological basis and outline key methods for assessing wetland condition
Provide ecological and socio-economic context for wetland management
Illustrate wetland assessment, management and rehabilitation by the example of case studies
Summary of Course Content:
General overview of wetlands: status, their value and function.
Assessment of wetland condition
Conservation and restoration
Wetland management (integrated management plans)
Legal context
Case studies

6. Impact of marinas on the coast and related legislation
Module Description - The Purpose or Aims: in view of basic coastal engineering eg. Coastal structures. Physical design of marinas, marinas as coastal development, environmental protection, coastal ecoturism and role of marinas
Summary of Course Content: A history of yachting and yacht tourism together with its management needs. Fundamentals of coastal hydraulics and coastal engineering. Marina layout, planning and design and environmental description of marina sties (physical, sediments, biology etc.) Environmental impacts. Marina economics/management. Coastal eco-tourism and marinas as a gateway for coastal eco-tourism.

7. Tourism in the coastal management and legislation
Ensuring the sustainability of tourism has become one of the main challenges of the modern society. Tourism is an essential element in the local economy for achieving the main objectives of social and economic growth, an adequate degree of occupation for citizens, a satisfactory regional development and a sound management of cultural and natural heritage. The tourism industry is a growing sector and produces social, economic, cultural and environmental impacts able to modify the physical aspect of a territory. The most important pressures exerted by tourism industry on the environment are an increased consumption of its natural resources, such as water, soil and energy, a great and uncontrolled use of territory, a large production of wastes and a diffuse atmospheric and water pollution. The growing consumption of natural resources represents an obstacle for the achievement of sustainable development particularly in small and coastal areas with fragile ecological environment. The tourism development, without an appropriate planning and management, can create competition for the use of land; it can encourage an intensive exploitation of territory and can cause deforestation, soil erosion and loss of biological diversity, producing as a consequence an irreversible damage to the ecosystems. On the other hand, a quality tourism can contribute to sustainable development of coastal areas by improving the local economy through the meeting of social needs and preserving, at the same time, the cultural and natural environment.

8. Urban planning and legislation
Module Description - The Purpose or Aims:
1.- Environmental Criminal Offences
2.- Urban Planning and land use
Summary of course content:
Duties of urban land owners
To develop the land according to urban planning.
To transfer free of charge to the Administration the land necessary to build roads, green zones and public services.
To transfer free of cost to the Administration 10% of the land subject to urban development.
To finance and, if any, implement the development.
To build on the land within the time period established in the planning.

10. The Water Framework Directive
Module Description - The Purpose or Aims:
Over the past decade, efforts based on Agenda 21's freshwater management guidelines in Chapter 18, which address the protection of the quality and supply of freshwater and the application of integrated approaches for the development, management and use of water resources, have focused on the following areas:
Integrated water resources development and management;
Water resources assessment;
Protection of water resources, water quality and aquatic ecosystems;
Drinking-water supply and sanitation;
Water and sustainable urban development;
Water for sustainable food production and rural development; and
The impact of climate change on water resources.
Summary of course content:
1. A World of Salt: Total Global Saltwater and Freshwater Estimates
Estimates of global water resources based on several different calculation methods have produced varied estimates. This graphic illustrates the proportions of saltwater and freshwater that make up the earth's water resources, and explains where these resources are located.
2. Global Freshwater Resources: Quantity and Distribution by Region
Glaciers and icecaps contain approximately 70% of the world's freshwater, but groundwater is by far the most abundant and readily available source of freshwater. This graphic illustrates the quantity and distribution of the world's freshwater resources in glaciers and icecaps, groundwater, and in wetlands, large lakes, reservoirs and rivers.

3. Major River Basins of the World
Rivers form a hydrological mosaic, with an estimated 263 international river basins covering 45.3% of the land surface area of the earth, excluding Antarctica. This graphic shows the locations of 26 of the world's major river basins.
4. Major River Basins of Africa
This graphic shows the locations of 13 major river basins in Africa
5. The World's Water Cycle and Estimated Residence Times of the World's Water Resources
The water cycle consists of precipitation, evaporation, evapotranspiration and runoff. This graphic explains the global water cycle, showing how nearly 577 000 km3 of water circulates through the cycle each year. A table of estimated residence times of the world's water shows the estimated times that water resources exist as biospheric water, atmospheric water and so on.
6. The World's Surface Water: Precipitation, Evaporation and Runoff by Region
The world's surface water is affected by different levels of precipitation, evaporation and runoff in different regions. This graphic illustrates the different rates at which these processes affect the major regions of the world, and the resulting uneven distribution of freshwater.
7. River Runoff through the 20th Century
River runoff is cyclical in nature, with alternating cycles of wet and dry years. These graphics show the average annual volumes of river runoff by continent and the deviations from average amounts of runoff for most of the 20th century.
8. Global Sediment Loads: Suspended Sediment Discharged by Region
Asia exhibits the largest runoff volumes and, therefore, the highest levels of sediment

discharge. This graphic shows the amounts of suspended sediments discharged every year in the major regions of the world.
9. Biological Oxygen Demand (BOD), 1976-2000 and Freshwater Alkalinity, 1976-2000
Biological oxygen demand is an indicator of the organic pollution of freshwater. Alkalinity is another indicator of freshwater quality. These graphics compare the concentrations of these two factors in the major regions of the world for the periods 1976 to 1990 and 1991 to 2000.
10. Global Average Nitrate Levels and Global Dissolved Phosphate Levels
Average concentrations of nitrate at major river mouths have not changed significantly between 1976 to 1990 and 1991 to 2000. There have been some changes, however, in phosphate concentrations at major river mouths. These graphics compare nitrate levels and phosphate levels for 1976-1990 and 1991-2000, and illustrate the changes that have occurred between the two time periods.
11. Global International Waters Assessment (GIWA) Case Studies.
The Global International Waters Assessment (GIWA) is an example of a comprehensive strategic assessment designed to identify priorities for remedial and mitigatory actions in international waters. This graphic shows GIWA case studies for the Black Sea, the Amazon, the Great Barrier Reef and the Agulhas Current.
12. Global International Water Assessment Tools for Better Monitoring of the World's Water Resources
GIWA's assessment tools for monitoring the world's water resources, incorporating five major environmental concerns and application of the DPSIR framework, are now beginning to yield results of practical use for management decisions. This graphic explains the GIWA Assessment Methodology and GIWA's main environmental concerns.

13. The DPSIR Framework (Driving Forces- Pressures- Impacts- State- Responses)
The DPSIR framework is used to assess and manage environmental problems. This graphic explains the DPSIR process.

5.5.1.4 OBSERVACIONES

NINGUNA

5.5.1.5 COMPETENCIAS

5.5.1.5.1 BÁSICAS Y GENERALES

CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CB 11 - Gestión, desarrollo tecnológico e investigación en el ambiente marino, del agua y en zona costera. Además de realzar la calidad de la enseñanza superior europea, fomentar la cooperación internacional y optimizar el desarrollo de recursos humanos mediante el dialogo y la comprensión entre las distintas personas y culturas que participan en el Master Erasmus Mundus in Water and Coastal Management (WACOMA).

5.5.1.5.2 TRANSVERSALES

No existen datos

5.5.1.5.3 ESPECÍFICAS

Seleccione un valor

5.5.1.6 ACTIVIDADES FORMATIVAS

ACTIVIDAD FORMATIVA	HORAS	PRESENCIALIDAD
No existen datos		

5.5.1.7 METODOLOGÍAS DOCENTES

No existen datos

5.5.1.8 SISTEMAS DE EVALUACIÓN

SISTEMA DE EVALUACIÓN	PONDERACIÓN MÍNIMA	PONDERACIÓN MÁXIMA
No existen datos		

6. PERSONAL ACADÉMICO

PERSONAL ACADÉMICO
Ver anexos. Apartado 6.
6.2 OTROS RECURSOS HUMANOS
Ver anexos. Apartado 6.2

7. RECURSOS MATERIALES Y SERVICIOS

Justificación de que los medios materiales disponibles son adecuados: Ver anexos, apartado 7.

8. RESULTADOS PREVISTOS

8.1 ESTIMACIÓN DE VALORES CUANTITATIVOS	
TASA DE GRADUACIÓN %	**TASA DE ABANDONO %**
TASA DE EFICIENCIA %	
TASA	**VALOR %**
No existen datos	

8.2 PROCEDIMIENTO GENERAL PARA VALORAR EL PROCESO Y LOS RESULTADOS

Para el desarrollo del programa de máster en la Universidad de Cádiz y siempre teniendo en cuenta la particularidad del Master Erasmus Mundus cuya competencia final en la gestión está en manos del comité de coordinadores de las seis Universidades que forman el consorcio se contará con los siguientes mecanismos:

- Para la supervisión del Programa se constituye la Comisión de Evaluación interna de cada Centro que realizará sus funciones a partir de la siguiente documentación:
- Informes personales de profesores sobre el grado de ejecución del programa, adecuación de los recursos materiales, idoneidad de las actividades realizadas, grado de consecución de los objetivos de aprendizaje, cualquier otro factor que se relacione con el programa. El informe finalizará con la propuesta de mejora para el próximo año.
- Resultados de las encuestas de satisfacción de los alumnos.
- Resultados de las encuestas de satisfacción a los recientes egresados, e informes globales donde se incluyan datos comparados de los diferentes programas de la UCA y si es posible con datos de otras Universidades
- Informe sobre las opiniones de empleadores y o empresas colaboradoras en el programa.
- Informe sobre la matrícula: alumnos, procedencia, estudios, etc. Estudio comparado de los diferentes programas de la UCA y de otras Universidades
- Además se utilizará como documentos de referencia: Programa o Memoria del Programa del Posgrado y las Guías académicas de los correspondientes módulos o asignaturas del Progr

9. SISTEMA DE GARANTÍA DE CALIDAD

ENLACE	http://www.uca.es/acl_users/credentials_cookie_auth/require_login?came_from=http%3A//www.uca.es/web/servicios/eval_calidad/sgccont/sgic_v02_003/inicio/document_view

10. CALENDARIO DE IMPLANTACIÓN

10.1 CRONOGRAMA DE IMPLANTACIÓN	
CURSO DE INICIO	2012
Ver anexos, apartado 10.	
10.2 PROCEDIMIENTO DE ADAPTACIÓN	
NO PROCEDE	
10.3 ENSEÑANZAS QUE SE EXTINGUEN	
CÓDIGO	**ESTUDIO - CENTRO**

11. PERSONAS ASOCIADAS A LA SOLICITUD

11.1 RESPONSABLE DEL TÍTULO			
NIF	**NOMBRE**	**PRIMER APELLIDO**	**SEGUNDO APELLIDO**
04168544R	TOMAS ANGEL	DEL VALLS	CASILLAS
DOMICILIO	**CÓDIGO POSTAL**	**PROVINCIA**	**MUNICIPIO**

CASEM. CAMPUS PUERTO REAL. POLÍGONO SAN PEDRO S/N	11519	Cádiz	Puerto Real
EMAIL	**MÓVIL**	**FAX**	**CARGO**
angel.valls@uca.es	686109753	956016040	Coordinador de Programas Erasmus Mundus
11.2 REPRESENTANTE LEGAL			
NIF	**NOMBRE**	**PRIMER APELLIDO**	**SEGUNDO APELLIDO**
31247791Z	EDUARDO SANTIAGO	GONZALEZ	MAZO
DOMICILIO	**CÓDIGO POSTAL**	**PROVINCIA**	**MUNICIPIO**
Rectorado. C/ Ancha, nº 16	11001	Cádiz	Cádiz
EMAIL	**MÓVIL**	**FAX**	**CARGO**
rector@uca.es	956015027	956015026	Rector
11.3 SOLICITANTE			
El responsable del título es también el solicitante			
NIF	**NOMBRE**	**PRIMER APELLIDO**	**SEGUNDO APELLIDO**
04168544R	TOMAS ANGEL	DEL VALLS	CASILLAS
DOMICILIO	**CÓDIGO POSTAL**	**PROVINCIA**	**MUNICIPIO**
CASEM. CAMPUS PUERTO REAL. POLÍGONO SAN PEDRO S/N	11519	Cádiz	Puerto Real
EMAIL	**MÓVIL**	**FAX**	**CARGO**
angel.valls@uca.es	686109753	956016040	Coordinador de Programas Erasmus Mundus

ANEXOS : APARTADO 1

Nombre : WACOMA Completo.pdf

HASH MD5 : fbbcbfd94fde2a947a67242b888846f2

Tamaño : 786577

Consortium Agreement for the development of a Joint European Master (Second cycle degree) in Water and Coastal Management (WACOMA)

between

University of Cadiz (coordinator), represented by Rector Diego Sales Marquez

University of Algarve represented by Vice Rector Sergio de Jesus

Alma Mater Studiorum- University of Bologna represented by its Rector, Prof. Ivano Dionigi

Hereafter named "the Parties"

Whereas

- The partners institutions are active in both ERA, the European Research Area and EHEA, the European Higher Education Area. The Universities of the Consortium have a history of co-operation in research and higher education under the framework of EU- research, Interreg EU programmes, EU-TEMPUS, Erasmus-Mundus Masters, Alban, INCO, Erasmus Mundus External cooperation windows and UNESCO UNITWIN and IOC programmes.

- The partners institutions in order to fully integrate their joint academic and research strengths have established cooperation within the scope of a joint Master programme in Water and Coastal Management (WACOMA);

- University of Bologna participates in Wacoma programme by developing and activating the master's degree programme "Laurea magistrale in analisi e gestione dell'ambiente";

- The national legislation in the 3 EU countries (Portugal, Spain and Italy) allows the granting of JOINT Master degrees and Diplomas.

- Non-awarding Third-Country higher education institutions, Russian State Hydrometeorological University (St. Petersburg, Russia), University of Santos (Brasil) and Ningbo University (China), also participate in the Consortium as partners but their specific obligations will be established in a specific agreement signed by Coordinator institution of the Consortium, University of Cadiz.

- University of Basque Country cooperates in the joint master programme as Associated partners, their specific commitments will be established in a specific letter of commitment signed by Coordinator institution of the Consortium, University of Cadiz .

Preamble and annexes are an integral part of this Agreement.

1 - Objectives

The present agreement provides the basis for:

- Jointly develop and arrange the master's degree programme named Joint Erasmus Mundus Master in Water and Coastal Management (WACOMA), valid as Laurea Magistrale (Master) in "Analisi e gestione dell'ambiente" curriculum Water and Coastal Management in Italy, and Master in Water and Coastal Management in Spain and Portugal.
- Shared Direction and Supervision of Master thessis in *Water and Coastal Management (WACOMA)*.
- Multilateral exchange of Master students, giving students the opportunity to attend Master courses and carry out research activities at partner Universities in *Water and Coastal Management (WACOMA)*.
- Multilateral exchange of Academic staff, which will enable Master teaching and research activities at partner Universities in *Water and Coastal Management (WACOMA)*.
- To offer a high standard joint Master programme in *Water and Coastal Management (WACOMA)* taking advantage of the previous experience in the Joint Master in water and coastal management selected by the Erasmus Mundus programme in the first call (2004) and complementary and specific strengths of the partner Universities through the mobility of Master students and academic staff. This approach is aimed at encouraging Master students to become integrated into international professional and research groups and to help them to acquire new experiences and skills in *Water and Coastal Management (WACOMA)*.

2 - Study programme

- Students of the joint Master programme in Water and Coastal Management (WACOMA) will participate in the relevant professional and research activities carried out at the host Universities.
- The academic staff of the partner Universities will give guest students the necessary Master supervision and teaching advice in Water and Coastal Management (WACOMA).
- Students of the joint Master programme in Water and Coastal Management (WACOMA) will be given the required facilities support, so to have the opportunity to carry out the professional and research activities at the research centres of the host Universities.
- The parties agree to jointly develop a common study programme consisting of a 60 ECTS taught programme and a 60 ECTS project and dissertation (Annex 1).

- In order to obtain a European Joint Masters Degree, the students must complete a programme of 120 ECTS.
- Student mobility is an integrated part of the curriculum. Students physically take part in study at a minimum of two participating Universities in different countries. Periods of study passed at the partner Universities are recognized fully and automatically; evaluations or examinations passed at the partner Universities are recognized fully and automatically using ECTS.

3 - Coordination

The consortium coordinator is the University of Cadiz and the coordinator of the joint Master programme in *Water and Coastal Management (WACOMA)*. Each partner University will nominate a Co-ordinator responsible for the implementation of the Agreement. After the first iteration of 5 years, the partnership and coordination will be revised.

4- Consortium

The Consortium members are: University of Cadiz (coordinator); University of Algarve (partner); Alma Mater Studiorum- University of Bologna (partner); Russian State Hydrometeorological University (RSHU), RUSSIA (non EU partner); Superior Institute of Education Santa Cecília (UNISANTA) BRAZIL (non EU partner); Ningbo University CHINA (non EU partner).

5 - Application and Selection of Candidates

The consortium coordinator will coordinate the joint Master programme in *Water and Coastal Management (WACOMA)* applications. Each partner University will nominate a member of the selection committee who will participate in the selection procedure. Calls for candidates will be published on line by the EU, including also the list of Consortia that will be offering the scholarships. Moreover, WACOMA Consortium will open a website providing all necessary information concerning the content of the course, its structure, the scholarship amounts as well as the application and selection procedures, in agreement with the EU guidelines.

6 – Enrolment

Enrolment will be centralized in the coordinating institution. All students will apply to the University of Cadiz, as the Coordinating University. Pertinent documents and registration fees will be sent to the Partner Universities. In particular, considering that the University

of Bologna will receive the students at the first semester, documents will be transmitted as soon as the applicants will be enrolled in the international curriculum Water and Coastal Management of the *Laurea magistrale in analisi e gestione dell'ambiente"* as Joint Erasmus Mundus Master Students. Documents will be transmitted to the other Partner Universities as soon as the students will select the specific University where to perform the second year of study. The **deadline for this selection is planned within the 9th month of study** during the first year. Students will be registered at the institutions in which they carry.

Students must obtain 30 ECTS at University of Bologna (first semester), 30 ECTS at University of Cadice (second semester). the remaining 60 ECTS can be carried out at other universities of the consortium.

The Parties can allow student mobility (maximum 30 ects) to non EU members of the Consortium and to associated partner University, on the basis of separate specific agreements.

7 - Insurance Obligation

The coordinating institution will insure students admitted to the joint study programme under contract to an European Insurance company **following guidelines provided in annex to this contract. All other** charges shall be borne by the students themselves. Partner University state that their students regularly admitted to the joint study programme are insured against any incident that they suffering for the activities concerned by this Agreement and that they are insured for legal liability against damage which they may involuntarily cause to third party (people or their properties).

8 - Risk prevention and safety

Each party will provide students hosted at their institutions with detailed information about the specific risks existing in the work environment in which they will operate and carry out their function, and with necessary documentation about risk prevention and emergency safety measures and provisions in force in relation to their activity, as well as information about the individuals in charge of these provisions, in accordance with legislation and regulations in force in the country of the hosting University.

9 - Procedure for the issue of the joint Master diploma

The joint Master diploma will be issued by the coordinating University. The Diploma will include the crests of all the institutions

where the Master student carried out the teaching period. The Diploma will include a minimum of two institutions in different countries.

The Master degree has to be recognized or accredited by every country where the Institutions of the consortium are located. If the delivery of a joint diploma was legally impossible for any of the European institutions of the Consortium, students may additionally obtain a national degree from the host institution.

Anyway University of Bologna, in accordance with the current legislation, will issue a single degree "Laurea magistrale in Analisi e gestione dell'ambiente" with a specific reference to the agreement Universities participating in the master.

Students will additionally obtain a Diploma Supplement using ECTS, issued by the host institution of the curricular programme.

The Diploma will be issued upon check on students' necessary requirements by the involved Institutions.

10 - Financial and administrative arrangements for the programme

Fee amounts will be agreed upon by the Parties and approved by their academic bodies.
The University of Cadiz, as Coordinator of the Consortium, will allot the fees amongst the partner Universities and will manage them according to the criteria agreed upon by the Partner Universities as described in the attached financial annex (Annex 2) respecting the agreements signed by the legal representative of the Coordinating University and the EXECUTIVE AGENCY EDUCATION AUDIOVISUAL AND CULTURE (EACEA).

The coordinating University will administer the studentships and scholarships on behalf of the consortium, celebrate Master student contracts and academic staff contracts and report to EACEA on behalf of the consortium. The funds will be distributed among EU and non EU members of the Consortium as reported on the Financial Annex.

11 - Quality Assurance

In order to maintain a high quality European Joint Masters programme, the parties will carry out student evaluation of the course using the questionnaires developed in the Joint Masters project by the European University Association. The Masters programme will be

subject to transparent quality Assurance mechanisms. The parties will collaborate with the national authorities and ENQA in establishing a common framework of reference for Quality Assurance.

12 - Use of Name/Logo

Each party may use the logos, names and other marks of the other parties only in connection with the Erasmus Mundus joint program.
Each party anticipates the other parties participation in press announcements, marketing and other reasonable promotional activities involving the double-degree program through the appropriate use of the logos, names and marks of the parties. Including the Diploma.

13 - Dissemination

In order to ensure a geographical balance of potential candidates, the parties will disseminate the existence of the European Joint Masters by oral presentations, posters, brochures at conferences and higher-education fairs, by national and international associations and through websites.

14 - Modification of this agreement

The agreement can be modified only by mutual consent of all parties. Any institution wishing to withdraw from the agreement must inform the other partners in writing, with one year notification. All modifications to this agreement are subject to the condition that they may not endanger the continuation of the ERASMUS MUNDUS Masters Course, as approved by the European Commission. All substantial changes to the agreement, such as the number of ECTS credits, the award of degrees and the withdrawal of a partner should be notified to the European Commission. These changes cannot be implemented if the Commission is of the opinion that they conflict with the rules of the ERASMUS MUNDUS Programme.
Annexes at the present agreement may be amended by means of a written note between the Parties without prejudice for the students already registered.

15 - Duration

This agreement will be in force for a period of five academic years, starting from academic year **2012/ 2013.**

UNIVERSITY OF CÁDIZ

Date:

Name and Position: Rector Diego Sales Marquez

Signature and Stamp

UNIVERSITY OF ALGARVE

Date

Name and Position: Vice Rector Sergio de Jesus

Signature and Stamp

UNIVERSITY OF BOLOGNA

Date 19 APR. 2011

Name and Position: Rector, Prof. Ivano Dionigi

Signature and Stamp

University of Cádiz

Date 25 de Abril de 2011

Name and Position: D. Diego Sales Marquez

Rector of the University of Cadiz

Signature and Stamp

Russian State Hydrometeorological University, RSHU

Date 30th March 2011

Name and Position: Prof. Lev Kaslin, Rector

Signature and Stamp

宁波大学
NINGBO UNIVERSITY

University of Cádiz

Date 14/04/2011

Name and Position

Signature and Stamp

UCA Universidad de Cádiz

UNESCO Unitwin: Wicop

Ningbo University

Date April 20, 2011

Name and Position Wang Wei, Vice-president

Signature and Stamp

University of Cádiz

Date

Name and Position: Prof. Diego Sales Marquez, Rector

Signature and Stamp

University of Santa Cecília (Brazil)

Date: March, 17th 2010.

Name and Position: Prof. Sílvia Ângela Teixeira Penteado, Rector

Signature and Stamp

UNISANTA
Universidade Santa Cecília
Reconhecida pela Portaria Ministerial nº 156/96

Date: March, 27th 2011

Letter of commitment to the programme

I the undersigned commit the University of Santa Cecília to participate in the joint European Masters in Water and Coastal Management (WACOMA) as described in the application to the EU ERASMUS MUNDUS programme submitted by the consortium coordinated by the University of Cádiz. It is understood that amongst other things we will be required to provide;

- Academic leadership for the programme and the students
- Pastoral support and guidance for the students
- Practical support for the students including support help with accommodation, language, visas and similar matters
- Efficient administrative support for the management of the programme

In addition we will be required to participate in at least one programme meetings each year to ensure the smooth management and running of the programme. We will also participate in the Quality Assurance of the programme as described in the application for ERASMUS MUNDUS funding.

Yours Faithfully,

Prof. Dr. Silvia Angela Teixeira Penteado

Rector. University of Santa Cecilia

Profa. Dra. Silvia Angela Teixeira Penteado
Reitora - UNISANTA

Rua Oswaldo Cruz, 266 • Santos SP CEP 11045-907 • PABX (13) 3202.7100 • FAX (13) 3234.5297
www.unisanta.br • unisanta@unisanta.br

ANEXOS : APARTADO 1.2

Nombre : EMMC-520104.pdf

HASH MD5 : c1f197e35bbb952b7d7030efa5152f60

Tamaño : 303844

Education, Audiovisual and Culture Executive Agency

Erasmus Mundus and External Cooperation

Prof. Diego Sales Márquez
UNIVERSITY OF CADIZ
UNESCO UNITWIN/WiCop.
QuimicaFisica
Rectorado. c/ Ancha, 16
ES - 11001 CADIZ
España

Brussels, 11 July 2011
ARES(2011)

Re: **Erasmus Mundus Action 1.A - Joint Masters Courses - Call for Proposals EACEA/41/10**
Title: **ERASMUS MUNDUS MASTER IN WATER AND COASTAL MANAGEMENT**
Ref.: **520104-1-2011-1-ES-ERA MUNDUS-EMMC**
(Please quote this number in all correspondence)

Dear Prof. Diego Sales Márquez,

You have submitted a proposal under Action 1.A in the framework of the Erasmus Mundus Call for proposals EACEA 41/10.

I am pleased to inform you that your above-mentioned proposal has been selected.

The Agency received 177 proposals under Action 1.A – Joint Masters Courses. 30 of these proposals were selected for funding, and 1 is on the reserve list.

All proposals were assessed with the assistance of independent academic experts. Enclosed you will find the consolidated version of the experts' assessments of your proposal. Please take account of the fact that most of the assessments were written by non-native speakers and that the Agency cannot comment on these independent assessments.

The selection decision is based on the quality of the proposal, its relative position in comparison with the other proposals received, the budget available as well as the respective selection procedure.

You will find attached the short summary of your proposal that was included in your *e*-application. We would appreciate if you could you revise and, if necessary amend, it in order for us to be able to publish it on the Agency's website in early September (please refer also to the summary already published on our website and that corresponds to the first cycle of your EMMC). The objective is to inform potential scholarship candidates about the content of your joint programme and allow them to contact you, if need be.

EACEA – "Education, Audiovisual and Culture" Executive Agency
Avenue du Bourget, 1 (BOUR 02/31) – 1140 Brussels – Belgium - Office : Rue Colonel Bourg, 135-139 - BE-1140 Brussels
Telephone : direct line (32-2)295.96.92 – fax (32-2)292.13.28
http://eacea.ec.europa.eu Email: joachim.fronia@ec.europa.eu

Please return the updated summary to EACEA-Erasmus-Mundus@ec.europa.eu, using the same subject as reference, **by 08/08 at the latest**. Note that if we do not hear from you by this deadline, the Agency will publish the summary as it is.

In addition we would like you to take note of the following information:

- Consortia should ensure that their consortium's website and any other promotion activities/material are ready to be used in September at the latest so that they can start promoting and advertising for potential students

- The issuing of your next Specific Grant Agreement (SGA) covering the scholarships for the 2012 students' intake will be conditioned by the provision to the Agency of a new duly signed Consortium Agreement covering the five years period of the new FPA and, if necessary, an updated version of the Student Agreement that will be signed between the consortium and the enrolled students. Consortia should prepare and finalise these documents during the second semester of 2011 so as to send them to the Agency at the latest by the scholarship/fellowship application deadline of 28 February 2012. Examples of existing Consortium and Student Agreements are available under the following "best practice" page of the Erasmus Mundus website: http://eacea.ec.europa.eu/erasmus_mundus/tools/good_practices_en.php.

- Please note that in the context of the eligibility check exercise carried out by the Agency on the partner institutions and the proposed degree(s), the following issue(s) has(/-ve) been identified by the relevant National Structure(s):
University of Algarve (Faro); the degree proposed to be delivered by this institution has not yet been accredited by the relevant national authorities.

  We invite you to inform the Agency and the relevant National Structure(s) as soon as the accreditation process has been concluded, and in any case by **28 February 2012 at the latest** (date by which your consortium will have to submit its 2012 scholarship/ fellowship candidates proposal to the Agency). We kindly remind you that all successful students/fellows are to be awarded with minimum a double degree. Should you need more information on the accreditation process, we invite you to contact the relevant Erasmus Mundus National Structure(s) and/or your contact persons in the Agency.

Please do not hesitate to contact us should you have any further questions.

Sincerely Yours,

J. Fronia

Joachim Fronia
Head of Unit

Annex: Comments and recommendations from the academic experts who assessed your proposal.

EACEA
Education, Audiovisual & Culture Executive Agency

Joint Masters Course

Evaluation Report

Proposal number:	520104-EM-1-2011-1-ES-ERA MUNDUS-EMMC
Proposal title:	ERASMUS MUNDUS MASTER IN WATER AND COASTAL MANAGEMENT
Coordinator:	Prof. T. Ángel Del Valls Casillas
Applicant organisation:	UNIVERSITY OF CADIZ

Award Criteria

A.1 Academic quality - Course content (30 % of the max. score)

The EMMC is a continuation of an existing joint European Master Course program that has been approved in the first call in 2004. The need for this course in Water and Coastal Management is well presented and expressed in terms of science, socio-economic issues, future challenges and supply of highly skilled workforce consisting of multi-disciplinary trained researchers. Objectives of the program are well presented and are consistent with the needs analysis. Promotion of inter-sectorial cooperation and exchange of information is clearly addressed.

Innovative aspects and added value of the program are adequately discussed. The proposal capitalizes very well on the successful implementation of the previous editions of the program and contains improvements and changes. The presence of 3 third country full and associate partners provides wide geographical coverage and relevant opportunities for cooperation, technology and scientific exchange.

The structure of the joint course program is well described and the course content is consistent with the objectives of the proposal. There is emphasis in conducting research by providing education through an integrated Training Through Research approach of lectures and field training. Also the majority of research dissertations are expected to include field studies. Language training will be recognized through ECTS credits. Specific and transferable skill courses are provided. Even though limited in terms of description, exposure of trainees to different (up to 3) research environments is encouraged and credible. Associate private sector and public partners will offer placements leading, in association with the HEI partners, to a Master thesis. It is not clear as written if the 3 third country HEIs will actually act as full partners, i.e., if they will deliver at least 15 ECTS.

There is credible potential in promoting career opportunities of young trainees as students will acquire a well-balanced set of subject specific and transferable skill set. Use of EU descriptors for expected learning outcomes would have supported this section of the proposal. Academic as well as other employability opportunities are discussed and are credible since the broad profile of the graduates fit well the needs of different job markets.

The composition of the Consortium is convincing and very well balanced and consists of 14 members,

six partners (3 from EU and 3 from third countries) and eight associates (6 from EU and 2 from third countries). All partners are clearly committed by letters of intent. Exchanges between full and associate partners are further promoted by the sharing of responsibilities in all dissertations. Non-EU partners have established links under previous editions of the program and bring increased visibility and scientific exchanges to the course. The Consortium has a high level of diversity and it is credible in terms of collaboration, but scientific complementarities should have been better presented. The role of invited scholars is discussed, but they are not identified. The need of experts from outside of this large network should be clearly justified.

Interactions with the professional sectors are highly relevant and justified and include research institutes, international and national bodies, private sector associated partners, bringing into the program mobility opportunities, facilities for training, and funding for research. Presence of co-funding participants will be regulated through specific agreements, issues such IPRs will be specifically addressed.

A.2 Course integration (25% of the max. score)

All Consortium partners and associates are highly integrated into the EMMC with high levels of participation and have jointly developed the curriculum using as background their integration experience in the previous editions of the joint master course. A Consortium Agreement of Cooperation specifies the policy of recognition of the joint program, and well substantiates the level of integration and institutional commitment of the partner HEIs. All partners have started running a recently granted EMJD. The master and doctorate programs will run independently but are expected to be mutually beneficial.

The EMMC awards a joint master degree, issued by a minimum of two institutions of the Consortium, i.e., the annual host and the institution where the project and dissertation is carried out. For partner P4, P5 and P 6, the recognition is not clearly stated. Implementation of the project may help a process of convergence in higher education in the EU and 3rd country HEIs.

The recruitment procedure is transparent, organized through a common procedure, described in detail. There is appropriate interest in concretely addressing gender issues, e.g., by providing child care facilities.

All partners have implemented the ECTS system and a transparent grading scale ranking. Examination methods are well stated and common criteria for dissertation evaluation are very good and clearly presented. Use of two languages for dissertation defence is highly appropriate. However, presence of external members is not considered in the final evaluation. A Diploma Supplement using ECTS will be provided by the HEI where the thesis defence will take place.

The students' participation costs are detailed. All institutions will claim for the highest costs. Each institution will cover extra costs. Partner P3 claims costs for "international candidates" which are inexplicably high given the low labour costs in the country (source OECD, Eurostat). Some clarifications are needed for the differences between the EU and third country students' costs.

A.3 Course management, visibility and sustainability measures (20 % of the max. score)

A good description of the management structures is provided with clear, balanced allocation of tasks and responsibilities, formally documented in the attached Consortium Agreement and the Associated Partner Agreement. Student participation in managing and quality assurance of the program is anticipated. Appropriate tools will be in place to ensure implementation of the program. Members of

the managing boards are not identified; external professionals from the field are not considered.

Each of the Consortium institutions will contribute financially to the running of the program in a variety of ways, but will largely cover the costs of supervision of the students and the provision of basic facilities. A co-funding scheme is anticipated. Financial management is sufficiently described, that is use of the lump sum and distribution of the grant among partners. Complementary funding opportunities are described.

A good analysis of the partners' previous achievements anticipates the potential sustainability of the program beyond the period of community funding. Associated partners play a relevant role in terms of sustainability by covering expenses in some research lines. The role of non-EU partners should have been discussed.

There is a well-detailed commitment to promote visibility and attractiveness of the program. More effort should be done to reach the public at large.

A.4 Students' services and facilities (15% of the max. score)

The partners provide the students prior to their enrolment with all necessary information concerning the structure, component, requirements and application issues of the program, as well as the facilities for the students mainly through the website. More effort would be required to establish a more personalized, feedback-based contact with international students.

A comprehensive Student Agreement, consistent with the European Charter, and containing the necessary information, terms and conditions concerning the important issues such as academic, administrative and financial aspects will define rights and regulations and a copy is appropriately annexed to the proposal.

Good quality services are offered to students. All partners dedicate excellent care to special needs, including psychological support. There is relevant attention to the social integration of students. However, contact persons at partner HEIs should have been clearly designated.

The official language is English. Learning of a second European language is encouraged and ECTS are awarded, which is fully in line with the program. The thesis is recommended to be written in English, although any other European language official in the European HEIs of the Consortium will be acceptable.

The students are expected to benefit from the previous Master course experience. The informal network of Alumni is also expected to play a special role in terms of networking opportunities. Given the size of the network, more defined opportunities for intercultural and professional communication could have been offered.

A.5 Quality assurance and evaluation (10 % of the max. score)

Mechanisms of internal quality evaluation are developed and approved by the Consortium partners. They are well suited, already in place at the partners' institutions, based on comments from the internal evaluation of students and scholars participating, and capitalize on the partner's experience in the previous editions of this program. Results on the evaluation of the previous joint Master Course are stated in an annexed document.

External university and independent national bodies of the host countries will provide quality assessment of the EMMC. Quality Assurance mechanisms are designed for quality assurance of

program instead of the whole institution, which is good. An external appointed professional will be appointed to review all aspects of the program, however the frequency of this exercise should be increased.
Other comments on the proposal
The program is credible and addresses a field of high socio-economic interest with a clearly established international perspective. The proposal capitalizes very well on previous editions of the joint master course, but some points required particular attention. The proposal is highly recommended.

ANEXOS : APARTADO 2

Nombre : Justificacion 520104 WACOMA.pdf

HASH MD5 : 88b5c89ef8af5118dba0213562fc9d58

Tamaño : 86379

WACOMA

Erasmus Mundus Master In Water And Coastal Management

Duration: 24 months

Course description:

The curricular programme is integrated and includes modules offered by all the Universities in the consortium. The Msc WACOMA is a 24 month programme (120 ECTS) running over three periods adapted from a previous Erasmus Mundus approved in the first call of the programme in 2004 (Joint European Master in Water and Coastal Management). The experiences developed during these years have suggested us to include some changes such us the total duration of the Master and some changes in the partnership. The development of the programme will be through different periods/semesters (the dates are for an example of the first edition of the Master 2012/14). 1st Semester first academic year 2012/13 August, 2012 to January 2013, 6 months at the University of Bologna, Italy. It will be conducted different compulsory modules focused on Freshwater, environmental economics, and social sciences to award 30 ECTS by the students. 2nd Semester first academic year 2012/2013 from February 2013 to July 2013, 6 months at the University of Cádiz, Spain. Composed by optional modules to be selected by the students. It is offered up to 90 ECTS to be selected by the students in all of the three general matters included in the master: Freshwater, General Environment and Coastal to complete the required 30ECTS in this period. Second academic year 2012/13 from August 2013 to July 2014 to conduct their research period at any of the 6 partner institutions: University of Algarve, Portugal, University of Bologna, Italy; University of Cadiz, Spain; University of Ningbo, China; University of Santa Cecilia, Brazil and the Russian State Hydrometeorological University, Russia. Also, the students can conduct their dissertation period in collaboration with any of the associated members always in collaboration and co-supervised by one professor from any of the consortium Universities. Students will have to complete 120 ECTS to be awarded the MSc WACOMA and at least 30 of those ECTS must be taken in a second EU Institution at a different European country of the consortium. Students will begin at the University of Bologna where there will be a core programme of 30 ECTS offered to all students. There will be no options in this core and it will prepare the students for all the subsequent option modules and for their dissertation phase. For the second period the students will move to the University of Cádiz where a range of option modules (diagram 1) will be available to enable the students to specialise in their main area of interest. The modules offered will be provided by experts from our wide network of European and international partners and will be organised into subject specific clusters to ensure the modules offered each year address an appropriate range of topics. On completion of the taught modules the students will progress to their dissertation during the second year (60ECTS)

Website: http://www2.uca.es/serv/catedra-unesco/erasmusmundus/macoma/index.htm

Contact:

UNIVERSITY OF CADIZ (SPAIN) Main coordinator. Prof. T. Ángel Del Valls Casillas/Carmen López

Address: Polígono río San Pedro s/n. Facultad de Ciencias del Mar, CASEM. ES - 11519 Puerto Real, CADIZ

Email: agua.mundus@uca.es

ANEXOS : APARTADO 3

Nombre : 4.1.- Sistemas de informacion previo.pdf

HASH MD5 : 389b7b8413afb553a109f675d591e564

Tamaño : 36581

4.1.- SISTEMAS DE INFORMACION PREVIO

Procedimiento de solicitud.

a) La solicitud para optar a las becas de la UE bajo el programa Erasmus Mundus se hará mediante una aplicación online sita en la siguiente página web: www.uca.es/wacoma

En este link, los solicitantes pueden encontrar la información pertinente al programa de master, como los miembros del consorcio y países, la descripción del programa y estructura del mismo (descripción del itinerario formativo y líneas de investigación), precios públicos, etc.

b) Las solicitudes de carácter general se realizarán a través del Distrito Único Andaluz (DUA), http://www.juntadeandalucia.es/innovacioncienciayempresa/sguit/; según los requisitos y plazos de admisión dictados por la Junta de Andalucía.

ANEXOS : APARTADO 4

Nombre : 4.4.-Diploma Erasmus Mundus.pdf

HASH MD5 : ddc31b82bf3e24eb27d58b6bee91a00f

Tamaño : 28642

Education and Culture

Erasmus Mundus

Diploma Conjunto de Master Europeo

Se concede el título de Master en Gestión de Agua y Costas

A *nombre completo del estudiante*

Por haber asistido y completado satisfactoriamente los cursos del Master con una duración de 18 meses durante los años académicos (años)

Créditos Europeos obtenidos: 90 ECTS

Nota Europea obtenida (A-F)

Expedido por: *nombre de las universidades del Consocio en su idioma original*

Universidade do Algarve	**Universitetet I Bergen**	**Universidad de Cádiz**	**University of Plymouth**
P FARO 2	N BERGEN 01	E CÁDIZ 01	UK PLYMOUTH 01

Firmas de los representantes oficiales de las Instituciones donde el estudiante ha realizado su estudios *(minimo 2)*

Education and Culture

Erasmus Mundus

Joint Diploma European Master Degree

The Degree of Master in Water and Coastal Management
is Conferred

To *full name of student (as appears on identification documents)*

For attending and successfully completing the Master course in *Academic years*
over a duration of 18 months

European Credits awarded: 90 ECTS European Grade awarded (A-F)

By *Names of the Universities in the original language*

Universidade do Algarve
P FARO 2

Universitetet I Bergen
N BERGEN 01

Universidad de Cádiz
E CÁDIZ 01

University of Plymouth
UK PLYMOUTH 01

Signatures of Legal Representatives of the Institutions *where the student pursued part of the studies (minimum 2)*

ANEXOS : APARTADO 5

Nombre : WACOMA.pdf

HASH MD5 : 92cee9729e5556a1610ad4bf0cf77df7

Tamaño : 98592

Master ERASMUS MUNDUS in Water and Coastal Management. **WACOMA**

STRUCTURE 1st Year: 60 ECTS

FRESHWATER MODULE

CORE MODULES (UoBologna)

Bioassessment of freshwater ecoystems	6
The hydrological Cycle and Climate change	6
TOTAL	**12**

GENERAL ENVIRONMENT MODULE

CORE MODULES (UoBologna)

Environmental economics and resource management in water policy making	6
TOTAL	**6**

COASTAL MODULE

CORE MODULES (UoBologna)

Planning and decision making in water basins and coastal systems	6
Environmental Impact and risk assessment for the society in water and coastal management	6
TOTAL	**12**

OPTIONAL BLOCKS (MODULES = 2 ECTS)
Choice of 6 ECTS from each of the 3 different blocks = 18 (UoCádiz)

Chemical analysis of environmental quality (3 modules to be selected = 6 ECTS)	6
1. Weight of Evidence Assessment of Chemical Contamination in Aquatic Environments 2. Chemical and ecotoxicological guidelines for the management of dredged material: regulation of disposal in open waters 3. Sensitive tools for the assessment of Environmental and Human risk 4. Environmental Assessment and management of accidental spill in fresh water ecosystems 5. Environmental Assessment and management of accidental spill in littoral ecosystems 6. Tools for hazard assessment of chemical and complex environmental media 7. Eutrophication of estuaries and coasts	
Physiology applied to the environment (3 modules to be selected = 6 ECTS)	6
1. Eutrophication and Hypoxia 2. Bioavailability and bioaccumulation: Keys for the quality of ecosystems 3. Biomarkers 4. Integrated tools to determine environmental quality 5. Distinct tools for freshwater quality determination and management 6. Seagrass management tools in human impacted areas 7. Tools for general environmetnal quality assessment 8. General methodology to assess coastal area quality 9. Coasts of the world	
Geochemistry of sediments (3 modules to be selected = 6 ECTS)	6
1. Basis for sediments and dredged material management 2. Integrative assessment of sediment quality in aquatic ecosystems 3. Water quality in mining areas 4. Scientific and technical strategies for CO2 mitigation in coastal ecosystems 5. Integrated concepts for water and coastal management 6. Coastal flooding hazard 7. Coastal lagoons	
ECTS TOTAL	**18**

INTEGRATIVE OPTIONAL BLOCKS (MODULES = 2 ECTS)
Choice of 6 ECTS from 2 out of the 3 different blocks = 12 (UoCádiz)

Environmental legislation (3 modules to be selected = 6 ECTS)	6
1. Marine Strategy Directive 2. Conflct Resolution 3. Communication Science 4. Beach management guidelines 5. Wetland management guidelines 6. Impact of marinas on the coast and related legislation 7. Toursim in the coastal management and legislation 8. Urban planning and legislation 9. Environmental legislation and water quality monitoring 10. The Water Framework Directive	
Biology of aquatic organisms (3 modules to be selected = 6 ECTS)	6
1. Microbial potential for the natural attenuation of contaminants in the aquatic ecosystems and its application in bioremediation 2. Models for aquaculture sitting 3. Alien Species 4. Marine reserves : rationale, case studies and scientific monitoring 5. General and biological tools for coastal management 6. Freshwater systems of the world 7. Global change implications for freshwater availability	
Renewable energies and resource management (3 modules to be selected = 6 ECTS)	6
1. Marine Renewable Energy 2. Modeling physical-biological processes 3. Techniques for the diagnosis on ICZM process 4. Water for Food and Rural Development 5. Simulation tools for the management of different processes in aquatic ecosystems 6. Integrated coastal zone management 7. Global warming and the role of the littoral ecosystems 8. Complex satellite monitoring of coastal zones 9. Vital water 10. Management of complex systems (ecological-social-economic	
ECTS TOTAL	**12**

Master ERASMUS MUNDUS in Water and Coastal Management. **MACOMA**

STRUCTURE 2nd Year: 60 ECTS

RESEARCH PERIOD 60 ECTS (any of the consortium Universities)

ALTERNATIVE STUDENT CHOICE

RESEARCH PERIOD MINIMUM 36 ECTS and

LANGUAGE KNOWLEDGE 6 ECTS and/or

LABORATORY SKILLS 6 ECTS and/or

1. Research activities 2. Scientific writing 3. Networking skills 4. Fieldwork skills 5. Laboratory skills 6. Research skills 7. Postgraduate skills: IT tools 8. Scientific diving in coastal research	**MAXIMUM 12 ECTS**
TOTAL	**12**

SUMMARY

FIRST YEAR (core modules + optional blocks)	
FRESHWATER MODULES	
GENERAL ENVIRONMENTAL MODULES	
COASTAL MODULES	
TOTAL	**60 ECTS**
SECOND YEAR (students can either select a research period of 60 ECTS or a combination of the following modules, up to 60 ECTS)	
RESEARCH PERIOD	**36 (min)**
FREE STUDENT CHOICES	**12 (max)**
LANGUAGE KNOWLEDGE	**6**
LABORATORY SKILLS	**6**
TOTAL	**60 ECTS**

ANEXOS : APARTADO 6

Nombre : Profesorado WACOMA.pdf

HASH MD5 : 1081d8acd506407ae22e15b79c84fbbd

Tamaño : 67981

ERASMUS MUNDUS Master in Water & Coastal Management			***Créditos ECTS***	
Core Modules. University of Bologna (Italy)				
1	Bioassessment of freshwater ecoystems	**Andrea Pasteris**	**6**	**Ubolg**
2	The hydrological Cycle and Climate change	**Marco Antonellini**	**3**	**Ubolg**
		Pauline Mollema (The Netherlands)	**3**	**externo**
3	Environmental economics and resource management in water policy making	**Andrea Contin**	**3**	**Ubolg**
		Paolo F. Ricci (USA)	**3**	**externo**
4	Planning and decision making in water basins and coastal systems	**Giovanni Gabbianelli**	**6**	**Ubolg**
5	Environmental Impact and risk assessment for the society in water and coastal management	**Andrea Contin**	**3**	**Ubolg**
		Paolo F. Ricci (USA)	**3**	**externo**
		TOTAL	**30**	
Optional modules. University of Cadiz (Spain)				
1	Weight of Evidence Assessment of Chemical Contamination in Aquatic Environments	**Peter Chapman**	**1**	**externo**
		Inmaculada Riba	**1**	**UCA**
2	Chemical and ecotoxicological guidelines for the management of dredged material: regulation	**Carmen Casado**	**1**	**externo**
		Angel del Valls	**1**	**UCA**
3	Sensitive tools for the assessment of Environmental and Human risk	**Laura Martín**	**2**	**UCA**
4	Environmental Assessment and management of accidental spill in fresh water ecosystems	**Angel del Valls**	**2**	**UCA**
5	Environmental Assessment and management of accidental spill in littoral ecosystems	**Inmaculada Riba**	**2**	**UCA**
6	Tools for hazard assessment of chemical and complex environmental media	**Laura Martín**	**0,5**	**UCA**
		Angel del Valls	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
		Maria Jose Salamanca	**0,5**	**Externo**
7	Eutrophication and Hypoxia	**Alice Newton**	**1**	**externo**
		Angel del Valls	**1**	**UCA**
8	Bioavailability and bioaccumulation: Keys for the quality of ecosystems	**Julian Blasco**	**0,5**	**externo**
		Phil Rainbow	**0,5**	**Externo**
		Inmaculada Riba	**1**	**UCA**
9	Biomarkers	**Christian Blaise**	**1**	**externo**
		Laura Martín	**1**	**UCA**
10	Integrated tools to determine environmental quality	**Laura Martín**	**0,5**	**UCA**
		Angel del Valls	**0,5**	**UCA**
		Judit Kalman	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
11	Distinct tools for freshwater quality determination and management	**Laura Martín**	**0,5**	**UCA**
		Natalia Jiménez	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
		Julian Blasco	**0,25**	**externo**
		Inmaculada Vallejo	**0,25**	**UCA**

12	Seagrass management tools in human impacted areas	**Juan Jose Vergara/Gloria Peralta**	**2**	**UCA**
13	Tools for general environmetnal quality assessment	**Laura Martín**	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
		Natalia Jiménez	**0,5**	**UCA**
		Angel del Valls	**0,5**	**UCA**
14	General methodology to assess coastal area quality	**Laura Martín**	**0,5**	**UCA**
		Angel del Valls	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
		Diana Fdez Reguera	**0,5**	**externo**
15	Basis for sediments and dredged material management	**Javier Viguri**	**1,5**	**externo**
		Angel del Valls	**0,5**	**UCA**
16	Integrative assessment of sediment quality in aquatic ecosystems	**Angel del Valls**	**1,5**	**UCA**
		Inmaculada riba	**0,5**	**UCA**
17	Water quality in mining areas	**Jose Miguel Nieto**	**1**	**externo**
		Aguasanta Miguel	**0,5**	**externo**
		Angel del Valls	**0,5**	**UCA**
18	Scientific and technical strategies for CO2 mitigation in coastal ecosystems	**Inmaculada Riba**	**1,5**	**UCA**
		Angel del Valls	**0,25**	**UCA**
		Diana Fdez Reguera	**0,25**	**externo**
19	Integrated concepts for water and coastal management	**Alfredo Izquierdo**	**2**	**UCA**
20	Coastal flooding hazard	**Laura del Rio**	**2**	**UCA**
21	The marine environment protection European Directive: a recent proposal for management of environmental quality in coastal ecosystems	**Jose Luis Buceta**	**0,5**	**externo**
		Angel del Valls	**0,5**	**UCA**
		Inmaculada Riba	**0,5**	**UCA**
		Diana Fdez Reguera	**0,5**	**externo**
22	Conflct Resolution	**Rupert Watson**	**2**	**externo**
23	Communication Science	**Ed Morris**	**2**	**UCA**
24	Beach management guidelines	**Allan Williams**	**2**	**externo**
25	Wetland management guidelines	**Nora Kovats**	**2**	**externo**
26	Impact of marinas on the coast and related legislation	**Aysen Ergin**	**2**	**externo**
27	Toursim in the coastal management and legislation	**Luigi Bruzzi**	**1**	**externo**
		Angel del Valls	**1**	**UCA**
28	Urban planning and legislation	**Rafael Montejo**	**1,5**	**externo**
		Angel del Valls	**0,5**	**UCA**
29	Microbial potential for the natural attenuation of contaminants in the coastal areas and its application in bioremediation	**Inmaculada Vallejo**	**2**	**UCA**
30	Models for aquaculture sitting	**Rune Rosland**	**2**	**externo**
31	Alien Species	**Erkki Lepakoski**	**2**	**externo**
32	Marine reserves : rationale, case studies and scientific monitoring	**Angel Luque**	**1**	**externo**

		Angel del Valls	**1**	**UCA**
33	General and biological tools for coastal management	**Mercedes Conradi**	**1**	**externo**
		Inmaculada Riba	**1**	**UCA**
34	Marine Renewable Energy	**Cristina Huertas**	**1,5**	**externo**
		Angel del Valls	**0,5**	**UCA**
35	Modeling physical-biological processes	**Bertrand Millet**	**2**	**externo**
36	Techniques for the diagnosis on ICZM process	**Oscar Aguilar**	**1**	**externo**
		Angel del Valls	**1**	**UCA**
37	Water for Food and Rural Development	**Maria del Mar Delgado**	**2**	**externo**
38	Simulation tools for the management of different processes in aquatic ecosystems	**Pablo Lara**	**2**	**UCA**
39	Integrated coastal zone management	**Filomena Cardoso**	**2**	**externo**
40	Global warming and the role of the littoral ecosystems	**Antonio Rivas**	**2**	**UCA**
41	Complex satellite monitoring of coastal zones	**Nicolay Plink**	**2**	**externo**
42	Research activities	**Inmaculada Riba**	**2**	**UCA**
43	Scientific writing	**Laura Martín**	**2**	**UCA**
44	Networking skills	**Laura Martín**	**2**	**UCA**
45	Fieldwork skills	**Laura Martín**	**2**	**UCA**
46	Laboratory skills	**Inmaculada Riba**	**2**	**UCA**
47	Research skills	**Angel del Valls**	**2**	**UCA**
48	Postgraduate skills: IT tools	**Laura Martín**	**2**	**UCA**
49	Scientific diving in coastal research	**Angel Luque**	**1,5**	**externo**
		Inmaculada Riba	**1,5**	**UCA**
		Angel del Valls	**1**	**UCA**
		TOTAL	**100**	

ANEXOS : APARTADO 6.2

Nombre : 6.2.- Otros Recursos Humanos.pdf

HASH MD5 : c12d1360a335c9619daf836e7c96920c

Tamaño : 42946

6.2.- OTROS RECURSOS HUMANOS

Personal de administración y servicios: Se utilizarán todos los recursos de las universidades que conforman el consorcio. En la actualidad la **Universidad de Cádiz** cuenta con una unidad coordinada por un Jefe de Gestión que realiza el apoyo a los estudios de doctorado. Esta unidad debe prestar apoyo a la Comisión de Posgrado de la Universidad y a los procesos que ésta deba asumir, y ocuparse fundamentalmente de conocer en cada momento la definición de la oferta formativa de Másteres Oficiales de la Universidad de Cádiz, de garantizar su promoción y difusión en diferentes foros, de gestionar administrativamente los procesos de admisión y de formalizar las admisiones de alumnos, del seguimiento de toda la normativa e información referida a los Estudios Oficiales de Posgrado, de la vigilancia de los indicadores de cada programa, del apoyo para la coordinación de las peticiones de ayuda que se formulen desde la universidad, del seguimiento de los ingresos y gastos tanto de la Universidad en su conjunto como de cada programa, y de contar con información sobre los modelos de gestión del posgrado en otras universidades. La Unidad debe recopilar las guías académicas de titulación y, bajo supervisión de la Comisión de Estudios de Posgrado, contar con procedimientos para contrastar que su contenido es correcto y completo. Los Jefes de Gestión de los Departamentos cumplirán funciones de apoyo a los coordinadores de Módulos y de Cursos de los programas de posgrado.

El Gabinete de Ordenación Académica será responsable de coordinar el proceso de Planificación Docente. El Área de Atención al Alumno aglutina una serie importante de funciones académicas, entre ellas las recogidas en la aplicación de gestión de alumnos (alta de asignaturas, matrícula, gestión de actas…), o la de gestión de títulos. Una vez que se determinen las políticas en materia de becas para posgrado también será necesario trabajar coordinadamente con la Unidad de Becas. La Unidad trabajará conjuntamente con la Oficina de Relaciones Internacionales para gestionar los intercambios y la promoción de programas en Europa y en Marruecos e Iberoamérica, contando con los coordinadores Erasmus de los centros para gestionar los intercambios de alumnos y profesores.

En especial en el caso del Master Erasmus Mundos se contará con el apoyo que se menciona a continuación:

- Oficina de Erasmus Mundus (Campus de Puerto Real)

Nombre: CARMEN MARÍA LÓPEZ VALLE

Cargo: Técnico de Proyectos de Educación Erasmus Mundus

Email: agua.mundus@uca.es

ANEXOS : APARTADO 7

Nombre : 7.1.- Justificación disponibles.pdf

HASH MD5 : 61b6962179db7e48c06315d6a8ec7972

Tamaño : 46214

Se utilizarán todos los recursos de la Universidad de Cádiz y demás universidades del Consorcio. En la actualidad la Universidad de Cádiz cuenta con una unidad coordinada por un Jefe de Gestión que realiza el apoyo a los estudios de máster. Esta unidad debe prestar apoyo a la Comisión de Posgrado de la Universidad y a los procesos que esta deba asumir, y ocuparse fundamentalmente de conocer en cada momento la definición de la oferta formativa de Posgrados Oficiales de la Universidad de Cádiz de garantizar su promoción y difusión en diferentes foros, de gestionar administrativamente los procesos de admisión y de formalizar las admisiones de alumnos, del seguimiento de toda la normativa e información referida a los Estudios Oficiales de Posgrado, de la vigilancia de los indicadores de cada programa, del apoyo para la coordinación de las peticiones de ayuda que se formulen desde la universidad, del seguimiento de los ingresos y gastos tanto de la Universidad en su conjunto como de cada programa, y de contar con información sobre los modelos de gestión del posgrado en otras universidades. La Unidad debe recopilar las guías académicas de titulación y, bajo supervisión de la Comisión de Estudios de Posgrado, contar con procedimientos para contrastar que su contenido es correcto y completo

Debe ser además la unidad administrativa que coordine con las demás unidades todas las decisiones y procesos referidos a los Estudios Oficiales de Posgrado: el alta de los estudios en el programa de gestión de alumnos y la codificación de los cursos, la puesta a punto del proceso de matrícula como estudios oficiales, la planificación docente de las asignaturas con la antelación suficiente, lo que incluye actualizar la oferta de estudios en los programas, la coordinación con las Unidades Administrativas de Campus y Centros y de Departamentos, la conexión con la gestión de títulos, o la conexión con el servicio de Campus Virtual, o la Biblioteca, así como con el área de Gestión Económica, o la Oficina de Relaciones Internacionales, entre otros.

Infraestructuras y equipamientos disponibles para el programa (TIC, laboratorios, bibliotecas y recursos documentales, etc.)

Se hará utilización de todos los recursos que ofrece la Universidad de Cádiz, y el resto de las universidades que participan en el consorcio. Todas las universidades del consorcio ofrecen excelentes facilidades a los estudiantes europeos e internacionales. Esta es una condición sin qua non para la estancia anual de los estudiantes.

Respecto a la Oficina de Relaciones Internacionales de nuestra Universidad de Cádiz posee algunos valores añadidos que son:

- Oficina de Relaciones Internacionales. Aulario La Bomba, Campus de Cádiz. Horario: 09.00 - 14.00h

- Oficina Erasmus Mundus. Campus de Puerto Real. Aulario Norte, Polígono San Pedro s/n. Puerto Real 11519. Tlf: 956 01 67 64. Horario: 09.00 - 14.00h

- - Oficina y servicio general de deportes

- Dependencia directa del vicerrectorado de ordenación académica e innovación y de la dirección general de EEES que le confiere una mayor experiencia en la internacionalización y su apliación a la calida docente en nuestra Universidad.

- Alojamiento: la universidad posee varias residencias destinadas al alojamiento de estudiantes, además de una oficina de alojamiento. En la página principal de la universidad se pueden descargar las solicitudes y se pueden consultar los precios.Cuidado y consejo: la universidad dispone de un servicio de clínica médica donde los estudiantes pueden encontrar consejo médico, psicólogos, ginecólogos y medicina general. - Además cuenta con el CSLM, Centro Superior de Lenguas Modernas donde se ofertan cursos en diversas lenguas como se ha descrito anteriormente. Programa de orientación: se establecen dos días al comienzo del curso para ofrecer orientación a los alumnos.

Todos los cursos impartidos en Programas Oficiales de Posgrado contarán con la posibilidad de emplear el "Campus Virtual" de la Universidad de Cádiz como apoyo a la enseñanza. La opción de reducir la componente presencial por debajo de 7 horas por crédito ECTS estará condicionada a un proceso de preparación del curso y de evaluación de los materiales elaborados y de la metodología a seguir, requiriendo una autorización expresa del Vicerrectorado de Ordenación Académica e Innovación Educativa. El "Campus Virtual" ofrece la opción de un sistema de Tutorías Electrónicas. Los alumnos contarán, como alumnos oficiales, con cuenta de correo y acceso en red al sistema de información sobre su expediente.

Asimismo los alumnos contarán con acceso a todos los recursos de información que ofrece la Biblioteca de la Universidad de Cádiz, una de las dos bibliotecas universitarias en Andalucía que cuenta con el sello de acreditación de la ANECA. La Biblioteca dispone en el momento de cumplimentar esta memoria de más de 530.000 volúmenes y 2.146 puestos de lectura, así como de 18.643 revistas electrónicas, 164.264 monografías electrónicas, y acceso a 153 bases de datos de información. Mediante un sistema de claves puede facilitarse el acceso a los recursos electrónicos de la biblioteca desde fuera de los locales de la UCA.

Finalmente, indicar la disponibilidad de acceso inalámbrico a conexión de red en los locales de la Universidad de Cádiz, y que en este momento se cuenta con un sistema de préstamos de 200 ordenadores portátiles en los espacios de biblioteca.

En cualquier caso, el centro responsable, en este caso la Facultad de Ciencias del Mar y Ambientales facilitará todos los recursos posibles para la correcta gestión y desarrollo del máster. También, y de forma interna, se solicitan las ayudas que concede la Universidad de Cádiz, como por ejemplo, el proyecto Europa.

ANEXOS : APARTADO 8

Nombre : 8.1.- Estimación de valores cuantitativos.pdf

HASH MD5 : 9db98ce06adb0608e47e21f75dc52be9

Tamaño : 18131

8.1.- ESTIMACIÓN DE VALORES CUANTITATIVOS

El programa de máster se iniciará durante el curso 2012/13, por lo que no s epueden adjuntar valores referentes a la tasa de fracaso, tasa de empleabilidad, etc.

ANEXOS : APARTADO 10

Nombre : Calendario WACOMA 2012-13.pdf

HASH MD5 : 18ed69d4ba398319cd5085bff50eb337

Tamaño : 66022

ERASMUS MUNDUS Master in Water & Coastal Management			Créditos ECTS	
Core Modules. University of Bologna (Italy)		**HORARIO**		
1er curso académico				
Modulos obligatorios				
1	Bioassessment of freshwater ecoystems	1er semestre	6	UNIVERSIDAD DE BOLOGNA (Italia)
2	The hydrological Cycle and Climate change	1er semestre	6	UNIVERSIDAD DE BOLOGNA (Italia)
3	Environmental economics and resource management in water policy making	1er semestre	6	UNIVERSIDAD DE BOLOGNA (Italia)
4	Planning and decision making in water basins and coastal systems	1er semestre	6	UNIVERSIDAD DE BOLOGNA (Italia)
5	Environmental Impact and risk assessment for the society in water and coastal manag	1er semestre	6	UNIVERSIDAD DE BOLOGNA (Italia)
		TOTAL	30	
Modulos opcionales				
1	Environments	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
2	Chemical and ecotoxicological guidelines for the management of dredged material: re	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
3	Sensitive tools for the assessment of Environmental and Human risk	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
4	Environmental Assessment and management of accidental spill in fresh water ecosyst	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
5	Environmental Assessment and management of accidental spill in littoral ecosystems	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
6	Tools for hazard assessment of chemical and complex environmental media	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
7	Eutrophication and Hypoxia	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
8	Bioavailability and bioaccumulation: Keys for the quality of ecosystems	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
9	Biomarkers	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
10	Integrated tools to determine environmental quality	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
11	Distinct tools for freshwater quality determination and management	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
12	Seagrass management tools in human impacted areas	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
13	Tools for general environmetnal quality assessment	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
14	General methodology to assess coastal area quality	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
15	Basis for sediments and dredged material management	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
16	Integrative assessment of sediment quality in aquatic ecosystems	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
17	Water quality in mining areas	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
18	Scientific and technical strategies for CO2 mitigation in coastal ecosystems	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
19	Integrated concepts for water and coastal management	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
20	Coastal flooding hazard	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
21	The marine environment protection European Directive: a recent proposal for management of environmental quality in coastal ecosystems	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
22	Conflct Resolution	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
23	Communication Science	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
24	Beach management guidelines	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
25	Wetland management guidelines	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
26	Impact of marinas on the coast and related legislation	2º semestre	2	UNIVERSIDAD DE CADIZ (España)
27	Toursim in the coastal management and legislation	2º semestre	2	UNIVERSIDAD DE CADIZ (España)

28	Urban planning and legislation	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
29	Microbial potential for the natural attenuation of contaminants in the coastal areas and its application in bioremediation	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
30	Models for aquaculture sitting	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
31	Alien Species	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
32	Marine reserves : rationale, case studies and scientific monitoring	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
33	General and biological tools for coastal management	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
34	Marine Renewable Energy	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
35	Modeling physical-biological processes	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
36	Techniques for the diagnosis on ICZM process	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
37	Water for Food and Rural Development	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
38	Simulation tools for the management of different processes in aquatic ecosystems	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
39	Integrated coastal zone management	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
40	Global warming and the role of the littoral ecosystems	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
41	Complex satellite monitoring of coastal zones	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
42	Research activities	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
43	Scientific writing	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
44	Networking skills	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
45	Fieldwork skills	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
46	Laboratory skills	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
47	Research skills	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
48	Postgraduate skills: IT tools	**2º semestre**	**2**	**UNIVERSIDAD DE CADIZ (España)**
49	Scientific diving in coastal research	**2º semestre**	**4**	**UNIVERSIDAD DE CADIZ (España)**
		TOTAL	**100**	
2º curso académico				
	Periodo de investigación	**2º curso académico**	**60 ECTS**	**Universidad de Cádiz, y/o Universidad de Algarve, y/o Universidad de Bolonia**