

Présidence

Vice-Présidente de la CFVU
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Sylvie MONSINJON

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CFVU - URN
4 septembre 2026
Délibération n°CFVU-2026-38

À l'ouverture de la réunion, le quorum est atteint par 21 votants, dont 3 membres représentés.

Offre de formation : Nouvelle formation rentrée 2027 – Master Gestion de l'Environnement parcours SMAC²

- Vu la demande de création de parcours en annexe
- Vu la note portant sur la création du parcours international de Master conjoint « Sustainable Maritime Management and Coastal Conservation (SMAC²) » en annexe
- Vu la convention en annexe
- Vu le tableau des enseignements en annexe

Approbation de l'offre de nouvelle formation pour la rentrée 2027 : SMAC²

Pour	21
Contre	0
Abstention	0

La CFVU approuve l'offre de nouvelle formation pour la rentrée 2027 : SMAC².

Le Président de l'Université de Rouen Normandie

Franck LE DERF



Université de Rouen Normandie

Présidence

Cindy Carrein-Lerouge

Rouen, le 28 août 2026

Le président de l'Université de Rouen
Normandie

À

Mesdames et messieurs les membres de la
CFVU

NOTE À L'ATTENTION DE LA COMMISSION DE LA FORMATION ET DE LA VIE UNIVERSITAIRE (CFVU)

Objet : Création du parcours international de Master conjoint « Sustainable Maritime Management and Coastal Conservation (SMAC²) » au sein de la mention Gestion de l'Environnement

1. Objet de la note

La présente note a pour objet de soumettre à l'approbation de la Commission de la Formation et de la Vie Universitaire (CFVU) la création du parcours international Sustainable Maritime Management and Coastal Conservation (SMAC²), rattaché à la mention de Master Gestion de l'Environnement de l'Université de Rouen Normandie.

Ce parcours est développé dans le cadre d'un diplôme conjoint européen réunissant l'Université de Rouen Normandie (URN, France), l'Université d'Oviedo (UNIOVI, Espagne) et la Munster Technological University (MTU, Irlande), partenaires de l'alliance européenne INGENIUM ; l'URN en étant le porteur (Imen Turki : responsable pédagogique et David Leroy : responsable qualité assurance).

2. Contexte et intérêt stratégique

Le développement du parcours SMAC² s'inscrit pleinement dans la stratégie d'internationalisation de l'offre de formation de l'Université de Rouen Normandie et dans les objectifs poursuivis par l'alliance européenne INGENIUM.

Ce projet répond aux enjeux européens liés à la transition écologique, à la résilience des territoires littoraux et à la gestion durable des espaces maritimes. Il vise à former des diplômés capables de répondre aux défis environnementaux, climatiques et sociétaux auxquels sont confrontés les territoires côtiers grâce à une approche pluridisciplinaire associant sciences de l'environnement, géosciences, gestion des risques, ingénierie et gouvernance des espaces maritimes.

La création de ce diplôme conjoint permettra notamment de :

- renforcer la visibilité internationale de l'Université de Rouen Normandie ;
- développer une offre de formation attractive à destination d'étudiants internationaux ;

- consolider les coopérations académiques avec deux établissements européens partenaires ;
- contribuer aux objectifs de l'alliance européenne INGENIUM en matière de formations conjointes.

3. Présentation du programme

Le master conjoint Sustainable Management in Coastal Conservation (SMAC²) est un programme de deux ans (quatre semestres, totalisant 120 crédits ECTS) dispensé intégralement en anglais. Il conduit à la délivrance d'un diplôme conjoint reconnu par les trois universités partenaires. Ce diplôme de master conjoint a fait l'objet d'une évaluation selon l'approche européenne, et a obtenu une accréditation de trois ans par l'HCERES.

Le public visé est constitué d'étudiants titulaires d'une licence (ou équivalent) dans les domaines de l'ingénierie civile et côtière, géosciences, biologie et géologie. L'objectif principal est de former des spécialistes capables d'analyser et de gérer des environnements marins et côtiers dans une perspective durable.

La capacité d'accueil prévisionnelle est comprise entre 8 et 15 étudiants par promotion.

4. Organisation académique et mobilité

Le parcours repose sur une mobilité obligatoire entre les trois établissements partenaires.

L'organisation pédagogique est la suivante :

- Semestre 1 : Université d'Oviedo (Espagne) : porte sur les bases scientifiques et conceptuelles nécessaires à la compréhension des environnements marins et côtiers ;
- Semestre 2 : Université Technologique de Munster (Irlande) : traite des dimensions appliquées et technologiques de la gestion durable des zones côtières et maritimes ;
- Semestre 3 : Université de Rouen Normandie (France) : consacré à la compréhension scientifique et analytique des étudiants des processus côtiers, des risques et des dynamiques environnementales ;
- Semestre 4 : Réalisation d'un stage obligatoire et d'un mémoire de master, effectués dans un établissement ou une entreprise du choix de l'étudiant parmi les pays partenaires.

Les étudiants français seront inscrits à l'Université de Rouen Normandie dès le premier semestre, tandis que les étudiants internationaux seront inscrits à l'URN à partir du troisième semestre, conformément au modèle de mobilité Erasmus+ classique.

Tous les enseignements du semestre rouennais seront mutualisés avec des unités existantes dans les parcours de la mention Gestion de l'Environnement, traduits et dispensés en anglais. Aucun nouvel enseignement ne sera créé spécifiquement pour ce parcours.

5. Gouvernance et pilotage

Le pilotage du programme est assuré par un Comité académique conjoint (Joint Academic Committee – JAC), composé de représentants des trois universités partenaires. Ce comité est chargé de la sélection conjointe des candidats, du suivi de la qualité académique, de la coordination des mobilités étudiantes et enseignantes, des jurys de délibération, ainsi que de l'harmonisation des procédures pédagogiques et administratives. Tous les documents de suivi

(comptes rendus, rapports qualité, modifications de maquette) seront archivés sur la plateforme numérique partagée de l'alliance INGENIUM.

6. Modalités administratives et financières

Les admissions seront gérées via la plateforme de sélection d'INGENIUM. Les candidats devront être titulaires d'un diplôme de niveau licence dans un domaine pertinent, justifier d'un niveau d'anglais B2 minimum (certifié) et présenter un dossier académique complet assorti d'un entretien de motivation. La sélection se fera sur dossier et entretien selon une grille d'évaluation commune. Les étudiants bénéficieront du statut d'inscription conjointe dans les trois établissements partenaires.

Les étudiants acquitteront leurs droits d'inscription auprès de l'université du premier semestre, à savoir UNIOVI (Espagne). Des frais administratifs limités pourront être appliqués par les autres établissements conformément à leurs réglementations nationales. À l'Université de Rouen Normandie, les étudiants s'acquitteront de la CVEC ainsi que des frais d'inscription correspondant au niveau Master.

7. Calendrier prévisionnel

Les principales étapes du projet sont les suivantes :

- Signature de la convention entre les trois établissements partenaires (réalisée) ;
- Obtention d'une accréditation selon l'approche européenne de 3ans par l'HCERES (procédure European Approach for Quality Assurance of Joint Programmes) ;
- Ouverture de la campagne internationale de recrutement au printemps 2027
- Accueil de la première promotion à l'Université d'Oviedo à la rentrée universitaire 2027-2028
- Accueil des étudiants à l'URN au semestre 3, au cours de l'année universitaire 2028-2029.

Création d'un parcours

Au sein d'une mention déjà existante

Composante : UFR ST

Type de diplôme :

- Licence
- Licence professionnelle
- Master X
- Autre (précisez) :

Mention de rattachement : Gestion de l'environnement

Intitulé du parcours souhaité *(une attention particulière doit être portée à l'intitulé, il figurera sur le parchemin remis en fin de cursus aux diplômés)* :

Sustainable Maritime Management and Coastal Conservation (SMAC²)

Responsable pédagogique du parcours :

Imen Turki et David Leroy

Etablissement partenaire ou co-accrédité :

Université d'OVIEDO (UNIOVI, Espagne)

Université technologique du Munster (MTU, Irlande)

Lieu(x) d'enseignement :

S1 : OVIEDO

S2 : MTU

S3 : URN

S4 : stage

Accessibilité de la formation :

- Formation initiale classique X
- Formation en alternance sous contrat (apprentissage ou contrat de professionnalisation)

- Formation continue

Modalité d'enseignement :

- Présentiel X
- Hybride
- A distance
- En comodalité

Démarche d'identification du besoin auquel répond ce parcours

Ce projet répond aux enjeux européens liés à la transition écologique, à la résilience des territoires littoraux et à la gestion durable des espaces maritimes. Il vise à former des diplômés capables de répondre aux défis environnementaux, climatiques et sociétaux auxquels sont confrontés les territoires côtiers grâce à une approche pluridisciplinaire associant sciences de l'environnement, géosciences, gestion des risques, ingénierie et gouvernance des espaces maritimes.

La création de ce diplôme conjoint permettra notamment de :

- renforcer la visibilité internationale de l'Université de Rouen Normandie ;
- développer une offre de formation attractive à destination d'étudiants internationaux ;
- consolider les coopérations académiques avec deux établissements européens partenaires ;
- contribuer aux objectifs de l'alliance européenne INGENIUM en matière de formations conjointes.

Spécificité de la formation (à préciser le cas échéant) :

Exemples : délocalisation totale ; prise en charge totale ou partiel par un partenaire ; projet de création d'un autre parcours en complément ; projet d'ouverture à l'international ; réponse à un appel à projet ...

Le master conjoint *Sustainable Management in Coastal Conservation (SMAC²)* est un programme de deux ans (quatre semestres, totalisant 120 crédits ECTS) dispensé intégralement en anglais. Il conduit à la délivrance d'un diplôme conjoint reconnu par les trois universités partenaires. Ce diplôme de master conjoint a fait l'objet d'une évaluation selon l'approche européenne, et a obtenu une accréditation de trois ans par l'HCERES.

																			MODALITES DE CONTRÔLE DES CONNAISSANCES																								
Effectif attendu (nouvelle formation)										0		Normes groupes							CM	TD	TD(L)	TP	Mise en place de la seconde chance : Non																				
												Présentiel :							400	36	24	18																					
Effectif au 15/01/2026										0		A distance :							400	36	24	18																					
												Accompagnement :							400	36	24	18																					
INFORMATIONS																																											
Champ disciplinaire : Chimie, Biologie, Santé										Type de diplôme : Master																																	
Domaine de formation : Sciences, Technologies, Santé										Année de formation : 1ère année																																	
Composante : UFR Sciences et Techniques										Année universitaire : Année universitaire 2027-2028																																	
Intitulé de la mention : GESTION DE L'ENVIRONNEMENT parcours Sustainable Maritime Management in Coastal Conservation [SMAC ²]																																											
S1 - SMAC ²																			VOLUMES HORAIRES										T O T A L	Volume horaire étudiant (Stage, projet tutoré, mémoire, ...) A déclarer en heures (1 semaine = 35h)	T O T A L	ECTS	COEF	Contrôle continu				Examen terminal		Session de rattrapage			
																			Heures présentiellees				Heures distancielles				CM	TD						TP	Total	Mutualisation(s)							
																			CM	TD	TP	Total	CM	TD	TP	Total										CM	TD	TP					
																																							CM	TD	TP		
⬇	Nature	Intitulé de l'élément constitutif	Langue Enseignement	NC	Comodalité	CM	TD	TP	Total	CM	TD	TP	Total	CM	TD	TP	Total	CM	TD	TP	0,00	0,00	0,00	30	30																		
	UE1	Partenariat Ingénium	-	C	Non	0,00	0,00	0,00	0,00					0,00	0,00	0,00	0,00																										
	Obligatoire	Semestre au sein de l'université d'Oviedo - UNIOVI (Espagne)	Anglais	C	Non				0,00	1	1	1		0,00	1	1	1	0,00																									
total	TOTAL VOLUME HORAIRE ENSEIGNEMENT					0	0,00	0,00	0,00	0,00	0	0	0	0,00	0,00	0,00	0,00	0	0	0	0,00	0,00	0,00	30	30																		

																MODALITES DE CONTRÔLE DES CONNAISSANCES																			
Effectif attendu (nouvelle formation)																0		Normes groupes				CM	TD	TD(L)	TP	Mise en place de la seconde chance : Non									
																		Présentiel :				400	36	24	18										
Effectif au 15/01/2026																0		A distance :				400	36	24	18										
																		Accompagnement :				400	36	24	18										
INFORMATIONS																																			
Champ disciplinaire : Chimie, Biologie, Santé												Type de diplôme : Master																							
Domaine de formation : Sciences, Technologies, Santé												Année de formation : 1ère année																							
Composante : UFR Sciences et Techniques												Année universitaire : Année universitaire 2027-2028																							
Intitulé de la mention : GESTION DE L'ENVIRONNEMENT parcours Sustainable Maritime Management in Coastal Conservation [SMAC ²]																																			

Effectif attendu (nouvelle formation)	10	Normes groupes	CM	TD	TD(L)	TP
		Présentiel :	400	36	24	18
Effectif au 15/01/2026	0	A distance :	400	36	24	18
		Accompagnement :	400	36	24	18

INFORMATIONS	
Champ disciplinaire : Chimie, Biologie, Santé	Type de diplôme : Master
Domaine de formation : Sciences, Technologies, Santé	Année de formation : 2ème année
Composante : UFR Sciences et Techniques	Année universitaire : Année universitaire 2027-2028
Intitulé de la mention : GESTION DE L'ENVIRONNEMENT parcours Sustainable Maritime Management in Coastal Conservation [SMAC ²]	

S3 - SMAC ²					VOLUMES HORAIRES												T O T A L	Volume horaire étudiant (Stage, projet tutoré, mémoire, ...) A déclarer en heures (1 semaine = 35h)	T O T A L	ECTS	COEF	Contrôle continu				Examen terminal		Session de rattrapage		
					Heures présentesielles				Heures distancielles																					
					CM	TD	TP	Total	Mutualisation(s)			CM	TD	TP	Total	Mutualisation(s)						CM	TD	TP	CM/TD	TP / Stage / Projet / Mémoire		Epreuves Ecrites	Epreuves Orales	Epreuves Ecrites
⬇	Nature	Intitulé de l'élément constitutif	Langue Enseignement	NC	Comodalité	CM	TD	TP	Total	CM	TD	TP	Total	CM	TD	TP														
	UE1	Hydro-climate variability	-	C	Non	13,00	0,00	19,00	32,00	0,00	0,00	0,00	0,00	0,00	1	1	1	32,00	0,00	32,00	3	3			40%		60%		100%	
	Obligatoire	Hydro-climate variability	Anglais	C	Non	13		19	32,00	2	1	2	0,00				0,00	1	1	32,00										
	UE2	Coastal Modelling	-	C	Non	22,00	0,00	26,00	48,00	0,00	0,00	0,00	0,00	0,00	1	1	1	48,00	0,00	48,00	5	5			60%		40%		100%	
	Obligatoire	Coastal Modelling	Anglais	C	Non	22		26	48,00	2	1	2	0,00				0,00	1	1	48,00										
	UE3	Remote sensing	-	C	Non	15,00	0,00	25,00	40,00	0,00	0,00	0,00	0,00	0,00	1	1	1	40,00	35,00	75,00	4	4								
	Obligatoire	Satellite-based Coastal Observations 1	Anglais	C	Non	10		6	16,00	4	1	4	0,00				0,00	1	1	16,00										
INGEN	Obligatoire	Satellite-based Coastal Observations 2	Anglais	C	Non	5		19	24,00	1	1	1	0,00				0,00	1	1	24,00				50%		50%		100%		
	Projet Tutoré	Tutored project	Anglais	C	Non				0,00	1	1	1	0,00				0,00	1	1	0,00	35	35,00	1,5	1,5			50%	50%	100%	
	UE4	Erosion and biodiversity	-	C	Non	16,00	8,00	0,00	24,00	0,00	0,00	0,00	0,00	0,00	1	1	1	24,00	0,00	24,00	3	3					50%	50%	100%	
	Obligatoire	Erosion and biodiversity	Anglais	C	Non	16	8		24,00	2	2	1	0,00				0,00	1	1	24,00										
	UE5	Biogeochemical cycles	-	C	Non	18,00	12,00	0,00	30,00	0,00	0,00	0,00	0,00	0,00	1	1	1	30,00	0,00	30,00	3	3	60%	40%				100%		
	Obligatoire	Biogeochemical cycles	Anglais	C	Non	18	12		30,00	2	2	1	0,00				0,00	1	1	30,00										
	UE6	Sustainable development	-	C	Non	16,00	8,00	0,00	24,00	0,00	0,00	0,00	0,00	0,00	1	1	1	24,00	0,00	24,00	3	3	50%				50%		100%	
	Obligatoire	Sustainable development	Anglais	C	Non	16	8		24,00	5	5	1	0,00				0,00	1	1	24,00										
	UE7	Contaminants	-	C	Non	32,00	32,00	0,00	64,00	0,00	0,00	0,00	0,00	0,00	1	1	1	64,00	0,00	64,00	3	3					100%		100%	
	Obligatoire	Contaminants	Anglais	C	Non	12	12		24,00	4	4	1	0,00				0,00	1	1	24,00										
	UE8	Coastal geosystem	-	C	Non	20,00	20,00	0,00	40,00	0,00	0,00	0,00	0,00	0,00	1	1	1	40,00	0,00	40,00	3	3	50%				50%		100%	
	Obligatoire	Coastal geosystem	Anglais	C	Non	20	20		40,00	2	2	1	0,00				0,00	1	1		40,00									
	UE9	Capacity development activities	-	C	Non	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1	1	1	0,00	0,00	0,00	3	3			30%	70%			100%	
	Obligatoire	Capacity development activities	Français	C	Non				0,00	1	1	1	0,00				0,00	1	1	0,00	75	75,00								
	TOTAL VOLUME HORAIRE ENSEIGNEMENT					0	152,00	80,00	70,00	302,00	8	5	3	0,00	0,00	0,00	0,00	0	0	0	302,00	35,00	337,00	30	30					

Effectif attendu (nouvelle formation)														0				Normes groupes				CM		TD		TD(L)		TP																			
																		Présentiel :				400		36		24		18																			
Effectif au 15/01/2026														0				A distance :				400		36		24		18																			
																		Accompagnement :				400		36		24		18																			
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Champ disciplinaire : Chimie, Biologie, Santé														Type de diplôme : Master																																	
Domaine de formation : Sciences, Technologies, Santé														Année de formation : 2ème année																																	
Composante : UFR Sciences et Techniques														Année universitaire : Année universitaire 2027-2028																																	
Intitulé de la mention : GESTION DE L'ENVIRONNEMENT parcours Sustainable Maritime Management in Coastal Conservation [SMAC ²]																																															
MODALITES DE CONTRÔLE DES CONNAISSANCES																																															
Mise en place de la seconde chance : Non																																															
Dispositions particulières :																																															
S4 - SMAC ²														VOLUMES HORAIRES														Volume horaire étudiant (Stage, projet tutoré, mémoire, ...) A déclarer en heures (1 semaine = 35h)		TOTAL		ECTS		COEF		Contrôle continu				Examen terminal				Session de rattrapage			
														Heures présentiellees						Heures distancielles						TOTAL																					
														CM		TD		TP		Total		Mutualisation(s)				CM										TD		TP		Total		Mutualisation(s)				CM	



INGENIUM
European University

Agreement to implement a Joint Master Program in Sustainable Maritime Management and Coastal Conservation:

SMaC²

Call: ERASMUS-EDU-2022-EUR-UNIV (EUROPEAN UNIVERSITIES)
Topic: ERASMUS-EDU-2022-EUR-UNIV-2

Proposal number: 101090042
Proposal acronym: INGENIUM

Project duration: from 1 January 2023
to 31 December 2026

COORDINATOR
University of Rouen, Normandy (URN), France

PARTNERS
Munster Technological University (MTU), Ireland
University of Oviedo (UNIOVI), Spain

Project URL: <https://ingenium-university.eu/>

Co- Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

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The Cooperation Agreement

1. Preamble

The University of Rouen, Normandy (URN), Munster Technological University (MTU) and the University of Oviedo (UNIOVI) acting within the framework of the **INGENIUM EUROPEAN UNIVERSITY ALLIANCE** and recognizing the importance of academic cooperation for the development of higher education, hereby enter into this Agreement to implement a **Joint Master Program in Sustainable Maritime Management in Coastal Conservation** (herein after referred to as “**SMaC²** Program”).

SMaC² master programme will be jointly organised by three partners: URN, MTU and UNIOVI, accredited higher education institutions, recognised by the home country, accredited following an external evaluation process carried out by a higher education quality assurance agency registered in the European Register for Quality Assurance in Higher Education. The partners already have accredited national and official Master programmes in **Marine Conservation, Marine Resources, Global Sustainability, Maritime Management and Environmental Science**.

The aforementioned three partners will act as degree awarding institutions, and they will be supported by the other 7 remaining partners of the INGENIUM European Universities Alliance, which will support the promotion, dissemination and continuous improvement of the programme, in line with INGENIUM's objectives as outlined in its Mission Statement. The INGENIUM Academic Committee, including representatives from all universities, will also provide support in the implementation of the programme, and explore opportunities for direct involvement of other INGENIUM students.

The Programme aims to offer students an advanced, interdisciplinary education that combines expertise in sustainable management in coastal conservation, enabling them to meet the challenges and demands of an evolving global industry. The development and delivery of the Program will be in full compliance with the European Approach for Quality Assurance of Joint Programmes and the European Standards and Guidelines for Quality Assurance (ESGs).

The programme has been designed taking into account the criteria for the European Degree Label approved by the Council of the European Union. As the lead partner, the University of Rouen Normandy is in charge of the process of accreditation of this programme according to the European Approach criteria.

The partner institutions affirm their shared commitment to the fundamental values of the European Higher Education Area. The SMAC² programme is founded on and promotes the principles of academic freedom, institutional autonomy, student and staff

participation in governance, respect for democratic principles and the rule of law, and respect for human rights and fundamental freedoms as enshrined in the European Charter for Fundamental Rights and the European Convention on Human Rights.

The consortium is committed to fostering diversity, equity, and inclusion in all aspects of the programme, ensuring wide participation and adopting tailored measures to support students and staff with fewer opportunities. The programme's governance, policies, and procedures are designed to reflect these democratic values and to promote active citizenship and social responsibility among its graduates.

In line with its thematic focus on sustainability and coastal conservation, the consortium commits to implementing measures to minimise the environmental footprint of the programme's activities, in alignment with the European Green Deal and the MSCA Green Charter. The programme's commitment to environmental sustainability extends beyond its curriculum to its operational practices.

The programme has been designed to meet the full set of criteria for the European Degree Label as defined in the Annex to the EU Council Recommendation on a European degree. The consortium will apply for the European Degree Label upon successful completion of the accreditation process, positioning SMAC² as a flagship joint programme of the INGENIUM European University Alliance within the framework of Next INGENIUM.

2. Scope of Policy and Procedures of this agreement

URN

URN is permitted to engage in collaborative provision, including joint and double degree programmes, within the framework established by national regulations and institutional governance structures. URN's policy supports the development of partnerships that enhance internationalisation, strengthen academic cooperation, and promote mobility of students and staff, in line with its strategic objectives and international partnerships.

The scope of collaborative provision at URN includes:

- Joint or double degree programmes leading to one or more qualifications awarded by URN and one or more partner institutions;
- Collaborative course/module delivery, where elements of a study program are delivered jointly across institutions;
- Student and staff mobility schemes linked to jointly delivered programs;
- Research-led teaching collaborations that inform the curriculum and benefit from shared expertise and infrastructure.

Before launching any collaborative program or joint award, URN requires both internal and external validation to ensure academic quality, institutional capacity, and regulatory compliance. The internal validation process at URN involves approval by the Faculty Council, the Committee for Education and Student Life (*Commission de la formation et vie étudiante universitaire* – CFVU).

URN applies internal quality assurance procedures in accordance with French national regulations for higher education. The joint degree programme is subject to national accreditation by the French Ministry of Higher Education and Research, following an external evaluation conducted by HCERES (*Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur*), the independent public authority responsible for quality assurance in higher education and research in France.

UNIOVI

At UNIOVI, new programs must fulfill the requirements of the Spanish legislation regarding the organisation and structure of official university education: Royal Decree 822/2021 of 28 September, establishing the organisation of university education programmes and the quality assurance process thereof, and Decree 90/2009 of July 29, on official university education and centres in the Principality of Asturias. Official programs, recognized and accepted as higher education, must be revised and approved by the Spanish Ministry of Universities and included in the “*Registro de Universidades, Centros y Títulos*” (RUCT). This requires that the program is accredited by a higher education accreditation agency that is a member of the **European Association for Quality Assurance in Higher Education** (ENQA). The approval of new programs at the University of Oviedo requires many steps with the participation of several entities. The program of the **SMaC²** Master will have to be approved by Departments of Functional Biology and Department of organism and system, Faculty of biology, the University Council, the Regional Asturian Government, and the Spanish Ministry of Universities. The later step requires the previous accreditation of the program by an accreditation agency, a member of ENQA.

At UNIOVI, the Internal Quality Assurance (QA) procedures are managed by the Quality Technical Unit (UTCál). The aim of this unit is the promotion and continuous improvement of quality at the University of Oviedo through the evaluation of the degrees, the teaching and the services. The UTCál offers the following services: design and implement Internal Quality Assurance Systems for Bachelor's, Master's, and Doctoral degrees, monitor the development of the programs through student and academic staff satisfaction surveys, support the continuous improvement of the programs by promoting and managing improvement plans for the centres evaluated, participate in national and international forums for the exchange and dissemination of university quality improvement initiatives, and disseminate information prepared or available from the UTCál online.

The External Quality Assurance agency for higher education of SPAIN is called ANECA (Agencia Nacional de Evaluación y Acreditación). It is a member of the European Association for Quality Assurance in Higher Education (ENQA).)

MTU

Munster Technological University (MTU) is an established Technological University and autonomous Designated Awarding Body (DAB) and is authorised to engage in collaborative provision, including joint and double degree programmes, in accordance with Irish national legislation and its approved institutional governance and quality assurance framework. MTU operates within the Irish national quality assurance system overseen by Quality and Qualifications Ireland (QQI), the independent statutory body responsible for maintaining and promoting quality and accountability in higher education and training in Ireland.

MTU's academic provision is aligned with the National Framework of Qualifications (NFQ) and is subject to the Qualifications and Quality Assurance (Education and Training) Act 2012. All taught programmes and awards are developed, approved, monitored, and reviewed in accordance with QQI's Core Statutory Quality Assurance Guidelines and the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). QQI is a full member of the European Association for Quality Assurance in Higher Education (ENQA) and the European Quality Assurance Register for Higher Education (EQAR), ensuring compatibility with European quality assurance standards.

Within MTU, responsibility for internal quality assurance rests with the Academic Council, a statutory body, which governs academic standards, programme design, assessment regulations, and the awarding of credit and qualifications. The approval of new programmes and participation in joint awards requires formal validation through MTU's internal quality assurance procedures, including external peer review, and approval by Academic Council.

Assessment, progression, and award decisions at MTU are governed by the University's Policy Regulations for Modules and Programmes (Marks and Standards), which apply to all taught programmes at NFQ Levels 6–9. These regulations define assessment principles, grading scales, progression rules, reassessment arrangements, Recognition of Prior Learning (RPL), and the operation of Module Examination Boards and Progression and Awards Boards. External examiners are appointed in accordance with MTU and QQI requirements to ensure academic standards and comparability with national and international norms.

3. Description of the INGENIUM Partner Collaboration

This Interinstitutional Agreement for the joint master program **Sustainable Management in Coastal Conservation (SMaC²)** is established between:

- University of Rouen Normandy (URN), France, 1 rue Thomas Becket, 76821 Mont-Saint-Aignan Cedex, Represented by its President, Mr. Franck Lederf
- University of Oviedo (UNIOVI), Spain, San Francisco Street 3, 33003, Oviedo (Asturias), Represented by Rector Ignacio Villaverde Menéndez,
- Munster Technological University (MTU) Bishopstown, Cork, Ireland T12 P928

These Parties are members of the INGENIUM Alliance. All the remaining INGENIUM partner universities are committed to the promotion, dissemination, and continuous improvement of the programme.

3.1 Names and description of collaborative partners

University of Rouen Normandy (URN - public university) is a multidisciplinary higher education and research institution located in north-western France. As an *établissement public à caractère scientifique, culturel et professionnel (EPSCP)*, it is fully recognised and accredited by the French Ministry of Higher Education and Research under the provisions of the French Education Code (*Code de l'éducation*). URN awards nationally recognised qualifications at all levels of the European Higher Education Area (EHEA), including the Licence (Bachelor), Master, and Doctorate/PhD degrees, in line with the LMD (Bologna) framework and the use of the European Credit Transfer and Accumulation System (ECTS). With more than 30,000 students and seven campuses across the Normandy region, URN combines a wide disciplinary scope with recognised research excellence in health, sciences and technology, humanities, law, economics, and social sciences. The university has a strategic plan and annual operational priorities covering education, research, internationalisation, sustainability, digital transformation, and engagement with regional, national, and international stakeholders.

The University of Oviedo (**UNIOVI**) is the public institution of higher education and research of Asturias (Spain). With more than 410 years of history and 21 000 students, it has a complete range of 4-year Bachelor's degrees and 1 or 2-year Master's degrees adapted to the European Higher Education Area in all branches of knowledge. Also, bilingual itineraries, double degrees with international universities, and Erasmus Mundus and interuniversity Master's degrees and in collaboration with more than 250 companies. The University of Oviedo has a clear international vocation and belongs to the INGENIUM association, a strategic alliance of ten European universities that aims to provide

excellent, international, inclusive, and socially responsible education. Our goal is to educate professionals and citizens who can contribute to the well-being of society.

Munster Technological University (MTU) is a public technological university in Ireland, established in 2021 under the Technological Universities Act 2018, with campuses across the south of Ireland. MTU educates approximately 18,000 students across undergraduate and postgraduate programmes spanning engineering, science, computing, business, maritime and logistics studies, humanities, health sciences, and creative disciplines. The University places a strong emphasis on applied, industry-engaged education, research-informed teaching, and regional and international collaboration, and operates within Ireland's national quality assurance framework overseen by Quality and Qualifications Ireland (QQI). MTU is a degree-awarding institution aligned with the National Framework of Qualifications (NFQ) and the European Higher Education Area, and is an active member of the INGENIUM European University Alliance. MTU's contribution to the SMAC² Joint Master's programme is delivered through the National Maritime College of Ireland (NMCI), a constituent college of MTU and Ireland's national centre of excellence for maritime education and training, with established expertise in maritime operations, logistics, marine sustainability, and applied coastal and marine studies.

All universities engage to take part in the efficient implementation of SMAC² Master Program, and to cooperate, perform and fulfil, promptly and on time, all of its obligations under this Consortium Agreement as may be reasonably required from it and in a manner of good faith. Each Party undertakes to notify promptly any significant information, fact, problem or delay likely to affect SMAC² Master Program.

3.1.1 Joint programme design process

The SMAC² Joint Programme was initiated under the framework of the INGENIUM European University Call for Collaboration on the development of joint academic offers, launched in March 2025 (<https://ingenium-university.eu/iec-faculty/call-for-the-development-of-joint-academic-offers/>). This initiative invited higher education institutions within the INGENIUM Alliance to co-design innovative, internationally study programmes that foster mobility, interdisciplinarity, and flexible learning pathways across Europe. In response to this call URN, MTU and UNIOVI jointly proposed the creation of a Master Programme in SMAC², aligning with the strategic objectives of the INGENIUM Alliance to promote shared European education standards and cross-border academic cooperation.

The design process began with an in-depth comparative analysis of existing Master's programmes delivered in English at each partner university. Building upon these foundations, academic representatives from all three institutions engaged in multiple rounds of consultations to harmonize course structures, identify common academic goals, and define a unified set of learning outcomes.

Through collaborative curriculum mapping, the partners jointly developed a teaching plan, integrating complementary expertise and course modules from each institution. The programme structure was designed to ensure academic coherence, mutual recognition of credits, and opportunities for student mobility. Continuous input from institutional quality assurance units and the INGENIUM Alliance Council (IAC) ensured that the programme adhered to national and European accreditation requirements and aligned with the INGENIUM vision of building internationally recognized study pathways.

Following the endorsement of the IAC and the outcomes of the INGENIUM Joint Education Call, the consortium partners formalized their commitment to deliver the SMaC² joint programme. The programme was selected as an “INGENIUM Flagship Programme” at the meeting of the INGENIUM Alliance Council.

3.2 Award title

Graduates of the *Joint Master's Programme in Sustainable Maritime Management in Coastal Conservation* (SMaC²) will be awarded a **Joint Degree** of the partner universities: University of Rouen Normandy (URN), Munster Technological University (MTU) and University of Oviedo (UNIOVI).

The award will reflect the collaborative nature of the programme and will clearly mention the names and logos of the awarding institutions. The degree will be conferred at **EQF Level 7** (corresponding to the master's level in the European Qualifications Framework), in accordance with national legislation and joint programme guidelines and the Irish NFQ Level 9.

Graduates will receive a Joint Master's Diploma in *Sustainable Management in Coastal Conservation* (SMaC²), awarded by the consortium of universities, compliant with the respective national regulations and EU standards. The diploma will be recognized in each partner country, in accordance with the national higher education legislation of France (French *Code de l'Éducation*, notably Articles L123-7, L123-7-1, L613-1, D123-15 to D123-22, D613-17 to D613-25, and D719-181 to D719-185, Spain (Royal Decree 822/2021 of 28 September, establishing the organisation of university education programmes and the quality assurance process thereof, and Decree 90/2009 of July 29, on official university education and centres in the Principality of Asturias), and Ireland MTU, which governs the organization of higher education, including the creation of national diplomas and the recognition and transfer of academic credits (ECTS)), as well as with the European Standards and Guidelines (ESG) and the principles of the European Approach for Quality Assurance of Joint Programmes.

As mentioned in the Preamble, the University of Rouen Normandy is in charge, as the lead partner, of the process of accreditation of this programme within the framework of the consortium. This process will respect the European Approach criteria and follow the HCERES regulations.

The Royal Decree 1002/2010, of 5th August, about the issuance of official university degrees in Spain, indicates the procedure graduates have to follow so that a Joint degree

diploma takes effect in Spain, when the issuance of the diploma corresponds to a foreign University. To take effect in Spain, the diploma must be presented to the Spanish University of the agreement (UNIOVI), so that it includes a document indicating to which official Master's Degree of the Registry of Universities, Centres and Degrees (Registro de Universidades, Centros y Títulos, RUCT) corresponds this diploma. Also, UNIOVI will proceed with the necessary procedures for the registration of the diploma and graduate name in the National Registry of Official University Graduates (Registro Nacional de Titulados Universitarios Oficiales).

To take effect in Ireland, the programme must be approved by the Academic Council (a statutory body) of Munster Technological University, which has Designated (Degree) Awarding Status. MTU then includes the Master's Degree in its 'Order of Council' register of approved programmes. Programme approval is for a period of 5 years. Inclusion in the Order of Council list permits student registration and conferring of awards.

3.2.1 Diploma Supplement

In addition to the joint diploma, all graduates will receive a Diploma Supplement following the Europass Diploma Supplement format. The Diploma Supplement shall:

- (a)** clearly describe all parts of the degree programme, including its structure across four semesters and three countries;
- (b)** contain information on the type and level of qualification awarded, including its position at EQF Level 7 and its equivalences in the national qualifications frameworks of France, Spain, and Ireland (NFQ Level 9);
- (c)** identify all three institutions that award the qualification, including their names, locations, and accreditation status;
- (d)** describe the content of the programme and the results gained by the graduate, clearly specifying at which institutions and in which countries the different components were completed;
- (e)** provide information on the national higher education systems of France, Spain, and Ireland;
- (f)** include the grading scale used, the grade conversion table, and the ECTS grade distribution where available.

The Diploma Supplement will be issued either in English, French or Spanish. Where required by national legislation, a translation or parallel version may be provided in the relevant national language.

3.3 Role of each partner in the consortium

The SMaC² Programme will be implemented in observance of the respective national laws and regulations in the countries of the partner universities, in particular the higher education laws. In this consortium, for SMaC² master program, each partner institution

has a specific role and responsibility to ensure the successful implementation and management of the joint degree program:

URN (Lead Partner) is responsible for the overall coordination and management of the joint degree program. This includes ensuring compliance with all academic, administrative, and regulatory requirements.

UNIOVI and MTU (Associate Partners) will contribute to the educational and research components of the joint degree program.

The partner institutions will participate in delivering specific components of the joint degree program, in alignment with the curriculum developed together. This includes ensuring the academic quality of their modules and contributing to the overall student learning experience.

All collaborative teaching and assessment activities must adhere to European Quality Assurance policies (European Approach to Quality Assurance of Joint Programmes, European Standards and Guidelines) and INGENIUM Quality Assurance Procedures, promoting a culture of mutual respect between students and teachers, while upholding the principles of academic freedom and integrity.

All partners will provide student support services, including advising, mentoring, and other services that contribute to the overall success of students participating in the program. URN, MTU and UNIOVI will contribute to research activities related to the program, facilitating joint research projects and providing opportunities for students and academic staff to engage in collaborative research.

Each partner will provide resources and expertise in their specific academic domains, contributing to the overall quality and scope of the program. The mobility partners will ensure seamless credit transfer and the consistency of academic outcomes across all institutions.

The joint diploma is issued by URN, the template is approved by all partners.

3.4 Mobility journey

According to the SMAC² curriculum, the program will have 120 ECTS, structured in 4 semesters (each of 30 ECTS):

1. **First semester:** modules delivered at UNIOVI
2. **Second semester:** modules delivered at MTU
3. **Third semester:** modules delivered at URN.
4. **Fourth semester:** Master's thesis. During this part, the students will be distributed among the partner institutions, allowing for close academic collaboration with faculty members in their chosen research areas; The master defense will be handled in URN, with the presence of all the partners who participate in the assessment committee, This part is considered as a joint SMAC² element,.

Each student shall be subject to the national legislation and institutional regulations of the country in which they are enrolled. A coordinated recruitment process will be implemented for the fourth semester, during which students will undertake a mandatory internship in either an industrial setting or a university research laboratory, with financial compensation provided in accordance with the applicable national laws.

The partner institutions agree to co-operate fully in relation to any audits, reviews, evaluations and quality assurance processes, monitoring, assessments and reports undertaken by any partner institution. The partner institutions will provide, within fourteen working days of receipt of a request for assistance from any other partner institution, any information in its possession or power to obtain as may be reasonably requested in order to assist the other partner institution in complying with its obligations under its national legislation.

3.5 Programme Governance

The governance of the Joint Master's Programme in SMaC² is structured to ensure effective academic, administrative, and strategic oversight across all partner institutions: URN, MTU and UNIOVI, while serving as a link with the other structures of the INGENIUM European Universities Alliance.

The governance of the programme will be carried out in full alignment with the fundamental values of the European Higher Education Area.

All governance decisions, including curriculum modifications, meeting minutes, and quality reports, are documented and stored on a shared digital platform accessible to all partners within the INGENIUM repository. This ensures transparency and facilitates external audits and accreditation processes.

3.5.1 The Joint Academic Committee (JAC)

At the core of this governance structure is the **Joint Academic Committee**, which serves as the primary coordinating and decision-making body. The JAC is responsible for all aspects related to the coordination of the programmes, unless otherwise stated in this agreement.

In cases of academic or administrative disputes between partner institutions, resolution efforts begin within the JAC.

If necessary, unresolved issues are escalated to the rectors of the participating universities and handled according to the terms outlined in the Consortium Agreement.

Decisions in the JAC are taken by consensus. In case that a consensus can not be reached, the partner may carry out a vote, with a voting weight of one vote per institution.

The meetings of the JAC are chaired by the academic representative of the coordinating institution (URN).

The JAC should meet at least twice a year to carry out the functions defined below. Any member of the JAC may request an extraordinary meeting to the Chair, which should call it within the following 2 weeks.

The three academic representatives and at least one of the student representatives should be present in order to reach a quorum.

Student representation is a fundamental component of the program's governance and quality assurance mechanisms. Students participate in the JAC and are actively involved in regular surveys, focus groups, and consultations, ensuring that their input informs program development and evaluation processes.

Composition of the JAC

The members of the JAC are:

1. **One academic representative per partner institution**, with voting rights.
2. **Two elected student representatives.** Two elected student representatives, with one student per cohort. The student representatives will be elected no later than one month after the beginning of each academic year. Their term will last until the end of the academic year. Student representatives shall have the right to propose topics, speak, and participate actively in all discussions. Student representatives shall have voting rights on all matters directly affecting the student experience, including curriculum design, assessment arrangements, student support services, programme policies, and quality improvement actions. Students shall not participate in selection processes for student admission or in personnel matters. The opinions expressed by student representatives shall be formally recorded in the JAC meeting minutes. Where a decision is taken that diverges from the position expressed by the student representatives, the JAC shall provide a written justification.
 - a. Due to the nature of their mandate, students will not participate in selection processes assigned to the JAC.
3. At least one **representative of the INGENIUM European University management.**
4. At least one **administrative /quality assurance officer.**

Any member of the JAC may propose the invitation of guests to the meeting. Guests' invitations will be deemed as accepted unless explicitly rejected by the other JAC members.

Functions of the JAC

The JAC is responsible for all the programme coordination functions described in this agreement, including:

- 1) Coordinating student admissions and selection, following the procedure described in this agreement
- 2) Oversee academic standards, curriculum design and alignment and other relevant academic activities to ensure consistency and quality.
- 3) Supporting the continuous enhancement of the program, ensuring that equivalent teaching standards are upheld throughout the whole learning journey of enrolled students.
- 4) ensuring consistent learning outcomes and credit allocation
- 5) Manage all aspects related to the management of the programme, including disciplinary aspects
- 6) Any other function assigned in this agreement

3.5.2 The continuous improvement council

The continuous improvement commission is a consultative body that supports the JAC to ensure that the curriculum and implementation of the programme is continuously improved and that it is adapted to societal needs.

The council should meet at least once per year and include:

1. The JAC members.
2. At least one representative from industry, selected by the JAC
3. Representatives from the INGENIUM Alliance bodies dealing with pedagogical innovation, sustainability, and inclusion.
4. Representatives from INGENIUM European Universities that are not degree-awarding partners in the programme
5. After the first cohort of the programme graduates, at least one alumnus from the programme

The council meeting should result in the production of a set of recommendations for potential improvements to be incorporated into the programme.

3.5.3 Support structures to the programme

The consortium partner commits to the creation of all the necessary support structures to the programme, bringing together representatives from the different units involved in the management of the different components of the programme.

The JAC will be responsible for requesting the creation of these support structures and ensuring effective coordination.

The list of support structures includes, but is not limited to:

1. Erasmus+ mobility coordinators
2. Student services (responsible for admission and enrolment)

3. Inclusion and student support
4. Employment offices

3.6 Admission and enrolment

The admission of candidates to the SMAC² program is carried out under the conditions imposed by national regulations and the regulations in force of the organizing higher education institutions.

Pre-registration will be carried out at each partner university during the spring semester, as part of the joint admission procedure. This step is essential to ensure students' eligibility for financial support and to facilitate administrative and logistical planning across institutions.

The formal admission process will be coordinated by URN, in accordance with French national regulations. Nevertheless, a unified joint admission policy will apply across all three partner institutions. Students will be able to access the application form through the INGENIUM platform, which will re-direct them to the URN system, following the agreed common procedures. A list of candidates will be sent to the coordinators of UNIOVI and MTU, and a sorted list of admitted candidates approved by the coordinators of the 3 partner Universities. The selection of candidates will be conducted by the JAC.

For the first cohort, the minimum number of students enrolled in the program is 8, and the maximum is 15.

This number may be reviewed every year at the request of one of the partner Institutions. If it is not reviewed, the number will remain as stated in the present agreement. The enrollment of candidates declared admitted following the admission competition is made by the decision of the rector of URN. The candidate declared admitted to the joint master program has the status of student for the entire period of his/her presence in the respective program, from enrollment until taking the final exam or expulsion, except for periods of interruption of studies. Students admitted to the **SMAC² programme** are registered in accordance with **French higher education regulations**, with **additional programme fees paid at University of Oviedo (UNIOVI)**.

Applicants must demonstrate proficiency in English: minimum B2 level (certified by an official institution).

The selection of candidates will be conducted by the Joint Academic Committee, composed of representatives from each partner university.

The following items will be considered by the Committee to evaluate the candidates:

1. Bachelor's degree academic record and its adequacy to the Master
2. Professional knowledge

3. Communication abilities and motivation, evaluated by the Assessment Committee. Interviews will only be conducted if deemed necessary by the Assessment Committee.

The academic record is an official document that enumerates all the modules of the Bachelor's degree and their corresponding marks.

3.6.2 Formula to determine enrolment priority

The admission process involves the calculation of an admission average according to the following formula:

- $MA = 0.6 \times MF + 0.4 \times MC$, where:
- MA = Admission contest average (entrance exam average)
- MF = Bachelor's degree final grade (Bachelor's or Diploma degree, Final grade)
- MC = Average score for the assessment of specific knowledge in the field of study, including professional knowledge, and communication abilities and motivation evaluated during the committee assessment. In the case of candidates obtaining identical final examination averages, ranking shall be determined based first on the grade obtained for the Bachelor's/Diploma thesis defense and, if necessary, on the overall graduation average for the undergraduate (first cycle) studies.

The Joint Academic Committee will publish a ranked list of admitted candidates based on the number of available positions. The top-ranked candidates will be offered admission to the Master's programme. In the event that an admitted candidate withdraws, the next candidate on the list will be offered the vacant position, in order of ranking.

INGENIUM scholarships may be awarded each year according to the same ranked list of candidates, within the limits of the scholarships available.

Admitted students will have the opportunity to participate in Erasmus+ mobility for study placements at partner institutions.

All academic activities undertaken at any of the consortium universities will be fully recognized through established academic equivalence mechanisms. URN Admission Regulations, annexed to this agreement, provide detailed guidelines on the application, selection, and admission procedures. This includes criteria for eligibility and selection, as well as the procedures for application and admission.

Citizens of European Union Member States, the European Economic Area, and the Swiss Confederation may apply for graduate studies in France under the same conditions as French citizens.

Non-EU citizens wishing to study in France must apply in accordance with the admission procedures of the host higher education institution. For admitted candidates, enrolment

is subject to compliance with French immigration regulations, including the issuance of a student visa or residence permit, where applicable.

To be eligible for admission, candidates must hold a diploma granting access to higher education in their country of origin. The assessment of foreign qualifications is carried out by the host institution, in accordance with French higher education regulations. Where required, candidates may be requested to provide a certificate of comparability issued by the ENIC-NARIC France centre (France Éducation internationale).

Applicants must demonstrate an appropriate level of proficiency in the language of instruction, through an international language certificate or a certificate issued by a recognised institution, in accordance with the programme requirements.

3.6.3 Promotion of the programme

The promotion of the degree program and awareness-raising shall be the joint responsibility of all Partner Institutions, with the support of all the partners of the INGENIUM European University. The programme will be considered as a de facto programme of the remaining INGENIUM partners

All institutions inform candidates by posting at the institutions' headquarters and on their own website, information regarding tuition fees, the organization and conduct of the admission process, the content of the study program, the organization of the educational process, the number of places available, according to the provisions of inter-institutional agreements.

The INGENIUM alliance will publicize the SMaC² master within their network. This will provide a good platform to inform prospective students and connect them to the Master administration or academic board in order to answer their queries about the program.

Once admitted, the students will enroll at URN, and all the information will be shared with the other partner universities, thus minimising the administrative burden for students.

3.7 Access to information and transparency

All the relevant programme information and documentation will be publicly available on the programme's website (included within the INGENIUM website) and respective websites of the partners. The information will be available in English and the three official languages of the partners.

The JAC will also commit to keep public records of all the programme management decisions and make them accessible to students and other interested partners upon requests as long as this does not go against any regulations.

The essential information to be communicated publicly through the programme website includes:

1. **Programme Description:**
 - Objectives and learning outcomes
 - Programme structure and curriculum
 - Mobility plan and academic calendar
 - Admission requirements and selection criteria
 - Fee structure and scholarship opportunities
2. **Module Information:**
 - Complete module descriptors for all taught modules
 - Reading lists and resources
3. **Teaching Staff:** Brief profiles with research interests
4. **Application Process:**
 - How to apply, deadlines, required documents
 - Selection process and timeline
 - FAQs for applicants
5. **Student Life:**
 - Student testimonials and experiences (to be included after the first cohort)
 - Information about each city/campus
 - Accommodation options
 - Living costs estimates
6. **Career Outcomes (to be included after the first cohort finalises the programme):**
 - Graduate employment statistics
 - Alumni profiles and destinations
 - Employer testimonials
7. **Key Documents** (public-facing versions):
 - Consortium agreement summary
 - Student handbook

- Code of conduct
- Examination and assessment regulations

8. **Contact Information:**

- Programme coordinators at each institution
- Enquiry email
- Social media links

Languages: Information available in English and all three partner languages (English, Spanish, French)

Updates: Website updated at least annually, with news/blog updated regularly

Accessibility: Website compliant with WCAG 2.1 accessibility standards

3.8 Student mobility model and arrangements

SMaC² Program will be structured over 4 semesters, with students completing mobility at all three partner institutions. Students will spend a minimum of 1 semester at each institution, with opportunities for internships, research projects, and thesis work to be completed collaboratively.

All institutions involved in the mobility will facilitate the visa process (if required), accommodation, and integration support for exchange students. All universities will monitor student progress, ensuring the achievement of learning outcomes and academic success. Regular assessments, feedback, and evaluations will be conducted.

Students are obliged to complete the mobility path set out below:

Table: Mobility plan

Semester	Institution(s)	Details of Mobility
1st Semester	UNIOVI	Students will complete the first semester of the program at UNIOVI
2nd Semester	MTU	Students will complete the second semester at MTU
3rd Semester	URN	Students will complete the third semester at URN
4th Semester	MTU, UNIOVI, URN	Students will be assigned to a partner institution based on their dissertation topics.

The mobility support measures are described in section 8 of this agreement

Regular information sessions will be organized to ensure that all stakeholders (students, faculty, and staff) are well-informed about the progress, updates, and key milestones of the joint degree program. Information sessions will be held at key stages of the program, such as at the beginning of each semester or before the start of the mobility periods. Additional sessions may be scheduled to address specific topics like the dissertation process or career opportunities.

Meetings will be held by the Joint Academic Committee between URN, UNIOVI and MTU every semester to review the program's progress, resolve issues, and discuss improvements. Additionally, the online INGENIUM alliance platform will be used to facilitate real-time communication and document sharing among academics, students, and administrators from all three institutions.

3.8.1 Mobility Alternative Policy

The SMAC² programme is built on a mandatory physical mobility model, and all students are expected to complete the full mobility journey as described in Section 3.4. Physical mobility across the three partner institutions is a defining feature of the programme and essential for the achievement of its learning outcomes.

In exceptional circumstances where a student is unable to complete a physical mobility period, the Joint Academic Committee may, on a case-by-case basis, approve an alternative arrangement. Exceptional circumstances include, but are not limited to: documented health conditions preventing travel, visa denial after all reasonable avenues have been exhausted, force majeure events affecting the host country, or other documented personal circumstances of a serious nature.

Students seeking a mobility alternative must submit a written request to the JAC, accompanied by supporting documentation, at least two months before the start of the affected mobility period (or as soon as the circumstances become known). The JAC shall respond within 15 working days.

Possible alternative arrangements may include: (a) virtual participation in the teaching activities of the host institution, using the digital infrastructure of the INGENIUM Alliance; (b) completion of equivalent modules through blended or online delivery, subject to the approval of the host institution and the achievement of equivalent learning outcomes; (c) temporary deferral of the mobility period to a subsequent semester or academic year.

Any approved alternative must ensure that the student achieves the same programme learning outcomes and that the joint character of the degree is preserved. The JAC shall document all approved alternatives and include them in the programme's annual quality report. The use of mobility alternatives shall be exceptional and shall not exceed 30 ECTS across the entire programme duration.

3.9 Financial Plan

The consortium agrees on a common participation fee for the programme, while permitting each partner to levy any mandatory local fees required by national, regional or institutional regulations. Any such fees will be transparent and kept to a minimum.

The fees charged by the consortium include:

1. Administrative costs
2. Costs of the joint activities of the programmes
3. Any other costs related to the organisation of the programme

If any of the partners needs to charge local enrollment or service fee, the consortium will clearly communicate this to applicants in advance. All partners remain committed to minimizing costs and will exempt students from duplicate charges. Once the base tuition is paid, no full tuition is charged a second time at mobility destinations, ensuring students do not pay double for joint enrollment.

The fees will be levied at the beginning of each of the two years by UNIOVI on behalf of the consortium.

3.9.1 Fee policy

Students participating in the programme will pay the amount of 2000 euros per year (4000 euros for the whole duration of the programme).

This fee covers the participation in the programme and may be complemented by local, regional or national administrative fees. No other academic fee will be collected.

This fee applies to the first cohort of the programme, and it may be revised by the JAC.

The JAC may decide to grant fee waivers and other fee reductions to support the participation of disadvantaged students. The participation fees of students may be co-financed using external funds, if available.

The University of Oviedo (UNIOVI) shall act as the financial agent of the consortium for the collection of all programme participation fees. All student fees shall be paid directly to UNIOVI, which shall hold them on behalf of the consortium.

UNIOVI shall distribute the collected fees among the consortium partners in accordance with the allocation determined by the Joint Academic Committee (JAC).

The JAC shall agree on the distribution model before the start of each academic year, taking into account each partner's contribution to the delivery of the programme, including teaching, supervision, administrative coordination, and student support services. UNIOVI shall execute the distributions within 60 calendar days of the close of the enrollment period for each academic year.

UNIOVI shall maintain transparent financial records of all fees collected and distributed, and shall present a financial report to the JAC at least once per academic year. This report shall detail the amounts collected, the amounts distributed to each partner, and any amounts retained for joint programme expenses.

In the event that the JAC does not reach agreement on the distribution model for a given academic year, the distribution model of the previous year shall apply.

Detailed instructions and necessary payment information will be available on the admission website.

3.10 Scholarships and Mobility Support:

The SMAC² is committed to exploring all possible opportunities for the provision of scholarships to students enrolled in the programme.

The INGENIUM European University will seek to dedicate funds from different sources to ensure the inclusivity of the programme. Funds may be used to lower or waive participation fees, to support travel, accommodation and living expenses, or a combination of the two.

The partner institutions are also committed to exploring all potential scholarship options for participating students.

The JAC will liaise with INGENIUM structures to analyse the different scholarship possibilities available.

Beneficiaries must sign a student agreement committing to the successful completion of the programme in order to receive the full scholarship. In case of non-completion or breach of the students' obligations described in the student agreement, students will have to reimburse the consortium.

3.10.1 Mobility support through Erasmus+ funds

In line with the conditions described in the Erasmus+ programme guide, mobilities within this joint degree programme are eligible to receive Erasmus+ student mobility support.

Erasmus+ funds can support a maximum of 12 months of student mobility. The partner universities commit to providing funds for the 12 months mobility to all students enrolled in the programme.

Erasmus+ representatives from the partner universities will support the Joint Academic Committee in the management of Erasmus+ scholarships.

The funding allocation will be divided between the partner universities. The partners may use the model included below, or any other option aligned with Erasmus+ regulations.

The group of Erasmus+ officers supporting the programme will monitor the implementation of Erasmus+ mobilities, following the instructions of the Joint Academic Committee.

Table: Erasmus+ mobility funding structure

	First Mobility	Second mobility
Hosting university	UNIOVI to MTU	MTU to URN
Funded by	UNIOVI (Erasmus+/other funds)	MTU Erasmus+/other funds
Max funded months	6 +	6 +

3.10 Staff qualification and training

All institutions will provide qualified teaching staff and administrative personnel to deliver the SMAC² Program, ensuring continuity and academic excellence. All three Universities involved URN, UNIOVI and MTU will provide the necessary training for academic staff and administrative personnel involved in the joint degree program. This training will cover key topics such as curriculum delivery, quality assurance procedures, student mobility processes, and the use of shared learning platforms.

Training sessions will be scheduled prior to the start of the program and will be delivered in both in-person and online formats to accommodate staff availability across institutions. Staff exchanges will be encouraged to foster collaboration, enhance teaching practices, and ensure academic alignment between the institutions.

Personnel covered by this Agreement will continue to comply with the contractual obligations of their originating university and will continue to receive their due remuneration. In each case, the originating university will consider the duration of the stay as an ordinary service period, for all intents and purposes.

The Parties agree that all financial issues relating to payments due to mobile staff will be negotiated during the delivery of the program and will depend on the availability of funds.

3.11 Availability and use of partner facilities, infrastructure and resources

The consortium partners confirm the availability of suitable facilities, infrastructure and resources for the implementation of the programme. The resources available across the three partner universities meet all the necessary quality standards to ensure that students will benefit from quality education across all three semesters.

Students will be able to access all the necessary resources and infrastructure (laboratories, student spaces) during their stay at each of the partner institutions.

Other resources (such as online resources, access to online learning and other support services) will also be made available to all students throughout the whole duration of the programme.

The partner institutions commit to ensuring that all SMAC² students, during their period of study at each partner institution, shall have access to all institutional services on equivalent terms to locally enrolled students. This includes, without limitation: IT services (including email accounts, learning management systems, and VPN access), library and digital learning resources, laboratory and research facilities, sports and leisure facilities, health and counselling services, career services, and participation in student associations and governance bodies. Similar access shall be provided to staff involved in the delivery of the programme at partner institutions.

The practical arrangements for granting access at each institution shall be detailed in the Student Handbook (CD1) and communicated to students during the induction programme at each mobility destination.

3.12 Environmental Sustainability of Programme operations

Consistent with its thematic focus on coastal sustainability and conservation, the SMAC² consortium commits to minimising the environmental footprint of the programme's own operations. The consortium shall implement the following measures:

Sustainable mobility: Students and staff shall be encouraged to use sustainable transport options for mobility between partner institutions. Rail travel shall be prioritised over air travel where feasible and where journey times allow. The consortium shall provide students with information on sustainable transport options and, where possible, shall offer financial incentives for sustainable travel choices.

Digital-first approach: The programme shall minimise paper use by adopting digital communication, documentation, and assessment submission as the default. Course materials, administrative documents, and meeting records shall be shared through digital platforms.

Sustainable fieldwork and laboratory practices: Field activities and laboratory work shall follow environmental best practices, including responsible waste management, minimal

ecological disturbance, and adherence to environmental protection regulations at all field sites.

Carbon awareness: The consortium shall estimate and report the carbon footprint of programme-related travel as part of its annual quality review, and shall set targets for reduction where feasible.

Sustainability awareness: Environmental sustainability principles shall be incorporated into the student induction programme at each institution.

This policy is aligned with the MSCA Green Charter and the INGENIUM Alliance's commitment to the European Green Deal objectives. The JAC shall review this policy annually and report on its implementation in the programme's quality report.

4. Core academic information

4.1 Programme Title

The official programme Title is Joint Master's Program in Sustainable Maritime Management and Coastal Conservation (SMAC²)

4.2 Introduction to the academic programme

The joint master's programme in *Sustainable Maritime Management and Coastal Conservation* (SMAC²) is an interdisciplinary and internationally oriented study programme developed collaboratively by:

1. University of Rouen Normandy (URN) – France
2. University of Oviedo (UNIOVI) – Spain
3. Munster Technological University

This joint degree aims to provide students with a high-level scientific and technical education focusing on coastal sustainability and resilience through innovative, science-based, and multidisciplinary approaches.

SMAC² responds to the increasing global demand for specialists capable of promoting coastal sustainability by integrating multi-approach engineering principles. The

programme is designed for students with academic backgrounds in civil engineering, geosciences, biology and related fields.

The programme is aligned with the requirements for the competences and skills corresponding to EQF 7 in the qualifications frameworks of the three partner institutions.

4.2.1 Interdisciplinarity

The SMAC² programme is built on embedded interdisciplinarity as a core design principle. The curriculum deliberately integrates knowledge and methods from multiple disciplines, including marine biology and ecology, coastal and civil engineering, environmental governance and policy, renewable energy systems, spatial analysis and geoinformatics, and socio-economic assessment. This interdisciplinary approach is reflected in: (a) the complementary thematic focus of each semester, with each partner institution contributing its specific disciplinary strengths; (b) the joint summer school and field activities, which bring together scientific, technical, and policy perspectives; (c) the Master's thesis, which requires students to integrate knowledge across disciplinary boundaries under the guidance of supervisors from different fields; (d) the composition of the Continuous Improvement Council, which includes representatives from industry, policy, and academia across sectors.

4.3 Programme Overview

The SMAC² programme offers:

- A multidisciplinary curriculum covering coastal sustainability and resilience through innovative, science-based, and multidisciplinary approaches.
- Hands-on learning through field practices, research projects, case studies, and Erasmus+ mobilities.
- Strong coastal applied relevance, with opportunities for interaction with stakeholders, European and international environmental organisations, site visits, and participation in real-life projects.

4.3.1 Programme Objectives

Graduates of the SMAC² programme will be able to:

1. **Assess marine and coastal ecosystems**, including biodiversity, climate change impacts, and contaminant dynamics, using ecological, genetic, and biogeochemical approaches.
2. **Apply international and EU maritime governance frameworks** to marine spatial planning, conservation, and sustainable blue growth.

3. **Design integrated conservation and spatial management strategies** that combine environmental, social, economic, and policy dimensions.
4. **Evaluate offshore renewable energy systems** from technical, economic, environmental, and risk management perspectives.
5. **Analyze and model coastal hazards and climate-driven processes** using numerical modelling, impact assessment, and hydrological tools.
6. **Use remote sensing and spatial analysis** for environmental monitoring, risk evaluation, and coastal planning.
7. **Develop resilience and adaptation strategies** to reduce climate impacts across coastal and maritime sectors, integrating technology and policy.

4.3.2 Learning Outcomes

- ❖ Analyse marine and coastal ecosystems by assessing biodiversity, ecosystem functioning, contaminant dynamics, and climate change impacts using multidisciplinary scientific methods.
- ❖ Apply quantitative and spatial tools (remote sensing, numerical modelling, and impact assessment) to evaluate coastal hazards, environmental risks, and climate–hydrological processes.
- ❖ Interpret and implement maritime governance frameworks, including international, EU, and national regulations, in marine spatial planning and conservation contexts.
- ❖ Design integrated marine and coastal management strategies that balance environmental protection, socio-economic development, and climate resilience.
- ❖ Evaluate offshore renewable energy and maritime systems considering technical feasibility, economic performance, environmental impacts, and supply-chain risks.
- ❖ Integrate ecological, technological, and policy perspectives to develop adaptation and resilience strategies for sustainable coastal and maritime sectors.
- ❖ Critically assess sustainability challenges in coastal development by incorporating environmental, social, and economic dimensions into decision-making processes.
- ❖ Graduates will integrate ethical awareness and professional responsibility into scientific, technical, and policy-related decisions affecting marine and coastal environments.

4.3.3 Programme Structure

1. Duration: 2 years (4 semesters)
2. Credit Load: 120 ECTS, distributed across core modules, electives, mobility projects, and Master's thesis.
3. Language of Instruction: English
4. Mobility Pathways: Students will study in the three partner institutions and benefit from cross-cultural and interdisciplinary experiences.
5. Degree Awarded: Joint diploma, EQF level 7.

4.3.4 Target Group

The programme is open to holders of a Bachelor's degree (or equivalent) in one of the following fields:

- Civil Engineering
- Geosciences
- Geology
- Biotechnology / Biology
- Marine sciences
- Environmental Engineering / Science

The programme seeks to target students from all across Europe and beyond, interested in combining an interdisciplinary specialisation with an international experience in three EU countries.

Applicants must demonstrate proficiency in English (minimum B2 level).

4.3.5 Career Prospects

Graduates will be prepared for positions in:

1. Research and development institutions
2. International environmental consultancy and project management
3. Management of marine protected areas,
4. Environmental education, and international conservation organizations.
5. Environmental & Coastal Management
6. Climate & Risk Assessment

7. Marine Conservation & Ecosystem Restoration
8. Renewable Energy & Blue Economy
9. Research, Academia & Innovation
10. Public Sector & Governance
11. Sustainable Supply Chain and logistics

Beyond discipline-specific knowledge, the SMAC² programme systematically develops the following transversal skills, which are integral to graduates' employability and professional effectiveness: intercultural competence and the ability to work in multinational teams (developed through the tri-country mobility model and collaborative projects), scientific communication and presentation skills (developed through seminar activities, oral defences, and the joint summer school), project management and teamwork (developed through laboratory projects and group assignments), critical thinking and evidence-based decision-making (embedded in all assessment activities), adaptability and resilience (developed through the experience of studying in three different academic and cultural environments).

The programme ensures labour market relevance through: systematic employer and industry consultation via the Continuous Improvement Council (Section 3.5.2), mandatory internship placements in Semester 4, career development support at all three partner institutions (Section 8.7.3), and regular review of graduate employment outcomes through the graduate tracking system (Section 7.8).

4.4 Learning and teaching approach

4.4.1 Use of ECTS

This programme follows the ECTS Users' Guide (2015) with credit allocation based on learning outcomes and student workload. While workload hours per ECTS credit vary slightly across partners (MTU 20h, UNIOVI: 25h, URN: 25-30h), all fall within the ECTS range of 20-30 hours and reflect different national conventions. This variation does not affect the achievement of learning outcomes or credit equivalence

4.4.2 Student centred approach

The consortium commits to the implementation of a student-centred approach that taps into the diversity of the student body and fosters Problem-based learning, teamwork and student autonomy.

The consortium will implement this student-centred approach through a range of initiatives:

1. **Active Learning Methods:**

- Laboratory-based inquiry learning
- Team projects and collaborative assignments

2. **Student Choice and Autonomy:**

- Flexibility in thesis topic selection
- Choice of internship placement

3. **Addressing Diversity:**

- **Support to intercultural learning:** through the induction weeks, buddy systems, and other support measures explained in section 8
- **Disciplinary diversity:** Bridging modules for students from biology vs chemistry backgrounds
- **Cultural diversity:** Intercultural communication workshops, acknowledgment of different academic traditions
- **Language support:** Beyond B2 English requirement, scientific English is included as a course in the curriculum, and will be encouraged to learn the local languages of the partner institutions

4.4.3 Online, Blended Mode and Digital Learning Policy

The SMAC² Master's programme is delivered through a blended learning approach with a strong emphasis on face-to-face instruction. Online activities are limited to specific interactions, such as lectures and seminars, primarily to support joint elements of the programme when necessary. These online components represent no more than 10% of the total learning activities, ensuring substantial in-person engagement and hands-on learning.

The majority of the programme is conducted exclusively on site, providing students with the direct, practical experience essential for mastering SMAC² methodologies and techniques.

SMAC² modules are structured around a teaching methodology that combines face-to-face activities (lectures, seminars, fieldwork, and mentored projects) with individual and group-based student work, including tasks, problem-solving exercises, and report preparation. Attendance at in-person fieldwork and project activities is compulsory, reflecting the programme's strong focus on experiential and applied learning.

4.4.4 Digital Skills Development

The SMAC² programme integrates the development of advanced digital skills throughout its curriculum, tailored to the scientific and professional demands of sustainable maritime management and coastal conservation. These skills are embedded within the programme's modules and are essential for graduates' competitiveness in the labour market and for their contribution to evidence-based environmental management.

The digital skills developed through the programme include, but are not limited to:

(a) Geographic Information Systems (GIS) and remote sensing: students will develop proficiency in spatial data analysis, satellite imagery interpretation, and environmental monitoring technologies (Semester 3, URN);

(b) Numerical modelling: students will use computational tools for coastal hazard simulation, hydrological modelling, and climate impact assessment (Semester 3, URN);

(c) Environmental data analysis: students will acquire skills in statistical analysis, data visualisation, and interpretation of large environmental datasets using specialised scientific software (all semesters);

(d) Digital collaboration tools: students will use shared digital learning platforms, collaborative project management tools, and virtual communication technologies throughout their studies across the three partner institutions.

The programme's approach to digital skills development is aligned with the European Digital Competence Framework (DigComp) and contributes to the digital dimension of the European Education Area. Specific digital learning outcomes are detailed in the module descriptors (Annexes II–IV).

4.4.5 Multilingualism

While English is the language of instruction and assessment throughout the programme, the SMAC² programme guarantees exposure to at least two additional EU official languages. By studying and living in Spain, Ireland, and France, students are immersed in three different linguistic environments.

The programme promotes multilingualism through: (a) structured opportunities for students to learn basic French and Spanish, supported by the INGENIUM language centres and local language learning resources; (b) encouragement of the use of local languages in fieldwork, stakeholder engagement, and professional interactions; (c) availability of key programme information and documentation in English, French, and Spanish; (d) optional language courses offered by each partner institution's language services.

This multilingual environment is an integral part of the programme's contribution to graduates' intercultural competence and employability in the European and international labour market.

4.5 Assessment schedule

The assessment framework for the Joint Master's Programme in Sustainable Maritime Management and Coastal Conservation (SMAC²) is designed to ensure academic coherence, transparency, and fairness across the three partner institutions: URN, MTU and UNIOVI. All assessments are aligned with the programme's intended learning outcomes and follow the European Credit Transfer and Accumulation System (ECTS).

Assessments are scheduled at the end of each semester. The formal assessment periods take place in January - February for the winter semester (Semesters I and III) and in May - June for the spring semester (Semesters II and IV). Each institution may also provide a resit or retake session, held in July (UNIOVI), August (MTU), URN, in accordance with its academic calendar. At MTU and UNIOVI, the exact academic calendar is determined annually by decision of the University Senate and is published prior to the start of the academic year.

A diverse range of assessment methods is used to reflect the interdisciplinary and applied nature of the programme. These include written examinations, oral presentations, laboratory reports, project work, essays, and group assignments. Each module outlines specific assessment methods and grading criteria in its corresponding module descriptor. The final semester (Semester IV) is dedicated to the Master's thesis, which includes an oral defence.

Each module is coordinated by academic staff from the institution delivering it, who are responsible for preparing, administering, and grading the assessments. The Joint Programme Committee ensures that assessment standards remain consistent and academically rigorous across all delivery sites.

While each university applies its own national grading scale, a common conversion table will be used to map local grades to the ECTS grading scale (see Annex VII).

This ensures transparency and facilitates the recognition of results across institutions. All modules are assigned ECTS credits, and students must successfully complete modules totalling 120 ECTS over the duration of the two-year programme.

In the final semester, students are required to complete and defend a Master's thesis. The thesis is supervised by academic staff, the supervisor of the Master thesis must be lecturer of the Master. Additionally, one co-supervisor is possible, for example, another lecturer, researcher, engineer from a company, etc, as appropriate. The thesis is evaluated by a joint examination board with representatives from all three universities. The total number of members of the examination board should be a minimum of 3 members (one member from each partner University to ensure a homogenous evaluation of the students, some of the members can participate on-line in the presentation).

The student should present and defend the Master's thesis in person at one of the Universities (preferably the University where the Master thesis work was done, but not limited to); on-line presentation should be limited to only special situations (problems with VISA and similar). The evaluation criteria include scientific quality, methodology, critical thinking, and communication skills. The thesis defence may be conducted in person.

Students will receive timely and constructive feedback on all assessments. Reassessment opportunities will be offered in line with the policies of the institution where the module was delivered, with oversight by the Joint Academic Committee to ensure that academic standards and fairness are upheld across the consortium.

4.6 Course Schedule (Schedule of modules)

The *Joint Master's Programme in Sustainable Maritime Management and Coastal Conservation (SMAC²)* is structured over four semesters (two academic years) and comprises a total of **120 ECTS credits**. The curriculum is designed to balance theoretical knowledge with applied, laboratory-based and project-oriented learning, while also supporting international mobility and specialization. Courses are delivered across the three partner institutions: URN, MTU and UNIOVI.

A semester is 14 weeks.

4.6.1 Semester I – UNIOVI:

Table: Semester I UNIOVI

Course title	Didactic hours, hour/week				ECTS
	Course	Sem	Lab	Project	
Biodiversity of marine food webs	1.5	0.5	0.4	0.6	3
Genetic Biodiversity	1.5	0.5	0.4	0.6	3
Evolution and biogeography of marine organisms	1.6	1.0	0.2	1.0	3
Impact detection and evaluation	0.6	0.3	1.3	0.8	3
Global Change	1.0	0.8	0.4	0.6	3
Geographic information systems and remote sensing	1.4	1.4	0	0.2	3
Legal and economic aspects of marine resources	2.2	0.6	0	0	3
Marine management and Planning	1.5	1.0	0	0.5	3
Joint element: Marine Diversity & Maritime Operations for a sustainable world	0.8	0.6	0	1.6	3

Opt. 1. Voluntary Work in a Solidarity Marine Space	1.0	0.5	0	1.5	3
Opt. 2. The Social View of Marine Conservation based on Audiovisual Resources.	1.4	0.6	0	1.0	3

4.6.2 Semester II - MTU

Table: Semester II MTU

Course title	Didactic hours, hour/week				ECTS
	Course	Seminar	Lab	Project	
Maritime Technology and Sustainability	3	2	0	5	10
Maritime Emergency Management	0	0	0	5	5
Maritime Surveying and Risk Management	3	2	0	5	10
Research Methods and Proposal (joint Element)	0	0	0	5	5

4.6.2 Semester III: University of Rouen Normandy (France)

Table: Semester III URN

Course title	Activities, hour/week				ECTS
	Course	Sem	Lab	Project	
<i>Hydro-climate variability</i>	2	1	0	1	3
<i>Coastal Modelling</i>	3	1	0	1	5
<i>Satellite-based Coastal Observations</i>	1.5	1.5	0	1	4
<i>Erosion and Biodiversity</i>	2	0	0	1	3
<i>Biogeochemical Cycles</i>	1	1	1	0	3
<i>Sustainable Development</i>	1	1	0	1	3
<i>Contaminants</i>	1	1	0	1	3
<i>Coastal Geosystems</i>	1.5	1.5	0	0	3
Joint Element : Capacity Development Activities (summer school, mentored projects, seminars)	0	1	0	2	3

4.7 Academic Calendar

4.7.1 UNIOVI

At UNIOVI, the academic year is structured in two main semesters and includes clearly defined teaching, examination, and holiday periods. The calendar is established annually by decision of the University Senate. If needed, the calendar can be modified for Master's degrees with the authorisation of the Vice-rectorate with competences in academic organization.

4.7.2 MTU

The Munster Technological University academic year is divided into two semesters, each lasting about 15 weeks. A semester consists of 12 teaching weeks, a study/revision/assessment period, followed by a period of examinations. The teaching weeks normally involve a series of lectures and tutorials, along with assignments and/or laboratory work, depending on your chosen discipline.

4.7.3 URN

The URN academic year is divided into two semesters, each lasting about 15 weeks. A semester consists of 14 teaching weeks and one week of examinations. The teaching weeks normally involve a series of lectures and tutorials, along with assignments and/or laboratory work, depending on your chosen discipline.

4.8 Module Descriptors

The module descriptors of the three semesters are included as Annexes to this document.

4.9 Evaluation and examination

The evaluation and examination of students enrolled in the SMAC² Joint Programme shall be conducted in accordance with the procedures and criteria defined in the module descriptor of each subject, as jointly agreed by the Partner Institutions. Each module descriptor specifies the evaluation criteria, evaluation methods, and weighting of components contributing to the final grade, ensuring transparency, fairness, and academic coherence across the consortium.

The evaluation methods are designed to reflect both the theoretical and practical dimensions of the learning process and to align with the learning outcomes established for each course unit. The percentage contribution of each component to the final grade is recommended to be proportional to the number of hours allocated to the respective type of activity (lecture, seminar, laboratory, or project work).

In accordance with the principles of the European Credit Transfer and Accumulation System (ECTS) and the general framework for Master's studies within the European Higher Education Area (EHEA), students are expected to obtain 30 ECTS per semester (60 ECTS per academic year) to ensure normal academic progression. In cases where a student does not pass certain modules, the partner institutions agree on this approach: each enrollment provides three opportunities to pass each course (the regular examination session, a resit session, and one additional attempt, as defined by institutional regulations). Progression to the following semester or academic year may be conditional upon the number of credits obtained: a minimum of 40 ECTS credits is required for promotion from Year 1 to Year 2. All outstanding credits must be completed before the Master's dissertation defense and graduation.

4.9.1. Course (Lecture-Based Activities)

Type of Evaluation: Final Exam / Assessment / Assignments

Evaluation Criteria: Completeness and correctness of knowledge; logical coherence, fluency, and strength of argumentation; analytical and interpretative skills; originality and creativity; degree of mastery of specialized terminology and communication skills; ability to apply acquired knowledge and problem-solving capacity.

Evaluation Methods: Systematic observation of student performance (e.g., individual or team assignments, reports, or case studies); formative assessment tests conducted during the semester; and summative assessment tests or final examinations conducted at the end of the course.

4.9.2. Laboratory Activities

Evaluation Criteria: Ability to work collaboratively and apply theoretical knowledge in practice across different contexts; analytical and interpretative capacity; originality and creativity in laboratory tasks.

Evaluation Methods: Completion of all laboratory sheets (with the possibility of making up one missed session); continuous assessment during laboratory work; and a final assessment test (laboratory colloquium).

4.9.3. Project Activities

Evaluation Criteria: Teamwork skills; ability to apply acquired knowledge in practical and multidisciplinary contexts; analytical ability, originality, and creativity in problem-solving and project design.

Evaluation Methods: Completion and submission of all project sheets and deliverables, accompanied by individual or group presentations where applicable.

4.9.4. Seminar Activities

Evaluation Criteria: Application of theoretical knowledge to practical cases; analytical and interpretative skills; originality and creativity in discussion and presentation.

Evaluation Methods: Active participation in seminar discussions and a final assessment test or equivalent formative task.

4.9.5. Final Grade and Passing Conditions

The final grade for each course shall be determined by aggregating the scores obtained from all evaluation components according to their predefined weights. Grades shall be awarded on a whole-number scale from 1 to 100 for MTU and UNIOVI and 1-20 for URN, with a grade of 5, and 10 respectively certifying that the student has achieved the minimum learning outcomes required for successful completion of the course and the corresponding award of study credits (ECTS).

All Partner Institutions agree to recognize the equivalence of grades and evaluation results within the framework of the Joint Programme, ensuring full academic recognition of student performance across institutions.

4.9.6 Progression Rules and Maximum Duration

Students are expected to obtain 30 ECTS per semester (60 ECTS per academic year) for normal progression. The following jointly agreed rules govern progression, failure, and programme duration:

(a) Progression from Year 1 to Year 2: A minimum of 40 ECTS credits from Year 1 must be successfully completed for promotion to Year 2. Students who do not meet this threshold after all resit opportunities shall be offered the possibility to repeat the failed modules in the following academic year, subject to JAC approval and the availability of places.

(b) Maximum programme duration: The maximum duration for completing the programme is four (4) academic years from the date of first enrolment, including any periods of interruption.

(c) Interruption of studies: A student may request an interruption of studies for documented medical, personal, or family reasons. The request shall be submitted to the JAC, which shall decide in consultation with the relevant partner institution. An interruption may not exceed one academic year. Upon return, the student shall resume the programme at the point of interruption, subject to practical arrangements agreed with the host institution.

(d) Voluntary withdrawal: A student wishing to withdraw from the programme must notify the JAC and the coordinating institution in writing. The student shall receive a transcript of all modules successfully completed and the corresponding ECTS credits. Scholarship obligations, if any, shall be governed by the student agreement (Section 3.10).

(e) Academic dismissal: A student who fails to meet the minimum progression requirements after exhausting all available resit and repeat opportunities, or who exceeds the maximum duration of the programme, may be dismissed from the programme as determined by the JAC. The student shall have the right to appeal this decision in accordance with the grievance procedure (Section 8.3).

4.10 Academic documents and templates

The SMAC² Joint Master Programme Consortium agrees that each partner university can use its own institutional templates, in ENGLISH.

All templates, whether joint or institutional, will be mutually recognized and accepted within the program framework. These templates facilitate clear communication, streamline documentation, and support efficient programme management. All templates are regularly reviewed and updated by the Joint Programme Committee. The partners also commit to using any INGENIUM templates produced and validated by the Alliance.

Key templates include, but are not limited to:

1. **Module Descriptor Template** must at least defines the learning outcomes, content, credit allocation, teaching methods, and assessment criteria for each module.
2. **Assessment Paper Templates:** Provide a standardized format for preparing examinations, quizzes, and assignments, ensuring clarity and fairness in student evaluation.
3. **Feedback Forms:** Designed for collecting structured feedback from students, academics, and external stakeholders to support continuous programme improvement.
4. **Student Mobility Documents:** Include templates for mobility agreements, learning agreements, and recognition forms to support Erasmus and other exchange activities.

4.11 Design of the diploma

The design of the diploma has been agreed by the consortium partners in alignment with their national and institutional regulations.

The joint diploma incorporates the main mandatory elements from the three partner universities, as well as the INGENIUM logo.

The proposed diploma is included in an Annex.

Besides the diploma, students will also receive a Diploma Supplement, including a detailed description of the qualification awarded, including programme content, learning outcomes, and grading information, in compliance with the European Higher Education Area standards – Europass diploma supplement.

5. Due Diligence, risk management and risk mitigation

5.1 Financial risks and mitigation measures

The financial risks of the programme are low due to the anchoring in existing programmes of the partner universities. The programme is not dependent on tuition fees for its viability, since the main expense (associated teaching costs) is covered by institutional funds of the partner institutions.

The unique mobility cycle also ensures the viability of the programme, as all students will enrol at all partner institutions.

The implementation of the program is subject to confirmation by the relevant specialized department.

The program will be operational with a minimum of 8 to 10 enrolled students. A smaller number would not threaten the implementation of the programme for enrolled students, although it could lead to a potential discontinuation if the number of students does not increase in future editions.

The scholarship model is envisaged as a pilot for the first cohort, with the intention of consolidating it in future editions. The programme is fully viable without this scholarship model, and it will still remain inclusive due to the very low tuition fees and the availability of other scholarship sources.

5.2 Legal risks and mitigation measures

This agreement shall enter into force upon signature by all three partner institutions, following the completion of all required internal approval processes at each institution. The agreement is concluded for an initial period of 2 years, aligned with the accreditation cycle of the linked French Master's programme, and may be automatically renewed to cover the full duration of the accreditation under the European Approach, provided that the relevant French Master's programme is re-accredited.

Following this period, the agreement may be renewed for subsequent terms of six (6) years, subject to successful re-accreditation and mutual agreement of all parties. Each renewal shall be formalised through an exchange of letters between the partner institutions' rectors.

In the event that one partner institution decides to withdraw from this agreement, a written notice of termination must be provided at least eighteen (18) months prior to the intended termination date, addressed to the other partner institutions and the INGENIUM Alliance management. The notice must include the reasons for withdrawal and a proposed transition plan.

The withdrawing partner shall be bound by the following teach-out obligations: (a) all students enrolled at the time of the notice shall be guaranteed the opportunity to complete the full programme as described in this agreement, including all mobility components and the joint degree award; (b) the withdrawing partner shall continue to

deliver its allocated teaching and assessment responsibilities for the duration of the teach-out period; (c) the withdrawing partner shall continue to contribute financially to the programme's operations during the teach-out period; (d) the teach-out period shall not exceed the maximum duration of the programme plus one additional year.

The remaining partners shall, with the support of the INGENIUM Alliance, use reasonable efforts to identify a replacement partner within six (6) months of receiving the withdrawal notice. Any replacement partner must meet the academic and quality standards required by the programme's accreditation.

In the event that the coordinating institution (URN) withdraws, the remaining partners shall agree on a new coordinating institution within three (3) months. The accreditation agency (HCERES) shall be notified immediately, and the consortium shall take all necessary steps to ensure the continuity of the accreditation.

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In the event that the coordinating institution (URN) withdraws, the remaining partners shall agree on a new coordinating institution within three (3) months. The accreditation agency (HCERES) shall be notified immediately, and the consortium shall take all necessary steps to ensure the continuity of the accreditation.

5.3 Operational and academic risks and mitigation measures

To ensure effective coordination of academic matters, a cross-consortium academic committee will be established, comprising representatives from all the partner institutions. This Joint Academic Committee will oversee academic standards, curricula alignment and other relevant academic activities to ensure consistency and quality. It will support the continuous enhancement of the program, ensuring that equivalent

teaching standards are upheld throughout the whole learning journey of enrolled students.

This committee will be responsible for overseeing the governance structure, monitoring and managing routine operations, and addressing any risks related to staff and student mobility. The committee will meet as necessary to ensure effective coordination and to address any operational challenges.

5.4 Reputational risks

The partners involved in the SMAC² joint master program are committed to ensuring the proposed collaboration operates as intended by carefully planning all aspects of the programme. Clear and accurate information will be provided to manage student and host university expectations effectively. Adequate administrative and support staff will be in place, at both involved universities, to support these efforts. The partner universities undertake to deliver the programme as described, in full, at the specified cost, and to award the qualifications as advertised.

5.5 Governing Law and Dispute Resolution

5.5.1 Governing Law.

This agreement shall be governed by and construed in accordance with French law, without prejudice to the application of mandatory provisions of the national laws of Spain and Ireland insofar as they relate to the academic recognition and delivery of the programme in those jurisdictions.

5.5.2 Dispute Resolution.

Any dispute arising out of or in connection with this agreement shall be resolved through the following escalation procedure: (a) the matter shall first be referred to the Joint Academic Committee for resolution within 30 working days; (b) if the JAC is unable to resolve the dispute, it shall be escalated to the rectors (or their designated deputies) of the partner institutions, who shall seek to resolve it within 60 working days through direct negotiation; (c) if the dispute remains unresolved, the parties agree to submit the matter to mediation under the rules of the International Chamber of Commerce (ICC); (d) if mediation fails, the dispute shall be referred to binding arbitration under ICC rules, with the seat of arbitration in Paris, France, and the language of proceedings being English.

5.6 Data Protection and Intellectual Property

5.6.1 Data Protection.

All processing of personal data in connection with this programme shall comply with Regulation (EU) 2016/679 (General Data Protection Regulation) and applicable national data protection legislation. The sharing of student and staff personal data between the partner institutions shall be governed by the GDPR Agreement annexed to this Cooperation Agreement (Annex VI). Each partner institution acts as an independent data controller for the personal data it processes in the context of the programme. Students

shall be informed of the data processing activities related to the programme, including the cross-border transfer of their data, at the time of enrolment.

5.6.2 Intellectual Property.

The ownership, use, and licensing of intellectual property developed in the context of the programme, including jointly developed teaching materials, course content, and research outputs, shall be governed by the IP Agreement annexed to this Cooperation Agreement (Annex VII). As a general principle, each partner retains ownership of the materials it produces individually, while jointly developed materials shall be co-owned by the contributing partners and available for use by all consortium members for the purposes of the programme

6. Formal Agreement Process

Munster Technological University's participation in the SMAC² Joint Master's Programme is subject to approval in accordance with its internal governance and quality assurance procedures. Formal agreement to participate in the programme is granted following consideration through MTU's programme approval processes, in line with the Policy for the Design and Approval of Programmes Leading to Major Awards, and requires approval by Academic Council. MTU ensures that all collaborative and joint programme arrangements comply with Irish national legislation, QQI quality assurance requirements, and the University's Regulations for Modules and Programmes (Marks and Standards).

For UNIOVI, the approval process of new programs involves the departments of Functional Biology and Department of Organisms and Systems Biology, the Faculty of Biology, the University Council, the Regional Asturian Government, and the Spanish Ministry of Universities.

For URN, the internal validation process involves approval by the Faculty Council, the Committee for Education and Student Life (*Commission de la formation et vie étudiante universitaire – CFVU*).

6.1 Alignment with Partner Standards, Systems and Practices

For MTU, UNIOVI and URN all academic processes are firmly established and verified in accordance with the European Standards and Guidelines for Quality Assurance (ESG).

For the SMAC² joint program, the INGENIUM Quality Assurance (QA) policy will be applied to ensure uniformity in academic standards and practices across the consortium.

The partner universities of the SMAC² joint programme will ensure that all academic and operational aspects align with European standards and practices.

The key commitments are:

1. **The evaluation procedure should be equivalent at the 3 universities**, also for the master thesis. Evaluation commitments are described in the respective section.

2. The courses and the evaluation of the student competences will be carried out in English.
3. The evaluation of students along the way, for the subjects studied within each partner university, will be carried out in compliance with the conditions provided in the Module/Course Descriptor, according to the rules adopted within the educational institution. This includes adherence to award standards, grading systems, work per ECTS, delivery model, assessment regulations and practices, academic management structures, monitoring.
4. **The award of the diploma is contingent upon the successful completion** of all courses, passing all exams, and the preparation and defence of the dissertation thesis.
5. **The Master thesis (dissertation)**, which forms a key component of the program, must demonstrate advanced scientific knowledge on the chosen topic, incorporating elements of originality in the development or solution of the research theme, as well as methods for scientific validation of the results.
 - 5.●.1 **The dissertation topic will be defined by the supervising lecturer in collaboration** with the student by the end of the second semester of the first year, ensuring alignment with the Master's degree training program and the supervisor area of expertise.
 - 5.●.2 **The recommended length for the dissertation thesis is between 35 and 50 pages**, using A4 format, Times New Roman font, size 12, with line spacing of 1 to 1.5. Dissertation supervisors will be jointly responsible with the student for ensuring the originality of the content, and they must prepare and sign a report confirming this, before the student is registered for the final exam.
 - 5.●.3 The Master's thesis will be presented and evaluated at URN University. It must be written in English and, optionally, it may include an abstract in French or Spanish.
 - 5.●.4 The Master's thesis will be presented orally to a committee formed by 3 members, lecturers of the Master, and then, the student will answer the questions raised by the members.
6. **All partner institutions must recognise the results obtained by the students.** ECTS grading system will be used to harmonize the interpretation of the records. Work per ECTS will be consistent with European norms, ensuring that students are provided with an appropriate workload and learning experience.
7. **Staff qualifications will meet the program's requirements** and delivery models will be harmonized to offer a high-quality educational experience.
8. **All partners will contribute to the preparation of promotional information, ensuring that all materials** are accurate and aligned with the programme's objectives. Additionally, the involved universities will actively participate in the registration and induction processes for both students and staff, ensuring that all participants are well-prepared for their roles in the program.

9. **Assessment regulations and practices will be aligned between the partner universities**, ensuring fairness and consistency. Academic management structures will participate in the program's monitoring and evaluation processes. Regular meetings will be documented to ensure transparency, and involved universities will actively contribute to program monitoring, feedback collection, and ongoing improvements, ensuring the program's success and compliance with quality standards.

7. Quality Assurance of the programme

7.1 Introduction

The SMAC² programme is designed in accordance with the French national regulations for higher education and quality assurance. In France, quality assurance is based on internal procedures implemented by higher education institutions and on periodic external evaluation conducted by HCERES (*Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur*), the independent public authority responsible for the evaluation of higher education and research institutions and programmes. As the lead partner, the University of Rouen Normandy is in charge of the process of accreditation of this programme according to the European Approach criteria.

This chapter outlines the Quality Assurance (QA) basis and QA strategy for the entire assessment process, focusing on standards related to degree awarding, learning outcomes, grading systems, assessment methods, and final decision-making processes, in line with the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). The joint contribution of URN, UNIOVI and MTU ensures that all institutions uphold and integrate these standards.

SMAC² academic quality assurance will adhere to the INGENIUM QA Policy, including the Quality Assurance Framework for Collaborative Delivery of Degrees within the INGENIUM partnership, ensuring consistent standards and rigorous academic oversight across all partner institutions. This policy has been produced with the European Approach to the Quality Assurance of Joint Programmes as a reference.

7.2 Quality Assurance Basis

The commitment of all three universities involved: **URN, UNIOVI and MTU** to the SMAC² program ensures the academic framework adheres to European standards and practices, as defined by HCERES, ANECA and QQI and MTU and the INGENIUM Alliance QA guidelines.

These standards include:

1. **Award Standards:** The Master's program will adhere to the European standards for higher education qualifications. URN, UNIOVI and MTU will ensure that graduates meet the required learning outcomes and competencies for a Master's degree.

2. **Learning Outcomes:** The learning outcomes of the SMAC² program are designed to ensure that graduates acquire a well-rounded education in Sustainable Maritime Management and Coastal Conservation, focusing on scientific knowledge, technical expertise, and interdisciplinary understanding. The specific learning outcomes are as follows:
3. **Scientific Expertise and Technical Proficiency:** Graduates will acquire in-depth scientific knowledge and advanced technical skills, enabling them to critically assess and apply various process technologies in both Sustainable Maritime Management and Coastal Conservation contexts.
4. **Global, Economic, and Societal Impact:** Graduates will evaluate and identify the broader implications of Sustainable Maritime Management and Coastal Conservation, considering their effects on global, economic, and environmental contexts.
5. **Interdisciplinary Competence in Process Technologies:** Graduates will identify, analyze, and compare different Sustainable Maritime Management and Coastal Conservation, integrating knowledge from multiple disciplines within engineering to address complex challenges.
6. **Business and Strategic Leadership:** Graduates will develop industry partnerships, based on business knowledge and strategic insight, drive innovation, and implement effective strategies for product development and organizational growth in the Sustainable Maritime Management and Coastal Conservation sectors.
7. **Adaptability to Industry Demands:** Graduates will apply their specialized knowledge to adapt to evolving labor market needs, positioning themselves as leaders in the development and application of cutting-edge technologies.
8. **Problem-Solving and Practical Application:** Graduates will identify key challenges within Sustainable Maritime Management and Coastal Conservation, leveraging their academic and practical experiences to propose and implement effective solutions to real-world problems.
9. **Ethical Awareness and Professional Responsibility:** Graduates will demonstrate a strong commitment to high ethical and professional standards, ensuring responsible decision-making in their work.
10. **Grading System:** The grading system will align with European and INGENIUM standards, ensuring consistency across partner institutions. The system will be transparent, objective, and provide students with clear feedback on their performance. The system is described in section 4.5
11. **Work per ECTS:** The program will ensure that the total workload is compliant with the European Credit Transfer and Accumulation System (ECTS), with the expected student workload corresponding to the program's credit requirements (60 ECTS per year). For URN, 1 ECTS corresponds to 10 hours of activities (didactic, practical, evaluation + individual study). For UNIOVI, 1 ECTS consists of 25 h of activities, 7.5 h of

them corresponds to face-to-face activities (lectures, seminars, laboratory and project sessions) and 17.5 h of them corresponds to unsupervised learning (individual study, team work, assessment preparation, etc.). For MTU 1 ECTS corresponds to 20 hours of notional work relating to the programme of study.

12. **Staff Qualifications:** All teaching staff involved in the delivery of the programme, from **URN, UNIOVI and MTU** , and all associated partners will meet the required academic qualifications, with a focus on expertise in the fields of sustainable development and coastal conservation
13. **Delivery Model:** The SMAC² Master's programme will be delivered through a blended learning model, integrating both online and face-to-face components. The delivery method will ensure accessibility while maintaining high academic standards and promoting interactive and collaborative learning.
14. **Promotional Information:** Accurate and clear promotional materials will be provided, outlining the program's objectives, learning outcomes, admission requirements, and structure, ensuring transparency for potential applicants from both institutions.
15. **Registration and Induction:** The programme will establish clear and effective registration procedures for students, supported by a comprehensive induction process for both students and staff. This induction will cover academic expectations, the use of learning resources, and practical aspects of program delivery across **URN, MTU and UNIOVI**.

7.3 Quality Assurance Policy

The three consortium partners agree on a joint QA policy for the programme.

The **URN, MTU and UNIOVI** QA policy for the SMAC² Master's program will involve a structured approach to assessment and decision-making processes. The policy will be based on the following elements:

Assessment Regulations and Practices:

Assessments will be designed to evaluate both theoretical knowledge and practical skills. Assessments will include written exams, project work, laboratory reports, and presentations. The assessments will be designed to evaluate students' ability to apply their knowledge to real-world problems in sustainable maritime management and coastal conservation. Assessment criteria will be clearly outlined in the descriptor for each module or discipline, detailing the required standards for successful completion. Each module will specify the minimum grade necessary to pass the examination, ensuring transparency and consistency across the program.

The grading scale and the assessment methods, including any requirements for written, oral, or practical exams, will be communicated to students at the start of the module. The minimum passing grade will reflect the academic rigor and expectations of the program,

ensuring that students meet the necessary standards for academic progression and the award of the postgraduate degree.

Continuous Monitoring and Feedback:

Throughout the program, students will receive continuous feedback on their progress, enabling them to improve and meet the required learning outcomes. Regular monitoring will ensure that the assessment methods are effective and that any necessary adjustments to the program can be made.

Academic Management Structures: URN, UNIOVI, and MTU, within the INGENIUM framework, will establish clear management structures to oversee the program's delivery, assessment, and evaluation processes (**Joint Academic Committee**).

Joint Academic Committee, having at least one responsible from each partner, will be established to oversee the management of SMAC² Program, ensuring alignment with the institutions' academic goals and quality standards and it will be responsible for overseeing the day-to-day management, ensuring that all actions align with the agreed timeline and objectives.

This Joint Academic Committee will oversee academic standards, curricula alignment and other relevant academic activities to ensure consistency and quality. It will support the continuous enhancement of the program, ensuring that equivalent teaching standards are upheld throughout the whole learning journey of enrolled students. The Joint Academic Committee will have regular meetings with the academic and administrative staff of both partner institutions to ensure alignment and continuous improvement of the program. This Committee will consist of representatives from all involved universities, including faculty permanent members, administrative staff *and student representatives*.

Final Examination and Thesis Assessment:

- The **award of the diploma** will depend on the successful completion of all required modules, passing all exams, and the preparation and defense of the dissertation thesis. The thesis is a key element of the program and must demonstrate advanced scientific knowledge of the chosen topic, incorporating originality in the development or solution of the research theme.
- **Dissertation Guidelines:** The dissertation is written in English. The dissertation must adhere to specific format guidelines, including a recommended length of 35-45 pages, in A4 format, with Times New Roman font, size 12, and line spacing of 1 to 1.5. The dissertation will be evaluated based on the depth of research, originality, and scientific rigor.
- **Supervision and Originality:** The dissertation will be supervised by a faculty member from either URN, UNIOVI and MTU, who will work closely with the

student to define the research topic by the end of the second semester of the first year.

- **Continuous improvement:** The Quality Assurance (QA) process for continuous improvement will be developed and implemented jointly by the partner institutions. Student feedback will be systematically collected at the end of each semester through standardized surveys and/or structured interviews, focusing on course content, teaching quality, learning outcomes, and administrative aspects. This feedback will be analyzed by the Joint Academic Committee, and results will inform annual review meetings to assess and implement improvements to the program structure, teaching methods, and learning resources.

7.4 Decision Process for Making Awards

- **Final Decision on Awards:** The decision to award the Master's degree will be made based on the successful completion of all courses, passing all examinations, and the satisfactory defense of the dissertation thesis. The final decision will be made by a Final Examination Committee (FEC) composed of academics from URN, UNIOVI, and MTU, ensuring impartiality and consistency with the program's academic standards.
- **Award and Graduation:** Upon meeting all requirements, the student will be awarded the Master's degree, accompanied by a diploma in line with European standards and the INGENIUM Alliance's joint academic regulations. The diploma will be accompanied by a diploma supplement with details on the student's performance, including grades, ECTS credits earned, and the grade obtained for the dissertation.

7.5 Processes for Monitoring and Review

a. Process for Ongoing Monitoring

Regular meetings will be held biannually by the Joint Academic Committee between the partner universities to effectively monitor and assess the progress of the collaborative program. These meetings will provide a platform for reviewing the program's quality, addressing challenges, and ensuring continuous improvement. Every five years, prior to the re-accreditation process (periodic evaluation), a comprehensive meeting will be convened to evaluate the program's performance and discuss the renewal or re-accreditation of the joint program. This meeting will ensure that the program remains aligned with the evolving academic standards, regulatory requirements, and strategic goals of the participating institutions.

b. Process for Periodic Review

SMAC² periodic review will be conducted in accordance with the regulatory standards of the participating institutions, including HCERES requirements. The periodic evaluation

will involve the collection and analysis of feedback from key stakeholders, including current students, alumni, and employers, to ensure the program's continued relevance, quality, and alignment with industry needs. Specifically, the evaluation process will include the analysis of data related to the SMAC² master's programme, gathered from these groups, to assess student satisfaction, alumni career outcomes, and employer expectations. This feedback will inform decisions regarding program updates, improvements, and potential areas for development, ensuring that the program remains responsive to both academic standards and professional requirements.

c. Process for Review of Policies and Procedures

For the SMAC² program, the partner universities will conduct a periodic review of the academic quality assurance policies and procedures at least every five years, or more frequently if there are significant changes in European standards or relevant accreditation requirements. This review process will ensure that the program remains aligned with evolving academic and regulatory expectations and that it continues to meet the highest standards of quality and relevance in the field. The review will involve an assessment of the program's structure, content, and delivery methods, with input from key stakeholders, to identify areas for improvement and ensure ongoing compliance with international best practices.

7.6 Quality Indicators and Data Collection

The following list of indicators will be collected annually and reviewed by the JAC.

This serves as a non-exhaustive, non-prescriptive list, which may be amended by the JAC depending on the feasibility of the data collection and the alignment with the partners' existing data collection processes.

Quantitative Indicators:

1. Application and admission rates (overall and by country)
2. Student enrollment and retention rates
3. Completion rates and time-to-degree
4. Grade distributions by module and institution
5. Graduate employment rates (6 months, 1 year, 3 years post-graduation)
6. Graduate further studies rates
7. Employer satisfaction with graduates

Qualitative Indicators:

1. Student satisfaction (surveys each semester)

2. Student feedback on modules
3. Teaching evaluations
4. Alumni feedback and career progression
5. Employer feedback on graduate competences
6. External stakeholder input through the continuous improvement committee

7.7 External Quality Assurance plan

The SMAC² joint programme will undergo external quality assurance in accordance with the European Approach for Quality Assurance of Joint Programmes (ESG 2015). The University of Rouen Normandy is in charge of the accreditation process in the name of the consortium to the HCERES (*Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur*), the independent public authority responsible for evaluating higher education programmes and institutions, ensuring compliance with national regulations and alignment with European higher education standards.

7.8 Graduate Tracking System

The consortium shall establish a joint graduate tracking system to monitor the outcomes and career progression of SMAC² graduates. The system shall be operational by the time the first cohort graduates.

The graduate tracking system shall collect data at the following intervals: 6 months, 1 year, and 3 years after graduation. Data collected may include: employment status and sector, relevance of the Master's qualification to current employment, salary range (anonymised), participation in further education or research, geographic location, and overall satisfaction with the programme.

The tracking system may be implemented at programme level or integrated into existing institutional alumni tracking systems, provided it is adapted to the transnational character of the programme. It shall link with European graduate tracking initiatives.

The University of Rouen Normandy, as coordinating institution, shall be responsible for the overall coordination of the graduate tracking system. Each partner institution shall contribute to data collection from graduates who completed their thesis at that institution. All data shall be processed in compliance with the GDPR (see Annex VI).

The results of graduate tracking shall be analysed by the JAC as part of the annual quality review and shall inform decisions on curriculum development, career services, and programme promotion. Summary results shall be published on the programme website and included in the periodic review self-assessment report.

The consortium shall also establish an alumni network to maintain engagement with graduates and to facilitate mentoring, networking, and industry connections for current students. The network will be coordinated by INGENIUM's management structures.

8. Student rights, responsibilities and support systems

8.1 Code of Conduct (Student)

All consortium partners agree to follow the codes of conduct of the partner institutions, reflecting the core academic values and standards of behavior expected across the University of Rouen, Normandy (URN), Munster Technological University (MTU) and the University of Oviedo (UNIOVI).

Key expectations include maintaining honesty and integrity in all academic work (no cheating, falsification or plagiarism), treating all members of the university communities with respect and without discrimination, and fostering a positive, collaborative learning environment.

All students, academics, and staff involved in the SMAC² programme are required to abide by the respective Codes of Conduct as a condition of participation. This means that a student must comply with the local code of conduct and regulations of whichever university they are attending at a given time, as well as the consortium's overarching principles.

By embracing these ideals, the programme ensures a safe, fair, and inclusive academic environment across all three campuses. Any form of harassment, discrimination, or academic misconduct will not be tolerated, and will be addressed under the agreed disciplinary procedures (see below).

The key principles of this shared Code of Conduct, based on the existing codes of conduct of the partner institutions, will be published in the Consortium Student Handbook and each student will sign a statement of adherence upon enrolment.

The partners also commit to the creation of a Joint Code of Conduct (JCC) once the JAC student representatives are elected. The JCC will be approved within the first 6 months of implementation of the programme and reviewed annually.

This joint Code of Conduct should be built on principles of academic integrity, respect, inclusivity, and professionalism, as well as the rejection of any type of discrimination. It should be fully aligned with the existing ethical codes and student charters at each institution, ensuring compatibility with local norms while upholding common standards for the entire programme community.

8.2 Student Disciplinary Policy and Procedures

The consortium establishes a unified framework for student disciplinary policy, coordinated across the three partner universities. This framework respects the existing disciplinary regulations at UNIOVI, URN, and MTU, while ensuring that misconduct is addressed consistently at the consortium level.

Any alleged breach of the Code of Conduct or other rules will initially be dealt with according to the procedures of the university where the incident occurs or is discovered. For example, each institution's competent bodies (such as UNIOVI's student discipline

committee and equivalent offices at URN and MTU) will carry out fact-finding and first-instance decisions under their local rules. At the same time, the partners will inform the programme's Joint Academic Committee of any serious disciplinary cases.

The Joint Academic Committee will oversee cases that affect the consortium as a whole or involve misconduct across multiple campuses. This committee will ensure that sanctions are proportionate and equitable across the consortium, and that repeat offenses at different universities are not treated in isolation.

Disciplinary measures may range (depending on severity) from warnings and mandatory training (for minor infractions) up to suspension or expulsion from the programme for grave misconduct, in line with each institution's regulations and national law.

In all cases, the student rights to due process will be upheld:

1. The student will be informed of the allegations, given an opportunity to respond, and allowed to appeal decisions.
2. Appeals will follow the relevant partner's appeal procedure, but the Joint Academic Committee may advise on appeals to promote consistency.
3. The consortium's approach is in keeping with European joint programme best practices, ensuring both local accountability and joint oversight. Notably, students are expected to observe the disciplinary codes of their host university at each mobility and must refrain from any fraudulent or unethical behavior such as plagiarism or cheating.

By coordinating our disciplinary processes, we aim to maintain high academic standards and protect the programme's integrity across all partners.

8.3 Grievance Policy and Procedure (Student)

The three partner universities agree to a common Grievance Policy to handle student complaints and problems in a fair and transparent manner. This policy covers any academic or administrative grievance a student might have during the programme – for example, concerns about course delivery, supervision, assessment, or services in the joint programme. The consortium's grievance procedure is designed to be compatible with each institution's existing complaint mechanisms while providing a clear escalation path across the consortium.

In practice, a student should first attempt to resolve a complaint at the local level by communicating with the local coordinator of the programme in each of the partner universities. A student may also decide to communicate the issue to one of the student representatives of the programme, who will then communicate it to the local coordinator.

This follows the principle that complaints should be addressed at the immediate level of concern whenever possible. If the issue is not satisfactorily resolved locally, or if it pertains to the joint programme structure rather than a single institution, the student may escalate the grievance to the consortium level.

The Joint Academic Committee will address any grievance brought by a student. An ad-hoc meeting may be called by any of the members of the JAC whenever a complaint is made. This body will review escalated complaints objectively and seek a solution in line with INGENIUM principles.

At the beginning of the programme and each semester, students will receive guidance on how to submit a formal complaint. Information on the formal complaint procedure (contacts, forms, and timelines) will be published on the programme's section within the INGENIUM website.

All grievances will be handled confidentially and without fear of reprisal. Decisions on complaints will be communicated in writing and, if the student remains dissatisfied, they retain the right to appeal further in accordance with the applicable university's rules.

By coordinating our grievance procedures, the consortium guarantees that students have a clear, effective way to voice concerns and receive resolutions, no matter which campus they are on at the time.

8.4 Reasonable Academic Accommodation Policy for students

The consortium is committed to ensuring inclusive and equitable access to the programme for students with disabilities, learning difficulties, or other special needs. We jointly adopt a Reasonable Academic Accommodation Policy that aligns with the best practices and legal requirements in France, Spain, France, and Ireland, as well as with European higher education inclusivity guidelines*.

Under this policy, any enrolled student who has a documented disability or specific educational need is entitled to appropriate accommodations across all partner institutions.

These accommodations may include, but are not limited to:

- modified assessment conditions (e.g. extra time on exams),
- accessible learning materials, assistive technologies,
- permission for support aids,
- adjusted course attendance requirements, or
- physical accessibility arrangements.

Each university in the consortium has established services and offices to support students with special needs :

1. UNIOVI: the University of Oviedo's Office for Students with Specific Needs (ONEO) provides personalized support to facilitate the inclusion and full participation of students with disabilities in academic and campus life
2. URN: "*Espace Handicap*" center provides support to students with disabilities and special needs

3. Munster Technological University is committed to ensuring equitable access to learning, assessment, and participation for students with disabilities, learning differences, or significant ongoing health conditions. Reasonable accommodation at MTU is provided following an individual needs assessment conducted by the University's Disability Support Service, in compliance with Irish equality legislation and the MTU Reasonable Accommodation Policy (Student). Any accommodation granted ensures that academic standards and programme learning outcomes are maintained and is implemented in line with principles of confidentiality, fairness, and Universal Design for Learning.

The partners will coordinate these services to ensure that when a student moves from one university to another for mobility, their accommodations travel with them.

Before or upon enrollment, students with disabilities requiring accommodations should inform the programme coordinators or the designated disability office at their home institution, providing any necessary documentation (e.g. medical certificates).

The consortium's Joint Academic Committee will then work with the local disability support officers at each university to develop an accommodation plan that is recognized by all partners.

All academic and administrative staff involved in the programme will be made aware of their obligations under this policy and given guidance on how to implement accommodations in coursework and assessment. The policy emphasizes a proactive and individualized approach: we strive to anticipate potential barriers and meet students' needs through reasonable adjustments, in line with the inclusive ethos of INGENIUM.

There will be no academic penalty for students using approved accommodations – for instance, if a student is granted additional exam time or assignment extensions, all consortium members will honor these measures. The confidentiality of students' disability-related information will be maintained, sharing details only as necessary with relevant staff and compliance with GDPR. By formalizing this Reasonable Accommodation Policy in the consortium agreement, the three universities affirm their shared commitment to diversity and equal opportunity, ensuring that no student is disadvantaged due to disability or health conditions.

8.5 General and Partner-Specific Policy and Procedures for Recognition of Prior Learning

The Recognition of Prior Learning- finalized with a bachelor diploma (RPL) may be utilized as a pathway for admitting learners to SMAC² programme, enabling the acknowledgment of relevant learning and experiences gained outside the formal education system.

The purposed master program is intended for Bachelor's degree in coastal engineering or a closely related field, Bachelor's degree in civil engineering, geosciences, Bachelor's degree in biology, geology or related fields, graduates with Interdisciplinary Backgrounds (graduates in related interdisciplinary fields, such as environmental engineering, environmental science, or geosciences, who have studied fundamental physical and biological principles and are interested in applying them to process technologies), professionals in related industries (working professionals with a background in civil engineering or environmental sciences who wish to advance their expertise in process technology and gain specialized knowledge in Sustainable Maritime Management and Coastal Conservation with relevant research experience (candidates with research experience in physical, civil engineering or geosciences or related areas who are looking to further their academic qualifications and specialize in process technology). SMAC² will attract students interested in the design, modeling, operation, and analysis of Sustainable Maritime Management and Coastal Conservation scopes.

Students may request Recognition of Prior Learning to the JAC or the adequate bodies of the partner institutions. The process shall be done in full alignment with the Lisbon Recognition Convention and the ECTS Users' Guide.

URN, UNIOVI and MTU recognise prior learning in accordance with its approved Recognition of Prior Learning (RPL) Policy. RPL may be used to support access, advanced entry, progression, or the awarding of credit, based on the assessment of demonstrated learning outcomes from formal, non-formal, or informal learning.

In the context of joint or collaborative programmes, including the SMAC² Joint Master's Programme, the application of RPL is subject to agreement between the partner institutions and must comply with each partner's quality assurance processes and NFQ standards.

RPL requests should comply with the following Maximum Recognition Ceilings aligned with the partner institutions' frameworks.

Table: RPL ceilings

Category	Maximum	Rationale
Overall Program	30 ECTS (25% of 120)	Ensures 90 ECTS SMAC ² -specific content

Category	Maximum	Rationale
Per Semester	15 ECTS (50% per semester)	Ensures participation at each location
Prior Certificated Learning (RPCL)	20 ECTS	From Bachelor or Master degrees
Prior Experiential Learning (RPEL)	10 ECTS	From work/research experience
Professional Certifications	6 ECTS	Process safety, environmental, etc

8.6 Provision of academic accommodation

The Partner Universities agree to make reasonable efforts to provide or help secure academic accommodations to all students enrolled in the SMAC² Master's Programme. Each Partner University shall follow its own established procedures, where they exist, for granting accommodations, including adjustments to schedules, access to campus facilities, resources, and assessment arrangements, as appropriate.

The Partner Universities shall cooperate to ensure that accommodations are implemented fairly and consistently.

8.7 Mobility support mechanisms and measures

All the student support mechanisms provided by the three partner universities and the INGENIUM European University will be incorporated into the student handbook to be distributed among all students upon enrollment.

8.7.1 Pre-Arrival Support

Before the start of each semester, students will be offered the following support measures:

1. **Buddy System:** students will be offered the possibility to enroll in Buddy Systems implemented by the partner universities in collaboration with local student associations (such as the Erasmus Student Network)

2. **Pre-arrival Communication:**

- Virtual orientation session
- Pre-arrival checklist and Student Handbook

3. **Practical Information:**

- Accommodation search assistance in line with institutional policies
- Visa guidance and support letters for non-EU students who need them
- Support with travel arrangements and arrival logistics

8.7.2 Upon-Arrival Support

1. **Induction Week (or equivalent):** Mandatory orientation at each institution before semester starts, including:

- Campus tours and facility introduction
- IT systems training (email, LMS, library)
- Academic expectations and study culture
- Local area orientation (transport, shops, emergency services)
- Team-building and social activities

2. **Administrative Support:**

- Registration procedures
- Residence permits
- Health insurance activation
- Student ID and access cards

3. **Meeting Key People:**

- Local programme coordinator
- Teaching and administrative staff
- Support services (counseling, disability, international office)

8.7.3 Ongoing Support Throughout Programme

Besides the targeted mobility support related to the frequent changes in location, the partners are also committed to the provision of comprehensive support through their existing offices and the structures of the INGENIUM European Universities Alliance.

1. **Academic Support:**

- Tutoring and mentoring
- Potential Academic skills workshops (scientific writing, presentation skills, research methods)
- Library and information literacy training
- Support for students struggling academically

2. **Personal Wellbeing:**

- Mental health counseling services at each location
- Support for culture shock and adjustment
- Peer support networks
- Crisis support and emergency contacts
- Confidential advice on personal issues

3. **Career Development:**

- Career counseling and planning
- CV and interview preparation
- Internship coordination in Semester 4
- Employer networking events
- Professional network building
- Job placement support and employer connections

4. **Inclusion, Diversity and Multilingualism**

- Accessibility accommodations across all locations
- Support for students with mental health conditions
- Cultural and personal accommodation

- o Family support if applicable
- o Language learning support in coordination with INGENIUM language centres

5. Sustainable and healthy habits

- o Support to acquire sustainable lifestyle
- o Advice on sustainable local (and potentially international) travel, cooperation with rail providers
- o Access to sport facilities

9. Revisions and modifications to the Cooperation Agreement

The partners may decide to revise this Cooperation Agreement to improve the implementation of the programme.

Minor revisions that do not alter the fundamental academic, financial, or legal aspects of the programme may be agreed within the JAC. Programme components may be considered fundamental based on the quality assurance and accreditation requirements of the programme. The coordinating institution shall be responsible to keep track of all changes to the agreement.

Comprehensive revisions should be approved by all partners following their respective institutional procedures.

The recommendations made by the Quality Assurance Agency responsible for the external evaluation of the programme should be considered as an Annex to this Cooperation Agreement.

10. Detailed Description of the SMAC² Structure

10.1 Programme Objectives

The SMAC² programme aims to develop experts capable of promoting coastal sustainability and resilience through innovative, science-based, and multidisciplinary approaches. Its main objectives are to:

1. Provide advanced knowledge in coastal and marine conservation, sustainability, and the assessment and management of environmental hazards, risks, and vulnerabilities.

2. Integrate a resilience-based approach, strengthening students' capacity to design adaptive management frameworks that enhance the resilience of coastal systems to climate change and multi-risk pressures.
3. Develop innovative tools and methodologies for sustainable and adaptive management tailored to coastal zones, promoting effective responses to environmental, climatic, and socio-economic challenges.
4. Promote strong and inclusive sustainable planning through a multi-disciplinary and integrative vision, combining scientific, technical, and socio-economic expertise from URN, MTU and UNIOVI.
5. Encourage applied research and innovation to advance knowledge in coastal sustainability, resilience, restoration, and conservation, and to explore nature-based and technological solutions for ecosystem protection.
6. Foster cross-border collaboration and harmonization of coastal management practices within the European INGENIUM University Alliance, strengthening the link between education, research, innovation, and policy implementation.

Keywords

Environmental risks ; Coastal Resilience ; Coastal sustainability ; Resource management ; Renewable energy ; Ecosystem conservation ; Multi-disciplinary approaches ; Transnational cooperation ; Blue economy

10.2 Semester 1 : University of Oviedo (UNIOVI), Spain

Theme: Foundations of Coastal and Marine Systems: Diversity, Ecology, Climate, and Spatial Management

Overview: The first semester provides the scientific and conceptual foundations necessary for understanding marine and coastal environments. It introduces students to marine biology, diversity, climate change processes, maritime spatial planning, and the principles of marine conservation, forming the ecological and analytical base for subsequent semesters.

Learning Outcomes : Semester 1

By the end of this semester, students will be able to:

To have knowledge, skills and autonomy in fundamental aspects of marine biodiversity and its changes over time and space.

1. Identify, measure and understand diversity in marine ecosystems.
2. Evaluate the impacts of climate change on coastal and marine ecosystems.

3. Interpret and apply international frameworks for maritime governance and spatial planning
4. Design integrated approaches to marine conservation and spatial management.
5. Apply multidisciplinary methods linking ecology, genetics, policy, and spatial analysis.

10.3 Semester 2 : Munster Technological University (MTU), Ireland

Theme: Applied Coastal Management, Offshore Renewable Energy, and Sustainable Maritime Operations

Overview:

The second semester focuses on the applied and technological dimensions of sustainable coastal and maritime management. Students explore the role of offshore renewable energy (ORE), risk management, and sustainable port operations in the context of the European Union's Green Deal and Ireland's blue economy strategy.

This phase of the programme bridges science, technology, and policy, deepening students' understanding of how climate change adaptation and clean energy transitions can strengthen coastal resilience and reduce environmental impacts.

Learning Outcomes : Semester 2

By the end of this semester, students will be able to:

1. Evaluate the technical, economic, and environmental dimensions of offshore renewable energy systems.
2. Apply risk management and supply chain analytics to maritime operations.
3. Understand EU and Irish regulatory frameworks supporting sustainable blue growth.
4. Develop strategies and management tools to reduce climate impacts in coastal and maritime sectors.
5. Integrate technological and policy perspectives to enhance coastal and maritime resilience.

10.4 Semester 3 : University of Rouen Normandy (URN), France

Theme: Coastal Hazards, Environmental Modelling, and Sustainable Development of Coastal Geosystems

Overview:

The third semester deepens students' scientific and analytical understanding of coastal processes, hazards, and environmental dynamics. Emphasis is placed on coastal resilience, hydrology, numerical modelling, and remote sensing techniques for assessing and mitigating environmental risks.

Students explore the relationships between coastal geomorphology, biodiversity, and contaminants, developing the technical and conceptual skills needed to design sustainable management and restoration strategies for vulnerable coastal systems.

Learning Outcomes: Semester 3

By the end of this semester, students will be able to:

- Analyze and model coastal hazards and their links with climate and hydrological processes.
- Apply remote sensing for environmental monitoring and spatial planning.
- Use numerical modelling and impact assessment tools for coastal risk evaluation.
- Assess contaminant dynamics and biogeochemical processes in marine and estuarine environments.
- Integrate environmental, social, and economic dimensions into sustainable coastal development and resilience planning.

10.5 Joint Elements of SMAC²

1. Joint Academic Framework

❖ Common Curriculum Core:

A harmonized set of modules across MTU, UNIOVI, and URN, focusing on *coastal systems science, environmental risks, resource management, renewable energy, and resilience approaches*.

❖ Harmonized Learning Outcomes:

Shared academic standards and competencies aligned with the European Qualifications Framework (EQF) and ESG guidelines for joint programmes.

❖ Joint Academic and Scientific Board:

Representatives from all three universities coordinate curriculum design, quality assurance, and continuous innovation in teaching and research.

2. Integrated Mobility and Learning Path

❖ Structured Student Mobility:

Semester 1 *University of Oviedo (Spain)*: Fundamentals of coastal ecology, coastal conservation, Climate change

Semester 2 *Munster Technological University (Ireland)*: Applied coastal management, renewable energy, and blue economy policy.

Semester 3 *University of Rouen Normandy (France)*: environmental risk management, Coastal resilience, ecosystem restoration, insights on governance/ planning.

Semester 4 *Research Thesis / Internship*: Conducted under joint supervision between partner institutions and external stakeholders.

❖ Mobility Integration:

Students receive joint academic recognition for credits earned across institutions under a unified ECTS framework.

3. Joint Research and Innovation Activities

❖ Complementary Research Themes:

- a. Coastal resilience and adaptive management
- b. Environmental hazards and risk mitigation
- c. Marine ecosystem conservation and restoration
- d. Nature-based and technological solutions
- e. Sustainable resource management and renewable energy in coastal areas

❖ Joint Student Projects:

Interdisciplinary projects integrating scientific, technical, and policy perspectives, co-supervised by academics from at least two universities.

3 projects from each semester are selected

Semester 1 UNIOVI: Marine resources and ecosystems sustainable management projects.

Semester 2 MTU: In the second semester students explore the technologies, trends and practices associated with offshore renewable energy (ORE), risk management, and sustainable port operations in the context of the European Union's Green Deal and Ireland's blue economy strategy.

Semester 3 URN: Remote Sensing Projects

❖ Shared Research Infrastructure:

Students gain access to laboratories, field sites, and datasets from all partner institutions to enhance collaborative research.

4. Research Internships and Applied Training

❖ Research Internships:

Students undertake internships with research centres, NGOs, local authorities, or private-sector partners focused on coastal sustainability and resilience. Internships are jointly recognized and co-supervised by the partner universities.

❖ Professional Training Modules:

Short-term placements or workshops addressing *GIS applications, environmental modelling, coastal engineering, and data-driven decision-making*.

❖ Capstone Research Thesis:

Jointly supervised final project integrating applied research, innovation, and fieldwork to address real-world coastal management challenges.

5. Joint Summer School, Workshops, and Training Events

A week is scheduled before the beginning of the second semester in Normandy University. This week gathers different joint elements including : 2 days of Field (2 different sites in Normandy; 1 day/ site) , 1 day of workshop and 1 day of skill development seminars.

A project integrating the different components of the first year of SMaC² Master 1 will be developed based on the different joint elements. The Credit of this project will be considered for the last semester (most of the credits with 85% will be assigned to the Master Internship + 15% Join summer School).

Immersive learning experiences at representative coastal and estuarine sites in Normandy supported by a strong interaction with SMaC² coordinators.

The SMaC² Master stands as a model of European excellence in coastal sustainability education, integrating:

- Coastal resilience and adaptive management as core principles
- Cross-border collaboration and knowledge sharing
- Applied research, field experience, and professional training
- A unified European vision for sustainable and resilient coastal futures
- Annual INGENIUM Summer School on Coastal Resilience:

Three different sites in Normandy are selected by the INGENIUM SMaC² coordinators and reflect the main insights, objective of this master.

6. Workshops and Thematic Training Events:

Focused sessions on *climate adaptation, blue economy innovation, coastal risk assessment, and nature-based solutions*, involving experts from academia, government, and industry.

- ❖ Skill Development Seminars:

Training in scientific communication, project management, and EU environmental policy frameworks to enhance students' professional competencies.

6. Joint Supervision and Degree Awarding

- ❖ Co-Supervision Model:

Each student's research project is supervised by at least two academics from different partner universities, ensuring a multidisciplinary and cross-border perspective.

- ❖ Joint or Multiple Degree Option:
 - ❖ joint diploma (preferred) awarded collectively by MTU, UNIOVI, and URN, or multiple national degrees with mutual recognition.
 - ❖ Unified Assessment Criteria: Standardized grading and evaluation framework applied across all institutions.

7. Joint Outreach and Collaboration

- ❖ Stakeholder Engagement:

Partnership with coastal management agencies, NGOs, and international organizations involved in marine conservation and sustainability.,

- ❖ Networking Events:

Annual *SMaCC Coastal Resilience Forum* hosted by each University during the master to connect students, researchers, and practitioners (stakeholders)

10.6 European Organisations and institutional centers, partners of SMAC²

- ❖ International and European Organisations

European Spatial Agency ; Mercator International , UNESCO

- ❖ French Institutional centers and organisms

BRGM , Water Authority, Seine Maritime Organism, SHOM

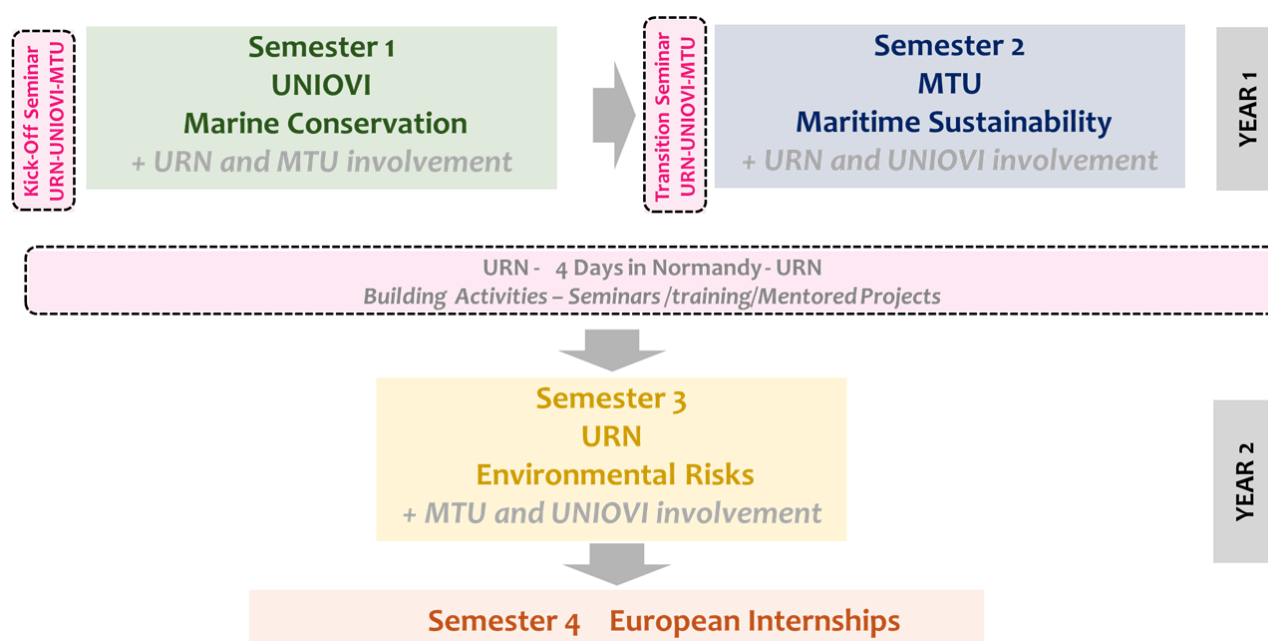
- ❖ Spanish Institutional centers and organisms

Port Authority of Gijon, Spain. Port authority of Aviles, Spain. Fisheries Experimentation Centre, Ministry of Rural Development and Natural Resources of the Principality of Asturias, Gijón, Spain. Tragsa and Tragsatec, Spain. Bioparc Acuario de Gijón, Spain. REDEPESCA Network, Asturias, Spain. Spanish Network of Knowledge Spaces for the Blue Economy (REECEA). Institute of Natural Resources and Land Management (INDUROT). IHCantabria, Cantabria, Spain. Spanish Institute of Oceanography IEO, Spain. Abei Energy, Spain.

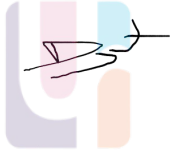
❖ Irish Institutional centers and organisms:

Port of Cork;

An overview of the programme structure is presented in the figure below, highlighting the four semesters. Three joint elements are included: (i) the opening and kick-off meeting of the Master's programme at UNIOVI, (ii) a transitional meeting designed to ensure continuity between Semester 1 and Semester 2, and (iii) team-building activities at the start of the second year (Semester 3).



Signatures



University of Rouen Normandy

President,
Prof. Franck LE DERF

University of Oviedo

Rector,
Prof. Ignacio Villaverde Menéndez

Munster Technological University

President
Prof. Maggie Cusack FRSE

List of Annexes

Annexes are provided as separate documents and included in the programme folder.

All documents shall be made available to the Quality Assurance Agency and any relevant authority involved in the accreditation of the programme.

Annex I: Model diploma

Annex II: Module descriptors – MTU

Annex III: Module descriptors – UNIOVI

Annex IV: Module descriptors – URN

Annex V: GDPR Agreement

Annex VI: IP Agreement

Annex VII : Grading scales of the consortium partners

Complementary documents (CDs)

Documents that the consortium commits to create as part of the implementation of this Cooperation Agreement.

The documents will be made available upon request to the Quality Assurance and Accreditation Agencies, the review panel responsible for the evaluation of the programme, or any relevant authority.

CD1: Student Handbook

CD2: Staff CVs

CD3: List of partner facilities and services available

CD4: Complete partner policies and procedures

CD5: Complete Recognition of Prior Learning Policy

Joint Master's Program in Sustainable Maritime Management and Coastal Conservation

MASTER délivré en partenariat international par l'Université de Rouen Normandie (France) avec l'Université d'Oviedo (Espagne) et la Munster Technology University (Ireland). MÁSTER expedido en colaboración internacional por la Universidad de Rouen Normandia (Francia), junto con la Universidad de Oviedo (España) y la Universidad tecnológica de Munster (Irlanda). MASTER OF SCIENCE Awarded as part of an international partnership with the University of Rouen Normandy (France), the University of Oviedo (Spain) and Munster University of Technology (Ireland).		
RÉPUBLIQUE FRANÇAISE MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE Vu le Code de l'éducation, notamment son article L. 613-1 ; Vu les textes réglementaires autorisant l'université de Rouen Normandie à délivrer le diplôme ; Vu l'arrêté du 27 juin 2022 accréditant l'Université de Rouen Normandie en vue de la délivrance de diplômes nationaux ; Vu les procès-verbaux du jury ; Le diplôme national de Master de SCIENCES, TECHNOLOGIES, SANTE, mention GESTION DE L'ENVIRONNEMENT, Parcours type Gestion maritime durable et conservation côtière est délivré à (Mme ou M) (prénom, NOM patronymique), date de naissance leà au titre de l'année universitaire.....et confère le grade de Master, pour en jouir avec les droits et prérogatives qui y sont attachés. Fait le Signature du chef d'établissement Le recteur de la région académique Chancelier des universités Numéro du diplôme	ESPAÑA FELIPE VI, REY DE ESPAÑA y en su nombre el/la Rector/a de la UNIVERSIDAD DE OVIEDO Considerando que, conforme a las disposiciones y circunstancias previstas por la legislación vigente, Don/Doña nacido/a el DD de MES de AAAA en, de nacionalidad, ha superado en modalidad presencial en MES de AAAA, los estudios conducentes al TÍTULO CONJUNTO oficial de MÁSTER UNIVERSITARIO en Gestión marítima sostenible y conservación costera por la Munster University of technology (Irlanda) la Universidad de Oviedo (España) y la Universidad de Rouen Normandía (Francia), establecido por Acuerdo de Consejo de Ministros de DD de MES de AAAA expide el presente título oficial con validez en todo el territorio nacional, que faculta a el/la interesado/a para disfrutar los derechos que a este título otorgan las disposiciones vigentes. Dado en a ... de de El/La interesado/a, El/La Rector/a, Los/as Rectores/as, El/La Jefe/a de la Secretaría, Número de registro	IRISH REPUBLIC <i>Munster Technological University (MTU) is designated as a Designated Awarding Body (DAB) primarily under the Technological Universities Act 2018, which provides the statutory basis for its establishment and awarding powers.</i> <i>MTU operates its DAB status in accordance with the Qualifications and Quality Assurance (Education and Training) Act 2012, which defines its authority to make awards.</i> <i>Munster Technological University (MTU) having statutory authority to award degrees, including joint awards and other qualifications under the Qualifications and Quality Assurance (Education and Training) Act 2012, and the Technological Universities (TU) Act, 2018 hereby with University of Oviedo (Spain) and University of Rouen Normandy (France) confers the Joint Masters Degree in</i> Sustainable Maritime Management and Coastal Conservation <i>upon :</i> <i>(First Name, Surname):</i> <i>Dated :</i> <i>(Day / Month / Year)</i> Conferred by President, Munster Technological University : Signed :

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	Munster Technological University
1.2 Faculty	Faculty of Engineering & Science
1.3 Department	National Maritime College of Ireland
1.4 Field	Maritime Studies
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC2)

2. Course information

2.1.1 Course name				Research Methods and Proposal			ECTS 5	
2.1.2 Course code				NAUT9007	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Kim Mulcahy				
2.3 Course instructors for applied activities					Kim Mulcahy			
2.4 Year of study ²	1	3 Semester ³	1/2	2.6 Evaluation type ⁴	Written Report (Literature Review), Presentation, Written Report (Proposal)	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	7	3.2 course	1	3.3a sem.	0	3.3b laboratory	0	3.3c project	3	3.3.d. practice	3
3.4 Total hours from curriculum ⁶	105	3.5 course	15	3.6a sem.	0	3.6b laboratory	0	3.6c project	45	3.6d. practice	45
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										45	
Practical skills development										12	
Preparation of seminars / laboratory works / project phases / homework / presentations										30	
Evaluation ⁸										3	
Other activities:										15	
3.7 Total hours of individual study ⁹		90									
3.8 Total hours per semester ¹⁰		105									
3.9 Number of credits		5									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Canvas LMS, PowerPoint, computer/laptop
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Canvas LMS, PowerPoint, computer/laptop

6. Overall objective of the course

This module develops the competence of students in selecting and using a range of appropriate quantitative and qualitative research methods, and professional skills and techniques associated with research and to assist them in the writing of a research proposal and the process of writing an extended research report/thesis.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Be able to review and appraise a wide range of literature.
Skills	The student / graduate will: 2. Be able to formulate a suitable related topic and develop an appropriate research statement. 3. Be able to explore, select, and develop applicable research methodologies.
Responsibility and autonomy	The student / graduate will: 4. Construct a valid research design. 5. Communicate the research project proposal through a presentation and written reports; the research topic, statement of aims, literature review, methodologies, research design, work schedule and project plan.

8. Teaching methods

The course is delivered through lectures introducing new material, in class discussions, application of new knowledge and methods supported by exemplars and hands-on practice. Teaching methods are designed to progressively build students' knowledge and skills to develop research and academic writing skills in line with best practice and Institute policies.

Core topics are introduced through concise lectures that are supported with additional resources on Canvas for self-directed learning. Learning is scaffolded throughout the semester to allow students to build knowledge and skills in researching, writing and presentation skills.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
Topic and idea generation Idea generation, formulating and clarifying a relevant research topic. Definition of the meaning of research. Identification of a research question. Development of the research statement. Examples of research.	Interactive lectures and discussions to support learning.	21 hours
Literature Review Library sources: Books, on-line journals, industry relevant publications, web sites. Use of search techniques. Topic focus. Critical reading. Referencing. Ethics.		21 hours
Research Methodologies At Master's degree level, the advanced research approach involves choosing a research question, a research design and the evaluation of alternatives, within the framework of responsible ethics. Appraising quantitative research, qualitative research and mixed methods. Interview techniques. Questionnaire design. Experiments. Observation techniques. Participant selection. Sampling techniques.		21 hours
Research Design. Constructing appropriate research design. Research theories. Research strategies. Project management. Gantt Charts.		21 hours
Dissertation proposal writing. Critique dissertation proposal writing styles. Dissertation layout. Composition techniques. Dissertation structure. Critical thinking.		21 hours
Course bibliography: Books: Naresh K. Malhotra, David F. Birks, Daniel Nunan. (2017), Marketing Research : An Applied Approach, 5th. Pearson Education Limited, UK, [ISBN: 9781292103129].		

Denscombe, Martyn. (2014), The Good Research Guide: For Small-Scale Social Research Projects, Open University Press - McGraw-Hill Education (UK), UK, p.378, [ISBN: 9780335264704]. Prabhat Pandey, Meenu Mishra Pandey,. (2015), Research Methodology : Tools and Techniques, 1st Bridge Centre, [ISBN: 9786069350270]. Mark Saunders, Philip Lewis, Adrian Thornhill. (2015), Research Methods for Business Students, 7th Edition. Prentice Hall, UK, p.768, [ISBN: 9781292016627]. Neil J. Salkind. (2021), Exploring Research, [GLOBAL EDITION], 10th Edition. Pearson Education, p.0, [ISBN: 1292364319]. Gina Wisker. (2007), The Postgraduate Research Handbook, 2nd Ed.. Palgrave, p.440, [ISBN: 9780230521308]. Supplementary Book Resources Jill Collis, Roger Hussey. (2009), Business Research, 3rd Ed.. Palgrave Macmillan, p.0, [ISBN: 9781403992475]. James D. Lester (Jr.). (2014), Writing Research Papers : A Complete Guide, 15th. Pearson, [ISBN: 9780321952950]. Murray, Rowena. (2011), How To Write A Thesis, 3rd Ed.. Open University Press - McGraw-Hill Education (UK), UK, p.384, [ISBN: 9780335244287]. Peter Levin. (2008), Excellent Dissertations - Student Friendly Guides, Open University Press - McGraw- Hill, London, UK, p.0, [ISBN: 9780335218226]. Les Oakshott. (2009), Essential Quantitative Methods, 4th Ed. Palgrave Macmillan, UK, p.496, [ISBN: 9780230218185]. Online Resources Website, Munster Technological University. (2023), MTU Library, https://www.library.mtu.ie Website, Central Statistics Office - Irish Government. (2023), Central Statistics Office - Irish Government, https://www.cso.ie Website, Enterprise Ireland IE. Enterprise Ireland, https://www.enterprise-ireland.com Website, European Union, https://european-union.europa.eu/index_en Website, Survey Monkey. Survey Monkey - Questionnaire Design, http://Http://surveymonkey.com Website, World Trade Organisation [WTO]. World Trade Organisation [WTO], https://www.wto.org/ Website, Amarach Research, https://www.amarach.com Website, Environmental Protection Agency. Environmental Protection Agency (EPA), https://www.epa.ie Website, International Maritime Organisation. International Maritime Organisation (IMO), https://www.imo.org/en/		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Written Report	Literature review: critical analysis examining and synthesizing the latest literature of the student's chosen research area.	Literature Review and submission of Coursework	30%
10.5 Student Presentation	Development of an individual presentation on their proposed research area and methods. Delivery of presentation to peers and lecturer.	Student presentation to peers and submission of course work	20%
10.6 Written Report	Development of a proposal for a research project in the student's chosen research area. To include the research topic and statement of aims and objectives, a literature review, methodologies	Proposal and submission of Coursework	50%

	identified, the research design, work schedule and project plan, and be underpinned with academic references.		
10.6 Conditions for passing			
Grades from 0 to 100 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 40 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 11 February 2026

Course instructor: Kim Mulcahy

Course instructors for applied activities: Kim Mulcahy

Date of approval by the department:

Head of Department: Brian Devitt

Date of approval by the Faculty Council:

Dean, Sean McSweeney

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	Munster Technological University
1.2 Faculty	Engineering
1.3 Department	National Maritime College of Ireland
1.4 Field	Maritime Studies
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				(ECTS 10)				
2.1.2 Course code				MARI9001	2.1.3. Course category Expert / Marine Engineering			S
2.2 Course instructor				Dr. Brian Devitt				
2.3 Course instructors for applied activities					Brian Devitt and JP Kern's			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴	Presentation Project Report	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	14	3.2 course	2	3.3a sem.	0	3.3b laboratory	0	3.3c project	6	3.3.d. practice	6
3.4 Total hours from curriculum ⁶	210	3.5 course	30	3.6a sem.	0	3.6b laboratory	0	3.6c project	90	3.6d. practice	90
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										90	
Practical skills development										24	
Preparation of seminars / laboratory works / project phases / home works / presentations										60	
Evaluation ⁸										6	
Other activities:										30	
3.7 Total hours of individual study ⁹		180									
3.8 Total hours per semestre ¹⁰		210									
3.9 Number of credits		10									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Whiteboard, video projector, laptops.
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5.2 Seminar / Laboratory / Project delivery requirements ¹³	Whiteboard, video projector, laptops.
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6. Overall objective of the course

The module examines modern maritime innovations driven by Industry 4.0 and sector digitalization. It delves into the potential implications of remote and autonomous shipping, focusing on critical sensors, safety, challenges, and opportunities. Additionally, it investigates the green shipping concept within the framework of the International Maritime Organization's 2050 greenhouse gas targets, highlighting key technologies being utilized by stakeholders to lower emissions.

7. Learning outcomes

Knowledge	The student / graduate will: • Critique the opportunities and challenges of digitalization technologies on maritime and port operations. • Evaluate advanced sensor technologies and their applications in enhancing navigation, safety, and efficiency in maritime operations.
Skills	The student / graduate will: • Develop strategies for adopting green shipping practices that meet the 2050 IMO emission targets. • Analyze the benefits, and operational challenges of integrating both autonomous and remote ships and port cargo handling equipment into existing operations.
Responsibility and autonomy	The student / graduate will: • Critically assess the regulatory and ethical considerations of deploying new maritime technologies, ensuring compliance with global standards

8. Teaching methods

This module is delivered through an applied, research-informed approach that integrates theoretical foundations with critical evaluation of contemporary maritime technologies. Structured lectures introduce core concepts in digitalisation, autonomous shipping, advanced sensor systems, and green shipping, drawing on peer-reviewed research, IMO policy instruments, and industry case studies.

Teaching emphasises critical analysis rather than descriptive coverage. Case-based discussions and scenario exercises require students to evaluate operational feasibility, regulatory implications (SOLAS, COLREG, STCW), cybersecurity risks, and sustainability trade-offs. Workshops support deeper exploration of sensor integration, automation systems, and decarbonisation strategies aligned with IMO 2050 targets.

Team-based learning activities scaffold the presentation and case study assessments, while guided literature review sessions support development of the individual research report. Formative questioning, peer feedback, and structured debate are embedded throughout to strengthen analytical skills and ensure constructive alignment with the module learning outcomes.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
Digitalization of the maritime industry: Cyber physical systems & internet of things; automation & robotics; additive manufacturing; big data & data analytics; virtualization, simulation & AR/VR/extended reality; drones; cloud computing; blockchain; cyber security; digital twining; artificial intelligence; human robot interaction & industry 5.0.	Presentation of new material, class discussions, application of new knowledge and skills through individual and group tasks with	50 Hours
Remote and autonomous shipping: Maritime autonomous surface ships (MASS): costs vs benefits, IMO four degrees of autonomy, cyber security threats, application of SOLAS, COLREG and STCW regulations to MASS. Security and Safety, ISPS Code and ISM Code, seagoing versus shore-side regulations. Key projects: MUNIN,		50 Hours

YARA Birkeland, ReVolt, AAWA, ASDS and AMOS. Sensors overview: global positioning system (GPS), inertial navigation systems (INS), optical and infra-red (IR) cameras, light detection and ranging (LIDAR), radio detecting and ranging (RADAR), high-resolution sonar, microphones, wind and pressure sensors, shore control centers, safe sea net, IMO e-navigation, MASS and the future role of the seafarer.	embedded formative assessments to support learning.	
The green shipping concept: 2050 IMO targets, green shipping corridors, green ports, the energy efficiency design index (EEDI), the ship energy efficiency management plan (SEEMP), the energy efficiency operational indicator (EEOI), the energy efficiency existing ship index (EEXI), emissions trading systems and carbon taxes.	Reviewing course materials, weekly readings, conducting research, preparing presentations and reports both individually and collaboratively.	50 Hours
Green shipping technologies: 1. Vessel hull: profile optimization, coatings, air lubrication techniques. 2. Propulsion systems: engine technology, propeller selection, efficient steering gear, wind propulsion technologies. 3. New fuels and treatments: biofuel, LNG, e-fuel, methanol, ammonia, hydrogen, solar and batteries. 4. power systems: AC vs DC systems, waste heat recovery. 5. ship operation: slow steaming ship speed, ballast water management.		50 Hours
Course bibliography:		
- John Erik Hagen. (2021), Sustainable Power, Autonomous Ships, and Cleaner Energy for Future Shipping, Artech House, p.300, [ISBN: 9781630818005]. R. GLENN. WRIGHT. (2024), Ship Sensors, Conventional, Unmanned and Autonomous, Routledge, [ISBN: 9781032456218]. - Lisa Otto. (2020), Global Challenges in Maritime Security, Springer, Switzerland, [ISBN: 978-3-030-34629-4]. - Michele Fiorini, Natalie Gupta. (2021), ICT Solutions and Digitalisation in Ports and Shipping, IET, London, [ISBN: 9781839530869]. - Nam Kyu Park. (2022), Smart Port Management and Strategy, Bentham Science Publishers Pte Ltd, Singapore, [ISBN: 9815050435]. - Hassan Rashidi, Edward P. K. Tsang. (2022), Port Automation and Vehicle Scheduling, 3rd Edition. CRC Press, [ISBN: 9781000629354].		
Articles/Papers - Ziajka-Poznańska, Ewelina, and Jakub Montewka. (2021), Costs and benefits of autonomous shipping—a literature review, Journal of Applied Sciences, 11(10). - Kim, M., Joung, T.H., Jeong, B. and Park, H.S. (2020), Autonomous shipping and its impact on regulations, technologies, and industries, Journal of International Maritime Safety, Environmental Affairs, 4(2). - Shahbakhsh, M., Emad, G.R. and Cahoon, S. (2022), Industrial revolutions and transition of the maritime industry: The case of Seafarer's role in autonomous shipping, The Asian journal of shipping and logistics, 38(1). - Tadros, M., Ventura, M. and Soares, C.G. (2023), Review of current regulations, available technologies, and future trends in the green shipping industry, Journal of Ocean Engineering, 280. - Agarwala, P., Chhabra, S. and Agarwala, N. (2021), Using digitalisation to achieve decarbonisation in the shipping industry, Journal of International Maritime Safety, Environmental Affairs, and Shipping, 5 (4). - Merz, M., Grøtli, E.I., Mørkrid, O.E., Tangstad, E., Fossøy, S. and Nordahl, H. (2023), A gap analysis for automated cargo handling operations with geared vessels frequenting small sized ports, Maritime Transport Research, 5 (1). - Vaca-Recalde, M.E., Hidalgo, C., Matute, J.A., Lattarulo, R., Murgoitio, J., Pérez, J., Vicente, C., Iturrioz, I., Camacho, A. and Hernández-Galán, C. (2023), Spanish approach for the Smart Digital Ports through highly automated logistics, Transportation Research Procedia.		
Online Resources Online report, World Maritime University. Transport 2040 : Impact of Technology on Seafarers - The Future of Work, https://commons.wmu.se/transport_2040/ Online report, KPMG. (2021), The Pathway to Green Shipping, https://kpmg.com/de/en/home/insights/2021/07/the-pathway-to-green-shipping.html#:~:text=%22The%20pathway%20to%20green%20shipping%22%20provides%20insight%20into%20developments%20to,business%20model%20of%20shipping%20companies Website, Regs4Ships, OneOcean, http://www.regs4ships.com/ Website, International Maritime Organisation, https://www.imo.org Online policy document, EU Operational Guidelines for Safe, Secure and Sustainable Trials of Maritime Autonomous Surface Ships (MASS), https://transport.ec.europa.eu/transport-modes/maritime/maritime-autonomous-ship-s-and-shipping_en Online policy document, IMO E-Navigation Guidelines,		

https://www.imo.org/en/OurWork/Safety/Pages/eNavigation.aspx Online policy, IMO Guidelines for the Development of the SEEMP, https://www.imo.org/en/OurWork/Environment/Pages/Improving%20the%20energy%20efficiency%20of%20ships.aspx Online report, FEPORT. (2020), Position Paper Automation and Digitalisation, https://www.feport.eu/images/downloads/public_documents/feport---position-paper-on-automation-and-digitalisation---final-version-june-2020.pdf Online report, The World Bank. (2021), Accelerating Digitalization Across the Maritime Supply Chain, https://www.worldbank.org/en/topic/transport/publication/accelerating-digitalization-across-the-maritime-supply-chain Online policy, European Commission. Digitalisation of Transport and Logistics and the Digital Transport and Logistics Forum, https://transport.ec.europa.eu/digitalisation-transport-and-logistics-and-digital-transport-and-logistics-forum_en		
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10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.1 Presentation	Team presentation: an analysis of a selected maritime digitalization technology: current applications, challenges, and future opportunities.	Presentation and submission of course work	30%
10.2 Project	Team case study: an evaluation of a number of maritime autonomous surface ship (MASS) case studies exploring costs, benefits, challenges and opportunities.	Submission of Coursework	30%
10.3 Written Report	Individual literature review: critical analysis examining and synthesizing the latest literature and future trajectory of a green shipping technology.	Submission of Coursework	40%
10.6 Conditions for passing			
Grades from 0 to 100 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 40 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 9 January 2026

Course instructor: Brian Devitt

Course instructors for applied activities: Brian Devitt & JP Kerns

Date of approval by the department:

Head of Department: Brian Devitt

Date of approval by the Faculty Council:

Dean, Sean Mc Sweeney

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	Munster Technological University
1.2 Faculty	Engineering
1.3 Department	National Maritime College of Ireland
1.4 Field	Maritime Studies
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name	Maritime Surveying and Risk Management (ECTS 10)		
2.1.2 Course code	MARI9003	2.1.3. Course category Fundamental/Specialized/Complementary	S
2.2 Course instructor	Dan Manning		
2.3 Course instructors for applied activities (S, L, P, Pr)	D. Manning		
2.4 Year of study ²	1	2.2 Semester ³	1
2.6 Evaluation type ⁴	Report Presentation Report	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	14	3.2 course	2	3.3a sem.	0	3.3b laboratory	0	3.3c project	6	3.3.d. practice	6
3.4 Total hours from curriculum ⁶	210	3.5 course	30	3.6a sem.	0	3.6b laboratory	0	3.6c project	90	3.6d. practice	90
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										90	
Practical skills development										24	
Preparation of seminars / laboratory works / project phases / home works / presentations										60	
Evaluation ⁸										6	
Other activities:										30	
3.7 Total hours of individual study ⁹		180									
3.8 Total hours per semestre ¹⁰		210									
3.9 Number of credits		10									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Whiteboard, video projector, laptop
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Whiteboard, video projector, laptop

6. Overall objective of the course

This module explores the critical roles of marine surveying and risk management within the maritime industry, focusing on ensuring the safety, security, and environmental compliance of maritime operations.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Identify the different types of marine surveys, describing the fundamental concepts, principles, theories and terminology used in this area of maritime shipping.
Skills	The student / graduate will: 2. Identify and analyse risks in maritime operations, including occupational, environmental, operational, and financial risks, using established risk assessment methodologies. 3. Develop and implement risk management strategies to mitigate identified risks, ensuring the safety, security, and environmental sustainability of maritime operations.
Responsibility and autonomy	The student / graduate will: 4. Navigate the regulatory landscape, understanding and applying maritime codes and regulations relevant to marine surveying and risk management. 5. Communicate effectively with stakeholders, presenting clear and concise reports, risk assessments, and management plans to ship owners, regulatory bodies, and insurance companies.

8. Teaching methods

Lecture; Presentation of new material, class discussions, application of new knowledge and skills through individual and group tasks with embedded formative assessments to support learning.

Independent and Directed Learning (Non-Contact), Reviewing course materials, weekly readings, conducting research, preparing presentations and reports both individually and collaboratively

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Ship types and terminology Overview of the different types of ships trading and the terminology used within shipping and ports	Interactive lecture. Clarifying explanations.	35 hours
9.1.2. Marine Surveying Exploration of the different types of surveys/inspections carried out ashore and afloat, why they are carried out and by whom.		35 hours

9.1.3. Risk Management in Maritime Operations: Techniques and tools for risk identification, analysis, and mitigation in the maritime context.		35 hours
9.1.4. Maritime Regulations and Compliance Key national and international conventions, regulations and codes affecting marine surveying and risk management, such as SOLAS, MARPOL, ISM Code and the ISPS Code		35 hours
9.1.5. Case Studies in Marine Surveying and Risk Management Analysis of real-world scenarios, highlighting the application of surveying and risk management principles		35 hours
9.1.6 Communication and Reporting Best practices for compiling and presenting survey findings and risk management plans to various stakeholders.		35 hours
Course bibliography: <i>Books:</i> Witherby Seamanship International. (2015), 21st Century Seamanship, Witherby Seamanship International, [ISBN: 978-1-85609-632-4]. C. F. Durham. Marine Surveys, [ISBN: 1901290077]. Klaas van Dokkum. (2016), Ship Knowledge, 9th. [ISBN: 9789071500329]. P. A. Caridis. (2009), Inspection, Repair and Maintenance of Ship Structures, 2nd. [ISBN: 9781905331376]. International Association of Classification Societies. (1999), General Cargo Ships, 1st. [ISBN: 1856091899]. International Maritime Organization. (2020), Solas, [ISBN: 9280116908]. International Maritime Organization. Guide to Maritime Security and the ISPS Code, [ISBN: 9789280117400]. Online Resources Website, International Maritime Organisation, http://www.imo.org/ Website, Marine Survey Office, https://www.gov.ie/en/organisation-information/111f0e-marine-survey-office-mso/ Website, IACS, http://www.iacs.org.uk/ Website, DNV-GL, http://www.dnvgl.com/ website, ABS, http://www.eagle.org/ website, ClassNK, http://www.classnk.or.jp/ website, Lloyd's Register, https://www.lr.org/ website, MCA, https://www.gov.uk/government/publications/code-of-safe-working-practices-for-merchant-seafarers-coswp-2024 website, Harbours Act 1996, https://www.irishstatutebook.ie/eli/1996/act/11		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		

9.2b Project	Working methods ¹⁶	Time allocation
Bibliography for applied activities (seminar / laboratory / project):		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.1 Written Report	Research Essay: on a specific marine survey. Students to choose a specific survey type and analysis how it reduces risk to the stakeholders.	Written report	20%
10.2 Presentation	Regulatory Compliance Presentation: Provide an presentation analyzing the impact of a specific maritime organisation or regulation on surveying practices and risk management strategies.	Student presentation	30%
10.3 Written Report	Risk Management Plan: Develop a comprehensive risk management plan for a given scenario in maritime operations, detailing risk assessment processes and mitigation strategies.	Written report	50%
10.6 Conditions for passing			
Grades from 0 to 100 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 40 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits			

Date: 06 February 2026

Course instructor: Dan Manning

Course instructors for applied activities: Dan Manning

Date of approval by the department:

Head of Department: Brian Devitt

Date of approval by the Faculty Council:

Dean, Sean Mc Sweeney

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	Munster Technological University
1.2 Faculty	Faculty of Engineering & Science
1.3 Department	National Maritime College of Ireland
1.4 Field	Maritime Studies
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC2)

2. Course information

2.1.1 Course name				Maritime Emergency Management (ECTS 5)				
2.1.2 Course code				NAUT	2.1.3. Course category Expert/Specialized/Complementary			S
2.2 Course instructor				Conor Moynihan				
2.3 Course instructors for applied activities					Conor Moynihan			
2.4 Year of study ²	1	3 Semester ³	1/2	2.6 Evaluation type ⁴	Critique, Written Report, Presentation	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	7	3.2 course	1	3.3a sem.	0	3.3b laboratory	0	3.3c project	3	3.3.d. practice	3
3.4 Total hours from curriculum ⁶	105	3.5 course	15	3.6a sem.	0	3.6b laboratory	0	3.6c project	45	3.6d. practice	45
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										45	
Practical skills development										12	
Preparation of seminars / laboratory works / project phases / homework / presentations										30	
Evaluation ⁸										3	
Other activities:										15	
3.7 Total hours of individual study ⁹		90									
3.8 Total hours per semester ¹⁰	105										
3.9 Number of credits	5										

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Canvas LMS, PowerPoint, computer/laptop,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Canvas LMS, PowerPoint, computer/laptop,

6. Overall objective of the course

This module provides an advanced exploration of emergency management within the maritime industry offshore, inshore and onshore. Students will critically evaluate risk management strategies, response mechanisms and scalable incident command structures for a variety of large and small scale emergencies. The module focuses on a wide range of sectors including offshore infrastructure, port readiness, pollution prevention, mass recovery and security.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Appraise national and international frameworks related to the maritime industry and emergency response stakeholders.
Skills	The student / graduate will: 2. Develop risk assessment methodologies and emergency response strategies that align with best practices, technological advancements and continuity requirements.
Responsibility and autonomy	The student / graduate will: 3. Apply crisis management models and decision-making frameworks to real-world maritime emergency scenarios 4. Design a comprehensive high level coordination plan for major maritime emergencies and a local response to minor maritime emergencies with industry and government stakeholder collaboration.

8. Teaching methods

This module will incorporate case study analyses, simulations, and industry engagement to enhance experiential learning and ensure alignment with current and emerging challenges and technologies in maritime emergency management.

Students will be working closely with industry during the course and assessments activities will create authentic transferable resources for application in industry.

The collaborative nature of classes and activities will create the framework for interoperability and collaboration needed in the globalist industry of emergency management.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
National and International Frameworks European frameworks related to the maritime industry and its governance with particular focus on emergency management and incident prevention. Future policies for emerging industries and technology. Regional, national and international agreements.	Presentations, Case Studies Class Discussions Tabletop/simulated Exercises	21 hours
National and International Stakeholders Maritime industry businesses and infrastructure; offshore, inshore and onshore. Emerging stakeholders and impact of sustainability development goals. Emergency services and private companies operating in the maritime industry with specific roles in emergency response.		24 hours
Maritime emergencies Maritime pollution, port infrastructure vulnerabilities, offshore renewable energy infrastructure considerations, sub sea security, natural weather events, mass casualty incidents. Existing limitations and future opportunities. Impact of large scale world wide events. National and international readiness and resilience. Effect of human factors in emergency response and resource management		30 hours
Risk assessment and emergency management models Identifying areas of risk and emergency preparedness. Key emergency management models for large and small scale responses. Policy formulation and industry		30 hours

collaboration. Preparation for new and growing industries such as the offshore renewable energy and the maritime autonomous ship sectors, through their entire life cycle.		
Course bibliography: Stein Haugen,Svein Kristiansen. (2023), Maritime Transportation, Second. [ISBN: 9780367518561].Supplementary Book Resources Guide on oil spill response in ice and snow conditions, 2017 Edition (I585E) Guide to Cold Water Survival, 2012 Edition (KB946E) Guide to Maritime Security and ISPS Code, 2021 Edition (IB116E) Guide to the Implementation of the OPRC Convention and OPRC-HNS Protocol, 2020 Edition (K559E) Guideline for Oil Spill Response in fast currents, 2013 Edition (K582E) Oil Spill Risk Evaluation Manual, 2010 Edition (E579E) Response to a Marine Oil Pollution Incident, 2016 Edition (I558E) IAMSAR Manual: Volume I, 2025 Edition (IL960E) IAMSAR Manual: Volume II, 2025 Edition (KI961E) IAMSAR Manual: Volume III, 2025 Edition (IL962E) Department of Ireland. (2025), The Maritime Navigation Safety & Emergency Response Guidance Documents for Offshore Renewable Energy Installations (OREI). Department of Housing, Local Government and Heritage. (2024), A framework for major emergency management. Department of Transport. (2020), National Maritime Oil/HNS Spill Contingency Plan. Government of Ireland. (2019), National Search and Rescue Plan. Department of Defence. (2017), Strategic Emergency Management National Structures and Framework.Online Resources Website, (2025), International Group of P&I Clubs, https://www.igpandi.org/ Website, (2025), European Maritime Safety Agency, https://www.emsa.europa.eu/we-do/safety.html Website, Association of Artic Expedition Cruise Operators, https://aeco.no/ Website, International Maritime Rescue Federation https://www.international-maritime-rescue.org/		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Critique	Short written piece determining the relevant national frameworks and regulations, stakeholders and emergency management models within a specific area of the maritime industry.	Submission of coursework	25%
10.5 Written Report	Write a SWOT style analysis on a specific area of the maritime industry in the context of its emergency preparedness.	Submission of coursework	45%
10.6 Presentation	Design and present a response plan to a specific emergency in the maritime industry	Proposal and submission of Coursework	30%
10.6 Conditions for passing			

Grades from 0 to 100 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 40 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.

Date: 12 February 2026

Course instructor: Conor Moynihan

Course instructors for applied activities: Conor Moynihan

Date of approval by the department:

Head of Department: Brian Devitt

Date of approval by the Faculty Council:

Dean, Sean McSweeney

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Functional Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Genetic Biodiversity				
2.1.2 Course code				MCONMARI-1-001	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Gonzalo Machado-Schiaffino Ferrer				
2.3 Course instructors for applied activities (S, L, P, Pr)					Gonzalo Machado-Schiaffino Ferrer			
2.4 Year of study ²	1	2.5 Semester ³	1	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.5	3.3a sem.	0.5	3.3b laboratory	0,4	3.3c project	0.1	3.3.d. practice	0.5
3.4 Total hours from curriculum ⁶	30	3.5 course	15	3.6a sem.	5	3.6b laboratory	4	3.6c project	1	3.6d practice	5
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, renting bus for field sampling (1 activity).
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, optimization software EXCEL, ARLEQUIN (Schneider et al. 2000) or similar.

6. Overall objective of the course

This course provides students with a comprehensive understanding of the foundations, measurements, and values of biodiversity, understood as the set of genetic variation within a marine community, both intra- and interspecific. The course includes the analysis and critical study of a case study and recent and relevant scientific articles on the topic.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Be able to understand Intra- and interspecific genetic diversity as one of the main components of biodiversity and its importance in the conservation of marine species.
Skills	The student / graduate will: 2. Be able to analyze the origin of genetic variation, its measurement and quantification in natural populations and species. 3. Be able to recognize and quantify population and intraspecific diversity and apply the theoretical genetic tools for application in both genetic diversity analysis and marine natural resource management.
Responsibility and autonomy	The student / graduate will: 4. Be able to integrate a multidisciplinary view of biodiversity, covering genetic variation within species and resources management.

8. Teaching methods

Theoretical sessions: Presentation of content by the professor as an introduction to each topic. This is followed by discussion and critical analysis of materials and bibliography by students.

Practical exercise: fieldwork. A trip will be made to a coastal ecosystem. There, an organism will be chosen on which to study some morphologically identifiable variable genetic characteristic (color, shape, banding pattern). In preparatory sessions, students will design a sampling plan to answer questions about the spatial distribution of that genetic variation (e.g., distance to fresh water, tide level, etc.). During the field trip, data corresponding to the planned sampling scheme will be collected, recorded, and coded as agreed in the preparatory sessions.

Analysis and discussion of the practical exercise: Teamwork supervised by professors. Students will analyze the data obtained in the fieldwork, interpret the results, and prepare a PowerPoint presentation for the last session of the course.

Preparation and presentation of individual seminars: These will be chosen by students according to their interests at the beginning of the course. Teachers will assist in the search for appropriate materials and, where appropriate, in the choice of the topic for the seminar or individual project. Each seminar will be prepared individually, as will the presentation with appropriate support materials (likely PowerPoint, digital animations, browser connection, videoconference, or Skype if necessary, etc.). The presentation will follow the speed presentation format.

Exceptionally, if health conditions require it, non-face-to-face teaching activities may be included. In this case, students will be informed of the changes made.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Genetic variation in marine prokaryotic, animal, and plant species.	Interactive lecture. Clarifying explanations.	2 hours
9.1.2. Genetic variation in natural populations.		2 hours
9.1.3. Distribution of genetic variation within a species.		4 hours
9.1.4. Natural selection, adaptation, genetic drift, and genetic diversity.		4 hours
9.1.5. More than biodiversity: metagenomes. Introduction to genomic analysis.		3 hours
Course bibliography: <i>Basic texts</i> ○ Bryant, P. J. 2007. <i>Biodiversity and Conservation, a hypertext book</i>. Online en: http://www.dbc.uci.edu/~sustain/bio65/Titlepage.htm ○ Hartl D. L., Clark A. G. (2006) <i>Principles of population genetics</i>. Sinauer Associates Inc. Sunderland, MA. ○ Krishnamurty, K. V. (2003) <i>Textbook of Biodiversity</i>. Science Publ. Inc., Enfield USA ISBN 978-1-57808-325-1; 2003; 276 pages. <i>Specialized Texts.</i> ○ Belkhir, K., P. Borsa, L. Chikhi, N. Raufaste and F. Bonhomme. 1996-2004. <i>GENETIX 4.05, logiciel sous Windows TM pour la génétique des populations</i>. Laboratoire Génome.		

<i>Populations, Interactions, CNRS UMR 5000, Université de Montpellier II, Montpellier, France.</i> ○ Goudet, J. 1995. A computer program to calculate F-statistics. <i>Journal of Heredity</i> 86:485-486. ○ Hauser, L. and R. D. Ward. 1998. Population identification in pelagic fish: the limits of molecular markers. 191-224 in G. R. Carvalho. <i>Population identification in pelagic fish: the limits of molecular markers</i>. IOS Press Series, Amsterdam. ○ Pritchard, J. K., M. Stephens and P. J. Donnelly. 2000. Inference of population structure using multilocus genotype data. <i>Genetics</i> 155:945-959. ○ Schneider, S., D. Roessli and L. Excoffier. 2000. Arlequin ver. 2000: A software for population genetics data analysis. <i>Genetics and Biometry Laboratory, University of Geneva, Switzerland.</i> ○ Waples, R. S. 1998. Separating the wheat from the chaff: patterns of genetic differentiation in high gene flow species. <i>Journal of Heredity</i> 89:439-450.		
9.2a Seminar	Working methods ¹⁶	Time allocation
Problem solving	Exercises and problem solving	5 hours
9.2b Project	Working methods ¹⁶	Time allocation
Practical exercise: Field sampling where students will analyze the data obtained in the fieldwork, interpret the results, and prepare a PowerPoint presentation for the last session of the course.	Work in groups of students to address and discuss practical cases.	6 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Attendance: minimum 80% of sessions and Active participation in practical exercises (fieldwork, laboratory work, data analysis): 50%.	50%
10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Speed presentation (5 minutes): 25%.	25%
10.5b Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation and discussion of the results of the practical exercise.	25%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: Gonzalo Machado-Schiaffino Ferrer

Course instructors for applied activities: Gonzalo Machado-Schiaffino Ferrer

Date of approval by the department:

Head of Department: Celestino González González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

Formular PO.DID.04 **M-F2** E3R0

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Biodiversity of marine food webs				
2.1.2 Course code				MCONMARI-1-002	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				José Luis Acuña Fernández				
2.3 Course instructors for applied activities (S, L, P, Pr)					José Luis Acuña Fernández			
2.4 Year of study ²	1	2.5 Semester ³	1	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.5	3.3a sem.	0.5	3.3b laboratory	0,4	3.3c project	0,1	3.3.d. practice	0.5
3.4 Total hours from curriculum ⁶	30	3.5 course	15	3.6a sem.	5	3.6b laboratory	4	3.6c project	6	3.6d practice	5
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, renting bus for field sampling (1 activity)
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, R packages.

6. Overall objective of the course

The course provides a descriptive and dynamic overview of the organization of marine ecosystems. Based on general principles, it highlights the characteristics of each ecosystem.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Have knowledge of the structure and functioning of marine ecosystems. 2. be able to identify physical and biological processes that regulate the dynamics of marine communities.
Skills	The student / graduate will: 3. Be able to characterize marine communities. 4. Be able to conduct data analysis and interpretation. 5. Have skills to establish communication, produce argumentation and scientific reasoning with creativity and working within a team.
Responsibility and autonomy	The student / graduate will: 6. Shift to becoming a steward of ocean health, focusing on sustainable seafood, reducing pollution (plastics, runoff), supporting MPAs, and mitigating climate change impacts; while autonomy grows in making informed personal choices (consumption, energy use) and professional contributions (research, policy, sustainable fishing/aquaculture, maritime tech) to protect these ecosystems, requiring new skills for autonomous systems and cyber awareness in maritime fields.

8. Teaching methods

Theoretical classes, practical classes, and seminars with discussions are combined. Although the theoretical classes are structured around different marine ecosystems (intertidal, plankton, deep benthos, coral reefs), these are used as a pretext to introduce theoretical concepts of general interest, whose origin is largely associated with that ecological system. Where possible, the content is structured according to a historical timeline. Standard tools are used: blackboard, PowerPoint presentations. The practical sessions consist of a trip out to sea to sample communities, followed by analysis of samples and data in the laboratory. The sampling aims to highlight the role of certain environmental variables in the structuring of the community and to provide an initial approach to community analysis using the R statistical package. Finally, students will prepare a short paper on a novel or important aspect related to marine biodiversity, which they will have previously chosen from a list, and in which they will use the theoretical concepts learned in the lectures, through an up-to-date bibliographic search. They will defend their project in the classroom with a 10-minute presentation followed by a question and answer session aimed at revealing deficiencies or areas for improvement that will enable them to modify and improve their projects. Exceptionally, if health conditions so require, distance learning activities may be included. In this case, students will be informed of the changes made.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Rocky intertidal systems: functional diversity, experimental ecology, competition for food and space, role of disturbances, key predation and indirect interactions, top-down regulation modified by stress, supply-side.	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	3 hours
9.1.2. Soft-bottom intertidal systems: structure, redox systems and bacterial diversity, anoxia, biofilms, the microbial loop, bioturbation, microbial gardening, zoning.		3 hours
9.1.3. Pelagic systems: Sverdrup's Critical Depth Hypothesis, seasonality, Critical Turbulence Hypothesis, hydrodynamic singularities, diversity, classical chain vs. microbial loop.		3 hours
9.1.4. Deep benthic systems: energy sources, benthic-pelagic coupling, diversity, hydrothermal vents.		3 hours
9.1.5. Climate change: Representative Carbon Pathways, temperature, sea level, acidification, deoxygenation (observations, predictions, and responses), Earth System models, tipping points.		3 hours

Course bibliography: The materials presented in the course and the bibliographic resources are available to students on the University of Oviedo's Virtual Campus, in PDF format and with access restricted to teachers and students. Current articles are used and the materials are updated annually. ○ <i>Belgrano, B. et al. (2005). Aquatic Food Webs: An Ecosystem Approach. Oxford University Press. A modern synthesis of food web research focusing on spatio-temporal scales.</i> ○ <i>Magurran, A. E. (2004). Measuring Biological Diversity. Blackwell Publishing. Essential for learning how to calculate and interpret biodiversity indices.</i> ○ <i>McClanahan, T. R., & Branch, G. M. (2008). Food Webs and the Dynamics of Marine Reefs. Oxford University Press. A comparative study of coral, kelp, and hard-bottom ecosystems.</i> ○ <i>Levinton, J. S. (2021). Marine Biology: Function, Biodiversity, Ecology. Oxford University Press. Covers polar and deep-ocean biology as specialized food web units</i>		
9.2a Seminar	Working methods ¹⁶	Time allocation
Seminars about marine ecosystems (intertidal, plankton, deep benthos, coral reefs), following an historical timeline.	Exercises and problem solving	5 hours
9.2b Project	Working methods ¹⁶	Time allocation
Practical exercise: Field sampling where students will analyze the data obtained in the fieldwork, interpret the results, and prepare a PowerPoint presentation for the last session of the course.	Work in groups of students to address and discuss practical cases.	6 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Attendance: minimum 80% of sessions and Active participation in practical exercises (fieldwork, laboratory work, data analysis).	50%
10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Oral presentation (10 minutes):	25%
10.5b Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation and discussion of the results of the practical exercise. Group work.	25%
10.6 Conditions for passing Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: José Luis Acuña Fernández

Formular PO.DID.04 **M-F2** E3R0

Course instructors for applied activities: José Luis Acuña Fernández

Date of approval by the department:

Head of Department: Luis Valledor González.

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Functional Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Global change				
2.1.2 Course code				MCONMARI-1-003	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Eva García Vázquez				
2.3 Course instructors for applied activities (S, L, P, Pr)					Laura Miralles López			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴	E, A	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1	3.3a sem.	0,8	3.3b laboratory	0,4	3.3c project	0.1	3.3.d. practice	0,5
3.4 Total hours from curriculum ⁶	30	3.5 course	10	3.6a sem.	8	3.6b laboratory	4	3.6c project	1	3.6d practice	5
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰	75										
3.9 Number of credits	3										

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, renting bus for field sampling (1 activity).
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector

6. Overall objective of the course

This course has to do with changes in the Ocean and Marine Biodiversity in time and space. Specifically, the factors responsible for the change and loss of biodiversity are identified and analyzed.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Have knowledge on conceptual bases for detecting changes in marine ecosystems, for predicting future changes and potential responses.
Skills	The student / graduate will: 2. Be able to sustainability reporting, climate data analysis, carbon accounting, and environmental consulting. 3. Acquire critical soft skills like adaptability, creative problem-solving, and systems thinking.
Responsibility and autonomy	The student / graduate will: 5. Be prepare for green/blue jobs in renewable energy, conservation, sustainable finance, and policy, crucial for the green transition.

8. Teaching methods

The teaching process will involve Relevant concepts and examples will be explained in expository classes. Students will carry out individual practices with concrete case studies using relevant software, and present their results to the whole class. A field trip to a coastal area affected by anthropogenic factors is contemplated in which physical, chemical and biological data will be taken. Working in small groups, students will analyze and interpret the results obtained and present them to the whole class.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Scientific bases of Global Change.	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	2 hours
9.1.2. Modifications of the Marine Environment derived from climate change.		2 hours
9.1.3. Responses of marine organisms to climate change and exploitation.		2 hours
9.1.4. Indicators of climate change. Model outputs from the IPCC and PRUDENCE.		2 hours
9.1.5. Limitations on the use of information and Information search and capture systems. Use of the information collected or generated for research or management of resources or protected areas.		2 hours
Course bibliography: The materials presented in the course and the bibliographic resources are available to students on the Virtual Campus of the University of Oviedo, in pdf format and with restricted access to teachers and students. Current articles are used and the materials are renewed annually. Some significant ones are cited below: ○ <i>Cheung et al. 2009. Projecting global marine biodiversity impacts under climate change scenarios. Fish & Fisheries 10: 235.</i> ○ <i>Harley et al. 2006. The impacts of climate change in coastal marine systems. Ecology Letters 9: 228.</i> ○ <i>Wassmann et al. 2011. Footprints of climate change in the Arctic marine ecosystem. Global Change Biology 17: 1235.</i>		
9.2a Seminar	Working methods ¹⁶	Time allocation
Develop a project proposal working in groups of students	Analysis and discussion of cases	8 hours
9.2b Project	Working methods ¹⁶	Time allocation
Practical exercise: Field sampling where students will analyze the data obtained in the fieldwork, interpret the results, and prepare a PowerPoint presentation for the last session of the course.	Work in groups of students to address and discuss practical cases.	6 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as in the course.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Attendance: minimum 80% of sessions and Active participation in practical exercises (fieldwork, laboratory work, data analysis).	40%
10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Oral presentation (10 minutes):	10%
10.5b Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation and discussion of the results of the practical exercise. Group work.	50%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: Eva García Vázquez

Course instructors for applied activities: Laura Miralles López

Date of approval by the department:

Head of Department: Celestino González González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Detection and Assessment of Impacts				
2.1.2 Course code				MCONMARI-1-009	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Julio Marcial Arrontes Junquera				
2.3 Course instructors for applied activities (S, L, P, Pr)					Julio Marcial Arrontes Junquera			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	0.62	3.3a sem.	0.32	3.3b laboratory	1.25	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	6.25	3.6a sem.	3.25	3.6b laboratory	12.5	3.6c project	8.0	3.3.d. practice	
Time spent for related activities ⁷											Hours
Study of recommended books, course support, scientific papers and course notes											20
Practical skills development											10
Preparation of seminars / laboratory works / project phases / home works / presentations											10
Evaluation ⁸											5
Other activities:											
3.7 Total hours of individual study ⁹	45										
3.8 Total hours per semestre ¹⁰	75										
3.9 Number of credits	3										

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector

6. Overall objective of the course

The detection and assessment of direct or indirect impacts on biodiversity that may result from human activities are a necessary tool for the management of marine natural resources. However, there is no unified methodology for assessing impacts, so it is necessary to learn some techniques that allow for a quantitative estimation of impacts and ways of reasoning that improve and update assessment methodologies.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Be able to assess changes in the natural environment resulting from human activity. 2. Be able to understand methods for predicting future changes and their potential impacts on exploited resources, biodiversity, or conservation systems.
Skills	The student / graduate will: 3. Be able to search for and acquiring information that will enable them to establish baselines. 4. Have skills in statistical, observational, and experimental designs that will enable them to detect and assess the existence of impacts.
Responsibility and autonomy	The student / graduate will: 5. Be competent to assume technical responsibilities related to data collection and analysis, and increasing autonomy in project design and decision-making

8. Teaching methods

The course is structured around four 3-hour theory sessions and four 3-hour practical sessions. The course will last for two consecutive weeks. The theory sessions will be concentrated in the first week and the practical sessions in the second. The content of the practical classes will be in line with that taught in the theory classes. Attendance is compulsory for both the theory and practical sessions. Completion of an individual, remote assignment consisting of the development of two comprehensive sampling plans that enable the detection of impacts in two different scenarios. The difference between the scenarios must be in the spatial and/or temporal scales of the impact. Exceptionally, if health conditions so require, remote teaching techniques will be used. In this case, students will be informed sufficiently in advance.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction. Basic principles. Identification of impacts.	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	0.5 hours
9.1.2. Elementary notions on sampling theory and statistical inference.		0.5 hours
9.1.3. Sampling designs		0.5 hours
9.1.4. Statistical inference		0.5 hours
9.1.5. Some common problems in sampling designs. Basic designs (1st part)		0.5 hours
9.1.6. Basic sampling designs (2nd part)		0.5 hours
9.1.7. Detection of impacts (1st part)		2.0 hours
9.1.8. Detection of impacts (2nd part).		1.25 hours
Course bibliography: - Downes JD, Barmuta LA, Fairweather PG, Faith DP, Keough MJ, Lake PS, Mapstone BD, Quinn GP. 2002. <i>Monitoring ecological impacts. Concepts and practice in flowing waters.</i> Cambridge UP, New York - Underwood AJ. 1997. <i>Experiments in Ecology: their logical design and interpretation using Analysis of variance.</i> Cambridge UP, New York - Underwood AJ. 1992 <i>Beyond BACI: The detection of environmental impacts on populations in the real, but variable, world.</i> J. Exp. Mar. Biol. Ecol. 161:145-178 - Underwood AJ. 1994. <i>On beyond BACI: Sampling designs that might reliably detect environmental disturbances.</i> Ecol. Appl. 4: 3-15		

9.2a Seminar	Working methods ¹⁶	Time allocation
Develop a project proposal working in groups of students	Analysis and discussion of cases	3.25 hours
9.2b Project	Working methods ¹⁶	Time allocation
The content of the practical classes will be in line with that taught in the theory classes. Attendance is compulsory for both the theory and practical sessions.	Discuss and work on practical case projects.	8 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Summative assessment test (final evaluation).	100%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: Julio Marcial Arrontes Junquera Course

instructors for applied activities: Julio Marcial Arrontes Junquera

Date of approval by the department:

Head of Department: Luis Valledor González.

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Functional Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Evolution and Biogeography of Marine Organisms				
2.1.2 Course code				MCONMARI-1-006	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Eva García Vázquez				
2.3 Course instructors for applied activities (S, L, P, Pr)					Eva García Vázquez			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.6	3.3a sem.	1.0	3.3b laboratory	0.2	3.3c project	1.0	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	16	3.6a sem.	10	3.6b laboratory	2	3.6c project	10		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer room.

6. Overall objective of the course

The current diversity of marine species can only be understood from molecular evolutionary processes and the specific environmental circumstances that occur in the marine environment. This course provides the theoretical bases and analysis tools necessary to understand the evolutionary mechanisms in the marine environment.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Be able to understand how genetic diversity is generated, its changes, the processes that shape its evolution in the marine environment, and the molecular evolutionary processes.
Skills	The student / graduate will: 2. Be able to explain the current distribution and projections of marine genetic resources.
Responsibility and autonomy	The student / graduate will: 3. Be able to understand humanity's impact (pollution, climate change) and stewardship for marine ecosystems, developing independent critical thinking, research skills, and designing/executing projects on marine evolution, speciation (like island biogeography), dispersal patterns, and habitat mapping, using tools from ecology, geology, and evolutionary biology to explain marine biodiversity. 4. be able to interpret complex data (sea-level changes, ocean currents) and applying island biogeography theory to explain marine speciation, moving from textbook knowledge to independent scientific inquiry.

8. Teaching methods

The course is organized into daily sessions of approximately 3 hours, and can be extended up to 4 hours at the request of the students. The first five sessions comprise 1.5 hours of theory and 1.5 hours of computer practice, in which students become familiar with the analysis of sequences, genes and genomes, and evolutionary mechanisms, using current software in practice. The rest of the face-to-face sessions consist of autonomous work guided in a class project. It can be individual or in groups of a maximum of two people. The evaluation session, which takes place on the last day, is dedicated to the presentation of the project in public and its discussion by the class and the teacher. On the last day, a maximum of two hours can be devoted to the preparation of a collaborative scientific article applying the knowledge acquired in the course. Exceptionally, if sanitary conditions require it, non-classroom teaching activities may be included. In which case, the student body will be informed of the changes made.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Mechanisms of Evolution	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	3 hours
9.1.2. Evolution of nucleotide sequences		2 hours
9.1.3. Nucleotide substitution patterns.		2 hours
9.1.4. Molecular phylogenetic relationships.		3 hours
9.1.5. Biogeography and evolution. Historical processes. Endemisms, biogeographic regions and provinces.		3 hours
9.1.6. Ecological Processes and Evolution		3 hours
Course bibliography: - o Class materials, consultation and bibliography are available on the Virtual Campus. - o How to build a phylogenetic tree: Campo & Garcia-Vazquez 2009 - o Phylogenetic summary http://www.ncbi.nlm.nih.gov/About/primer/phylo.html - o Software for molecular evolution: http://www.megasoftware.net/ - o BLAST information: http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=comgen&part=blast - o Other educational resources on the subject at NIH: http://www.ncbi.nlm.nih.gov/Education/ - o Encyclopaedia of Life - student initiative http://education.eol.org/collaborations/under_init1 - o Animal Diversity Web: http://animaldiversity.ummz.umich.edu/ - o Graur & Li. 2000. Fundamentals of Molecular Evolution (2nd ed.) Sinauer		
9.2a Seminar	Working methods ¹⁶	Time allocation
Computer practice for the analysis of sequences, genes and genomes, and evolutionary mechanisms, using current software in practice.	Exercises and problem solving. Discuss practical cases.	10 hours

9.2b Laboratory	Working methods ¹⁶	Time allocation
Autonomous computer work guided in a class project.	Individual or in groups of a maximum of two people.	2 Hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment/Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Quality of the reconstruction of the phylogeny, the adequate interpretation of the results and the presentation.	70%
10.5a Seminar 10.5b Laboratory	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation of the project in public and its discussion by the class and the teacher. Participation and contribution in class sessions, including practices for each topic.	30%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: Eva García Vázquez

Course instructors for applied activities: Eva García Vázquez

Date of approval by the department:

Head of Department: Celestino González González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Geographic Information Systems and Remote Sensing				
2.1.2 Course code				MCONMARI-1-011	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Mario Quevedo De Anta				
2.3 Course instructors for applied activities (S, L, P, Pr)					Mario Quevedo De Anta			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.4	3.3a sem.	1.4	3.3b laboratory		3.3c project	0.2	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	14	3.6a sem.	14	3.6b laboratory		3.6c project	2.0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer room. The course requires computers and fair Internet access. The software used is free, and available for download and installation. The data used in practical sessions are also obtained from public repositories.

6. Overall objective of the course

Geographic Information Systems (GIS) are very versatile tools in environmental sciences. Spatial data - increasingly accessible and flexible - together with GIS analytic capabilities allow modeling and predicting the occurrence of phenomena, or the presence and abundance of species. GIS have become important tools in scientific and technical studies of environmental problems, as well as in the study and management of biodiversity. The especially dynamic nature of the abiotic context in marine ecosystems implies that the integration of remote sensing with GIS is of special interest. GIS makes possible mapping natural resources and biophysical characteristics (chlorophyll, water temperature, salinity...), as well as following their spatial and temporal changes.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Have a knowledge and understanding of the basic principles of GIS, their main applications, and their limitations. 2. Be able to identify the key characteristics of surfactants, emulsions and other colloidal systems, as well as their main industrial applications.
Skills	The student / graduate will: 3. Be able to undertake GIS work regardless of the software or the specific nature of data. 4. Be able to go for autonomous and continuous learning with the help of freeware GIS and public data.
Responsibility and autonomy	The student / graduate will: 5. Be able to solve basic to moderately complex spatial problems in the study of the marine environment. We do not seek learning the precise, immediate response, but rather that the acquired understanding of the combination GIS / remote sensing allowed students to identify the required solution to the problem, and handle it.

8. Teaching methods

The course consists of approximately 1/4 theory and 3/4 computer practice. The sessions generally combine a short theoretical introduction with interactive practical cases. The scheme reflected in "Contents" is the one followed when approaching the theoretical-practical sessions, although with flexibility to adapt the sessions to the dynamics of the specific group of students, and to the doubts that may raise. Exceptionally, if health conditions so require, we may use virtual teaching. Should this be the case, students will be readily informed.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to maps and GIS	Interactive lecture. Clarifying explanations.	1 hours
9.1.2. Basic cartographic notions		1 hours
9.1.3. Map viewers vs. GIS software		1 hours
9.1.4. Data. Data structure, types, Data sources		1 hours
9.1.5. Remote sensing servers		1 hours
9.1.6. Layers		1 hours
9.1.7. Common vector operations. Data tables.		1 hours
9.1.8. Common raster operations		1 hours
9.1.9. Map calculators (algebra)		1 hours
9.1.10. Overlays between discrete (vectors) and surface (raster) layers		1 hours
9.1.11. Intro and overview of satellite remote sensing		1 hours
9.1.12. Ocean color		1 hours
9.1.13. Infrared sensors and sSST [restricted now to Ocean Color datasets]		1 hours
9.1.14. Case studies and interfacing GIS and R: spatial patterns and planning, basic habitat modeling and protected areas, etc.		1 hours
Course bibliography: ○ Anderson CB (2018) <i>Biodiversity monitoring, earth observations and the ecology of scale</i>. ○ Halpern BS, Walbridge S, Selkoe KA, et al (2008) <i>A Global Map of Human Impact on Marine Ecosystems</i>. <i>Science</i> 319:948–952. doi: 10.1126/science.1149345 ○ IUCN-UNEP (2015) <i>World Database on Protected Areas</i>. In: <i>The World Database on Protected Areas (WDPA)</i>. www.protectedplanet.net. Accessed 23 Mar 2015 ○ McClain CR (2009) <i>A Decade of Satellite Ocean Color Observations</i>. <i>Annu Rev Marine Sci</i> 1:19–42. doi: 10.1146/annurev.marine.010908.163650 ○ Sherman GE (2008) <i>Desktop GIS: Mapping the Planet With Open Source Tools</i>. <i>Pragmatic Bookshelf</i> ○ Steiniger S, Hay GJ (2009) <i>Free and open source geographic information tools for landscape ecology</i>. <i>Ecological Informatics</i> 4:183–195. ○ Turner W, Spector S, Gardiner N, et al (2003) <i>Remote sensing for biodiversity science and conservation</i>. <i>Trends in Ecology & Evolution</i> 18:306–314. doi: 10.1016/S0169-5347(03)00070-3		
9.2a Seminar	Working methods ¹⁶	Time allocation

Problem solving. Discussion of practical case studies	Exercises and problem solving	14 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam/Assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	The evaluation is based on a theoretical-practical test with the computer, in which the students must solve similar problems to those practiced in the sessions of the course.	75%
10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	In order to pass the course, it is mandatory attending to a minimum of 75% of the practical sessions. Active participation in activities. Assignments.	25%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Exceptionally, if health conditions so require, methods of assessment may include online exams and/or assignments. Should this be the case, students will be readily informed.

Date:

Course instructor: Mario Quevedo De Anta

Course instructors for applied activities: Mario Quevedo De Anta

Date of approval by the department:

Head of Department: Luis Valledor González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Law/ Faculty of Economics and Business
1.3 Department	Public Law, Applied Economics, Economics
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Legal and Economic Aspects of Marine Resources				
2.1.2 Course code				MCONMARI-1-013	2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Javier Andrés Gonzalez Vega				
2.3 Course instructors for applied activities (S, L, P, Pr)					Antonio María Álvarez Pinilla Alberto Fonseca Peña. María Avello Martínez.			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	2.2	3.3a sem.	0.6	3.3b laboratory		3.3c project	0.2	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	22	3.6a sem.	6	3.6b laboratory		3.6c project	2		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector

6. Overall objective of the course

The course is devoted to legal reference related with management and administration of marine resources. During the course three levels of related legal references: international, national and regional will be considered as basis to management and conservation. Environmental economics will be introduced, and a few cases of economic valuation will be discussed. Special emphasis will be devoted to the economic analysis of natural resource exploitation of renewable and open access resources, with

application to fisheries. The course also addresses marine ecosystem conservation and biodiversity management, with an emphasis on the social-ecological aspects of marine protected areas. It tackles threats to marine conservation and current designs and lessons from the implementation of marine protected areas. The course explores different strategies to manage, control and monitor marine protected areas and their relationship with end users.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Have a knowledge and understanding of legal regulations at international, national and regional level for marine resources exploitation and marine biodiversity conservation. 2. Have a knowledge to valorize marine resources and to understand economic matters concerning externalities and natural resource management.
Skills	The student / graduate will: 3. Be able to understand the complexities in managing existing marine protected areas and to adopt decisions for the establishment of new areas. 4. Be able to include social and ecological complexity the management of marine resources.
Responsibility and autonomy	The student / graduate will: 4. Be aware of the need of multidisciplinary work on biodiversity management at different administrative level and in a multi institutional framework.

8. Teaching methods

Students will be presented a detailed syllabus at the beginning of the course both at the classroom and through the online teaching platform. Teaching will be based on group work, lectures, seminars, self-reliant study activities, field trips and a role play. The course will have a strong component of case studies. Eventually, in case of sanitary restrictions on the access to the Faculty, more online activities could be included, as lectures, meetings, etc. Under this situation, students will be informed both by email and through the Virtual Campus.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to the marine resource's framework.	Interactive lecture. Clarifying explanations.	2 hours
9.1.2. Regulations on marine resources. Relationships between different legal levels. Legal framework for marine areas. General legal framework on biological conservation (Convention on Biological Diversity and Aichi targets).		2 hours
9.1.3. Legal tools for the protection of marine ecosystems: principles, pollution prevention, management and conservation of living resources, and biodiversity conservation. International, European, and national regulations (European directives including the Water Framework Directive, the Marine Strategy Directive, the Common Fisheries Policy, the Habitats Directive; regional sea conventions such as OSPAR or Barcelona; Bern Convention).		2 hours
9.1.4. Ecosystem services: definitions, assessments including different methods for monetary assessments, different values of nature, uses and misuse of ecosystem services in biodiversity conservation (see the TEEB initiative, the MAES program, or IPBES)		2 hours
9.1.5. Environmental economics. Externalities and the cost of pollution. Coase theorem and market failures; Pigouvian taxes and other alternatives: real case studies		2 hours
9.1.6. Economic valuation of natural resources.		1 hours
9.1.7. Economic analysis of fisheries. Examples of fisheries management.		1 hours
9.1.8. Fundamentals of marine conservation: the objectives of marine conservation (from nature itself to nature for people).		2 hours
9.1.9. Classic view of MPAs.		2 hours

9.1.10. Marine conservation in Europe.		1 hours
9.1.11. High seas conservation		1 hours
9.1.12. Marine spatial planning		1 hours
9.1.13. Bottom-up approaches: TURF, ITQ, Co-management.		2 hours
9.1.14. Bottom-up approaches: community participation and local ecological knowledge.		1 hours
Course bibliography: - Benett, J. (2003) <i>The economic value of biodiversity: a scoping paper</i> http://www.environment.gov.au/biodiversity/publications/scoping-paper/application.html - Caddy, J.F; Grifitts, R.C. (1996) <i>Recursos marinos vivos y su desarrollo sostenible. Perspectivas institucionales y medioambientales</i>, http://www.fao.org/docrep/003/V5321s/V5321S00.htm - Cavuta, G.(2003) <i>Environmental Goods Valuation: The Total Economic Value</i>. Gorizia Campus. Università. http://www.openstarts.units.it/dspace/bitstream/10077/860/1/e7cavuta.pdf - FAO, 1996 (cap 7) http://www.fao.org/DOCREP/003/V5321s/V5321S00.htm - Field, B.C. y Field, M.K.(2012): <i>Environmental Economics: An Introduction</i> - Harrison, J., (2011), <i>Making the Law of the Sea</i>, Cambridge University Press. - Kiss, A., and Shelton, D., (2007), <i>Guide to International Environmental Law</i>, MartinusNijhoff Publishers; - King, N.A. (2007): "Economic valuation of environmental goods and services in the context of good exosystem governance". <i>Water 2007 Vol 2 p 51-67</i>. - Kula,E. (1994): <i>Economics of natural resources and environment and policies</i>. - Krupnik. A. ET AL (2011) <i>Understanding The Costs And Benefits Of Deepwater Oil Drilling Regulation</i> RESOURCES FOR THE FUTURE DISCUSSION PAPER NO. 10-62 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1744203 - Lipton, W; Weilman, K; Sheifer, C., Weiher, F. <i>Economic Valuation Of Natural Resources: A Guidebook for coastal resources policymakers</i> NOAA http://www.mdsg.umd.edu/programs/extension/valuation/handbook.htm - Parejo, L.; Jans, J. H., Vedder, H., (2008) <i>European Environmental Law</i> (3rd. Ed.) - Pearce, D. W., Turner, R.K. and Bateman, I. (1994): <i>Environmental Economics: An elementary introduction</i>. Harvester Wheatsheaf, New York. . - Rothwell, D.R., Stephens, T., (2016), <i>The International Law of the Sea</i>, (2nd ed.), Hart, Oxford-Portland. - Tanaka, Y., (2012), <i>The International Law of the Sea</i>, Cambridge UP. - For the second part of the course, focused on Marine Conservation and Marine Protected Areas, a compilation of up to date reports will be made available to the students. Other resources - Ocean Law of the Sea: Division of Ocean affairs of the United Nations: http://www.un.org/Depts/los/index.htm - FAO (FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS) http://www.fao.org/index_es.htm Specially, the webpage on Fisheries and Aquaculture: http://www.fao.org/fi/inicio.asp - International Authority on Seabed: http://www.isa.org.jm/sp/default.htm - The World Conservation Union: http://www.iucn.org/		
9.2a Seminar	Working methods ¹⁶	Time allocation
Problem solving. Discussion of practical case studies	Exercises and problem solving	6 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam/assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Examination method: written examination with open and closed questions.	90%

10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities. Assignments.	10%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. Evaluation will be based on written exam and/or written essay and/or oral presentations and classroom performance. Eventually, online evaluation methods could be applied, in case sanitary restrictions measures deter the access to the Faculty. Differentiated evaluation: in cases with the right to duly formulated differentiated evaluation and that entail the impossibility of participating in face-to-face activities, the personal situation of each student will be taken into account and the assessment of participation in the sessions may be totally or partially replaced. face-to-face tasks for alternative non-face-to-face tasks. It is recalled that the Code of Ethics of the University of Oviedo is in force and is applicable, which you can access from the following link: Universidad de Oviedo - Código ético (uniovi.es)			

Date:

Course instructor: Javier Andrés Gonzalez Vega

Course instructors for applied activities: Antonio María Álvarez Pinilla, Alberto Fonseca Peña,
María Avello Martínez.

Date of approval by the department: Head of Department Public Law: Alejandro Jose Huergo Lora
Head of Department Economics: Ana María Rodríguez Alvarez
Head of Department Applied Economics: Matías Mayor Fernández

Date of approval by the Faculty Council: Dean Faculty of Law, Javier Gustavo Fernández Teruelo
Date of approval by the Faculty Council: Dean Faculty of Economics and Business, Carmen Benavides González

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name	Marine Management and Planning				
2.1.2 Course code	SMaC ² -01	2.1.3. Course category	Fundamental/Specialized/Complementary	S	
2.2 Course instructor	Nicolás Felipe Weidberg López, Bárbara Ondiviela, Daniel Depellegrin				
2.3 Course instructors for applied activities (S, L, P, Pr)	Bárbara Ondiviela Daniel Depellegrin				
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴	E, A
				2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.5	3.3a sem.	1.0	3.3b laboratory		3.3c project	0.5	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	15	3.6a sem.	10	3.6b laboratory		3.6c project	5		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer room.

6. Overall objective of the course

This course introduces the principles and practices of Integrated Coastal Zone Management (ICZM) and Maritime Spatial Planning (MSP) as key strategies for sustainable marine governance. Students will examine policy frameworks, planning processes, analytical tools, and real-world applications, with a particular focus on the sustainable use of marine resources and adaptation to change.

7. Learning outcomes

Capacity, to

Knowledge	The student / graduate will: 6. Have a knowledge and understanding of ICZM and MSP concepts and theoretical foundations. 7. Be able to understand methodological frameworks and analytical tools to real-world case studies at different geographic scales
Skills	The student / graduate will: 8. Be able to evaluate marine management and planning processes and their drivers. 9. Be able to assess human-marine system interactions and environmental sustainability objectives.
Responsibility and autonomy	The student / graduate will: 10. Be able to start collaborative planning and fuel up stakeholder engagement (government, industry, NGOs), 11. Be able of conduct data analysis, conflict resolution, and sustainable development for activities like energy, transport, and conservation, and make informed, integrated decisions, balancing economic needs with environmental protection, requiring ethical judgments and adaptive management in complex, often transboundary settings.

8. Teaching methods

Students will examine policy frameworks, planning processes, analytical tools, and real-world applications, with a particular focus on the sustainable use of marine resources and adaptation to change. The scheme reflected in "Contents" is the one followed when approaching the theoretical-practical sessions, although with flexibility to adapt the sessions to the dynamics of the specific group of students, and to the doubts that may raise. Exceptionally, if health conditions so require, we may use virtual teaching. Should this be the case, students will be readily informed.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Theoretical foundations of ICZM and Maritime Spatial Planning (MSP): Regulatory frameworks, Policies, Zoning, coastal and marine systems, risks and challenges.	Interactive lecture. Clarifying explanations.	3 hours
9.1.2. Planning phases in ICZM and MSP: objectives and visions, data needs, diagnosis, implementation, and monitoring.		3 hours
9.1.3. Blue Economy activities and ocean multi-use.		3 hours
9.1.4. Analytical tools and methods: DAPSIR, Cumulative Impact Assessment, Climate-Smart planning, Marine Ecosystem Services.		3 hours
9.1.5. Practical work: International and Spanish application examples.		3 hours
Course bibliography: ○ Ehler, C., & Douvère, F. (2009). <i>Marine Spatial Planning: A Step-by-Step Approach Toward Ecosystem-Based Management</i>. UNESCO. ○ Douvère, F. (2008). <i>The importance of Marine Spatial Planning in advancing ecosystem-based sea use management</i>. <i>Marine Policy</i>. ○ Ehler, C. (2008). <i>Conclusions: Benefits, lessons learned and future challenges of marine spatial planning</i>. <i>Marine Policy</i>. ○ SpringerLink.com (2019). <i>Maritime/Marine Spatial Planning at the Interface of Research and Practice</i>.		
9.2a Seminar	Working methods ¹⁶	Time allocation
Problem solving. Discussion of practical case studies	Exercises and problem solving	10 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
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10.4 Final Exam/Assignment	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	The evaluation is based on a theoretical-practical test in which the students must solve similar problems to those practiced in the sessions of the course.	80%
10.5a Seminar	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	In order to pass the course, it is mandatory attending to a minimum of 80% of the practical sessions. Active participation in activities. Project Assignments.	20%

10.6 Conditions for passing

Grades from 0 to 10 points will be awarded to each activity of the course.

The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.

In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made.

Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.

Date:

Course instructor: Nicolás Felipe Weidberg López, Bárbara Ondiviela, Daniel Depellegrin

Course instructors for applied activities: Nicolás Felipe Weidberg López, Bárbara Ondiviela, Daniel Depellegrin

Date of approval by the department:

Head of Department: Luis Valledor González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Functional Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				Voluntary work in a Solidarity Marine Space					
2.1.2 Course code				SMaC ² -02		2.1.3. Course category Fundamental/Specialized/Complementary			C
2.2 Course instructor				Yaisel Juan Borrell, Laura Miralles, Raúl García					
2.3 Course instructors for applied activities (S, L, P, Pr)						Yaisel Juan Borrell, Laura Miralles, Raúl García			
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵		DFA

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.0	3.3a sem.	0,5	3.3b laboratory		3.3c project	1.5	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	10	3.6a sem.	5	3.6b laboratory		3.6c project	15		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer

6. Overall objective of the course

NGOs are crucial in marine conservation by acting as advocates, researchers, watchdogs, and enablers, bridging gaps between governments, communities, and science to drive policy, monitor illegal activities, build capacity for local management (like fish sanctuaries), and promote sustainable practices through projects, data collection, and public awareness campaigns. They facilitate collaboration, provide crucial expertise, and empower stakeholders, ensuring more inclusive and effective marine protection. In this course students will know about their structure, function, lines of work, success and fails. WWF will lead the course looking for the participation of other NGOs such as MARINE ANIMAL RESCUE, ENVIRONMENTALISTS IN ACTION, etc.

7. Learning outcomes

Knowledge	The student / graduate will: 5. Be able to understand NGOs structure, stakeholder's engagement, functions, lines of work, funding, success and fails.
Skills	The student / graduate will: 6. Have practical conservation skills (project design, monitoring, data analysis), community engagement strategies, policy understanding, fundraising/proposal writing, and crucial professional skills (leadership, communication, networking) to tackle threats, secure funding, and drive sustainable impact in marine environments.
Responsibility and autonomy	The student / graduate will: 7. Be able to transit from passive learners to active, autonomous "ocean guardians" with heightened personal and professional responsibilities. 8. Be able to shift toward ethical and social accountability in managing marine resources.

8. Teaching methods

The course is organized into daily sessions of approximately 2 hours, and can be extended up to 4 hours at the request of the students. The rest of the face-to-face sessions consist of autonomous work guided in a class project. It can be individual or in groups of a maximum of two people. The students will choose any of the NGOs lines of work associated to an environmental problem and will collect information on it. Students will plan an action within the framework of the chosen topic / line of work. The evaluation session, which takes place on the last day, is dedicated to the presentation of the project in public and its discussion by the class and the teacher. Exceptionally, if sanitary conditions require it, non-classroom teaching activities may be included. In which case, the student body will be informed of the changes made.

9. Course content

9. 1. Courses¹⁵	Teaching methods	Time allocation
9.1.1. What is a NGO (legal definition, structure and functions)	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	2 hours
9.1.2. The global role of NGOs in Marine Conservation. Case studies.		2 hours
9.1.3. The MPAs and Oceans programs at WWF		2 hours
9.1.4. Action lines in other local NGOs		2 hours
9.1.5. Hot topics in Marine Conservation through the lens of the NGOs perspective		2 hours
Course bibliography: The materials presented in the course and the bibliographic resources are available to students on the University of Oviedo's Virtual Campus, in PDF format and with access restricted to teachers and students. Current articles are used and the materials are updated annually. ○ <i>Crosman, D. (2013/2014): Explored five key NGO roles (advocate, expert, manager, watchdog, enabler) in marine conservation, detailing the "enabler" role's nuances, benefits, and challenges.</i> ○ <i>Ban, N. C., et al. (2017): Assesses the social and ecological effectiveness of large MPAs, relevant to NGO roles.</i> ○ <i>Fletcher, S., et al. (2014): Examines England's evolving marine and coastal governance, including NGO involvement.</i>		
9.2a Seminar	Working methods ¹⁶	Time allocation
Face to face contact with NGO partners about the marine conservation topic chosen by student/group to develop their personal project.	Discuss practical cases/interviews.	5 hours

9.2b Project	Working methods ¹⁶	Time allocation
Autonomous work guided in a class project.	Individual or in groups of a maximum of two people.	15 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment/Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Quality of the essays/practical case study	70%
10.5a Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation of the project in public and its discussion by the class and the teacher. Participation and contribution in class sessions, including practices for each topic.	30%
10.6 Conditions for passing Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: Yaisel Juan Borrell, Laura Miralles, Raúl García

Course instructors for applied activities: Yaisel Juan Borrell, Laura Miralles, Raúl García

Date of approval by the department:

Head of Department: Celestino González González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				The social View of Marine Conservation based on Audiovisual Resources.						
2.1.2 Course code				SMaC ² -03		2.1.3. Course category Fundamental/Specialized/Complementary		C		
2.2 Course instructor				José Manuel Rico Ordás, Alberto José Redondo Villa						
2.3 Course instructors for applied activities (S, L, P, Pr)						José Manuel Rico Ordás, Alberto José Redondo Villa				
2.4 Year of study ²		1	2.5 Semester ³		2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵	DFA

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	1.4	3.3a sem.	0.6	3.3b laboratory		3.3c project	1.0	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	14	3.6a sem.	6	3.6b laboratory		3.6c project	10		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, computer
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer

6. Overall objective of the course

This course aims to explore how audiovisual media, particularly documentaries, can serve as powerful tools for marine conservation and scientific outreach. Students will examine the social and cultural dimensions of marine environmental issues through film analysis and media critique. By integrating scientific knowledge with visual storytelling, the course wants to give students tools to facilitate public understanding of ocean conservation, promote environmental awareness, and encourage behavioral change. Participants will also develop critical thinking and communication skills to create and evaluate media content that inspires collective action toward sustainable ocean stewardship.

7. Learning outcomes

Knowledge	The student / graduate will: 9. Be able to understand how audiovisual media can serve as powerful tools for marine conservation and scientific outreach.
Skills	The student / graduate will: 10. Capacity to examine the social and cultural dimensions of marine environmental issues through film analysis and media critique.
Responsibility and autonomy	The student / graduate will: 11. Be able to acquire critical thinking and communication skills to create and evaluate media content that inspires collective action toward sustainable ocean stewardship.

8. Teaching methods

The course is structured in three main parts. The first section introduces the fundamentals of cinematographic language, focusing on visual storytelling, narrative structure, image composition, sound, and editing as essential tools for effective communication. In the second part, students will analyze a selection of scientific and popular audiovisual materials related to marine conservation, including documentaries, short films, and digital media projects. Through guided discussions, they will explore how these works convey scientific information and shape public perception of ocean issues. The final section is practical and creative: students will learn basic tools and techniques for documentary production—such as scripting, filming, and editing—with the goal of developing their own short audiovisual project. This hands-on component encourages teamwork, creativity, and critical reflection on how to communicate marine science and conservation messages to diverse audiences.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Fundamentals of cinematographic language	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	2 hours
9.1.2. Marine conservation in scientific and popular audiovisual materials Case study 1.		2 hours
9.1.3. Marine conservation in scientific and popular audiovisual materials Case study 2.		2 hours
9.1.4. Marine conservation in scientific and popular audiovisual materials Case study 3.		2 hours
9.1.5. Basic tools and techniques for documentary production.		2 hours
Course bibliography: The materials presented in the course and the bibliographic resources are available to students on the University of Oviedo's Virtual Campus, in PDF format and with access restricted to teachers and students. Current articles are used and the materials are updated annually. ○ Kolandai-Matchett, K., et al. (2020). "The role of visual framing in marine conservation communication." <i>Ocean & Coastal Management</i>. Discusses how different visual formats (e.g., YouTube vs. text/photos) impact knowledge and motivation for marine protection. ○ Sugimoto, C. R., & Thelwall, M. (2013). "Scholars on YouTube: How and why scientists use video." <i>PLOS ONE</i>. Provides foundational context for the shift toward video as a scientific communication tool. ○ Wright, J. H. (2010). "Visual Content in Science Communication." Analyzes how observing phenomena not visible to the naked eye (like deep-sea ecology) enhances scientific understanding ○ León (2013). <i>Cómo producir un video científico con un iPhone</i>. ○ <i>Sharing Science with Film: A Guide to Student Productions_Full (pdf)</i>. ○ Finkler, Wiebke y León, Bienvenido (2019). <i>The power of storytelling and video: a visual rhetoric for science communication</i>. <i>Journal of Science Communication</i>, 18 (5), A(02). ○ Welbourne, Dustin. J. y Grant, Will J. (2016). <i>Science communication on YouTube: Factors that affect channel and video popularity</i>. <i>Public Understanding of Science</i>, 25(6), 706-718.		
9.2a Seminar	Working methods ¹⁶	Time allocation

Detailed analyses and debate on Case studies	Discuss practical cases/interviews.	6 hours
9.2b Project	Working methods ¹⁶	Time allocation
Autonomous work to develop an annotated script for a documentary guided in a class project.	Individual or in groups of a maximum of two people.	10 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment/Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Quality of the essays/practical case study	70%
10.5a Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation of the project in public and its discussion by the class and the teacher. Participation and contribution in class sessions, including practices for each topic.	30%
10.6 Conditions for passing Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: José Manuel Rico Ordás, Alberto José Redondo Villa

Course instructors for applied activities: José Manuel Rico Ordás, Alberto José Redondo Villa

Date of approval by the department:

Head of Department: Luis Valledor González

Date of approval by the Faculty Council:

Dean, Belén López Martínez

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Biology
1.3 Department	Organism and System Biology/Functional Biology
1.4 Field	Environmental sciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name					Joint element: Marine Diversity & Maritime Operations for a sustainable world.						
2.1.2 Course code					SMaC ² -04		2.1.3. Course category Fundamental/Specialized/Complementary			S	
2.2 Course instructor					José Manuel Rico Ordás, Gonzalo Machado-Schiaffino Ferrer, Nicolás Felipe Weidberg López, Yaisel Juan Borrell						
2.3 Course instructors for applied activities (S, L, P, Pr)					José Manuel Rico Ordás, Gonzalo Machado-Schiaffino Ferrer, Nicolás Felipe Weidberg López, Yaisel Juan Borrell, Invited speaker from MTU, Invited speaker from URN						
2.4 Year of study ²		1	2.5 Semester ³		2	2.6 Evaluation type ⁴		E, A	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	15	3.2 course	0.8	3.3a sem.	0.6	3.3b laboratory		3.3c project	1.6	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	8	3.6a sem.	6	3.6b laboratory		3.6c project	16		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										20	
Practical skills development										10	
Preparation of seminars / laboratory works / project phases / home works / presentations										10	
Evaluation ⁸										5	
Other activities:											
3.7 Total hours of individual study ⁹		45									
3.8 Total hours per semestre ¹⁰		75									
3.9 Number of credits		3.0									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, computer for internet connections
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer for internet connections

6. Overall objective of the course

The course is one of the joint elements planned in the SMAC² master degree. Until now the master degree has deepened students' knowledge, skills and autonomy in fundamental aspects of marine biodiversity and its changes over time and space in this first

semester of SMAC². Specifically, students have analyzed biodiversity patterns at various scales (from genetic biodiversity to the complexity of food webs); have identified and analyzed the factors responsible for biodiversity change and loss; and sets out the basis for biodiversity conservation. Moreover, they have analyzed the models and theories behind strategies that cushion, minimize, or correct biodiversity loss from a multidisciplinary approach. Besides this the module have provided the ability to use advanced techniques for measuring, evaluating, managing, and conserving biodiversity. A specific course merging Maritime Operations, Coastal Conservation and Marine Biodiversity aims to show to future professionals the need of balance sea use with ocean health, sustainable management, policy, and technical skills to minimize impacts like pollution or habitat destruction while maximizing resource use, covering biodiversity assessment, marine spatial planning, biosecurity, and implementing conservation for sustainable blue economies. Key goals involve understanding threats (pollution, climate change), applying management tools (MSP, monitoring), fostering stakeholder collaboration, and integrating ecological knowledge into maritime practices for conservation and policy.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Have knowledge about how shipping, ports, and resource extraction impact oceans and how to make them more sustainable 2. Identify major threats (pollution, overfishing, climate change) due to maritime operations and start to delineate possible solutions.
Skills	The student / graduate will: 3. Learn how to involve communities and industry in collaborative marine conservation efforts. 4. Combine technical, economic, and ecological knowledge for holistic marine management.
Responsibility and autonomy	The student / graduate will: 5. Start to balance operational efficiency with environmental protection, valuable for leadership in ports, shipping, consultancies, and conservation bodies.

8. Teaching methods

The course will start with interactive face to face (UNIOVI) and online lectures (MTU, URN) about the great diversity of maritime operations currently in use and their potential impacts on species and ecosystems from very diverse conservation perspectives. Teachers and students will together elaborate a maritime operations topic list to be scrutinized from a marine conservation and sustainability perspective in a project-based strategy where knowledge gaps (in students and in literature) will be self-identified and presented for the group and for the teachers that will receive students in the second and third semester of the SMAC². Group and individual knowledge gaps will thus be part of the teaching strategy for be filled in upcoming studies.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. An Overview on current and future maritime operations in a changing world (MTU).	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	2 hours
9.1.2. Diversity threats due to maritime operations and knowledge gaps (UNIOVI).		2 hours
9.1.3. Coastal hazards due to maritime operations and knowledge gaps (URN).		2 hours
9.1.4. Sustainable strategies in maritime operations. Perspectives (MTU).		2 hours
Course bibliography: The materials presented in the course and the bibliographic resources are available to students on the University of Oviedo's Virtual Campus, in PDF format and with access restricted to teachers and students. Current articles are used and the materials are updated annually. ○ <i>Marine Conservation: Science, Policy, and Management</i> (Ray & McCormick-Ray, 2014): A foundational text that argues for a holistic understanding of social, legal, and political issues alongside science for successful marine management. ○ <i>Handbook of Marine Fisheries Conservation and Management</i> (OUP, 2010): Bridges industrial fishing operations with conservation, examining interactions between high-seas use and habitat protection. ○ <i>Marine Studies</i> (2nd Edition, 2025): A newly updated educational resource (E-Pub) released in January 2025 that covers modern marine environmental topics. ○ <i>Contemporary Marine and Maritime Policy</i> (Nova, 2014): Explores the nexus between legal policies and market forces in maritime business, emphasizing the regulation of		

commercial activities.		
9.2a Seminar	Working methods ¹⁶	Time allocation
Detailed analyses and debate to elaborate a maritime operations topic list to be scrutinized from a marine conservation and sustainability perspective (UNIOVI).	Group discussions on practical cases/interviews.	6 hours
9.2b Project	Working methods ¹⁶	Time allocation
Autonomous work to develop a research case study guided in a class project.	Individual or in groups of a maximum of two people.	16 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Assignment/Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Quality of the essays/practical case study	70%
10.5a Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Presentation of the project in public and its discussion by the class and the teacher. Participation and contribution in class sessions, including practices for each topic.	30%
10.6 Conditions for passing			
Grades from 0 to 10 points will be awarded to each activity of the course. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits. In the event of an extraordinary exam session, the assessment will consist of a written exam that will account for 100% of the final grade. Exceptionally, if health conditions so require, non-face-to-face assessment methods may be included. In this case, students will be informed of the changes made. Differentiated assessment: in cases where students are entitled to a duly formulated differentiated assessment and are unable to participate in face-to-face activities, the personal situation of each student will be considered and the assessment of participation in face-to-face sessions may be replaced in whole or in part by alternative non-face-to-face tasks.			

Date:

Course instructor: José Manuel Rico Ordás, Gonzalo Machado-Schiaffino Ferrer, Nicolás Felipe Weidberg

López, Yaisel Juan Borrell

Course instructors for applied activities: José Manuel Rico Ordás, Gonzalo Machado-Schiaffino Ferrer, Nicolás

Felipe Weidberg López, Yaisel Juan Borrell

Date of approval by the department:

Head of Department Organism and System Biology: Luis Valledor González

Head of Department Functional Biology: Celestino González González

Bachelor's / Master's degree.

² For Bachelor's: 1-4; for Master's: 1-2.

³ For Bachelor's: 1-8; for Master's: 1-4..

⁴ Exam (E), assessment (A) – according to the curriculum.

⁵ DOB – mandatory course, DOP – optional course, DFA – elective course;

⁶ Duration equals 14 weeks multiplied by the number of hours listed at point 3.1 (similarly for points 3.5 and 3.6abc).

⁷ The lines below refer to individual study; total is completed at point 3.7.

⁸ Between 2 and 6 teaching hours, not included in individual study.

⁹ Total number of individual study hours (sum of values from previous lines).

¹⁰ Total of direct teaching hours (3.4) plus individual study hours (3.7); must equal the number of credits (3.9) multiplied by 27 hours per credit.

¹¹ Prerequisite courses that must be passed previously or their equivalents are indicated.

¹² Teaching resources: blackboard, video projector, flipchart, specific teaching materials, etc.

¹³ Technical equipment: computers, software packages, experimental stands, etc

¹⁴ Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course, aligned with level 7 of the National Qualifications Framework (NQF) and adapted to the type of university program. For research master's programs, these include competences necessary for conducting independent scientific research (<https://www.aracis.ro/wp-content/uploads/2025/07/Standarde-specifice-masterat.pdf>).

¹⁵ Titles of chapters and paragraphs.

¹⁶ Teaching methods: discussions, debates, presentations and/or paper analyses, exercises and problem solving.

¹⁷ Practical demonstrations, exercises, experiments.

¹⁸ Case studies, demonstrations, exercises, error analysis, etc.

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				HYDRO-CLIMATE VARIABILITY				ECTS 3	
2.1.2 Course code				M2-S1-UE4		2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				N. Massei, I. Turki, M. Fournier					
2.3 Course instructors for applied activities (S, L, P, Pr)						N. Massei			
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴		Exam, Project	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2,6	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	32	3.5 course	26	3.6a sem.	0	3.6b laboratory	0	3.6c project	6		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰		34									
3.9 Number of credits		3									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, optimization software (Rstudio)

6. Overall objective of the course

This course explores the variability of the hydrological cycle across temporal and spatial scales and its links to climate dynamics. Students will examine how atmospheric, oceanic, and terrestrial processes drive variations in precipitation, temperature, river discharge, waves, surges. A special focus will be given to extreme events inducing coastal hazards as floods and marine submersion.

7. Learning outcomes

Knowledge	The student / graduate will: 1. Be able to explain the physical processes governing hydro-climate variability.
Skills	The student / graduate will: 1. Be able to analyse hydro-climatic datasets using statistical approaches. 2. Be able to identify key drivers of climate variability and extremes.
Responsibility and autonomy	The student / graduate will: 1. Assess the impacts of hydro-climate variability on water resources and coastal systems. 2. Apply hydro-climate knowledge to support sustainable management and adaptation strategies.

8. Teaching methods

The course is delivered through an applied, example-driven learning approach, combining theoretical foundations with hands-on technical training. Teaching methods are designed to progressively build students' capacity to analyze hydro-climate variability using real data, computational tools, and project-based learning, in line with previous scientific and operational practices in hydro-climate research.

Lectures Based on Previous Works and Case Studies

Core concepts are introduced through concise lectures that draw on peer-reviewed studies, international assessment reports, and documented hydro-climate projects. Examples include historical drought and flood analyses, climate variability assessments, and impact studies relevant to water resources and coastal systems. These examples help students connect theory to real-world applications and established methodologies.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Data processing from observational and reanalysis sources + Identification of climate variability signals and trends	Interactive lecture. Clarifying explanations.	8 hours
9.1.2. Linking large-scale climate patterns to local hydrological responses		8 hours
9.1.3. Stochastic approaches for estimating geophysical variables		6 hours
9.1.4. Modelling of extreme events		6 hours
9.1.5. Project-Based Learning with Technical Objectives		6 hours
9.2a Seminar	Working methods ¹⁶	Time allocation
Course bibliography: <i>Books:</i> Assefa M. Melesse, Wossenu Abtew and Gabriel SenayExtreme. Hydrology and Climate Variability. DOI: 10.1016/C2017-0-04193-9; ISBN: 978-0-12-815998-9		
9.2b Project	Working methods ¹⁶	Time allocation

Practical cases of Extreme Modelling and Coastal drivers' projections Practical cases of climate contribution on the hydrological variability	Work in groups of students to address and discuss practical cases.	6 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Summative assessment test (final evaluation).	60%
10.5 Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities.	30%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: Nicolas Massei

Course instructors for applied activities: Nicolas Massei, Imen Turki, Matthieu Fournier

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				COASTAL MODELLING				ECTS 5	
2.1.2 Course code				M2-S2-UE1	2.1.3. Course category Fundamental/Specialized/Complementary				S
2.2 Course instructor				E.I. Turki					
2.3 Course instructors for applied activities (S, L, P, Pr)					E.I. Turki ; A. Jardani ; N. Lecoq				
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴	Exam, Project	2.7 Course type ⁵			DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	8	3.2 course	5	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	48	3.5 course	40	3.6a sem.	0	3.6b laboratory	0	3.6c project	8		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										4	
Practical skills development										6	
Preparation of seminars / laboratory works / project phases / home works / presentations										4	
Evaluation ⁸										4	
Other activities:											
3.7 Total hours of individual study ⁹		18									
3.8 Total hours per semestre ¹⁰	66										
3.9 Number of credits	5										

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, optimization software TELEMAR , XBEACH, CAESAR Lisflood, Mod-Flow, AI techniques

6. Overall objective of the course

This course introduces the principles and applications of numerical modelling in the interface land-sea environments. It focuses on the simulation of hydrodynamic processes from riverine/ estuarine and coastal/ocean systems, and the induced coastal morphodynamics. Students will learn how models are developed, calibrated and applied to analyse coastal dynamics, assess risks, and support sustainable coastal management and conservation.

The course is closely aligned with coastal risk assessment, climate adaptation, and marine spatial planning, with applications relevant to erosion, flooding, habitat evolution, and infrastructure planning.

7. Learning outcomes

Knowledge	The student / graduate will demonstrate: 1. Highly specialized knowledge of coastal physical processes and numerical modelling approaches, forming the basis for originality in analysing complex coastal systems. 2. A critical understanding of model assumptions, parameterizations, and uncertainties, at the interface between hydrodynamics, sediment dynamics, and climate-driven processes. 3. Advanced knowledge enabling the integration of coastal modelling into risk assessment, spatial planning, and sustainable management frameworks.
Skills	The student / graduate will be able to: - Apply advanced analytical and computational skills to set up, run, and interpret coastal numerical models in research and professional contexts. - Solve complex and unpredictable problems related to coastal dynamics, erosion, flooding, and extreme events using modelling tools. - Integrate heterogeneous data sources (observations, remote sensing, model outputs) to support evidence-based coastal analyses. - Communicate results clearly to both scientific and professional audiences.
Responsibility and autonomy	The student / graduate will be able to: 1. Manage and take responsibility for complex technical modelling tasks, including methodological choices and quality control. 2. Work autonomously and in teams in multidisciplinary and international contexts. 3. Exercise professional judgement in applying coastal modelling to policy-relevant and management-oriented problems. 4. Reflect on ethical, environmental, and societal implications of modelling outcomes.

8. Teaching methods

Teaching is based on a concise combination of focused lectures, hands-on practical sessions, and project-based learning. Lectures introduce key coastal processes, numerical modelling principles, and recent advances in coastal models using examples from current research. Practical computer labs provide training in the use of new and state-of-the-art coastal models, including model setup, programming for data processing, and analysis of simulation outputs. Students apply these tools in individual or group projects with clearly defined technical objectives, supported by continuous feedback and an emphasis on critical model evaluation, uncertainty awareness, and responsible professional practice.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Understand Coastal System Dynamics	Interactive lecture. Clarifying explanations.	4 hours
9.1.2. Introduce Modelling Concepts and Principles		10 hours
9.1.3. Develop Technical Competence in Coastal Modelling Tools		10 hours
9.1.4. Apply Models to Coastal Risk Assessment		10 hours
9.1.5. Support Sustainable Coastal Management		6 hours
Course bibliography: <i>Books:</i> K. W. Chau. Modelling for Coastal Hydraulics and Engineering		

U.S. Army Corps of Engineers. (2002). Coastal Engineering Manual (Engineer Manual EM 1110-2-1100). Washington, DC: U.S. Army Corps of Engineers.		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation
Practical cases and handling a project of modelling a coastal and hydrological system	Work in groups of students to address and discuss practical cases.	8 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Summative assessment test (final evaluation).	60%
10.5 Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities.	30%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: E.I. Turki

Course instructors for applied activities: I. Turki, N. Lecoq, A. Jardani

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				EROSION & BIODIVERSITY					ECTS 3
2.1.2 Course code				M2-S3-UE6	2.1.3. Course category Fundamental/Specialized/Complementary				S
2.2 Course instructor				Lucie Vincenot					
2.3 Course instructors for applied activities (S, L, P, Pr)					L. Vincenot				
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴	Exam.	2.7 Course type ⁵			DOP

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	24	3.5 course	24	3.6a sem.		3.6b laboratory	0	3.6c project	0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰		34									
3.9 Number of credits		3									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector,

6. Overall objective of the course

The course Erosion and Biodiversity aims to provide students with a comprehensive understanding of erosion processes and their impacts on biodiversity across terrestrial, freshwater, and coastal ecosystems. It develops the ability to analyse natural and human-induced causes of erosion, assess their ecological consequences, and evaluate risks to habitats, species diversity, and ecosystem stability. The course also equips students with practical skills to conduct basic environmental assessments and design sustainable management and conservation strategies that integrate erosion control with biodiversity protection, promoting long-term ecosystem resilience and responsible environmental stewardship.

7. Learning outcomes

Knowledge	The student / graduate will demonstrate: Explain the fundamental principles of erosion processes (water, wind, and coastal erosion). 1. Describe the different levels of biodiversity (genetic, species, and ecosystem diversity). 2. Identify natural and anthropogenic factors contributing to erosion. 3. Discuss the ecological impacts of erosion and sedimentation on terrestrial and aquatic ecosystems. 4. Recognize the role of biodiversity in ecosystem stability and resilience
Skills	The student / graduate will be able to: 1. Analyze erosion patterns and their environmental consequences. 2. Assess biodiversity status using basic ecological indicators. 3. Interpret environmental data related to soil loss, sedimentation, and habitat degradation. 4. Apply appropriate erosion control and conservation techniques in case studies. 5. Develop practical solutions integrating sustainable land and coastal management principles.
Responsibility and autonomy	The student / graduate will be able to: 1. Demonstrate environmental responsibility in managing natural resources. 2. Make informed decisions regarding erosion mitigation and biodiversity conservation. 3. Work independently and collaboratively in analyzing environmental problems. 4. Propose evidence-based recommendations for sustainable ecosystem management. 5. Show ethical awareness in environmental planning and conservation practices.

8. Teaching methods

The course will adopt a blended and student-centered teaching approach combining theoretical instruction with applied learning methods to ensure both conceptual understanding and practical competence. Teaching will include interactive lectures to introduce key concepts related to erosion processes and biodiversity dynamics, supported by visual materials such as maps, diagrams, and scientific case examples. Guided discussions and case study analysis will be used to examine real-world environmental problems, particularly in coastal and watershed systems. Practical learning will be encouraged through problem-solving exercises, group work, and scenario-based analysis, allowing students to propose erosion control and biodiversity conservation strategies.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Fundamentals of Erosion	Interactive lecture. Clarifying explanations.	8 hours
9.1.2. Principles of Biodiversity		4 hours
9.1.3. Erosion–Biodiversity Interactions		4 hours
9.1.4. Human Activities and Climate Change		4 hours
9.1.5. Assessment and Monitoring Methods		4 hours
9.1.6 Sustainable Management and Conservation Strategies		4 hours
Course bibliography: <i>Books:</i> Christian Lévêque (2022); Biodiversity Erosion: Issues and Questions Morgan, R.P.C. (2005). <i>Soil Erosion and Conservation</i> . 3rd Edition. Blackwell Publishing.		
9.2a Seminar	Working methods ¹⁶	Time allocation

NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation
NO PROJECT		
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	The final examination will assess students' understanding of theoretical concepts, analytical abilities, and application of sustainable management principles related to erosion and biodiversity.	Summative assessment test (final evaluation). Knowledge and Understanding (30%) Analytical and Critical Thinking Skills (20%) Application and Problem-Solving (20%)	70%
10.5 Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities.	30%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: L. Vincenot

Course instructors for applied activities: L. Vincenot

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				CONTAMINANTS				ECTS 3	
2.1.2 Course code				M2-S3-UE5		2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				Florence Koltalo					
2.3 Course instructors for applied activities (S, L, P, Pr)						Florence Koltalo			
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴		Exam,	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	24	3.5 course	24	3.6a sem.		3.6b laboratory	0	3.6c project	0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰		34									
3.9 Number of credits		3									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector,

6. Overall objective of the course

The course aims to provide students with a comprehensive understanding of environmental contaminants, their sources, transport mechanisms, ecological and human health impacts, and strategies for monitoring, control, and remediation within terrestrial, freshwater, and coastal systems.

7. Learning outcomes

Knowledge	The student / graduate will demonstrate: 1. Define and classify different types of environmental contaminants (chemical, physical, and biological). 2. Identify major sources of contamination, including industrial, agricultural, urban, and natural sources. 3. Explain the transport, transformation, and fate of contaminants in air, water, soil, and marine systems. 4. Describe processes such as bioaccumulation and biomagnification. 5. Discuss ecological and human health impacts associated with environmental pollution. 6. Recognize environmental standards and regulatory frameworks related to contamination control.
Skills	The student / graduate will be able to: 1. Analyze contamination case studies and identify key environmental risks. 2. Interpret environmental monitoring data and laboratory results. 3. Conduct basic contamination risk assessments. 4. Apply appropriate pollution control and remediation strategies to different environmental contexts. 5. Prepare technical reports and present findings related to environmental contamination.
Responsibility and autonomy	The student / graduate will be able to: 1. Demonstrate ethical awareness and environmental responsibility in pollution prevention and management. 2. Make informed decisions regarding contamination mitigation strategies. 3. Work independently and collaboratively in solving environmental contamination problems. 4. Critically evaluate environmental policies and propose sustainable solutions. 5. Show accountability in environmental analysis and reporting practices.

8. Teaching methods

The course will use an interactive and application-oriented teaching approach combining theoretical instruction with practical analysis. Teaching will include structured lectures to introduce key concepts related to types of contaminants, sources, transport mechanisms, and environmental impacts. Case studies will be used to examine real-world contamination events and pollution management strategies.

Students will engage in guided discussions, problem-solving exercises, and group work focused on contaminant risk assessment and remediation planning. Practical components may include laboratory demonstrations, data interpretation exercises, and analysis of environmental monitoring reports. Multimedia tools such as scientific databases, environmental maps, and regulatory guidelines will support learning. Independent research assignments and presentations will further develop analytical skills and critical thinking in environmental pollution management.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to Environmental Contaminants	Interactive lecture. Clarifying explanations.	4 hours
9.1.2. Types of Contaminants		4 hours
9.1.3. Transport in the Environment		4 hours
9.1.4. Ecological Impacts		4 hours
9.1.5. Monitoring and Assessment Methods		4 hours
9.1.5 Pollution Control and Remediation		4 hours
Course bibliography: <i>Books:</i> Manahan, S. E. (2017). Environmental Chemistry. 10th Edition. CRC Press.		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		

9.2b Project	Working methods ¹⁶	Time allocation
NO PROJECT		
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	The final examination will assess students' understanding of theoretical concepts, analytical abilities, and application of sustainable management principles related to erosion and biodiversity.	Summative assessment test (final evaluation). Knowledge and Understanding (40%) Analytical and Critical Thinking Skills (25%) Application and Problem-Solving (20%)	100%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: L. Kotalo

Course instructors for applied activities: L. Kotalo

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				SUSTAINABLE DEVELOPMENT					ECTS 3			
2.1.2 Course code				M2-S3-UE7		2.1.3. Course category Fundamental/Specialized/Complementary				S		
2.2 Course instructor				A. Derguine								
2.3 Course instructors for applied activities (S, L, P, Pr)						A. Deguigne						
2.4 Year of study ²		2	2.5 Semester ³		1	2.6 Evaluation type ⁴		Exam.	2.7 Course type ⁵			DOP

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	24	3.5 course	24	3.6a sem.		3.6b laboratory	0	3.6c project	0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰	34										
3.9 Number of credits	3										

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector,

6. Overall objective of the course

The course aims to provide students with a comprehensive understanding of the principles, dimensions, and practical applications of sustainable development. It seeks to develop the ability to integrate environmental protection, economic growth, and social equity into decision-making processes at local, national, and global levels. The course also intends to equip students with analytical tools to evaluate sustainability challenges, assess development policies, and design strategies that promote responsible resource management, climate resilience, biodiversity conservation, and long-term socio-economic stability. Ultimately, it fosters critical thinking, ethical awareness, and active engagement in advancing sustainable development goals and environmental stewardship.

7. Learning outcomes

Knowledge	The student / graduate will demonstrate: 1. Define sustainable development and explain its historical evolution and core principles. 2. Describe the three pillars of sustainability: environmental protection, economic development, and social equity. 3. Identify major global sustainability challenges, including climate change, biodiversity loss, poverty, and resource depletion. 4. Explain the structure and objectives of the Sustainable Development Goals (SDGs). 5. Recognize key policies, governance frameworks, and sustainability indicators.
Skills	The student / graduate will be able to: 1. Analyze sustainability issues using interdisciplinary approaches. 2. Evaluate development projects and policies based on sustainability criteria. 3. Apply sustainability assessment tools and indicators in case studies. 4. Propose practical strategies for sustainable resource management and community development. 5. Prepare analytical reports and presentations related to sustainability planning.
Responsibility and autonomy	The student / graduate will be able to: 1. Demonstrate ethical awareness and responsibility in sustainability decision-making. 2. Engage independently in sustainability assessment and problem-solving. 3. Work collaboratively to design sustainable solutions for environmental and socio-economic challenges. 4. Advocate for responsible resource use and long-term environmental stewardship. 5. Critically evaluate the impacts of development activities on future generations.

8. Teaching methods

The course will adopt a multidisciplinary and student-centered teaching approach that combines theoretical foundations with practical application. Interactive lectures will be used to introduce key concepts, principles, and global sustainability frameworks, supported by visual materials, policy documents, and real-world examples. Case studies and guided discussions will allow students to examine sustainability challenges at local, national, and global levels. Group work and problem-based learning activities will encourage collaborative analysis of development scenarios and the design of sustainable solutions. Practical exercises may include sustainability assessments, policy evaluations, and project planning simulations. Multimedia resources, sustainability reports, and international development data will be integrated to strengthen analytical skills. Independent research assignments and student presentations will further promote critical thinking, ethical reflection, and active engagement in sustainable development practices.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to Sustainable Development	Interactive lecture. Clarifying explanations.	4 hours
9.1.2. Global Sustainability Challenges		4 hours
9.1.3. Sustainable Resource Management		4 hours
9.1.4. Sustainable Development Goals (SDGs)		4 hours
9.1.5. Governance and Policy for Sustainability		4 hours
9.1.6 Tools and Strategies for Sustainable Development		2 hours

9.1.7 Case Studies and Practical Applications		2 hours
Course bibliography: <i>Books:</i> Euston Quah , Renate Schubert , Sustainability and Environmental Decision Making		
9.2a Seminar	Working methods ¹⁶	Time allocation
NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation
NO PROJECT		
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	The final examination will assess students' understanding of theoretical concepts, analytical abilities, and application of sustainable management principles related to erosion and biodiversity.	Summative assessment test (final evaluation). Knowledge and Understanding (40%) Analytical and Critical Thinking Skills (25%) Application and Problem-Solving (20%)	100%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: A. Deguigne
Course instructors for applied activities: A. Deguigne

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				COASTAL GEOSYSTEM					ECTS 3			
2.1.2 Course code				M1-S1-UE5		2.1.3. Course category Fundamental/Specialized/Complementary				S		
2.2 Course instructor				J. Deloffre								
2.3 Course instructors for applied activities (S, L, P, Pr)						J. Deloffre and S. Le Bot						
2.4 Year of study ²		2	2.5 Semester ³		1	2.6 Evaluation type ⁴		Exam,	2.7 Course type ⁵			DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	40	3.5 course	40	3.6a sem.		3.6b laboratory	0	3.6c project	0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰		54									
3.9 Number of credits		3									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector,

6. Overall objective of the course

The course aims to provide students with a comprehensive understanding of coastal geosystems, including their physical processes, geomorphological features, ecological interactions, and dynamic responses to natural and anthropogenic pressures. It seeks to develop analytical skills to evaluate coastal evolution, sediment transport, shoreline change, and the impacts of climate change and human activities on coastal stability and sustainability

7. Learning outcomes

Knowledge	The student / graduate will demonstrate: 1. Define coastal geosystems and explain their main components and interactions. 2. Describe coastal geomorphological features such as beaches, dunes, cliffs, deltas, estuaries, and lagoons. 3. Explain coastal processes including waves, tides, currents, and sediment transport mechanisms. 4. Discuss the impacts of climate change, sea-level rise, and extreme events on coastal systems. 5. Identify human activities affecting coastal stability and ecosystem functioning.
Skills	The student / graduate will be able to: 1. Students will be able to: 2. Analyze coastal dynamics and shoreline change processes. 3. Interpret coastal maps, profiles, and geomorphological data. 4. Assess coastal vulnerability and erosion risks. 5. Evaluate the interactions between physical processes and coastal ecosystems. 6. Propose appropriate coastal management and adaptation strategies.
Responsibility and autonomy	The student / graduate will be able to: 1. Demonstrate environmental responsibility in coastal resource management. 2. Make informed decisions regarding coastal development and conservation. 3. Work independently and collaboratively in analyzing coastal issues. 4. Critically evaluate coastal engineering and nature-based solutions. 5. Advocate for sustainable coastal planning and long-term resilience..

8. Teaching methods

The course will adopt an integrated teaching approach combining theoretical instruction with practical and analytical applications to enhance understanding of coastal dynamics and management. Teaching will include interactive lectures to introduce fundamental concepts of coastal geomorphology, hydrodynamics, sediment transport, and climate-related coastal changes. Visual materials such as coastal maps, satellite imagery, cross-sectional profiles, and geomorphological diagrams will support conceptual understanding. Case study analysis will be used to examine real coastal environments, shoreline evolution, and management challenges. Students will engage in group discussions and problem-based learning activities focused on coastal erosion, vulnerability assessment, and adaptation strategies. Where possible, field observations, coastal profile analysis, or practical demonstrations will be incorporated to strengthen experiential learning. Students may also analyze shoreline data, interpret GIS-based coastal maps, or review environmental reports. Independent research assignments and student presentations will further develop analytical thinking, critical evaluation skills, and the ability to propose sustainable coastal management solutions.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to Coastal Geosystems	Interactive lecture. Clarifying explanations.	6 hours
9.1.2. Coastal Geomorphology		6 hours
9.1.3. Coastal Processes		6 hours
9.1.4. Coastal Ecosystems		6 hours
9.1.5. Climate Change and Coastal Dynamics		8 hours
9.1.6 Human Impacts and Coastal Management		8 hours
Course bibliography: <i>Books:</i> Judith Bosboom and Marcel Stive ; Coastal Dynamics Krystian Pilarczyk; Geosynthetics and Geosystems in Hydraulic and Coastal Engineering		
9.2a Seminar	Working methods ¹⁶	Time allocation

NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation
NO PROJECT		
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	The final examination will assess students' understanding of theoretical concepts, analytical abilities, and application of sustainable management principles related to erosion and biodiversity.	Summative assessment test (final evaluation). Knowledge and Understanding (40%) Analytical and Critical Thinking Skills (25%) Application and Problem-Solving (20%)	100%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: J. Deloffre
Course instructors for applied activities: J. Deloffre and S. Le Bot

Date of approval by the department: Head of Department: Yoann Copard

Date of approval by the Faculty Council: Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				REMOTE SENSING				ECTS 4	
2.1.2 Course code				M1-S1-UE2		2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				I. Turki					
2.3 Course instructors for applied activities (S, L, P, Pr)						I. Turki			
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴		Exam, Project	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2,6	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	40	3.5 course	30	3.6a sem.	0	3.6b laboratory	0	3.6c project	10		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										4	
Preparation of seminars / laboratory works / project phases / home works / presentations										8	
Evaluation ⁸										4	
Other activities:											
3.7 Total hours of individual study ⁹		20									
3.8 Total hours per semestre ¹⁰		60									
3.9 Number of credits		4									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
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5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, optimization software SNAP , GIS,
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6. Overall objective of the course

This course aims to introduce students to the principles, techniques, and applications of remote sensing in environmental and coastal management. It focuses on the acquisition, processing, interpretation, and analysis of satellite and aerial imagery to monitor coastal ecosystems, land use change, marine pollution, shoreline dynamics, and climate impacts..

7. Learning outcomes

Knowledge	The student / graduate will: 1. Understand the physical principles of remote sensing (electromagnetic spectrum, radiation laws, spectral signatures). 2. Identify different types of remote sensing systems (optical, thermal, radar, LiDAR). 3. Distinguish between spatial, spectral, temporal, and radiometric resolutions. 4. Explain satellite missions used in environmental monitoring (e.g., NASA missions such as Landsat 8 and Sentinel-2). 5. Understand image processing techniques and classification methods. 6. Recognize applications of remote sensing in coastal zone management and sustainable development.
Skills	The student / graduate will: 1. Interpret satellite images and aerial photographs. 2. Perform basic image processing (georeferencing, correction, enhancement). 3. Apply supervised and unsupervised classification methods. 4. Use GIS and remote sensing software for coastal analysis. 5. Assess shoreline change, vegetation health, and water quality using remote sensing data. 6. Produce thematic maps for environmental management decision-making..
Responsibility and autonomy	The student / graduate will: 1. Conduct independent remote sensing analyses for environmental case studies. 2. Critically evaluate satellite data sources and methodological limitations. 3. Propose sustainable coastal management strategies based on geospatial evidence. 4. Work collaboratively in project-based coastal monitoring assignments. 5. Demonstrate ethical use of geospatial data and environmental reporting.

8. Teaching methods

The teaching methods for the Remote Sensing course combine theoretical instruction with applied practice to ensure both conceptual understanding and technical competence. The course is delivered through interactive lectures supported by satellite imagery and real-world coastal case studies, followed by hands-on laboratory sessions where students use remote sensing and GIS software to process and analyze spatial data. Practical exercises include image interpretation, classification, and shoreline change detection. Project-based learning is emphasized through group assignments focused on environmental and coastal management issues, encouraging critical thinking and problem-solving. Where possible, field validation activities (ground-truthing) are incorporated to link satellite observations with real environmental conditions, fostering analytical skills, autonomy, and professional responsibility

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to Remote Sensing	Interactive lecture. Clarifying explanations.	3 hours
9.1.2. Physical Principles of Remote Sensing		3 hours
9.1.3. Remote Sensing Platforms and Sensors		4 hours
9.1.4. Digital Image Processing		4 hours
9.1.5 Applications in Coastal and Environmental Management		6 hours

9.1.6 Remote Sensing and GIS Integration		4 hours
9.1.7 Project Work and Review		2 hours
Course bibliography: Books: Xiaojun Yang Remote Sensing and Geospatial Technologies for Coastal Ecosystem Assessment and Management		
9.2a Seminar	Working methods ¹⁶	Time allocation
Seminar Objectives 1. Deepen understanding of real-world remote sensing applications 2. Develop critical analysis of satellite data in coastal management 3. Strengthen research, presentation, and discussion skills 4. Encourage autonomous learning and teamwork	Integrated component on Sustainable Coastal and Environmental Applications	4 hours
9.2b Project	Working methods ¹⁶	Time allocation
The project aims to: 1. Apply remote sensing techniques to a real coastal or environmental issue. 2. Develop independent analytical and problem-solving skills. 3. Strengthen technical capacity in image processing and GIS integration. 4. Produce a scientific report and professional presentation.	Work in groups of students to address and discuss practical cases.	10 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Summative assessment test (final evaluation).	50%
10.5 Project	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities.	50%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: Imen Turki

Course instructors for applied activities: Imen Turki

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier

COURSE GUIDE – EXTENDED FORM

Academic year 2027 – 2029

1. Program information

1.1 University	Rouen Normandy University
1.2 Faculty	UFR Sciences et Techniques
1.3 Department	Geosciences and Environment
1.4 Field	Geosciences
1.5 Study level	Master
1.6 Specialization	Joint Master Program in Sustainable Maritime Management and Coastal Conservation (SMaC ²)

2. Course information

2.1.1 Course name				BIOGEOCHEMICAL CYCLES				ECTS 3	
2.1.2 Course code				M1-S1-UE2		2.1.3. Course category Fundamental/Specialized/Complementary			S
2.2 Course instructor				V. Mesnage					
2.3 Course instructors for applied activities (S, L, P, Pr)						V. Mesnage ; Y. Copard			
2.4 Year of study ²	2	2.5 Semester ³	1	2.6 Evaluation type ⁴		Exam.	2.7 Course type ⁵		DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2,6	3.2 course	1	3.3a sem.	0.8	3.3b laboratory	0	3.3c project	0.8	3.3.d. practice	
3.4 Total hours from curriculum ⁶	30	3.5 course	30	3.6a sem.	0	3.6b laboratory	0	3.6c project	0		
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										6	
Practical skills development										2	
Preparation of seminars / laboratory works / project phases / home works / presentations										0	
Evaluation ⁸										2	
Other activities:											
3.7 Total hours of individual study ⁹		10									
3.8 Total hours per semestre ¹⁰		40									
3.9 Number of credits		3									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector, animations,
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, optimization software SNAP , GIS,

6. Overall objective of the course

This course examines the major biogeochemical cycles that regulate the movement of matter between the atmosphere, hydrosphere, lithosphere, and biosphere. Special emphasis is placed on carbon, nitrogen, phosphorus, and water cycles, and their role in climate regulation, ecosystem functioning, marine productivity, and coastal sustainability.

7. Learning outcomes

Knowledge	The student / graduate will: Explain the principles and mechanisms governing major biogeochemical cycles (water, carbon, nitrogen, and phosphorus). 1. Describe the interactions between the atmosphere, hydrosphere, lithosphere, and biosphere. 2. Understand the role of microorganisms in nutrient transformations. 3. Identify natural and anthropogenic drivers altering global nutrient cycles. 4. Analyze the links between biogeochemical cycles and climate change. 5. Explain processes such as ocean acidification, eutrophication, and hypoxia in coastal ecosystems. 6. Understand the concept of nutrient limitation and ecosystem productivity
Skills	The student / graduate will: 1. Interpret environmental and biogeochemical datasets (carbon fluxes, nutrient concentrations, hydrological data). 2. Analyze nutrient budgets in coastal and marine systems. 3. Assess the environmental impacts of agricultural runoff, wastewater discharge, and fossil fuel emissions. 4. Evaluate ecosystem responses to nutrient enrichment and climate variability. 5. Apply scientific reasoning to propose mitigation and management strategies. 6. Prepare technical reports related to nutrient dynamics and coastal sustainability.
Responsibility and autonomy	The student / graduate will: 1. Conduct independent analysis of biogeochemical processes in environmental case studies. 2. Critically evaluate scientific information related to climate and nutrient management. 3. Propose sustainable solutions for reducing nutrient pollution and carbon emissions. 4. Integrate scientific knowledge into coastal management decision-making. 5. Demonstrate ethical responsibility in environmental assessment and policy recommendations.

8. Teaching methods

The Biogeochemical Cycles course is delivered through a combination of structured lectures and applied practical sessions to ensure both theoretical understanding and analytical competence. Lectures introduce fundamental concepts of the water, carbon, nitrogen, and phosphorus cycles, supported by conceptual diagrams, real environmental data, and case studies related to coastal and marine ecosystems. Practical sessions focus on the interpretation of biogeochemical datasets, nutrient budget calculations, and analysis of environmental impacts such as eutrophication and ocean acidification. Problem-based learning is encouraged through applied exercises addressing nutrient pollution and climate-related disturbances. Students are required to prepare short technical reports based on data analysis, fostering critical thinking, scientific reasoning, and the ability to connect biogeochemical processes with sustainable coastal management strategies.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Introduction to Biogeochemical Cycles	Interactive lecture. Clarifying explanations.	4 hours
9.1.2 The Hydrological (Water) Cycle		5 hours
9.1.3. The Carbon Cycle		6 hours
9.1.4. The Nitrogen Cycle		5 hours
9.1.5 The Phosphorus Cycle		5 hours
9.1.6 Coupled Cycles and Global Environmental Change		5 hours
Course bibliography: <i>Books:</i> Han Dolman 2019; Biochemical Cycles and Climate		
9.2a Seminar	Working methods ¹⁶	Time allocation

NO SEMINAR		
9.2b Project	Working methods ¹⁶	Time allocation
NO PROJECT		
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	The final examination will assess students' understanding of theoretical concepts, analytical abilities, and application of sustainable management principles related to erosion and biodiversity.	Summative assessment test (final evaluation). Knowledge and Understanding (40%) Analytical and Critical Thinking Skills (25%) Application and Problem-Solving (20%)	100%
10.6 Conditions for passing			
Grades from 0 to 20 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 6 points and the score of the Project activities, at least, 3 points. The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 10 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.			

Date: 03 April 2026

Course instructor: V. Mesnage

Course instructors for applied activities: V. Mesnage ; Y. Copard

Date of approval by the department:

Head of Department: Yoann Copard

Date of approval by the Faculty Council:

Dean, Matthieu Fournier



INGENIUM
European University

DATA PROTECTION AND GDPR AGREEMENT

**Joint Master's Programme in Sustainable
Maritime Management and Coastal
Conservation (SMAC²)**



Co-funded by
the European Union

Call: ERASMUS-EDU-2022-EUR-UNIV (EUROPEAN UNIVERSITIES)
Topic: ERASMUS-EDU-2022-EUR-UNIV-2

Proposal number: 101090042
Proposal acronym: INGENIUM

Project duration: from 1 January 2023
to 31 December 2026

COORDINATOR
University of Oviedo (UNIOVI), Spain

PARTNERS
Medical University - Sofia (MUS), Bulgaria
University of Crete (UoC), Greece
Karlsruhe University of Applied Sciences (HKA), Germany
South-Eastern Finland University of Applied Sciences (XAMK), Finland
University 2G. d'Annunzio², Chieti-Pescara (Ud'A), Italy
University of Skövde (HS), Sweden
Munster Technological University (MTU), Ireland
University of Rouen, Normandy (URN), France
²Gheorghe Asachi² Technical University of Iasi (TUIASI), Romania

Project URL: <https://ingenium-university.eu/>

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

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1. Purpose and Legal Framework

This Data Protection Agreement ("**Agreement**") sets out the conditions under which personal data are processed by the Parties in the context of the **Joint Master's Programme in Sustainable Maritime Management and Coastal Conservation (SMAC²)**.

This Agreement forms **Annex VI** to the Cooperation Agreement and is binding on:

- **University of Rouen Normandy (URN)** – France
- **University of Oviedo (UNIOVI)** – Spain
- **Munster Technological University (MTU)** – Ireland

It ensures compliance with:

- **Regulation (EU) 2016/679** (General Data Protection Regulation – GDPR),
- **French Law n°78-17** of 6 January 1978 (as amended),
- **Spanish Organic Law 3/2018** (LOPDGDD),
- **Irish Data Protection Act 2018**,

2. Roles of the Parties

2.1 Joint Controllers

For the purposes of Article 26 GDPR, **URN, UNIOVI and MTU act as Joint Controllers** for all personal data processing operations that are **jointly determined** in relation to the SMAC² programme, including but not limited to:

- Joint admissions and selection,
- Programme administration and governance,
- Academic management and assessment,
- Student mobility and scholarships,
- Joint quality assurance,
- Issuance of the joint diploma and diploma supplement.

2.2 Independent Controllers

Each Party acts as an **independent controller** for processing operations that fall exclusively within its national legal obligations, including:

- National student registration and statutory reporting,

- Immigration and visa procedures,
- Social security, taxation, and employment-related processing,
- Archiving obligations under national higher education law.

3. Categories of Data Subjects

The Agreement applies to personal data relating to:

- Applicants to the SMAC² programme,
- Enrolled students and graduates,
- Academic and administrative staff involved in the programme,
- External supervisors, examiners, and stakeholders,
- Scholarship beneficiaries.

4. Categories of Personal Data

Depending on the stage of the programme, the following categories of data may be processed:

4.1 Identification and Contact Data

- Name, surname, date of birth, nationality,
- Student and staff identification numbers,
- Postal and electronic contact details.

4.2 Academic and Professional Data

- Academic records and transcripts,
- Admission scores and rankings,
- Assessment results and progression data,
- Thesis files, evaluations, and defence records,
- Recognition of prior learning documentation.

4.3 Mobility and Financial Data

- Erasmus+ mobility data,
- Scholarship and grant information,
- Bank account details (where required),

- Travel and accommodation information.

4.4 Special Categories of Data (Article 9 GDPR)

- Disability-related data strictly necessary for reasonable accommodations,
- Health data related to insurance or mobility support, processed **only where legally required and subject to enhanced safeguards**.

5. Purposes and Legal Bases of Processing

Personal data shall be processed solely for the following purposes:

Purpose	Legal Basis (GDPR Art. 6)
Admission, enrolment, academic management	Art. 6(1)(e) – task in the public interest
Delivery of teaching and assessment	Art. 6(1)(e)
Student mobility and Erasmus+	Art. 6(1)(e), Art. 6(1)(c)
Scholarships and financial support	Art. 6(1)(c), Art. 6(1)(e)
Issuance of diplomas and supplements	Art. 6(1)(c), Art. 6(1)(e)
Quality assurance and accreditation	Art. 6(1)(e)
Reasonable accommodation	Art. 9(2)(g), Art. 9(2)(b)

6. Description of Data Flows

The Parties expressly acknowledge and document the following **data flows**:

6.1 Admissions and Selection

- Applicant data collected via the joint admission process coordinated by **URN**,
- Secure transmission of ranked candidate lists to **UNIOVI** and **MTU**,
- Joint decision-making by the Joint Academic Committee.

6.2 Enrolment and Academic Management

- Sharing of enrolment confirmation, student IDs, and academic status,
- Exchange of grades, ECTS recognition, and progression data,

- Storage of academic records on secure institutional systems.

6.3 Mobility and Scholarships

- Transmission of mobility data between sending and receiving institutions,
- Sharing with Erasmus+ National Agencies where required by law,
- Financial data exchanged only with authorised services.

6.4 Thesis Supervision and Examination

- Exchange of thesis drafts, reports, and evaluation data,
- Joint examination board documentation,
- Archiving by URN as coordinating institution.

6.5 Diploma Issuance

- Transmission of final results to all degree-awarding partners,
- Registration in national graduate registries (Spain, France, Ireland),
- Long-term archiving in accordance with national law.

7. Rights of Data Subjects

The Parties ensure that data subjects may exercise their rights under Articles 12–22 GDPR, including:

- Right of access,
- Right to rectification,
- Right to erasure (where applicable),
- Right to restriction of processing,
- Right to data portability,
- Right to object.

The **single contact point regarding GDPR questions/issues** is indicated to students in the Student Handbook, without prejudice to the right to contact any Party directly. Students can contact the Data Protection Office at URN: dpo@univ-rouen.fr.

8. Transparency and Information Obligations

The Parties commit to providing **clear and harmonised privacy information**, including:

- A joint privacy notice for SMAC²,

- References to national institutional privacy notices,
- Explicit information on joint controllership under Article 26 GDPR.

9. Security Measures

Each Party shall implement **appropriate technical and organisational measures**, including:

- Access control and authentication,
- Encryption of data transfers,
- Role-based access to academic systems,
- Staff confidentiality obligations,
- Secure archival procedures.

10. Data Retention

Personal data shall be retained **only for as long as necessary**, in accordance with:

- National higher education archiving laws,
- Erasmus+ and EU funding rules,
- Accreditation and quality assurance requirements.

Retention schedules remain the responsibility of each Party acting as controller under its national law.

11. International Transfers

No personal data shall be transferred outside the **European Economic Area** in the framework of SMAC² unless:

- Required by EU law or funding rules, and
- Appropriate safeguards under Chapter V GDPR are in place.

12. Data Breaches

Each Party shall notify the other Parties **without undue delay** of any personal data breach affecting SMAC² data and cooperate fully in:

- Risk assessment,
- Notification to supervisory authorities,
- Communication to data subjects where required.

13. Liability and Cooperation

Each Party remains responsible for its own compliance with GDPR. The Parties agree to cooperate in good faith in the event of:

- Complaints by data subjects,
- Investigations by supervisory authorities,
- Audits related to the programme.

14. Duration and Applicability

This Agreement shall apply for the **entire duration of the Cooperation Agreement**, including:

- The period of enrolment,
- Graduation and diploma issuance,
- Statutory retention periods thereafter.

15. Governing Law

This Agreement shall be governed by **EU law**, supplemented by the applicable national law of each Party for processing activities falling under its jurisdiction

Student privacy note blueprint

JOINT PRIVACY NOTICE – SMAC²

(Student-facing, Article 13/14 GDPR)

Who is responsible?

The SMAC² Joint Master's Programme is jointly delivered by:

- University of Rouen Normandy (France)
- University of Oviedo (Spain)
- Munster Technological University (Ireland)

They act as **Joint Controllers** under GDPR.

What data do we process?

- Identification and contact details
- Academic records and assessments
- Mobility and Erasmus+ data
- Scholarship and financial data
- Disability/accommodation data (where applicable)

Why do we process your data?

To:

- Manage admissions and enrolment
- Deliver teaching and assessment
- Organise mobility and scholarships
- Award the joint degree
- Ensure quality assurance and accreditation

Legal basis

Processing is carried out under:

- Public-interest task of universities
- Legal obligations (Erasmus+, diplomas)
- Special safeguards for sensitive data

Who receives your data?

- Partner universities
- Erasmus+ National Agencies

- Accreditation and public authorities (where required)

No data is transferred outside the EEA.

How long is data kept?

According to national higher-education laws and EU funding rules.

Your rights

You have the right to access, rectify, restrict, object, and (where applicable) erase your data.

Requests may be addressed to **any partner university**.

Complaints

You may lodge a complaint with your national Data Protection Authority:

- CNIL (France)
- AEPD (Spain)
- Irish Data Protection Commission

Signatures

For and on behalf of:

- University of Rouen Normandy (France)
- University of Oviedo (Spain)
- Munster Technological University (Ireland)



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INTELLECTUAL PROPERTY AGREEMENT

SMAC² Joint Master's Programme



Co-funded by
the European Union

Call: ERASMUS-EDU-2022-EUR-UNIV (EUROPEAN UNIVERSITIES)
Topic: ERASMUS-EDU-2022-EUR-UNIV-2

Proposal number: 101090042
Proposal acronym: INGENIUM

Project duration: from 1 January 2023
to 31 December 2026

COORDINATOR
University of Oviedo (UNIOVI), Spain

PARTNERS
Medical University - Sofia (MUS), Bulgaria
University of Crete (UoC), Greece
Karlsruhe University of Applied Sciences (HKA), Germany
South-Eastern Finland University of Applied Sciences (XAMK), Finland
University 2G. d'Annunzio², Chieti-Pescara (Ud'A), Italy
University of Skövde (HS), Sweden
Munster Technological University (MTU), Ireland
University of Rouen, Normandy (URN), France
²Gheorghe Asachi² Technical University of Iasi (TUIASI), Romania

Project URL: <https://ingenium-university.eu/>

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

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1. Parties and status

This Intellectual Property Agreement (“IP Agreement”) is concluded between:

1. Université de Rouen Normandie (URN), France (coordinator)
2. Universidad de Oviedo (UNIOVI), Spain
3. Munster Technological University (MTU), Ireland

(together, the “Partner Universities”).

This IP Agreement is an annex to the SMAC² Cooperation Agreement and governs intellectual property and related rights arising from the design, delivery and quality assurance of the SMAC² joint programme.

2. Objectives and guiding principles

2.1. The Parties seek to ensure:

- (a) legal certainty for ownership and permitted uses of SMAC² teaching and research outputs;
- (b) respect for academic freedom and moral rights;
- (c) open access by default, with proportionate and documented exceptions;
- (d) subsidiarity: institutional and national rules apply unless this IP Agreement provides otherwise.

2.2. This IP Agreement is to be interpreted consistently with the partners’ broader consortium practice on IPR, joint ownership and access rights.

3. Applicable law and subsidiarity clause

3.1. This IP Agreement is governed by EU law as applicable, and supplemented—on an issue-by-issue basis—by the national law of the Partner University that is legally responsible for the relevant Output and/or where the relevant right vests (France, Spain or Ireland).

3.2. Subsidiarity rule (priority of norms):

- (a) mandatory EU and national law; then
- (b) each Partner University’s binding institutional regulations and employment/student rules; then
- (c) this IP Agreement (for matters jointly agreed and not otherwise regulated); then
- (d) ad hoc written decisions adopted under Section 12 (Exceptions and approvals).

3.3. Where a conflict exists, the Parties will implement the most compliant solution that preserves the purpose of this IP Agreement and the SMAC² programme.

4. Definitions

For purposes of this IP Agreement:

Background: any data, know-how, works, software, course content, materials, methods, trademarks or other IP owned/controlled by a Party or a third party before being used for SMAC², or developed outside SMAC², that is needed to implement SMAC².

Output: any result generated in the context of SMAC², including Teaching Materials and Research Outputs.

Teaching Materials: syllabi, slides, recordings, online modules, assessment items, rubrics, case studies, simulations, datasets prepared for teaching, instructional design, and programme deliverables intended for learning.

Research Outputs: theses, dissertation manuscripts, research data (where applicable), publications, reports, posters, software/code created in the context of SMAC² learning or supervision, excluding purely administrative records.

Joint Output: an Output created by authors from more than one Partner University and not reasonably separable into individual contributions.

5. Background: declaration and access for implementation

5.1. Each Party remains the owner of its Background.

5.2. Each Party grants the other Parties a non-exclusive, non-transferable, royalty-free right to use the necessary Background solely to implement SMAC², for the duration of the programme and for the necessary post-programme retention/QA periods, unless the Background owner identifies it as restricted and offers a practical alternative.

5.3. No sublicensing of Background is permitted except to:

- (a) enrolled SMAC² students and staff on a strict need-to-know basis for learning/teaching; and
- (b) service providers acting under written terms protecting confidentiality and IP.

6. Ownership of Teaching Materials

6.1. Staff-created Teaching Materials

Ownership is determined by the applicable national law and the creator's employment relationship and institutional rules (subsidiarity). Nothing in this Agreement modifies mandatory rules on employee-created works.

6.2. Programme-use licence (minimum common rights)

Regardless of where ownership vests, the owning Party/rights-holder grants the Partner Universities a non-exclusive, worldwide, royalty-free licence to:

- (a) use, reproduce, adapt (including translation), and communicate Teaching Materials to SMAC² students;

- (b) store them on institutional learning platforms;
- (c) use them for internal QA, audits, accreditation reviews, and reporting linked to SMAC²;
- (d) preserve them for academic record-keeping and continuity of the programme.

6.3. Open access default for Teaching Materials

Unless an exception is approved under Section 12, Teaching Materials that are intended for dissemination beyond enrolled cohorts shall be released under Creative Commons Attribution 4.0 (CC BY 4.0) (or equivalent open licence), with appropriate attribution to authors and institutions.

7. Ownership of Research Outputs

7.1. Student-owned work (default rule)

Students retain ownership of their theses, dissertations, projects and other student-created Research Outputs, subject to:

- (a) third-party rights (e.g., copyrighted materials, datasets, images) and
- (b) any mandatory institutional/national rules on thesis deposit.

7.2. Consent-based licence to the Partner Universities

Students may be invited to grant the Partner Universities a non-exclusive, royalty-free, worldwide licence to use their student Research Outputs for:

- (a) quality assurance and accreditation;
- (b) dissemination (e.g., repositories, programme showcases);
- (c) teaching and training (e.g., examples, case studies).

This licence requires the student's explicit, informed, written consent and must include: permitted uses (QA / dissemination / teaching),

- whether publication is allowed,
- attribution standards,
- any embargo period,
- withdrawal/limitations where legally possible (not affecting already-completed QA obligations).

7.3. No consent, no dissemination

If the student does not consent, the Partner Universities may still process and use the thesis/project as necessary for examination, awarding, internal archiving and statutory obligations, but shall not publicly disseminate it beyond what is legally required.

7.4. Staff research outputs linked to SMAC²

For research outputs authored by staff (papers, reports, code) within SMAC² activities, ownership follows national/institutional rules. The Parties will promote open access in line with Section 10.

8. Joint Outputs: joint ownership and internal exploitation

8.1. Joint Outputs are jointly owned by the participating Parties/rights-holders to the extent permitted by applicable law.

8.2. Unless otherwise agreed in writing for a specific Joint Output:

- (a) each joint owner may use the Joint Output for non-commercial educational and research purposes, including in SMAC², without needing the other joint owner's prior approval;
- (b) public dissemination requires prior consultation and a reasonable opportunity for co-authors to review for attribution, confidentiality and third-party rights;
- (c) authorship credit must reflect actual contributions.

9. Attribution and moral rights

9.1. The Parties shall ensure appropriate attribution of authors, creators and institutions in any use or dissemination of Outputs.

9.2. Moral rights (including integrity and attribution) shall be respected to the extent recognised under applicable law (notably relevant in France and Spain).

10. Open access, repositories and embargoes

10.1. Default: Outputs intended for broad reuse should be made available under open access terms (Teaching Materials: CC BY 4.0 default; Research Outputs: open access where feasible and lawful).

10.2. Embargoes/exceptions may apply where justified under Section 12, including:

- third-party licensed content,
- confidential information,
- personal data constraints,
- security, export control or dual-use concerns,
- publication strategies consistent with academic norms.

10.3. Where open dissemination is approved, Parties will deposit Outputs in their institutional repositories or a mutually agreed platform, with licence metadata and attribution.

11. Third-party materials and clearance

11.1. Each Party and creator shall ensure that third-party content used in Outputs (images, articles, datasets, software) is either:

- (a) licensed appropriately,

- (b) used under a lawful exception/limitation, or
- (c) replaced/removed.

11.2. The Party disseminating an Output is responsible for rights clearance for the dissemination format.

12. Exceptions and approvals (Joint Academic Committee / Programme Governance)

12.1. A Party may request an exception from the open-licensing default for a specific Output by submitting a brief justification (template recommended) addressing:

- reason for exception,
- proposed access conditions (restricted access / embargo / alternative licence),
- duration and review date,
- third-party rights/personal data considerations.

12.2. The competent programme body (as defined in the SMAC² Cooperation Agreement governance) shall decide within a reasonable time. Decisions shall be recorded.

13. Use of names, logos and reputation

13.1. No Party may use another Party's name, logo or trademarks in external materials beyond what is necessary for SMAC² communication, unless authorised under the programme's communication rules.

13.2. Any public-facing use of institutional branding must follow the relevant brand guidelines and approval procedures.

14. Confidential information and sensitive materials

14.1. Outputs or underlying materials designated as confidential (e.g., partner internal documents, restricted datasets) shall not be disseminated beyond authorised persons.

14.2. Where an Output contains confidential content, the disseminating Party shall create a redacted/public version whenever feasible.

15. Non-commercialisation

15.1. The Parties confirm that commercial exploitation is not foreseen for SMAC² Outputs.

15.2. If an unexpected commercial opportunity arises, the Parties shall negotiate a specific written agreement before commercial exploitation. Absent such agreement, only non-commercial uses under this IP Agreement are permitted.

16. Dispute prevention and resolution

16.1. The Parties shall first seek resolution through:

- (a) the programme governance bodies; then
- (b) consultation between institutional legal services / IP offices.

16.2. If unresolved, disputes shall be handled by competent courts determined by the applicable law rule in Section 3 (France/Spain/Ireland depending on the Output and responsible institution), unless the Parties agree in writing to mediation.

17. Duration

This IP Agreement applies for:

- (a) the duration of the SMAC² programme; and
- (b) any additional period necessary for statutory archiving, QA, audits, and accreditation obligations.

Licences granted for QA and record-keeping survive as long as legally required



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GRADING SCALES OF THE CONSORTIUM PARTNERS

SMAC² Joint Master's Programme



Co-funded by
the European Union

Call: ERASMUS-EDU-2022-EUR-UNIV (EUROPEAN UNIVERSITIES)
Topic: ERASMUS-EDU-2022-EUR-UNIV-2

Proposal number: 101090042
Proposal acronym: INGENIUM

Project duration: from 1 January 2023
to 31 December 2026

COORDINATOR
University of Oviedo (UNIOVI), Spain

PARTNERS
Medical University - Sofia (MUS), Bulgaria
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Annex VII: Grading Scales of the Consortium Partners

ECTS	FX, F, Fail	E, Sufficient	D, Satisfactory	C, Good	C, Good	B, Very good	A, Excellent
MTU	<35 Fail	35-39 Compensation range	40-49 Pass	50-59 H2.2		60-69 H2.1	70+ H1
UNIOVI	<5, Suspensio	5-5.99 Aprobado	6.0-6.99, Aprobado	7.0-7.99 Notable	8.0-8.99 Notable	9.0-9.49, Sobresaliente Excellent	9.5-10, Sobresaliente Excellent The best Sobresaliente score by class (1/20) will be awarded as "Matrícula de Honor"
URN	Insuffisant <10	Passable (10-10.99)	Passable, (11-11.99)	Assez bien (12-12.99)	Assez bien (13-13.99)	Bien (14-15.99)	Très bien (16-20)

Joint Master's Program in Sustainable Maritime Management and Coastal Conservation

MASTER délivré en partenariat international par l'Université de Rouen Normandie (France) avec l'Université d'Oviedo (Espagne) et la Munster Technology University (Ireland). MÁSTER expedido en colaboración internacional por la Universidad de Rouen Nornandia (Francia), junto con la Universidad de Oviedo (España) y la Universidad tecnológica de Munster (Irlanda). MASTER OF SCIENCE Awarded as part of an international partnership with the University of Rouen Normandy (France), the University of Oviedo (Spain) and Munster University of Technology (Ireland).		
RÉPUBLIQUE FRANÇAISE MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE Vu le Code de l'éducation, notamment son article L. 613-1 ; Vu les textes réglementaires autorisant l'université de Rouen Normandie à délivrer le diplôme ; Vu l'arrêté du 27 juin 2022 accréditant l'Université de Rouen Normandie en vue de la délivrance de diplômes nationaux ; Vu les procès-verbaux du jury ; Le diplôme national de Master de SCIENCES, TECHNOLOGIES, SANTE, mention GESTION DE L'ENVIRONNEMENT, Parcours type Gestion maritime durable et conservation côtière est délivré à (Mme ou M) (prénom, NOM patronymique), date de naissance leà au titre de l'année universitaire.....et confère le grade de Master, pour en jouir avec les droits et prérogatives qui y sont attachés. Fait le Signature du chef d'établissement Le recteur de la région académique Chancelier des universités Numéro du diplôme	ESPAÑA FELIPE VI, REY DE ESPAÑA y en su nombre el/la Rector/a de la UNIVERSIDAD DE OVIEDO Considerando que, conforme a las disposiciones y circunstancias previstas por la legislación vigente, Don/Doña nacido/a el DD de MES de AAAA en, de nacionalidad, ha superado en modalidad presencial en MES de AAAA, los estudios conducentes al TÍTULO CONJUNTO oficial de MÁSTER UNIVERSITARIO en Gestión marítima sostenible y conservación costera por la Munster University of technology (Irlanda) la Universidad de Oviedo (España) y la Universidad de Rouen Normandía (Francia), establecido por Acuerdo de Consejo de Ministros de DD de MES de AAAA expide el presente título oficial con validez en todo el territorio nacional, que faculta a el/la interesado/a para disfrutar los derechos que a este título otorgan las disposiciones vigentes. Dado en a ... de de El/La interesado/a, El/La Rector/a, Los/as Rectores/as, El/La Jefe/a de la Secretaría, Número de registro	IRISH REPUBLIC <i>Munster Technological University (MTU) is designated as a Designated Awarding Body (DAB) primarily under the Technological Universities Act 2018, which provides the statutory basis for its establishment and awarding powers.</i> <i>MTU operates its DAB status in accordance with the Qualifications and Quality Assurance (Education and Training) Act 2012, which defines its authority to make awards.</i> <i>Munster Technological University (MTU) having statutory authority to award degrees, including joint awards and other qualifications under the Qualifications and Quality Assurance (Education and Training) Act 2012, and the Technological Universities (TU) Act, 2018 hereby with University of Oviedo (Spain) and University of Rouen Normandy (France) confers the Joint Masters Degree in</i> Sustainable Maritime Management and Coastal Conservation <i>upon :</i> <i>(First Name, Surname):</i> <i>Dated :</i> <i>(Day / Month / Year)</i> <i>Conferred by President, Munster Technological University :</i> <i>Signed :</i>