
Studiestyresak: **18/14**

Møte: 6. juni 2018

Saksnr.: 2018/6315

OPPRETTING AV FELLESGRAD INTERNATIONAL MASTER OF SCIENCE IN MARINE BIOLOGICAL RESOURCES (IMBRSEA)

Innledning

Institutt for biovitenskap har sammen med 7 andre europeiske institusjoner fått innvilget et internasjonalt Erasmus Mundus Joint masterprogram «*International Master of Science in Marine Biological Resources (IMBRSea)*». Universitetet i Ghent er koordinator.

Programmet ble godkjent i EU i august 2016, og de første studentene har allerede startet på programmet ved noen av de andre institusjonene. Høst 2018 kommer de første 21 studentene til UiB, og studieprogrammet skal derfor godkjennes i Universitetsstyret allerede i august.

Om programmet

IMBRSea er et interuniversitetsprogram basert på rammen Erasmus Mundus Master Joint Master Degrees. Det er 8 hovedpartnere og i tillegg er det 14 assosierte partnere involvert (<http://imbrsea.eu/>). IMBRSea har utspring i erfaringer fra partneruniversitetene fra organiseringen av *International Master of Science in Marine Biodiversity and Conservation EMBC/EMBC+*.

Programmet er delt opp i ni blokker som går over to år (4 semester, 120 ECTS), undervisningsspråket er engelsk. Ved UiB er det mulig å ta masteroppgave, eller velge mellom syv emner. Alle emnene er hele eller deler av emner som Institutt for biovitenskap har fra før i sin emneportefølje. De har utarbeidet nye emnebeskrivelser for emnene (vedlagt saken).

Universitetet i Ghent er koordinator for programmet, og ansvarlig for å skrive ut et felles vitnemål ved oppnådd grad.

Saksgang

Institutt for biovitenskap har tidligere varslet i studieplanendringene (sak 16/9271) at programmet var søkt om, og ville bli opprettet dersom søknaden ble innvilget. Nytt studieprogram er også varslet til Studieadministrativ avdeling i november 2016 (15/12262-7). Kontrakt for konsortiet er utarbeidet, og signert ved UiB av rektor 6.11.2017 (15/12262-14).

I tillegg til dette må programmet formelt opprettes ved UiB. Ifølge [kvalitetshåndboken \(s. 15\) ved UiB](#) kan fellesgrader opprettes utenom universitetet sine gjeldende frister for oppretting av ordinære bachelor- og masterprogram. I kvalitetshåndboken framgår det også at for fellesgrader gjelder UiB sitt kvalitetssystem for de emnene som UiB tilbyr.

Dersom oppretting av programmet blir anbefalt i Studiestyret og Fakultetsstyret skal det til endelig vedtak i Universitetsstyret 30. august. I tillegg til dette skal programmet vurderes av programopprettingskomitéen ved UiB, som gir sin anbefaling til Universitetsstyret, basert på søknaden om Erasmus Mundus-støtte, studieplan for programmet og emnebeskrivelser for de syv UiB-emnene som inngår i programmet.

UNIVERSITETET I BERGEN

Det matematisk-naturvitenskapelige fakultet

FORSLAG TIL VEDTAK:

Studierstyret vedtar å anbefale at det internasjonale Erasmus Mundus Joint masterprogram *International Master of Science in Marine Biological Resources (IMBRSea)* opprettes ved UiB.

Bergen 01.06.2018

MN/BIG

Vedlegg:

- 1) Oversendelse fra Institutt for biovitenskap om å opprette fellesgrad
- 2) Studieplan IMBRSea
- 3) Emnebeskrivelse IMBRSeaBIO206
- 4) Emnebeskrivelse IMBRSeaBIO324
- 5) Emnebeskrivelse IMBRSea BIO325
- 6) Emnebeskrivelse IMBRSeaBIO382
- 7) Emnebeskrivelse IMBRSeaBIOxx
- 8) Emnebeskrivelse IMBRSeaBIOxyy
- 9) Emnebeskrivelse IMBRSeaBIOxyy
- 10) Søknad om Erasmus Mundus Joint Master, del 1
- 11) Søknad om Erasmus Mundus Joint Master, del 2
- 12) Innvilget søknad Erasmus Mundus Joint Master
- 13) Konsortiumavtale



Bergen, 1. juni 2018

Ber om opprettelse av International master of Science in Marine Biological Resources (IMBRSea)

Første varsel om opprettelsen av programmet IMBRsea ble varslet sendt høsten 2016 (ref 2015/12262), da var hensikten å tilby masteroppgaver i studieprogrammets 2. år. I følge brevet som ble sendt til SA, skulle studieplanen settes opp og det skulle legges et løp for oppretting av programmet. Dette er dessverre ikke gjort, og dette skrivet vil forsøke å gi en kortfattet oversikt over prosessen og programmet, samt en oversikt over studentflyt og emnene de skal ta.

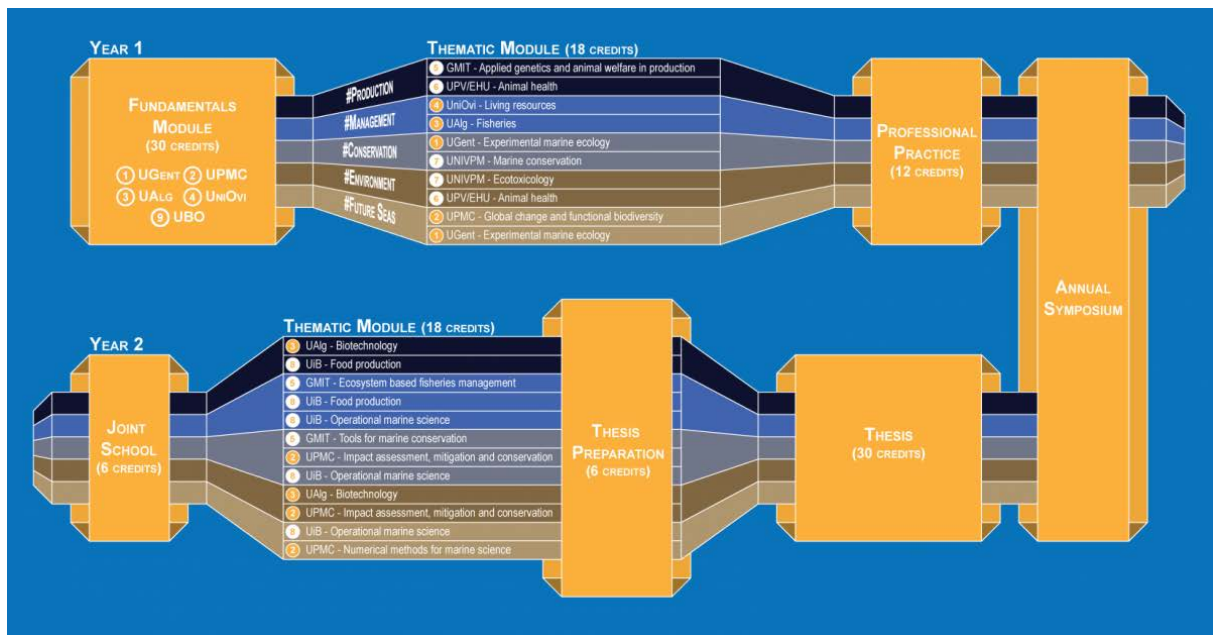
Varselet ble sendt 03.11.2016 til studieadministrativ avdeling og hele saken kan leses i ephorte: 2015/12262:

Varsel om nytt studieprogram Erasmus Mundus Joint Master's Degree - IMBRSea 2017/2018

Institutt for biologi, ved Audrey Geffen, er med i søknaden IMBRSea som ble sendt inn til EUs utlysning Erasmus Mundus Joint Master Degree-utlysning i februar. IMBRSea er et 2-årig masterprogram i marinbiologi og forvaltning. Universitetet i Ghent er koordinator. I august fikk BIO positivt svar, og programmet skal opprettes i løpet av 2016/2017. Konsortieavtalen og finansiering er vedlagt.

IMBRSea er et interuniversitetsprogram basert på rammen Erasmus Mundus Master Joint Master Degrees. Det er 8 hovedpartnere og i tillegg er det 14 assosierte partnere (<http://imbrsea.eu/>). IMBRSea har utspring i erfaringer fra partneruniversitetene i fra organiseringen av International Master of Science in Marine Biodiversity and Conservation EMBC/EMBC+.

Programmet er delt opp i 9 blokker går over 2 år (4 semester, 120 ECTS) (Fig. 1), undervisningsspråket er engelsk.



Figur 1: IMBRSea master, utdanningløp for de forskjellige modulene.

Semesteret skal gå fra september/oktober til juni/august (<http://imbrsea.eu/student/keydates>). Dette passer jo dessverre ikke med vår semesterinndeling, men vi får dette til å gå opp med at studentene tar en tidlig sommerskole og kommer rett til Bergen fra denne. Studentene velger selv tema etter interesse og av de 5 forskjellige temamodulene tilbyr vi emner i 3. semester innen temaene: #Production, #Management, #Conservation og #Future seas.

Programmet er bygget opp som vist i Figur 1 og på nettsiden: <http://imbrsea.eu/studyprogramme>.

Overisktt over emner de skal ta, emnebeskrivelsene er vedlagt:

PRODUCTION, MANAGEMENT

Aquatic food production 10

Fish nutrition 8

Fish behaviour 8

MANAGEMENT, CONSERVATION, FUTURE SEAS

Quantitative methods for modern

fisheries and marine research 6

Sampling and observational field methods 6

Biological oceanography and ocean productivity 6

Alle emnene er hele eller deler av opprinnelige emner som BIO har fra før i sin emneportefølje.

Fra semesterstart høsten 2018 er det meldt inn at det kommer 21 studenter til UiB på dette programmet og alle skal bli godt mottatt. Vi har fått uvurderlig hjelp i fra Studieadministrativ avdeling for hjelp til å sende ut invitasjons- og opptaksbrev samt informasjon som nye studenter trenger til oppstart. Ta gjerne kontakt om det er noe som er uklart.

Med vennlig hilsen

Ørjan Totland

Instituttleder

Beate Ulrikke Rensvik

Konstituert studieleder

Mal for forside til studieplanar ved UiB:

International Master in Marine Biological Resources (IMBRSea)

Godkjenning:

Studieplanen er godkjend av:

Universitetsstyret:(dd.mm.år)

Programstyret:(dd.mm.år)

..... fakultet:(dd.mm.år)

Studieplanen vart justert:(dd.mm.år)

Evaluering:

Studieprogrammet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Mal for studieplanar ved UiB

Krav til studieplanar for studieprogram går fram av:

- § 2-1 og 2-2 i [Forskrift om tilsyn med utdanningskvaliteten i høgere utdanning \(tilsynsforskriften\)](#)
- Kapittel 3 i [Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen](#), (Studieforskrifta),

Forslag til formuleringar på engelsk finst i [Mal for norske vitnemål og vitnemålstillegg](#) frå Universitets- og høgskulerådet.

Om framside og struktur i malen

I tillegg til kategoriane i tabellen nedanfor, skal studieplanen innehalde følgjande informasjon: Dato for godkjenning av studieplan, dato for eventuelle justeringar, namn på instans som har godkjent planen, dato for siste og neste evaluering av programmet. Denne informasjonen skal stå på framsida til planen. Framsidemal finst sist i dette dokumentet.

Forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Denne må fjernast før studieplanen vert send til råd og styre. Kolonnen «Infotype» viser til kvar tekstane skal leggjast inn i Felles studentsystem (FS), som er eit studieadministrativt verktøy. Dei som har fagleg ansvar for å utvikle studieprogrammet, treng ikkje bry seg om infotypane.

Kategori	Infotype	Tekst
Namn på studieprogrammet, nynorsk		International Master in Marine Biological Resources (IMBRSea)
Navn på studieprogrammet, bokmål		International Master in Marine Biological Resources (IMBRSea)

Name of the programme of study, English		International Master in Marine Biological Resources (IMBRSea)
Namn på grad Name of qualification	SP_GRAD EN	Joint Master in Marine Biological Resources (IMBRSea)
Omfang og studiepoeng ECTS credits	SP_OMFANG	120 ECTS. Two years of full-time study, where the normal workload for a full-time student is 60 credits for one academic year.
Fulltid/deltid Full-time/part-time	SP_FULLDEL	Full-time
Undervisningsspråk Language of instruction	SP_SPRAK	<i>English</i>
Studiestart - semester Semester	SP_START	Autumn
Mål og innhald Objectives and content	SP_INNH ALD	<p>IMBRSea covers a wide, yet consistent, range of subjects within the marine sciences and biological resources. With an emphasis on marine biological and ecological processes, the programme links biology of marine organisms and environmental studies with subjects in marine policy and planning.</p> <p>The subjects are covered through Thematic Modules in Specialization Tracks to prepare the next generation of scientists who need to understand the marine ecosystem functioning and conservation of biodiversity to work in biological resources exploitation and management. IMBRSea offers a unique combination of Courses, Annual Symposia, Professional Practices and Thesis subjects in an integrated program to learn how to develop blue biotechnologies in a sustainable way.</p>

		<p>The graduated student understands basic physical, geochemical ocean system dynamics;</p> <p>The graduated student is able to identify processes involved in local and regional changes for zones that are particularly affected by climate change, such as the Arctic Ocean and the Mediterranean-Atlantic biogeographical transition zone;</p> <p>The graduated student understands the main drivers affecting at all scales the marine biodiversity, and is able to tackle the key challenges to diminish threats on evolving marine species and communities.</p>
<p>Opptakskrav</p> <p>Admission requirements</p>	<p>SP_OPPT AK</p>	<p>A Bachelor, Honours or Master degree in biology, ecology, environmental sciences, oceanography, marine sciences, geography, geology, or other equivalent degrees with a minimum of 180 ETCS at the latest by 1st September of 2018 and for non-European students preferably before 1st March 2018.</p> <p>Knowledge of the English language is considered as a basic requirement. All students must provide evidence of their proficiency in English through one of the following documents:</p> <p>A recent <u>TOEFL</u> Certificate: minimum score: 570 points (paper) or 87 points (internet)</p> <p>A recent <u>IELTS</u> Certificate: minimum score: 6.5</p> <p>A recent Certificate of a University Language Centre testifying that the student masters the necessary knowledge of English to function academically (specify CEF-level / minimum CEF-level B2)</p> <p>A recent <u>Cambridge English certificate</u>: Cambridge English First (FCE) - grade A or B</p> <p>A certificate proving that you have followed at least 1 year of higher education in English</p>
<p>Tilrådde forkunnskapar</p> <p>Recommended previous knowledge</p>	<p>SP_ANBF ORK</p>	
<p>Obligatoriske emne</p>	<p>SP_OBLIG AT</p>	<p>Semester 1: Marine policy and governance - 3 <u>ECTS</u> Marine genomics - 3 ECTS Quantitative methods in marine science - 6 ECTS Oceanography - 6 ECTS</p>

<p>Compulsory units</p>		<p>Marine ecology - 6 ECTS Marine GIS and spatial planning - 3 ECTS Transferable skills course - 3 ECTS</p> <p>These courses are at Ghent University, Université de Bretagne Occidentale, University of Algarve or University of Oviedo.</p> <p>Semester 2: Thematic Module 1 - 18 ECTS <u>Professional practice</u> - 12 ECTS</p> <p>Semester 3: IMBRSea Joint School - 6 ECTS Thematic Module 2 - 18 ECTS Thesis Preparation: <u>Research Design, Data management en Data communication in Marine Sciences</u> - 6 ECTS</p> <p>Semester 4: Master thesis - 30 ECTS</p> <p>More information about the study programme can be found at: www.imbrsea.eu/studyprogramme</p>
<p>Specialisering</p> <p>Specialisation</p>	<p>SP_SPE SPECIAL</p>	<p>Specialization tracks (One to choose)</p> <p>Marine Food Production Aquatic food production 10 ECTS Fish behaviour 8 ECTS Fish nutrition 8 ECTS</p> <p>Management of Living Marine Resources Aquatic food production 10 ECTS Fish behaviour 8 ECTS Fish nutrition 8 ECTS</p> <p>Applied Marine Ecology and Conservation Biological oceanography and ocean productivity 6 ECTS Quantitative methods for modern fisheries and marine research 6 ECTS Sampling and observational field methods 6 ECTS</p> <p>Marine Environment Health Global Ocean Changes</p>

Tilrådte valemne Recommended electives	SP_VALG FRI	None
Rekkefølge for emne i studiet Sequential requirements, courses	SP_REKKE FO	The recommended sequence of the courses in the programme can be found under the heading "Compulsory units".
Delstudium i utlandet Study period abroad	SP_DELST UD	Student mobility is an integral aspect of the IMBRSea programme. Partner universities engage to make practical arrangements for their incoming students before and during the mobility. This includes, if applicable, instructions on visa procedures, providing a local admission letter, housing and other services for international students. Students are required to undertake a mobility period of at least one semester (30 ECTS) but can, depending on their interests, maximize their mobility opportunities. The full IMBRSea study programme is divided into nine blocks run over two academic years.
Arbeids- og undervisningsformer Teaching and learning methods	SP_ARBU ND (Erstatter SP_UND METO)	A combination of teaching and learning methods is used in the various courses, including lectures, hands-on laboratory, workshops, seminars, computer labs, cruise on research vessels. You may find more information in the course description. The Master's thesis is an independently scientific work, under supervision of an academic supervisor.
Vurderingsformer Assessment methods	SP_VURD ERI	Courses at UiB use different forms of examination such as written examinations, assigned exam papers, take-home examinations and oral examinations. The type of examination may vary according to the subject. Many courses require students to complete mandatory assignments (e.g. lab work or methodological assignments) or a term paper before being permitted to take examinations. Course may also offer continuous assessment throughout the semester. The examination or assessment type, and the grading scale (A-F or pass/fail), are listed in the course description of every course.

<p>Litteraturliste</p> <p>Reading list</p>		<p>The reading list will be published in Mitt UiB by 1 June/1 January.</p> <hr/> <hr/>
<p>Karakterskala</p> <p>Grading scale</p>	<p>SP_KSKAL A</p>	<p>At UiB the grades are given in one of two possible grading scales: passed/failed and A to F.</p> <p>The master's thesis will be graded A to F.</p> <p>The grading scale for each course is given in the course description.</p>
<p>Vitnemål og vitnemålstillegg</p> <p>Diploma and Diploma Supplement</p>	<p>SP_VITNE M</p>	<p>After successful completion of the IMBRSEA academic Programme, graduates shall receive a Joint Masters degree by the nine Consortium Universities. The Diploma is fully based on the ECTS system and will be accompanied by a Diploma Supplement that lists all the courses and the title of the thesis with their accompanying ECTS credit points and grades with specification of training hours, language of instruction, institution delivering the course and all other relevant details such as the ECTS system. The Diploma will be materially issued by Ghent University, jointly with and also signed by the respective partner Universities, according to the European regulations. The Diploma supplement will be issued according to the European regulations, following the model developed by the European Commission, the Council of Europe and UNESCO/CEPES. The Supplement provides sufficient independent data to ensure the international transparency and fair academic and professional recognition of qualification (diplomas, degrees, etc.). The Supplement will provide a description of the nature, level, content, context and status of studies pursued and successfully completed by the student</p>
<p>Grunnlag for videre studium</p> <p>Access to further studies</p>	<p>SP_KOMP ETA</p>	<p><i>To be eligible for admission to the Doctoral education (PhD) the candidate must have completed a master's degree.</i></p>
<p>Relevans for arbeidsliv</p>	<p>SP_ARBLR EL</p>	<p>Graduates in the Marine Food Production track will be competitive applicants and attractive to employers for jobs in the aquaculture sector as employee or self-employed in production, managerial, sales or technical roles; in the seafood processing and technology sector; in national or regional planning offices (evaluation of site</p>

Employability		<p>licenses); in animal feed/pharmaceutical and aquamedicine companies; for further veterinary training; with NGOs for food security, food safety and authenticity.</p> <p>Graduates in the Management of Living Marine Resources track will be competitive applicants and attractive to employers for jobs in fisheries research (as scientist or technician) at national and international fisheries institutes; regional fisheries management boards; advising bodies to commercial fishing companies and associations; consultancy companies (e.g. development of fisheries management plans); environmental impact assessment; climate change effects, as database manager; fisheries monitoring; conservation; fisheries advisory bodies (at NGO or government ministry level); regional planning offices (coastal zone planning); mineral and oil exploitation companies; NGOs for food security, food safety and labeling, and authenticity; lobbying.</p> <p>Graduates in the Applied Marine Ecology and Conservation Track will be competitive applicants and attractive to employers for jobs in compliance/observer activities for offshore oil and gas companies, marine construction, dredging and pipe/cable laying; marine renewable energy sectors; NGOs; lobbying; marine spatial management/planning.</p> <p>Graduates in the Global Oceans Changes Track will be competitive applicants and attractive to employers for jobs in modelling in environmental consultancy companies and government research institutions; data management in research projects; scientific or technical roles in geophysics and climate related institutions (e.g. IOC, ICES).</p>
Evaluering Evaluation	SP_EVAL UER	The programme will be evaluated according to the quality assurance system of the University of Bergen.
Skikkavurdering og autorisasjon Suitability and authorisation	SP_AUTO RIS	
Programansvarlig	SP_FAGA NSV	<i>Programstyret har ansvar for fagleg innhald og oppbygging av studiet og for kvaliteten på studieprogrammet</i>

Programme committe		
Administrativt ansvarleg	SP_ADMA NSV	<i>Institutt for biovitenskap har det administrative ansvaret for studieprogrammet.</i>
Administrative responsibility		
Kontaktinformasj on	SP_KONT AKT	studie@bio.uib.no
Contact information		

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst	
Emnekode		IMBRSeaBIO206	
Course Code			
Namn på emnet, nynorsk		Ernæring hjå fisk	
Namn på emnet, bokmål		Ernæring hos fisk	
Course Title, English		<u>Fish Nutrition</u>	
Studiepoeng, omfang	EB_POENG	8	
ECTS Credits			
Studienivå (studiesyklus)	EB_NIVA	<i>Bachelor/master</i>	
Level of Study			
Fulltid/deltid	EB_FULLDEL	Full-time	Til dømes kan eit studieemne normert til eitt semester leggjast til rette for å gjennomførast på 2 semester. Det er då eit deltidsstudium med 50% studieprogresjon.
Full-time/Part-time			
Undervisningsspråk	EB_SPRAK	English	
Language of Instruction			
Undervisningssemester	EB_UNDSEM	<i>Autumn</i>	
Semester of Instruction			
Undervisningsstad	EB_UNDSTED		Skal fyllast ut dersom undervisninga ikkje er ved UiB, i Bergen.
Place of Instruction			

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	<p>EB_INNHOLD</p>	<p><i>The course will provide an introduction to the various food components nutritional impact on growth, development, reproduction, health and quality of farmed fish. This involves learning about the fish's digestive system and the various nutrients' digestion, absorption, metabolism and biochemical function. The course also covers relevant undesirable substances in feed that can be a challenge for the health and for the seafood product produced. Students will also learn about alternative resources and substances used in fish feed, and the legislation that the FSA and the industry must deal with in this area. The course builds on the basic knowledge of biology and biochemistry</i></p>	<p>Om innhald: Gi ei kort oversikt over faginnhaldet.</p> <p>En behøver ikkje å ha med underoverskrifter (<i>Mål, innhald</i>). Det kan være en samanhengande tekst som dekker begge.</p> <p>Det kan være greitt å begynne med «Målet med programmet/emnet er å ... (/at ...) ..» for deretter å gå vidare med info om innhald og kanskje også trekke fram særlig viktige/karakteristiske sider ved programmet/emnet/fagområdet.</p>
<p>Læringsutbyte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	<p>EB_UTBYTTE</p>	<p>The course aims to give students the knowledge and skills to keep track of the quantitative importance of food in the production of farmed fish, which feed resources are used, and the ratios between the energizing nutrient (protein, fat and carbohydrates) in commercial feeds.</p> <p>By completing the course, students will:</p> <p>Possess a detailed knowledge of the fish's digestive system, including a deeper focus on the development of the gastrointestinal tract of marine fish larvae</p> <p>Show detailed knowledge of various energizing- and micro (vitamins and minerals) nutrients digestion, absorption, metabolism and biochemical function.</p> <p>Understand how the food composition can affect health, both by lack of nutrients and through preventive nutrition</p> <p>Explain the components of fish feed on fish product quality, both positive (nutrients) and negative (contaminants from food and environment)</p> <p>Have knowledge of fish reproduction and how diet affects egg and fry quality</p> <p>Have a basic understanding of legislation that business and government must deal with in the food area, in terms of fish quality, health and environmental impact</p>	<p>Læringsutbyte er det ein person veit, kan og er i stand til å gjere som eit resultat av læringsprosessen.</p> <p>Læringsutbytet skal beskrivast i kategoriene kunnskapar, ferdigheiter og generell kompetanse. (* Bruk verb i presens.)</p> <p>Ein kan sløyfe ein kategori dersom den ikkje er relevant.</p>

Emnekode:

Krav til forkunnskapar Required Previous Knowledge	EB_KRAV	None	Krav til forkunnskapar, eventuelt andre emne som skal vere bestått før opptak til emnet. Skriv "Ingen" her dersom det ikkje finst slike krav.
Tilrådde forkunnskapar Recommended previous Knowledge	EB_ANBKRAV		
Studiepoengsreduksjon Credit Reduction due to Course Overlap	EB_SPREDUK	BIO206 – 8 sp	Skal fyllast ut om emnet overlappar med andre emne. Talet på studiepoeng emnet overlappar med andre emne.
Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a programme of study at The Faculty of Mathematics and Natural Sciences	Her kan ein informere t.d. om emnet er eit tilbod berre til studentar som er tatt opp til eit bestemt program.
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	Contact hours: Lectures (20), practicals (0), seminars (4), computerclass (0), fieldwork (0), other (0)	Undervisningsformer kan vere seminar, gruppearbeid, prosjekt, føreløsingar, feltkurs, laboratoriekurs osv. Kravet til eit studieår (60 studiepoeng) er for studentane ved UiB 1600 arbeidstimar fordelt på 10 månader. Eitt – 1 – studiepoeng svarer til 26/27 arbeidstimar. Eit 15 studiepoengs emne har såleis 400 studietimar. Her reknar ein inn alle former for studierelatert arbeid. Tid til individuelt arbeid er det som blir att når ein trekkjer frå tida til organisert undervisning.

Emnekode:

<p>Obligatorisk undervisningsaktivitet</p> <p>Compulsory Assignments and Attendance</p>	EB_OBLIGAT	Compulsory assignment and oral presentation.	<p>Her registrerer ein både krav om obligatorisk frammøte og obligatoriske arbeidskrav. <i>Hugs å ta med tal på semester aktiviteten er gyldig.</i></p> <p>NB! Ein brukar omgrepet «godkjent» for å registrere at krava er oppfylte.</p> <p>Egenandel: jf september 2017 brev fra KD: kan vi ikkje ta betalt for transport og oppoldsutgifter i forbindelse med obligatoriske undervisningsaktiviteter, herunder obligatorisk feltarbeid og ekskursjoner. Derfor er setning under fjernet.</p> <p><i>Standardsetning Eigendel::</i> <i>«Dette emne har obligatorisk felt/toktbasert aktivitet og har eigendel ved gjennomføring av emne. Summen på eigendel vert opplyst ved oppstart på emne»</i></p> <p><i>«This course has mandatory field work/scientific cruise and has course costs. The amount will be announced at course start.»</i></p>
<p>Vurderingsformer</p> <p>Forms of Assessment</p>	EB_VURDERI	Digital exam (60%), evaluation of assignment (20%) and oral presentation (20%).	<p>Gi ei oversikt over vurderingsformene (eksempel skriftleg, munnleg, hjemmeeksamen) som blir brukte for å vurdere om læringsutbyttet er oppnådd. Vis gjerne til dei læringsutbyta som vurderings-formene skal vurdere oppnåinga av.</p> <p>Ta med faktainformasjon som er viktig for studenten, mellom anna om varigheit, vekting av dei ulike vurderingsdelane i høve til kvarandre, og elles ulike krav eller ordningar som gjeld her.</p> <p>Angje her om skriftleg eksamen er digital og henvisning</p>

Emnekode:

			til nettstad om digital vurdering for studentar: Norsk: http://www.uib.no/student/86719/digital-vurdering-studenter Engelsk: http://www.uib.no/en/student/87471/digital-assessment-students
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None	Skal fyllast ut der det er aktuelt. Skriv Ingen dersom ingen hjelpemiddel er tillatt.
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>	Det finst to karakterskalaer: <ul style="list-style-type: none">• «bestått» / «ikkje bestått»• Bokstavkarakterar med skalaen A, B, C, D, E, F Jf. Universitets- og høgskolerådet: http://www.uhr.no/ressurser/temasider/karaktersystemet_1/tekst_som_beskriver_det_norske_karaktersystemet
Vurderingssemester Assessment Semester	EB_EKSSEM	<i>Digital exam each semester.</i>	
Litteraturliste Reading List	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester</i>	Litteraturlista ligg ikkje inne i sjølve emnebeskrivinga, noko som gjer at ho kan endrast utan emnebeskrivinga vert endra. Men ho <u>skal</u> , slik det står i tekstfeltet, vere lagd inn på Mitt UiB før 1. juni for haustsemesteret og før 1. desember for vårsemesteret (jf kvalitetshandboka). Litteraturlista bør skilje tydeleg mellom kjernelitteratur og eventuell annan tilrådd litteratur. Lista kan óg gje eit oversyn over ulike former for digitale læringsressursar og verktøy som skal brukast.

Emnekode:

Emneevaluering <i>Course Evaluation</i>	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department	Kor ofte skal emnet evaluerast? <i>Ev. skildring av evalueringsmetode (elektronisk skjema, referansegruppe, osv) og evalueringsfrekvens (kvarrt år, annen kvart år, osv)</i>
Programansvarleg <i>Programme Committee</i>	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.	
Emneansvarleg <i>Course Coordinator</i>	EB_EMNANS V	<i>You find course- and administrative coordinator at MittUiB, you can also contact: studie@bio.uib.no</i>	
Administrativt ansvarleg <i>Course Administrator</i>	EB_ADMANS V	<i>The Department of biological sciences is course administrator.</i>	
Kontaktinformasjon <i>Contact Information</i>	EB_KONTAKT	Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no	

Emnekode:

Forside til emnebeskrivinga

Emnebeskriving for (Namn på emnet, nynorsk)

..... (Navn på emnet, bokmål)

..... (Name of the course, English)

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst -	
Emnekode Course Code		IMBRSeaBIO324 https://www.uib.no/en/course/BIO206	
Namn på emnet, nynorsk			
Namn på emnet, bokmål			
Course Title, English		Fish behaviour	
Studiepoeng, omfang ECTS Credits	EB_POENG	8	
Studienivå (studiesyklus) Level of Study	EB_NIVA	Master	
Fulltid/deltid Full-time/Part-time	EB_FULLDEL	Full-time	Til dømes kan eit studieemne normert til eitt semester leggjast til rette for å gjennomførast på 2 semester. Det er då eit deltidsstudium med 50% studieprogresjon.
Undervisningsspråk Language of Instruction	EB_SPRAK	English	
Undervisningssemester Semester of Instruction	EB_UNDSEM	Autumn	
Undervisningsstad Place of Instruction	EB_UNDSTED		Skal fyllast ut dersom undervisninga ikkje er ved UiB, i Bergen.

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	EB_INNHOLD	<p><i>The subjects are the genetic basis of fish behaviour, motivation and ontogeny, different reactions to stimulation, and the most important sense organs. Special emphasis will be put on the behavioural ecology of foraging, reproduction and schooling, in particular differences in behaviour between populations and individuals. Selected articles and monographs will be discussed in seminars.</i></p>	<p>Om innhald: Gi ei kort oversikt over faginnhaldet.</p> <p>En behøver ikkje å ha med underoverskrifter (<i>Mål, innhald</i>). Det kan være en samanhengande tekst som dekker begge.</p> <p>Det kan være greitt å begynne med «Målet med programmet/emnet er å ... (/at ...) ..» for deretter å gå vidare med info om innhald og kanskje også trekke fram særleg viktige/karakteristiske sider ved programmet/emnet/fagområdet.</p>
<p>Læringsutbyte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	EB_UTBYTTE	<p>The course aims to provide students with increased knowledge about the organisation and function of fish behaviour and how it can be quantified and analysed.</p>	<p>Læringsutbyte er det ein person veit, kan og er i stand til å gjere som eit resultat av læringsprosessen.</p> <p>Læringsutbytet skal beskrivast i kategoriane kunnskapar, ferdigheiter og generell kompetanse. (* Bruk verb i presens.)</p> <p>Ein kan sløyfe ein kategori dersom den ikkje er relevant.</p>
<p>Krav til forkunnskapar</p> <p>Required Previous Knowledge</p>	EB_KRAV	<p>On master's level</p>	<p>Krav til forkunnskapar, eventuelt andre emne som skal vere bestått før opptak til emnet. Skriv "Ingen" her dersom det ikkje finst slike krav.</p>
<p>Tilrådde forkunnskapar</p> <p>Recommended previous Knowledge</p>	EB_ANBKRAV	<p>Compulsory subjects of Bachelor's in Biology</p>	<p>Kan fyllast ut om det trengst.</p>
<p>Studiepoengsreduksjon</p> <p>Credit Reduction due to Course Overlap</p>	EB_SPREDUK	<p>BIO324 – 5 sp</p>	<p>Skal fyllast ut om emnet overlappar med andre emne. Talet på studiepoeng emnet overlappar med andre emne.</p>

Emnekode:

Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a programme of study at The Faculty of Mathematics and Natural Sciences	Her kan ein informere t.d. om emnet er eit tilbod berre til studentar som er tatt opp til eit bestemt program.
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstatter EB_UNDMET O)	Lectures and seminars.	Undervisningsformer kan vere seminar, gruppearbeid, prosjekt, føreløsingar, feltkurs, laboratoriekurs osv. Kravet til eit studieår (60 studiepoeng) er for studentane ved UiB 1600 arbeidstimar fordelt på 10 månader. Eitt – 1 – studiepoeng svarer til 26/27 arbeidstimar. Eit 15 studiepoengs emne har såleis 400 studietimar. Her reknar ein inn alle former for studierelatert arbeid. Tid til individuelt arbeid er det som blir att når ein trekkjer frå tida til organisert undervisning.

Emnekode:

<p>Obligatorisk undervisningsaktivitet</p> <p>Compulsory Assignments and Attendance</p>	EB_OBLIGAT	<p>Deltagelse i forelesningsemnene gjennom hele semesteret, med 20-25 min forelesninger hver, som evalueres til 20% av endelig karakter.</p> <p>En kortere tematisk semesteroppgave (5-6 sider) som evalueres til 20 % av endelig karakter.</p> <p>Skriftlig digital eksamen som vektes til 60% av endelig karakter.</p> <p>Godkjente obligatoriske aktiviteter er gyldig i 6 semestre, inkludert inneværende.</p>	<p>Her registrerer ein både krav om obligatorisk frammøte og obligatoriske arbeidskrav. <i>Hugs å ta med tal på semester aktiviteten er gyldig.</i></p> <p>NB! Ein brukar omgrepet «godkjent» for å registrere at krava er oppfylte.</p> <p>Egenandel: jf september 2017 brev fra KD: kan vi ikkje ta betalt for transport og oppholdsutgifter i forbindelse med obligatoriske undervisningsaktiviteter, herunder obligatorisk feltarbeid og ekskursioner. Derfor er setning under fjernet.</p> <p><i>Standardsetning Eigendel::</i></p> <p><i>«Dette emne har obligatorisk felt/toktbasert aktivitet og har eigendel ved gjennomføring av emne. Summen på eigendel vert opplyst ved oppstart på emne»</i></p> <p><i>«This course has mandatory field work/scientific cruise and has course costs. The amount will be announced at course start.»</i></p>
<p>Vurderingsformer</p> <p>Forms of Assessment</p>	EB_VURDERI	Oral examination	<p>Gi ei oversikt over vurderingsformene (eksempel skriftleg, munnleg, hjemmeeksamen) som blir brukte for å vurdere om læringsutbyttet er oppnådd. Vis gjerne til dei læringsutbyta som vurderings-formene skal vurdere oppnåinga av.</p> <p>Ta med faktainformasjon som er viktig for studenten, mellom anna om varigheit, vekting av dei ulike vurderingsdelane i høve til kvarandre, og elles ulike krav eller ordningar som gjeld her.</p> <p>Angje her om skriftleg eksamen er digital og henvisning</p>

Emnekode:

			til nettstad om digital vurdering for studentar: Norsk: http://www.uib.no/student/86719/digital-vurdering-studenter Engelsk: http://www.uib.no/en/student/87471/digital-assessment-students
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None	Skal fyllast ut der det er aktuelt. Skriv Ingen dersom ingen hjelpemiddel er tillatt.
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>	Det finst to karakterskalaer: <ul style="list-style-type: none">• «bestått» / «ikkje bestått»• Bokstavkarakterar med skalaen A, B, C, D, E, F Jf. Universitets- og høgskolerådet: http://www.uhr.no/ressurser/temasider/karaktersystemet_1/tekst_som_beskriver_det_norske_karaktersystemet
Vurderingssemester Assessment Semester	EB_EKSSEM	Autumn and spring	
Litteraturliste Reading List	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester</i>	Litteraturlista ligg ikkje inne i sjølve emnebeskrivinga, noko som gjer at ho kan endrast utan emnebeskrivinga vert endra. Men ho <u>skal</u> , slik det står i tekstfeltet, vere lagd inn på Mitt UiB før 1. juni for haustsemesteret og før 1. desember for vårsemesteret (jf kvalitetshandboka). Litteraturlista bør skilje tydeleg mellom kjernelitteratur og eventuell annan tilrådd litteratur. Lista kan óg gje eit oversyn over ulike former for digitale læringsressursar og verkty som skal brukast.

Emnekode:

Emneevaluering <i>Course Evaluation</i>	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department	Kor ofte skal emnet evaluerast? <i>Ev. skildring av evalueringsmetode (elektronisk skjema, referansegruppe, osv) og evalueringsfrekvens (kvart år, annen kvart år, osv)</i>
Programansvarleg <i>Programme Committee</i>	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.	
Emneansvarleg <i>Course Coordinator</i>	EB_EMNANS V	<i>You find course- and administrative coordinator at MittUiB, alternatively; studie@bio.uib.no</i>	
Administrativt ansvarleg <i>Course Administrator</i>	EB_ADMANS V	<i>Department of Biological Sciences are course administrators.</i>	
Kontaktinformasjon <i>Contact Information</i>	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>	

Emnekode:

Forside til emnebeskrivinga

Emnebeskriving for (Namn på emnet, nynorsk)

..... (Navn på emnet, bokmål)

..... (Name of the course, English)

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstille standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst
Emnekode Course Code		IMBRSeaBIO382 https://www.uib.no/emne/BIO382
Namn på emnet, nynorsk		Akvatisk matproduksjon
Namn på emnet, bokmål		Akvatisk matproduksjon
Course Title, English		Aquatic food production
Studiepoeng, omfang ECTS Credits	EB_POENG	10
Studienivå (studiesyklus) Level of Study	EB_NIVA	<i>Master</i>
Fulltid/deltid Full-time/Part-time	EB_FULLDEL	Full-time
Undervisningsspråk Language of Instruction	EB_SPRAK	English
Undervisningssemester Semester of Instruction	EB_UNDSEM	<i>Autumn</i>
Undervisningsstad Place of Instruction	EB_UNDSTED	

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	<p>EB_INNHOLD</p>	<p>The aquatic environment covers about 70% the globe and is central in today's discussion on increased global food production. The challenges are both to produce enough food from well treated organisms and food with a good composition of nutrients. This course will give students a state of the art insight to how aquatic food production has global impact on food access and the environment and discuss the future potentials for growth. It will use a combination of selected scientific articles, interdisciplinary expert panels with outside guests, and Oxford-style student debates to elucidate key aspects of seafood production and nutritional value.</p> <p>The aim of the course is to disseminate knowledge about the composition of seafood in relation to the global nutritional challenges; under nutrition, over nutrition and malnutrition, and how nutrients and contaminants are transported in the man-made food chain developed for aquaculture. We will discuss the sustainability of traditional and novel feed resources, which resources are limiting and which ingredients can supply the needed nutrients for the cultured organisms and for the people who eat them. Environmental effects of aquaculture, effects of climate on aquatic farming and the future potential of fisheries and aquaculture to contribute to the global food production will be discussed.</p>
<p>Læringsutbytte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	<p>EB_UTBYTTE</p>	<p>The student should explain well-founded, biologically based views within the course topics. He/she must be able to assess the extent to which claims are documented and distinguish between emotional, political and biological basis for decision making, show insight in current theories and could argue structured and convincing both in writing and orally.</p>
<p>Krav til forkunnskapar</p> <p>Required Previous Knowledge</p>	<p>EB_KRAV</p>	<p>Bachelor's in Biology</p>
<p>Tilrådde forkunnskapar</p> <p>Recommended previous</p>	<p>EB_ANBKRAV</p>	<p>Bachelor's in Biology</p>

Emnekode:

Knowledge Studiepoengsreduksjon Credit Reduction due to Course Overlap	EB_SPREDUK	BIO382
Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a master's programme at The Faculty of Mathematics and Natural Sciences
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	

Emnekode:

Obligatorisk undervisningsaktivitet Compulsory Assignments and Attendance	EB_OBLIGAT	<i>Written assignment, participation in at least one debate panel, participation in class.</i>
Vurderingsformer Forms of Assessment	EB_VURDERI	<i>Folder evaluation of written and oral assignments</i>
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>

Emnekode:

Vurderingssemester <i>Assessment Semester</i>	EB_EKSSEM	Autumn
Litteraturliste <i>Reading List</i>	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester.</i>
Emneevaluering <i>Course Evaluation</i>	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department.
Programansvarleg <i>Programme Committee</i>	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.
Emneansvarleg <i>Course Coordinator</i>	EB_EMNANS V	<i>You find course- and administrative coordinators at MittUiB, alternatively: studie@bio.uib.no</i>
Administrativt ansvarleg <i>Course Administrator</i>	EB_ADMANS V	<i>Department of Biological Sciences is responsible for the course.</i>
Kontaktinformasjon <i>Contact Information</i>	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>

Emnekode:

Emnebeskriving for: Akvatisk matproduksjon

Aquatic Food Production

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst
Emnekode Course Code		IMBRSeaBIO382 https://www.uib.no/emne/BIO382
Namn på emnet, nynorsk		Akvatisk matproduksjon
Namn på emnet, bokmål		Akvatisk matproduksjon
Course Title, English		Aquatic food production
Studiepoeng, omfang ECTS Credits	EB_POENG	10
Studienivå (studiesyklus) Level of Study	EB_NIVA	<i>Master</i>
Fulltid/deltid Full-time/Part-time	EB_FULLDEL	Full-time
Undervisningsspråk Language of Instruction	EB_SPRAK	English
Undervisningssemester Semester of Instruction	EB_UNDSEM	<i>Autumn</i>
Undervisningsstad Place of Instruction	EB_UNDSTED	

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	<p>EB_INNHOLD</p>	<p>The aquatic environment covers about 70% the globe and is central in today's discussion on increased global food production. The challenges are both to produce enough food from well treated organisms and food with a good composition of nutrients. This course will give students a state of the art insight to how aquatic food production has global impact on food access and the environment and discuss the future potentials for growth. It will use a combination of selected scientific articles, interdisciplinary expert panels with outside guests, and Oxford-style student debates to elucidate key aspects of seafood production and nutritional value.</p> <p>The aim of the course is to disseminate knowledge about the composition of seafood in relation to the global nutritional challenges; under nutrition, over nutrition and malnutrition, and how nutrients and contaminants are transported in the man-made food chain developed for aquaculture. We will discuss the sustainability of traditional and novel feed resources, which resources are limiting and which ingredients can supply the needed nutrients for the cultured organisms and for the people who eat them. Environmental effects of aquaculture, effects of climate on aquatic farming and the future potential of fisheries and aquaculture to contribute to the global food production will be discussed.</p>
<p>Læringsutbytte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	<p>EB_UTBYTTE</p>	<p>The student should explain well-founded, biologically based views within the course topics. He/she must be able to assess the extent to which claims are documented and distinguish between emotional, political and biological basis for decision making, show insight in current theories and could argue structured and convincing both in writing and orally.</p>
<p>Krav til forkunnskapar</p> <p>Required Previous Knowledge</p>	<p>EB_KRAV</p>	<p>Bachelor's in Biology</p>
<p>Tilrådde forkunnskapar</p> <p>Recommended previous</p>	<p>EB_ANBKRAV</p>	<p>Bachelor's in Biology</p>

Emnekode:

Knowledge Studiepoengsreduksjon Credit Reduction due to Course Overlap	EB_SPREDUK	BIO382
Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a master's programme at The Faculty of Mathematics and Natural Sciences
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	

Emnekode:

Obligatorisk undervisningsaktivitet Compulsory Assignments and Attendance	EB_OBLIGAT	<i>Written assignment, participation in at least one debate panel, participation in class.</i>
Vurderingsformer Forms of Assessment	EB_VURDERI	<i>Folder evaluation of written and oral assignments</i>
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>

Emnekode:

Vurderingssemester <i>Assessment Semester</i>	EB_EKSSEM	Autumn
Litteraturliste <i>Reading List</i>	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester.</i>
Emneevaluering <i>Course Evaluation</i>	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department.
Programansvarleg <i>Programme Committee</i>	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.
Emneansvarleg <i>Course Coordinator</i>	EB_EMNANS V	<i>You find course- and administrative coordinators at MittUiB, alternatively: studie@bio.uib.no</i>
Administrativt ansvarleg <i>Course Administrator</i>	EB_ADMANS V	<i>Department of Biological Sciences is responsible for the course.</i>
Kontaktinformasjon <i>Contact Information</i>	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>

Emnekode:

Emnebeskriving for: Akvatisk matproduksjon

Aquatic Food Production

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst
Emnekode <i>Course Code</i>		IMBRSeaBIOXXX
Namn på emnet, nynorsk		
Namn på emnet, bokmål		
<i>Course Title, English</i>		Biological oceanography and ocean productivity
Studiepoeng, omfang <i>ECTS Credits</i>	EB_POENG	6
Studienivå (studiesyklus) <i>Level of Study</i>	EB_NIVA	<i>Master</i>
Fulltid/deltid <i>Full-time/Part-time</i>	EB_FULLDEL	Full-time
Undervisningsspråk <i>Language of Instruction</i>	EB_SPRAK	English
Undervisningssemester <i>Semester of Instruction</i>	EB_UNDSEM	<i>Autumn</i>
Undervisningsstad <i>Place of Instruction</i>	EB_UNDSTED	

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	<p>EB_INNHOLD</p>	<p>An introduction to biological oceanography, the basis for marine productivity, and presentation of selected marine ecosystems and models. The course builds on theory, with hands-on practical exercises working with ocean models. Lectures and hands-on practical exercises are combined to help understand how physical processes and structure influence the biological interactions and distribution of marine organisms. Further topics include biological production - ocean versus land, the importance of microbial life in marine primary production, and marine productivity patterns and modelling</p>
<p>Læringsutbyte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	<p>EB_UTBYTTE</p>	<ul style="list-style-type: none"> - Understand and be able to use modelling tools to study the driving forces of marine productivity - Understand how physical processes and structure influence the biological interactions and distribution of marine organisms - Be able to communicate scientific results from field studies - Have knowledge of the basic effects of fisheries and harvesting/exploitation of marine biological resources - Understand and consider the uncertainties in marine data collection and modelling and what that means for management advice
<p>Krav til forkunnskapar</p> <p>Required Previous Knowledge</p>	<p>EB_KRAV</p>	<p>Bachelor's in Biology</p>
<p>Tilrådde forkunnskapar</p> <p>Recommended previous Knowledge</p>	<p>EB_ANBKRAV</p>	<p>Bachelor's in Biology</p>
<p>Studiepoengsreduksjon</p> <p>Credit Reduction due to Course Overlap</p>	<p>EB_SPREDUK</p>	<p>BIO325 – 6 sp</p>

Emnekode:

Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a master's programme at The Faculty of Mathematics and Natural Sciences
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	<i>Lectures (16), Seminars (4) and Computerclass (12)</i>
Obligatorisk undervisningsaktivitet Compulsory Assignments and Attendance	EB_OBLIGAT	<i>Lectures (16), Seminars (4) and Computerclass (12)</i>
Vurderingsformer	EB_VURDERI	<i>practical reports (modelling experiments), multiple choice exam</i>

Emnekode:

Forms of Assessment		
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>
Vurderingssemester Assessment Semester	EB_EKSSEM	Autumn
Litteraturliste Reading List	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester.</i>
Emneevaluering Course Evaluation	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department.
Programansvarleg Programme Committee	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.
Emneansvarleg Course Coordinator	EB_EMNANS V	<i>You find course- and administrative coordinator at MittUiB, alternatively: studie@bio.uib.no</i>
Administrativt ansvarleg Course Administrator	EB_ADMANS V	<i>Department of Biological Sciences is responsible for the course.</i>
Kontaktinformasjon Contact Information	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>

Emnekode:

Emnebeskriving for: Biological oceanography and ocean productivity

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst
Emnekode <i>Course Code</i>		IMBRSeaBIOXXY
Namn på emnet, nynorsk		
Namn på emnet, bokmål		
<i>Course Title, English</i>		Quantitative methods for modern fisheries and marine research
Studiepoeng, omfang <i>ECTS Credits</i>	EB_POENG	6
Studienivå (studiesyklus) <i>Level of Study</i>	EB_NIVA	<i>Master</i>
Fulltid/deltid <i>Full-time/Part-time</i>	EB_FULLDEL	Full-time
Undervisningsspråk <i>Language of Instruction</i>	EB_SPRAK	English
Undervisningssemester <i>Semester of Instruction</i>	EB_UNDSEM	<i>Autumn</i>
Undervisningsstad <i>Place of Instruction</i>	EB_UNDSTED	

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	EB_INNHOLD	<p>The course is aimed at understanding fisheries in an ecological context and with a global perspective. Topics include the distribution of marine biological resources and responsibility for management of the resources and the importance of fish resources for national economies. Population ecology and fisheries assessment models are covered, as well as the impact of uncertainties in marine data collection and modelling and what that means for management advice.</p>
<p>Læringsutbyte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	EB_UTBYTTE	<ul style="list-style-type: none">- Understand and be able to use modelling tools to study the driving forces of marine productivity- Understand how physical processes and structure influence the biological interactions and distribution of marine organisms- Have knowledge of selected habitats and nursery areas/recruitment areas of marine organisms and have an overview of the major inshore and open ocean organisms and their ecology- Be able to plan and execute field work to answer research questions- Have basic knowledge of the most common methods for collection of field data for modern marine research- Be able to explain and evaluate the principles of different sampling approaches, and their strengths and weaknesses- Be able to process, catalog, and interpret collected field samples and experimental data- Be able to communicate scientific results from field studies- Have knowledge of the basic effects of fisheries and harvesting/exploitation of marine biological resources- Understand and consider the uncertainties in marine data collection and modelling and what that means for management advice

Emnekode:

		- Have learned to work as part of a team onboard a research ship, following safe practices in field work
Krav til forkunnskapar Required Previous Knowledge	EB_KRAV	Bachelor's in Biology
Tilrådde forkunnskapar Recommended previous Knowledge	EB_ANBKRAV	Bachelor's in Biology
Studiepoengsreduksjon Credit Reduction due to Course Overlap	EB_SPREDUK	BIO325 – 6 sp
Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a master's programme at The Faculty of Mathematics and Natural Sciences
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	<i>Lectures (20), Practicals (4), Fieldwork (8) and Computerclass (4)</i>

Emnekode:

Obligatorisk undervisningsaktivitet Compulsory Assignments and Attendance	EB_OBLIGAT	<i>Lectures (20), Practicals (4), Fieldwork (8) and Computerclass (4)</i>
Vurderingsformer Forms of Assessment	EB_VURDERI	lab report, oral exam
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>

Emnekode:

Vurderingssemester <i>Assessment Semester</i>	EB_EKSSEM	Autumn
Litteraturliste <i>Reading List</i>	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester.</i>
Emneevaluering <i>Course Evaluation</i>	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department.
Programansvarleg <i>Programme Committee</i>	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.
Emneansvarleg <i>Course Coordinator</i>	EB_EMNANS V	<i>You find course- and administrative coordinators at MittUiB, alternatively: studie@bio.uib.no</i>
Administrativt ansvarleg <i>Course Administrator</i>	EB_ADMANS V	<i>Department of Biological Sciences is responsible for the course.</i>
Kontaktinformasjon <i>Contact Information</i>	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>

Emnekode:

Emnebeskriving for: Quantitative methods for modern fisheries and marine research

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

Emnekode:

Mal for Det matematisk-naturvitenskapelige fakultet

Mal for emnebeskrivingar ved Universitetet i Bergen - Course Plan

Eit studieprogram inneheld fleire emne. Ei emnebeskriving er ein detaljert plan for eitt av emna i eit studieprogram.

Krav til studiar går fram av *Forskrift for tilsyn med utdanningskvalitet i høgere utdanning (studietilsynsforskriften)*, NOKUT 2013,

<http://link.uib.no/?21Vcl> . UiBs *Forskrift om opptak, studier, vurdering og grader ved Universitetet i Bergen* (Studieforskrifta) gir i kapittel 3 reglar for studiestruktur og studieplan: <http://link.uib.no/?YoXx>

UiB si *Handbok for kvalitetssikring av universitetsstudia* gir meir rettleiing om ansvar, prosedyrar og krav til oppretting av studieprogram og emne (pkt. 16.1 og 16.4). Sjå <http://www.uib.no/studiekvalitet> .

Studietilsynsforskrifta (NOKUT) seier i § 7-4 at «Delene studiet består av skal utgjøre en samlet helhet i samsvar med læringsutbyttet for studiet», og at de «skal tilfredsstillende standarder og kriterier for akkreditering av studier i § 7-1 til § 7-3.»

I tillegg til kategoriane i tabellen nedanfor, skal emnebeskrivinga innehalde følgjande informasjon: dato for godkjenning, dato for eventuelle justeringar, namn på instans som har godkjent beskrivinga, dato for førre evaluering og neste planlagde evaluering av emnet. Denne informasjonen skal stå på forsida til planen. Forsidemal finn ein sist i dette dokumentet.

Eventuelt forslag til tekst står i kursiv i kolonnen «Tekst». Rettleiing og nokre døme finn ein i kolonnen til høgre. Den må fjernast før emnebeskrivinga vert send til programstyre, institutt og fakultet.

Emnekode:

Kategori	Infotype	Tekst
Emnekode <i>Course Code</i>		IMBRSeaBIOXY
Namn på emnet, nynorsk		
Namn på emnet, bokmål		
<i>Course Title, English</i>		Sampling and observational field methods
Studiepoeng, omfang <i>ECTS Credits</i>	EB_POENG	6
Studienivå (studiesyklus) <i>Level of Study</i>	EB_NIVA	<i>Master</i>
Fulltid/deltid <i>Full-time/Part-time</i>	EB_FULLDEL	Full-time
Undervisningsspråk <i>Language of Instruction</i>	EB_SPRAK	English
Undervisningssemester <i>Semester of Instruction</i>	EB_UNDSEM	<i>Autumn</i>
Undervisningsstad <i>Place of Instruction</i>	EB_UNDSTED	

Emnekode:

<p>Mål og innhald</p> <p>Objectives and Content</p>	EB_INNHOLD	<p>Sampling and recording and handling marine field data, as well as data analysis and modelling, will give training in the central research methods for observation and assessing abundance of marine species. Field work/experiments will cover various techniques, using practical examples to evaluate the purpose, strengths and weaknesses of each approach. This will include common approaches for collecting data for marine research, such as surveys, acoustics, times series, ROVs, and their applications in process studies and resource mapping. The links between these and assessment and advice for exploitation of marine resources will be introduced in this course.</p>
<p>Læringsutbyte (endret standardoppsett og introsetning)</p> <p>Learning Outcomes</p>	EB_UTBYTTE	<ul style="list-style-type: none">- Understand how physical processes and structure influence the biological interactions and distribution of marine organisms- Have knowledge of selected habitats and nursery areas/recruitment areas of marine organisms and have an overview of the major inshore and open ocean organisms and their ecology- Be able to use appropriate tools, including taxonomic keys, to identify common marine animals in Norwegian waters- Be able to plan and execute field work to answer research questions- Have basic knowledge of the most common methods for collection of field data for modern marine research- Be able to explain and evaluate the principles of different sampling approaches, and their strengths and weaknesses- Be able to process, catalog, and interpret collected field samples and experimental data- Be able to communicate scientific results from field studies- Have knowledge of the basic effects of fisheries and harvesting/exploitation of marine biological resources

Emnekode:

		<ul style="list-style-type: none"> - Understand and consider the uncertainties in marine data collection and modelling and what that means for management advice - Have learned to work as part of a team onboard a research ship, following safe practices in field work
Krav til forkunnskapar Required Previous Knowledge	EB_KRAV	Bachelor's in Biology
Tilrådde forkunnskapar Recommended previous Knowledge	EB_ANBKRAV	Bachelor's in Biology
Studiepoengsreduksjon Credit Reduction due to Course Overlap	EB_SPREDUK	BIO325 – 6 sp
Krav til Studierett Access to the Course	EB_STUDRET	Access to the course requires admission to a master's programme at The Faculty of Mathematics and Natural Sciences
Arbeids- og undervisningsformer Teaching and Learning Methods	EB_ARBUND (Erstattar EB_UNDMET O)	<i>Lectures (20), Computerclass (12) and fieldwok (3 day cruise)</i>

Emnekode:

Obligatorisk undervisningsaktivitet Compulsory Assignments and Attendance	EB_OBLIGAT	<i>Lectures (20), Computerclass (12) and fieldwok (3 day cruise)</i>
Vurderingsformer Forms of Assessment	EB_VURDERI	production of demo VIDEO on selected methods, field report, oral exam.
Hjelpemiddel til eksamen Examination Support Material	EB_HJELPEM	None
Karakterskala Grading Scale	EB_K-SKALA	<i>The grading scale used is A to F. Grade A is the highest passing grade in the grading scale, grade F is a fail.</i>

Emnekode:

Vurderingssemester Assessment Semester	EB_EKSSEM	Autumn
Litteraturliste Reading List	EB_LEREM	<i>The reading list will be available within June 1st for the autumn semester and December 1st for the spring semester.</i>
Emneevaluering Course Evaluation	EB_EVALUER	The course will be evaluated by the students in accordance with the quality assurance system at UiB and the department.
Programansvarleg Programme Committee	EB_PROGANS	The Programme Committee is responsible for the content, structure and quality of the study programme and courses.
Emneansvarleg Course Coordinator	EB_EMNANS V	<i>You find course- and administrative coordinators at MittUiB, alternatively: studie@bio.uib.no</i>
Administrativt ansvarleg Course Administrator	EB_ADMANS V	<i>Department of Biological Sciences is responsible for the course.</i>
Kontaktinformasjon Contact Information	EB_KONTAKT	<i>Contact the Study Section at the Department of Biological Sciences: studie@bio.uib.no</i>

Emnekode:

Emnebeskriving for: Sampling and observational field methods

Godkjenning:

Emnebeskrivinga er godkjend av (Fakultetet brukar nemningar for godkjenningsorgan i samsvar med eigen praksis.):

Programstyret:(dd.mm.år)

Institutt for :(dd.mm.år)

..... fakultet:(dd.mm.år)

Emnebeskrivinga vart justert:(dd.mm.år) av

Evaluering:

Emnet vart sist evaluert:(dd.mm.år)

Neste planlagde evaluering:(dd.mm.år)

F STEP 1
2016 – Erasmus Mundus Joint Master Degrees (EMJMD)

In this step the following information will be considered during the evaluation:

➤ **Award criterion:**

- *Relevance of the project*

The information below provides guidance on the type and scope of information to be provided by applicants under the award criterion. Applicants should provide full but concise information on each point. The questions in *italics* should give guidance to applicants in order to respond to the award criterion.

The information provided by applicants on this first EMJMD award criterion should not exceed **15 pages in total** (Font 11 - Times New Roman).

Only those proposals that score at least 75% of the maximum allocated points (i.e. minimum 30 points out of 40) under this criterion will go to step 2 of the selection.

A.1 Relevance of the project (maximum 40 points)

A.1.1 The proposal's elements of "jointness"/integration, design and structure are tailored and effective for achieving the EMJMD aims and objectives.

How does your proposed EMJMD reflect a common and integrated approach by the consortium? What concrete elements of "jointness" have been tailored and incorporated into the Master design/structure? How relevant are these elements for achieving the EMJMD's objectives?

The International Master in Marine Biological Resources (IMBRSea), is a joint Master programme organized by eight leading European universities in the field of marine sciences, supported by the European Marine Biological Resource Centre (EMBRC). The IMBRSea programme takes the strengths from the International Master of Science in Marine Biodiversity and Conservation (EMBC+, formerly EMBC), and prepares students for the rapidly evolving demands of the blue bio-economy (all economic activities that depend on the sea) and research on the sustainable use of marine biological resources.

Industry and society face significant challenges to achieve growth and to further develop the blue bio-economy in Europe, in harmony with the European Union's (EU) Blue Growth strategy (see page 14 for a glossary of all words beginning with a capital letter and a list of abbreviations). The international, interdisciplinary and intersectoral nature of these challenges demands a similarly integrated approach to train the marine scientists of tomorrow. IMBRSea is designed so its students will graduate with both core and specialist competences and skills required by employers in key themes of the blue bio-economy: fisheries and aquaculture; nature conservation; sustainability; ecosystem based management; blue biotechnology and global change.

The proposed IMBRSea programme stems from the experience of different Partner universities in organizing the International Master of Science in Marine Biodiversity and Conservation, EMBC/EMBC+, successfully running since 2008 (<http://www.embcplus.org>): Ghent University (UGent - P1), University of Pierre and Marie Curie (UPMC - P2), University of the Algarve (UALg - P3), University of Oviedo (UniOvi - P4), and Galway-Mayo Institute of Technology (GMIT - P5). Three new Partners, University of the Basque Country (UPV/EHU - P6), Polytechnic University of Marche (UNIVPM - P7), and University of Bergen (UiB - P8) will join the consortium in order to cover all complementary expertise fields relevant in organizing the IMBRSea programme.

Although the EMBC/EMBC+ programme was considered as a success story on many aspects, for different reasons addressed in the needs analysis in section A.1.3, the consortium decided, with the support of EMBRC, to assimilate EMBC/EMBC+ into an improved innovative Master programme: IMBRSea.

EMBRC is a distributed European research infrastructure consortium that was added to the roadmap of the European Strategy Forum for Research Infrastructures (ESFRI) in 2008 as a research infrastructure of pan-European interest. The consortium builds on its experience and will extend its coverage to meet the challenges of producing the marine scientists of the next generation. IMBRSea will be an integrated flagship programme that capitalizes on the operational, research and academic strengths of its members, to provide the best possible opportunities for employability and career development of programme graduates. The programme integrates the operational utility of EMBRC's research infrastructure for marine biology with the combined research and academic capacities of experienced Partner universities, and involves important non-academic actors to forge strong industry and

governmental links for training opportunities. The IMBRSea consortium members are connected through their participation in the EMBRC network, and have been able to work jointly to identify what is needed to enable improvements in European marine biological resources education and training.

The resulting programme is thus a joint and integrated project, consistent with the goals of the EMBRC consortium and aligned with the EMJMD objectives:

- O.1. to foster excellence, innovation, and internationalization in higher education institutions (HEIs);
- O.2. to increase the quality and the attractiveness of the European higher education area (EHEA) and to support the EU's external action in the higher education field, by offering full degree scholarships to the best Master students worldwide;
- O.3. and to improve the level of competences and skills of Master graduates, and in particular their relevance for the labour market, through an increased involvement of employers.

IMBRSea offers a common and integrated approach for the functioning of the programme, forming joint boards and committees that take responsibility for administrative matters via the Coordination office (CO) and Local secretariats (LS) which support the Programme board (PB). Selection of students is done by the Selection committee (SC). The Examination board (EB) is responsible for the student evaluations. Promotion of the programme for recruitment of students within and beyond Europe is led by a communication officer. Furthermore, the Programme board is in charge of curriculum review and educational quality control and is, in this role, advised by student representatives of both first and second years (Student board - SB) and by a committee of external stakeholders (External advisory board - AB). During the first preparatory and promotion/awareness-raising year, the programme will be advertised and the first intake of students selected, jointly by all Partners. See Figure 1 below for an organogram of IMBRSea.

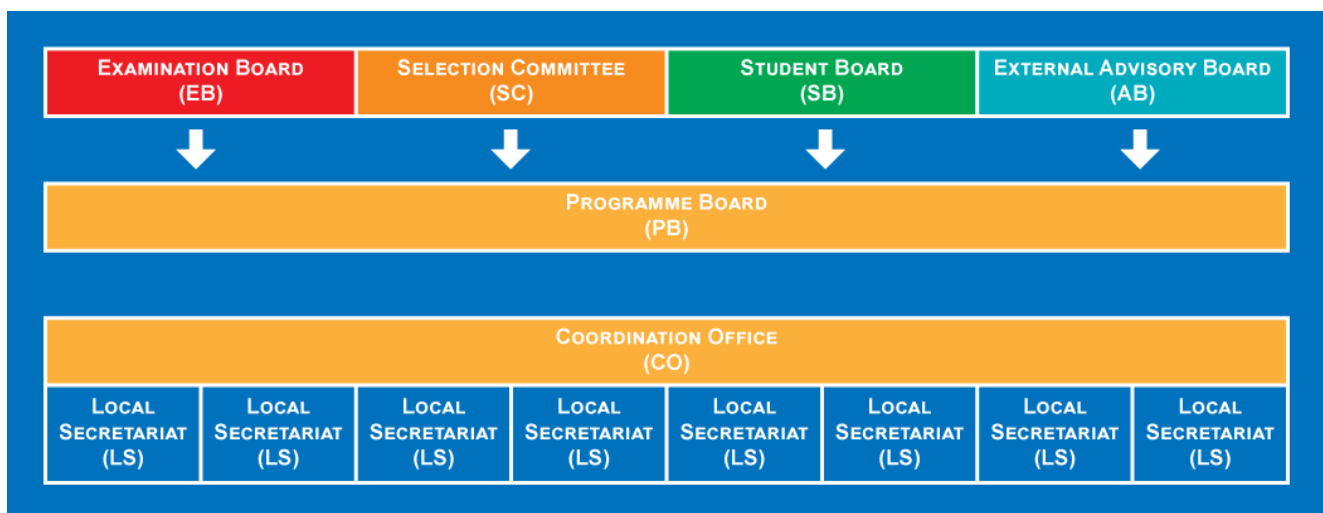


Figure 1: Organogram of IMBRSea

Integrated delivery of core competencies across the consortium occurs throughout the programme, and is complemented by the acquisition of specialist knowledge and skills aligned to student's personal interest. Figure 2 represents a detailed view on the structure of IMBRSea, see Annex 1 for a detailed view on the course offerings within each module. A jointly developed Fundamentals Module is delivered simultaneously by four Partners (UGent - P1, UPMC - P2, UAlg - P3 and UniOvi - P4) during the first semester of the programme. Further programme-level components include a Joint School and Annual Symposium, all planned and delivered jointly by Partners and Associate Partners. Specialization Tracks have been designed jointly by consortium Partners with complementary strengths to offer a progression of Thematic Modules of individual Courses. An online selection interface will allow students to evaluate all programme offerings, facilitating students in designing tailored Pathways through their selected Track, and the Thematic Modules within those Tracks that are most complementary to their chosen individual career paths.

IMBRSea combines the strengths of a jointly developed curriculum with the advantages of thematic specializations to enhance the educational outcomes and employability of student mobility, which is a fundamental pillar of the EMJMD concept. Programme-wide activities such as the Joint School and the Annual Symposium also foster good communication and networking among students and staff pursuing diverse thematic specializations. Teacher mobility and online teaching is built into the programme as part of the integrated delivery of programme-wide activities and jointly developed learning components.

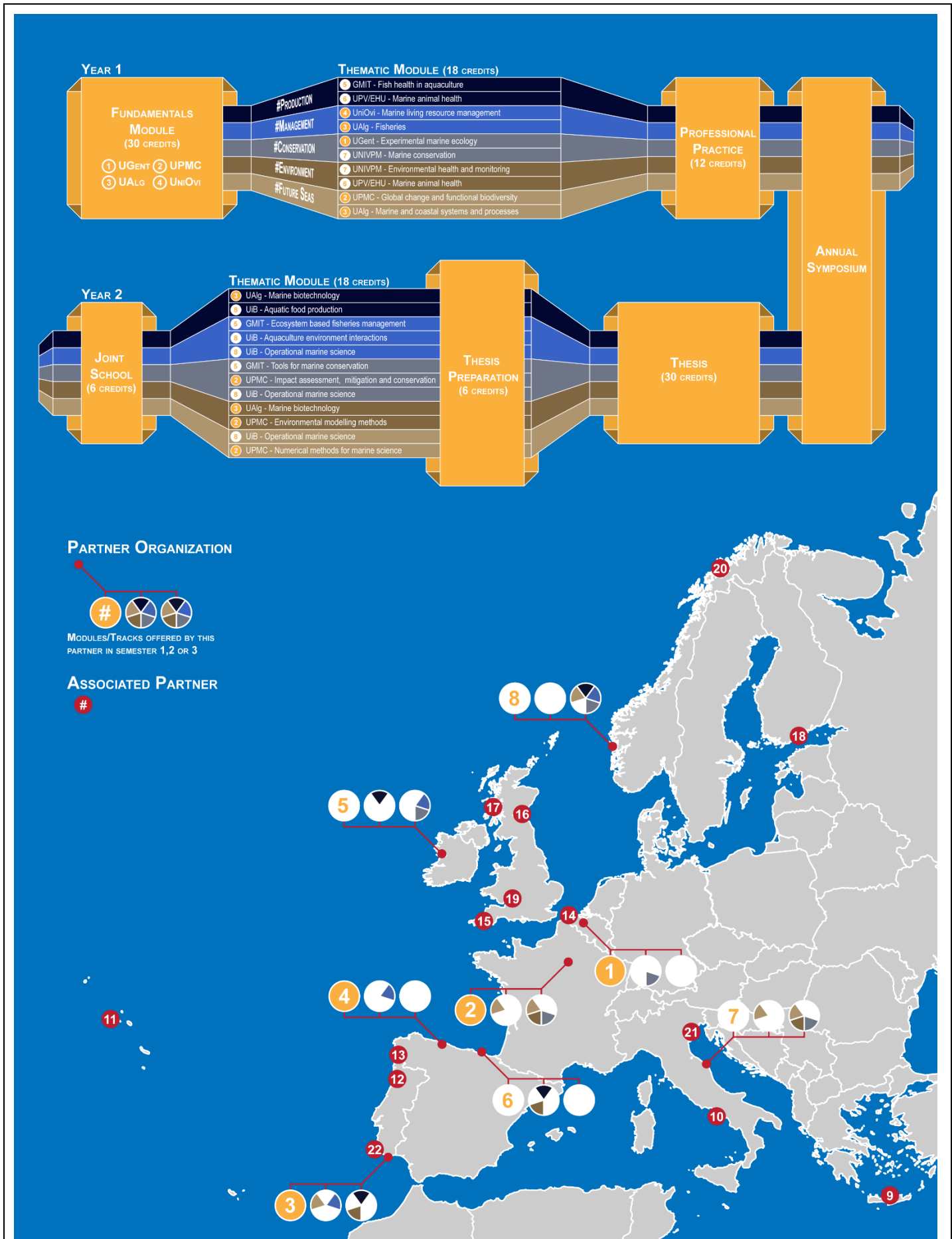


Figure 2: Structure and consortium of IMBRSea

The jointly developed curriculum reflects the cross-disciplinary components that are required to foster excellence, innovation and internationalization in marine science training, relevant to achieve the EMJMD objective 1 (O.1). The learning components offer a diversity of learning environments and real-world experiences, which showcase the quality and enhance the attractiveness of European HEIs, relevant to the EMJMD O.2. The teaching methods of the jointly developed curriculum exploit a diversity of learning platforms, including lectures, on-line modules, problem-based learning, activating teaching methods and study-led activities. The use of more active learning modes results in a more effective science learning experience and by adopting these principles, the IMBRSea programme will meet its objectives.

In the first semester, the Fundamentals Module, delivering basic knowledge and skills required by all programme graduates, will be taught at four universities (UGent - P1, UPMC - P2, UAIG - P3 and UniOvi - P4). This module contains six jointly developed Courses covering: Marine policy and governance, Marine genomics, Quantitative methods in marine science, Oceanography, Marine ecology, Marine GIS and spatial planning. In addition to these six Courses, students have also the opportunity to take one transferable skills Course (for example language training, scientific diving, scientific communication). For each of these topics, essential content, learning outcomes and the most appropriate learning and evaluation methodologies have been identified by a working group composed of experts from the four first year universities.

During the second and the third semester, the students follow two Thematic Modules, leading to one of the five Specialization Tracks defined according to the EU Horizon2020 Blue Growth innovation challenges:

1. Marine food production (#Production) led by UAIG - P3 and UPV/EHU - P6
2. Management of living marine resources (#Management), led by UniOvi - P4 and GMIT - P5
3. Applied marine ecology and conservation (#Conservation), led by UPMC - P2 and GMIT - P5
4. Marine environment health (#Environment), led by UAIG - P3 and UNIVPM - P7
5. Global ocean change (#FutureSeas), led by UPMV - P2 and UiB - P8

The curriculum in each Track is developed by the two Partner universities with the most expertise in the field of the Track, jointly with the other Partners involved in the curriculum of the concerned Track. During the first preparatory and promotion/awareness-raising year, the curriculum will be further reviewed by these expert groups and optimized where needed.

In the second half of the second semester, students will gain authentic experience during six weeks of Professional Practice offered by employers, relevant to EMJMD O.3. During these internships guidance of students by their industrial mentors will be integrated with support provided by academic supervisors from the Partner universities. At the end of the third semester, the students follow a jointly developed Thesis preparation before the start of their Thesis research. The first part of this preparation is a Joint School which will bring all students from the same cohort together for programme-wide training on multi-disciplinary topics, again relevant to EMJMD O.1. The Joint School is a truly integrated activity, organized and delivered by teachers representing each Partner university. Evaluations of student performance during the Joint School are also integrated: assessment criteria are common for all students and students are jointly assessed by representatives of the full consortium. Since the same evaluation criteria are used for the reports of the Joint School and the Thesis, the students gain a first exposure to this type of evaluation and feedback.

The second part of the Thesis preparation is more tailored to the individual student situation and her/his Thesis project. In all cases, transferable skills are important learning outcomes for the students to gain through topics including: project management, data management, research proposal writing and scientific communication. Transferable skills learning activities will be jointly developed assuring that, independent of the university where the student is, the same final competences are obtained. The Annual Symposium is a programme-wide activity that both first and second year students will attend, with important joint elements which address all EMJMD objectives. This is, amongst other activities, the forum for presentation and evaluation of the Master Thesis research (thesis defense). A jury will evaluate each Thesis and examine each student against jointly developed evaluation criteria (see Annex 2) that conform to the requirements of each HEI Partner, leading to the delivery of the Joint degree diploma. The Symposium also offers first year students the opportunity to see which choices are offered for their Thesis research. Associate Partners and other non-HEI actors will be encouraged to participate and take the opportunity to hold a professional (job) fair, relevant to EMJMD O.3., to attract students and future employees. Facilities for meet-places and interviews can also be made available at this professional fair within the Symposium.

Programme-wide activities are concrete joint measures that are incorporated into the design to deliver a better educational experience than available at a single institution. In addition, the consortium fosters increased cooperation between Partners and students. The Programme and Examination boards work together with assessment aligned to

learning outcomes. The Joint School and Annual Symposium ensure joint activities and planning. Students spend significant time together, so they can build up the network that will enhance their career prospects. Students who complete the IMBRSea programme, with its common and integrated approach, receive a Joint degree diploma, signed by a legal representative of all Partner universities. This Joint degree diploma meets EMJMD O.2. for increased attractiveness of European higher education. The Course curriculum and the cornerstones of the academic programme are clearly structured within a common framework, agreed upon by all consortium Partners.

A.1.2 The proposal describes how the EMJMD is integrated within the degree catalogues of partners and defines the degree(s) intended to be delivered, especially the award of an EMJMD joint degree, if national legislation allows.

How does the EMJMD integrate within the accredited national degree catalogues of the HEIs partners from Programme Countries? Are these Master programmes recognised by all degree awarding consortium HEIs from Programme Countries? What type of degrees (joint/multiple/double degrees) will be provided to the EMJMD graduates? If applicable, outline the envisaged steps towards accreditation of the EMJMD as such and describe how the consortium will overcome any remaining obstacles for issuing joint degrees for EMJMD graduates?

The IMBRSea programme will be supported by accredited local Master programmes currently running in all Partner universities (see Annex 3 for the links to the programme's website). The accreditation process for new courses will be finalized by the start of the proposed programme. IMBRSea graduates will receive a Joint degree diploma, signed by a legal representative of all Partner universities. As mentioned before IMBRSea is considered as the follow-up programme of the EMBC+ programme. Due to the fact that many of the modules and some of the thematic orientations have changed, it was decided to change the name "International Master of Science in Marine Biodiversity and Conservation" into the "International Master of Science in Marine Biological Resources". This change in name, as well as the change of courses, will be implemented in all the degree catalogues during the preparatory year, and thus before the start of the programme in September 2017.

Two accredited Master programmes are currently running at UGent (P1) of which Courses will support IMBRSea: the International Master of Science in Marine Biodiversity and Conservation (EMBC+) and the Master of Marine and Lacustrine Science and Management (Oceans and Lakes). Joint degree diplomas are possible at UGent.

The current accredited Master programmes on which IMBRSea will be based at UPMC (P2) are the International Master of Science in Marine Biodiversity and Conservation (EMBC+) and the Master en Océanographie, Environnement Marin - Oceanography and Marine Environment. The current accreditation includes the EMBC+ programme. In the framework of the new law for Higher Education and Research (loi 2013-660 of the 22nd of July 2013), the decree of the 4th of February 2014 fixes the MSc nomenclature, in which the corresponding degree is named Sciences de la Mer. At UPMC, a Joint degree diploma is possible, allowed by Decree 2005-450 of 11th of May 2005.

Two Masters in Aquaculture and Fisheries, and Marine Biology are the backbone of the current accredited EMBC+ programme at UAlg (P3). Both of the Master programmes were recently evaluated by A3ES (Agência de Avaliação e Acreditação do Ensino Superior) and have received a preliminary accreditation. In addition, the Master in Biotechnology will provide the Courses for the Thematic Module on marine biotechnology. This Master is accredited by A3ES. The Master in Marine and Coastal Systems will contribute to the Thematic Module on marine and coastal systems and processes at UAlg. In Portugal Joint degrees are possible according to decree-law n° 67/2005 of 15 March 2005.

Two accredited Masters with strong emphasis on management and monitoring of marine environments are offered at UniOvi (P4): EMBC+, accredited by ANECA (National Agency for Quality Evaluation and Accreditation) on 17/07/2015 with an ID 4315572, and Máster Universitario en Conservación Marina – Master in Marine Conservation (60 ECTS), accredited by ANECA on 17/07/2015 with an ID 4315571. UniOvi offers the possibility for Joint degree diplomas.

EMBC+ is currently running at GMIT (P5) and GMIT has an MSc in environmental resource management GMIT has the power to award Joint degrees under delegated authority from the Irish National Quality Assurance (QA) Agency, Quality and Qualifications Ireland (QQI), established by the Quality Assurance and Qualifications (Education and Training) Act 2012.

Two accredited Master programmes are running at UPV/EHU (P6) of which Courses will support IMBRSea: the Master in Environmental Contamination and Toxicology (CTA) and the European Master in Marine Environment and Resources (MER). Joint degree diplomas are possible at UPV/EHU.

The current accredited Master programme on which the IMBRSea programme will be based at UNIVPM (P7) is called Master in Marine Biology. UNIVPM offers two Thematic Modules in IMBRSea, on environmental health and monitoring, and on marine conservation. UNIVPM can offer Joint degree diplomas.

At UiB, the Master of Science in Biology, with seven specialization options relevant to IMBRSea (Microbiology; Marine biology; Fisheries biology and management; Aquaculture biology; Biodiversity, evolution and ecology; Developmental biology and physiology; Environmental toxicology), is offered. The Thematic Modules offered by UiB are composed of Courses which are currently in the university catalog. The Joint degree will be entered into the programme catalog with its own programme code after approval by the department and faculty programme boards, and Norwegian Agency for Quality Assurance in Education (NOKUT) accreditation. NOKUT is the government body that accredits Joint degrees, and an application will be made for full accreditation of the full IMBRSea programme following the legal government regulations.

A.1.3 The proposed EMJMD responds to clearly identified needs in the academic field.

How did the consortium conduct the needs analysis on which the proposal is built? Based on the needs analysis results (at national/international level), what does the proposal offer as added value in concrete terms? How does this justify EU financial support?

In order to identify the needs for marine scientists with different specialization fields, a needs analysis was conducted based on (see Annex 4 for the complete list):

- 1) European Union and national marine policy documents and directives, including the Marine Strategy Framework Directive, Horizon2020 and Blue Growth EU Maritime Affairs;
- 2) the EMBRC Marine Training Portal (MarineTraining.eu), a centralized access point for marine training that has carried out a Marine Graduate Training Survey with the European Marine Board (EMB) Working Group on Marine Graduate Training of which some of the consortium members are members, and will produce a Future Science Brief;
- 3) analysis of other Master programmes;
- 4) non-academic stakeholder (industry) input.

The EU's blue bio-economy (all economic activities that depend on the sea) provides 5.4 million jobs and a gross added value of around €500 billion/year. Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. Seas and oceans are drivers for the European economy and have great potential for innovation and growth. It is the maritime contribution to achieving the goals of the Europe2020 strategy for smart, sustainable and inclusive growth. The Blue Growth EU Maritime Affairs policy highlights the need to develop sectors that have a high potential for sustainable jobs and growth, such as aquaculture, coastal tourism and marine biotechnology. The blue bio-economy will be driven by knowledge, requires legal certainty and security and sea basin specific strategies.

The European Marine Board Working Group on Marine Graduate Training: Future Science Brief (FSB) for building future marine graduate training programmes states the need “...to bridge the culture gap between disciplines, marine and maritime sectors, to create an interdisciplinary and adaptable workforce that can tackle holistic ocean issues, marine graduate training needs”, identifying the most promising segments of the marine and maritime sectors for marine graduate programmes and the need for innovative training, including transferable skills. It also highlights the importance of internationalization, with the need to coordinate and support mobility for training activities in search of an enhanced European training network in marine science, multidisciplinary sea-going practical training, removal of barriers to providing such training by for example: alliances with European Research Vessels Operators (ERVO), through programmes like Eurofleets or collaborative initiatives with RV operators, and the creation of national/European knowledge alliances or networks for exchange of learning/teaching practice, skills, quality assurances (QA) and standardization of training. It also promotes active partnerships between academia, policy and industry. It recommends best practice exchanges and co-design of training programmes between sectors, in the form of internships, work experience, practical training and invited lectures, and the inclusion of policy and industrial components in Master programmes.

Based on analysis of the information compiled on 482 Master programmes in the EMBRC Marine Training Portal (MarineTraining.eu), there are only 15 marine and maritime Joint Master programmes across Europe, of which nine are in the marine natural sciences area. None of these, however, cover the interdisciplinary area covered by IMBRSea. Furthermore, none of the five specializations that will be offered in the IMBRSea programme are clearly covered by any existing joint Master programme.

National needs analyses based on marine policy documents of different countries show that each country has its own national and even regional priorities/needs. For example the Regional Strategy for Research and Innovation of Intelligent Specialization for the Algarve region in Portugal (RIS3 - ALGARVE 2014-2020) aims to promote research and development (R&D) in marine sciences to increase our understanding of the sea, while (i) adding value to the economy of the sea, and (ii) better managing the natural resources associated to the sea. Blue bio-economy opportunities linked to the extension of the Portuguese continental platform to approximately 4,000,000 km² are identified, namely biotechnology and biomedical applications of marine living resources. On the other hand, the Portuguese national marine policy documents identify gaps and threats, especially in terms of lack of knowledge and training of qualified personnel for the development of the blue bio-economy. This point is also highlighted in feedback from industry. For example, in Norway, the seafood industry board has declared that there is a lack of students/graduates with multidisciplinary studies, and also a lack of students who have spent any time in a commercial setting. They worry that the next generation is not ready for joining the industry.

Furthermore, many problems facing the marine environment (e.g. climate change) are on a global scale, requiring a pan-European large-scale geographic approach. IMBRSea covers the four Marine Regions of the Marine Strategy Framework Directive: the Baltic Sea, the Black Sea, the Mediterranean Sea and the North-East Atlantic Ocean (including the Barents Sea and sub-Arctic) and the waters surrounding the Azores, Madeira and the Canary Islands. The diversity of ecosystems, problems and needs of these marine regions requires different approaches and solutions. Thus there is a need for flexible, adaptable, integrative students who have experienced a number of different learning environments, exposure to different ecosystems, cultures and languages.

From sources for job opportunities (see Annex 4) consulted in January 2016, 30 job vacancies in relevant marine sciences were attributed to the five Specialization Tracks that IMBRSea will offer. Marine food production covers 27% of the vacancies, Management of living marine resources 7%, Applied marine ecology and conservation 36%, Marine environment health 23% and Global ocean change 7% (see Figure 3). It is worth noting that all the five thematic specializations defined in the proposal are actively looking for job positions, highlighting the relevance of the training strategy of the project.

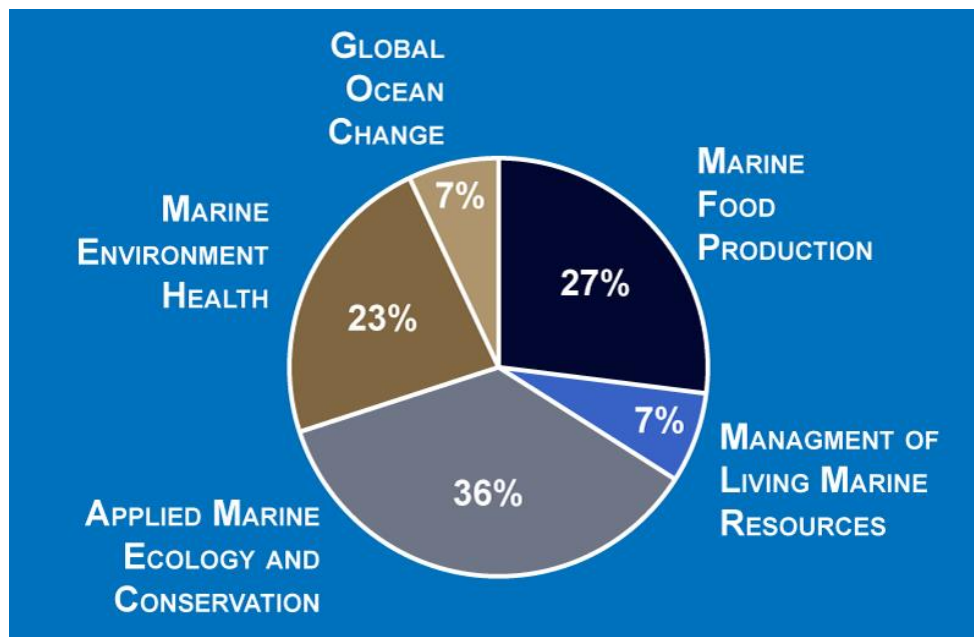


Figure 3: Relevant job opportunities for different Specialization tracks

An added value of the joint IMBRSea programme is the involvement of a broad network of key research institutes and universities. Five of the current EMBC+ universities (UGent (coordinator); UAlg, UPMC, UniOvi, GMIT) which have already proven their excellence in the highly successful EMBC/EMBC+ programme, will be joined by UiB, UNIPVM and UPV/EHU in the current consortium. The IMBRSea programme, however, will introduce the students to a considerably broader international network through its embeddedness in EMBC, leading to Professional Practices and Thesis work in a variety of environments. The IMBRSea programme will continue with the involvement of external lecturers (scholars), as well as with the exchange of IMBRSea lecturers. This possibility, supported by the Erasmus Mundus funding, enables the programme to invite the best lecturers and researchers from around the globe to teach particular aspects of the programme. National Master programmes in similar topics are running simultaneously in each of the universities of the eight main Partners. However, students who are looking for innovative methods in

teaching and challenging issues related to multidisciplinary approaches, are attracted not only by the mobility within the IMBRSea joint programme, but also by the clearly indicated interdisciplinary challenge. In other comparable, but local Master programmes there are also possibilities to spend a period of the study programme in another country by means of bilateral agreements and regular Erasmus Mobility grants. However, this mobility depends on the students' initiative, and well-structured tracks and support are lacking which often results in problems regarding the recognition of the obtained credits in the mobility university or insufficient integration pathways.

IMBRSea will provide essential components to acquire scientific knowledge, legal certainty and security in the blue bio-economy, primarily in regard to marine knowledge, maritime spatial planning and integrated marine surveillance (environmental data, monitoring, fisheries, pollution). It will train people to contribute to creating a common framework for maritime spatial planning and in the key sectors which have a high potential for sustainable jobs and growth including aquaculture and fisheries, applied ecology and ecotoxicology, and marine biotechnology. The new programme meets the recommendations and needs of the EMB WG Future Science Brief by developing active partnerships between academia, policy makers and industry. It will promote best practice exchanges and co-design of training programmes between sectors through internships, work experience, practical training and guest lectures. Policy, governance and industrial components will be included in the curricula. IMBRSea will offer innovative training, including compulsory transferable skills such as language training, boat handling and scientific diving. Through the EMBRC and IMBRSea consortia there will be creation of networks, opportunities to exchange learning/teaching practices, skills, quality assurance, and standardization of training. The link with EMBRC offers access to research vessels and mobile platforms/marine stations to provide multidisciplinary sea-going practical training which is essential for marine scientists.

Ecosystem-based management and assessment will become more important in meeting the climate goals Europe has signed up to. Oceans deliver multiple resources for renewable energy (e.g. tide and wave generators, algal biomass, space for wind-turbines). The planning and environmental assessment needed to transition to a C-neutral Europe depends on highly qualified marine graduates with integrated skills, cross-disciplinary knowledge, and applied real-world experience. IMBRSea addresses the main policy drivers identified by EMBRC as being of national and pan-European importance, based on documents in the public domain. The programme covers research themes that have been identified as currently being supported by EMBRC Partners, and which are considered to be important national and pan-European strategic research priorities in marine biology including biodiversity and ecosystem function, biogeochemistry and global change, marine products and resources.

The programme will enable students to acquire and advance their scientific knowledge and training through this active, modern and effective learning environment. This experience will enable them (during and after) to participate in actions such as the Good Environmental Status (GES) asked by the Marine Strategy Framework Directive (MSFD) and the objectives of other international and national strategies and policies, such as Water Framework Directive, EU Biodiversity Strategy to 2020, Integrated Maritime Policy, Common Fisheries Policy, Habitats Directive and OSPAR convention.

The IMBRSea programme will be attractive for students looking for university excellence, innovation and competitiveness. This is clearly manifested in the standing of the universities involved. UGent, for instance, now ranks within the top-100 worldwide based on indicators measuring research productivity and quality. The Shanghai Ranking as well has recognized UGent's research profile as the best in Belgium. The university was placed within the top 10 by the readers of *The Scientist* in their most recent list of best places to work in academia outside the US (<http://www.ugent.be/en/ghentuniv/presentation/rankings.htm>). Many non-European and European students will be attracted by the IMBRSea programme because of the integration of university excellence into a well-structured and ambitious EMJMD programme. According to their description and objectives, most of the identified Master programmes relevant to marine sciences are well established and offer a high quality education. We believe, however, that expanding the study experience to different institutions, each with their specific approach, offers a substantial added value, compared with regular national programmes. A survey carried out among the alumni of the EMBC/EMBC+ programme showed that 94% of the respondents consider studying at several universities as 'very important', an opinion that is shared by 60% of their current employers.

We envisage that EU financial support for this EMJMD will reinforce the attractiveness of the European Higher Education Area (EHEA) through the following innovative and challenging elements:

- 1) increasing the number of Partner Country students (via Erasmus Mundus scholarships);
- 2) enabling students to get training in areas of great relevance and importance for their national economies, development, health and well-being and developing a network of graduate ambassadors who can in turn promote the interest of new students from their home countries;
- 3) organizing long-term sea-going training activities across Europe (crucial for skills training and community building), providing the ideal format for “team science approach” in order to promote collaborative and cross-disciplinary approaches;
- 4) integrate students into the wider EMBRC network;
- 5) involving, in a more structural way, both Programme and Partner Country institutes and industry through internships and thesis research placements;
- 6) opening our knowledge and skills to a wider audience by providing online educational tools for marine sciences;
- 7) developing a clear strategy to communicate outcomes of the programme, and;
- 8) integrating international students within local communities.

Finally, EU financial support of this joint Masters programme is justified by the need for greater employability of graduates. In Norway for example, the seafood industry board has declared that there is a lack of students/graduates with multidisciplinary studies, and of students who have spent any time in a commercial setting. There is a clear need to improve quality and renew the training of future marine resources scientists. A crucial part of that is taking the aligned learning outcome approach to improve student learning, and improve the professionalism of our science teaching. The innovative structure and approach of the IMBRSea programme, involving different Specialization Tracks, student and teacher mobility, practical experience in industry during Professional Practices, and joint activities will produce graduates who will be better trained and more attractive to employers, helping to unlock the potential of marine living resources and contributing to biological and socio-economic sustainability.

A.1.4 The proposal defines the academic programme and learning outcomes of the EMJMD aiming to increase the attractiveness of the European Higher Education Area, and to foster excellence, innovation and competitiveness in terms of academic fields/subjects targeted.

What precisely are the main academic subjects on which the EMJMD proposal has been built? How relevant are they in the context of the academic discipline(s)/field(s)? What are the learning outcomes that the Master aims to achieve? What is new and innovative in your EMJMD proposal, and how does this contribute to university excellence and competitiveness in the targeted academic subjects/field(s)? How relevant are the expected project results in terms of strengthening innovation and excellence not only of the HEIs involved, but also of the European higher education in general vis-à-vis other regions and competitors in the education field? In which way does the proposal contribute to increasing the attractiveness and internationalisation of the European Higher Education Area?

Based on the objectives of the EMBRC consortium, IMBRSea covers a wide, yet consistent, range of subjects within the marine sciences and biological resources. With an emphasis on marine biological and ecological processes, the programme links biology of marine organisms and environmental studies with subjects in marine policy and planning. The subjects are covered through Thematic Modules in Specialization Tracks to prepare the next generation of scientists who need to understand the marine ecosystem functioning and conservation of biodiversity to work in biological resources exploitation and management. IMBRSea offers a unique combination of Courses, Annual Symposia, Professional Practices and Thesis subjects in an integrated program to learn how to develop blue biotechnologies in a sustainable way (see Annex 1 for a detailed view on the course offerings in each module).

Marine biological systems are complex, and understanding the processes and functioning for sustainable management requires a learning programme that crosses several academic disciplines. The Specialization Tracks through the Thematic Modules enable the students to work at the interface of biology, chemistry and physics, and to apply their knowledge to problems that have the societal dimension. By including multi-disciplinary aspects such as Marine policy and governance and spatial planning, the students will be prepared for the changing role of scientists in building Europe’s blue society. These academic subjects are at the confluence of a wide range of disciplines, both theoretical and applied, that must be integrated in order to provide students systematic understanding of how sciences can contribute to a better rational exploitation and protection of living resources within the evolving marine biosphere. This challenge is far beyond the possibilities of one particular university, and only a consortium of universities, already specialized in various fields of marine sciences, and collaborating to one unified formation can address this challenge.

The learning outcomes of the IMBRSea programme are defined consistent with the goals of the EMBRC consortium and aligned with the EMJMD objectives to offer an educational opportunity leading to a comprehensive understanding of the structure and dynamics of marine systems, integrating biological, physical and chemical components at different scales of organization. It includes a critical awareness of the factors affecting structure and functioning of marine systems in which living resources are studied, and a critical awareness on how scientific knowledge is applied to marine resources exploitation and management. The programme-level learning outcomes (LOs) are defined as below:

- LO.1 The graduated student possesses a broad knowledge at an advanced level in all basic aspects of marine sciences and can access, analyze and interpret scientific information;
- LO.2 The graduated student has acquired a scientific problem solving capacity to formulate and test hypotheses, to design research protocols, and to collect, analyze and interpret data;
- LO.3 The graduated student is able to apply appropriate theoretical and practical concepts in a professional context and, when required, identify and utilize opportunities for continuous professional development in response to emerging techniques, knowledge and challenges in the field of marine sciences;
- LO.4 The graduated student demonstrates an ability to integrate with, or lead multidisciplinary teams reflecting the breadth of the field of marine sciences and variety of professional roles;
- LO.5 The graduated student is able to communicate with peers, with various stakeholders in marine sciences, and with a general public concerning scientific concepts and research;
- LO.6 The graduated student is able to examine societal, environmental and policy concerns and consequently to apply the scientific method to match these demands with scientific challenges and opportunities.

These learning outcomes arise from the programme-wide activities; specifically on completion of the Fundamentals Module, the Professional Practice, the Joint School and Annual Symposia, and the development and completion of the Thesis preparation and research. Students follow individual Pathways through the Specialization Tracks, choosing among the different Thematic Modules containing individual Courses. Courses within the Modules have defined learning outcomes, but for clarity learning outcomes are defined for each Track below together with the associated opportunities for Professional Practices facilitating these LOs and further career options.

Marine food production

- LO.#Production.1 The graduated student understands biological principles of culturing marine organisms for food or products;
- LO.#Production.2 The graduated student understands vectors of disease/parasites and principles of managing marine animal health in culture;
- LO.#Production.3 The graduated student understands challenges and societal conflicts arising from increased production of food and products from the marine environment.

Professional Practice opportunities: national and international aquaculture enterprises in Norway, Chile, UK, Ireland, France, Spain, Greece, Portugal, Canada, Iceland, USA, China, South-East Asia; aquaculture disease management research and development (R&D) companies; seafood processing and technology sector; feed companies; regional planning offices (language dependent); non-governmental organizations (NGOs) working on certification for example Marine Stewardship Council (MSC), Aquaculture Stewardship Council (ASC).

Potential employment sectors: Graduates with this Specialization Track will be competitive applicants and attractive to employers for jobs in the aquaculture sector as employee or self-employed in production, managerial, sales or technical roles; in the seafood processing and technology sector; in national or regional planning offices (evaluation of site licenses); in animal feed/pharmaceutical and aquamedicine companies; for further veterinary training; with NGOs for food security, food safety and authenticity.

Management of living marine resources

- LO.#Management.1 The graduated student understands and is able to apply quantitative methods of population assessment, including survey methods, data collection, analysis, and assessment models;
- LO.#Management.2 The graduated student understands the ecological principles governing variability in marine resource availability and its sustainable exploitation;
- LO.#Management.3 The graduated student is able to identify the major stakeholders and the conflicts arising from exploitation of marine resources in Europe.

Professional Practice opportunities: national fisheries directorate/ministry, for example Food and Agriculture Organization (FAO), International Council for the Exploration of the Sea (ICES), secretariat or working and expert

groups; research laboratories (especially with EMBRC partners); national and international assessment and management agencies; trade associations; producer's organizations; NGOs and conservation lobbies.

Potential employment sectors: Graduates with this Specialization Track will be competitive applicants and attractive to employers for jobs in fisheries research (as scientist or technician) at national and international fisheries institutes; regional fisheries management boards; advising bodies to commercial fishing companies and associations; consultancy companies (e.g. development of fisheries management plans); environmental impact assessment; climate change effects, as database manager; fisheries monitoring; conservation; fisheries advisory bodies (at NGO or government ministry level); regional planning offices (coastal zone planning); mineral and oil exploitation companies; NGOs for food security, food safety and labeling, and authenticity; lobbying.

Applied marine ecology and conservation

- LO.#Conservation.1 The graduated student understands the principles of ecological interactions and how they shape the marine communities and their response to environmental pressures;
- LO.#Conservation.2 The graduated student is able to evaluate and assess anthropogenic impacts on marine ecosystems, services and resources, and to identify mitigation and remediation measures that can be taken on short and long terms;
- LO.#Conservation.3 The graduated student is able to implement restoration and conservation initiatives, together with the design and analysis of environmental monitoring schemes.

Professional Practice opportunities: national and international environmental consultancy companies (e.g. RPS Group, Fugro); offshore oil and gas sector (e.g. Shell, Statoil, Aqip); offshore marine renewable energy sector; NGOs; public sector; regulatory/statutory authorities.

Potential employment sectors: Graduates with this Specialization Track will be competitive applicants and attractive to employers for jobs in compliance/observer activities for offshore oil and gas companies, marine construction, dredging and pipe/cable laying; marine renewable energy sectors; NGOs; lobbying; marine spatial management/planning.

Marine environment health

- LO.#Environment.1 The graduated student knows the sources and response pathways of pollutant exposure for marine organisms;
- LO.#Environment.2 The graduated student can design and implement testing programmes with appropriate methodology for monitoring marine ecosystem health within the regulatory frameworks;
- LO.#Environment.3 The graduated student is able to apply molecular biology and biotechnology techniques to problems in ecotoxicology, water quality and to find remediation solutions.

Professional Practice opportunities: environmental consulting firms on impact assessment; research institutes working on ecotoxicology projects; regional water quality offices.

Potential employment sectors: Graduates with this Specialization Track will be competitive applicants and attractive to employers for jobs in environmental biotechnology; environmental monitoring; aquatic (eco)toxicology; environmental research; environmental consulting; environmental compliance inspections; governmental research institutions.

Global ocean changes

- LO.#Futureseas.1 The graduated student understands basic physical, geochemical ocean system dynamics;
- LO.#Futureseas.2 The graduated student is able to identify processes involved in local and regional changes for zones that are particularly affected by climate change, such as the Arctic Ocean and the Mediterranean-Atlantic biogeographical transition zone;
- LO.#Futureseas.3 The graduated student understands the main drivers affecting at all scales the marine biodiversity, and is able to tackle the key challenges to diminish threats on evolving marine species and communities.

Professional Practice opportunities: participating in research cruises with government research institutions; environmental departments of international ports; climate study foundations/institutes (e.g. Nansen Environmental and Remote Sensing Centre, British Antarctic Survey); environmental consultancy companies; international organizations (e.g. World Health Organization (WHO), ICES, FAO) and bodies promoting global ocean studies (e.g. UNESCOs Intergovernmental Oceanographic Commission (IOC)).

Potential employment sectors: Graduates with this Specialization Track will be competitive applicants and attractive to employers for jobs in modelling in environmental consultancy companies and government research institutions;

data management in research projects; scientific or technical roles in geophysics and climate related institutions (e.g. IOC, ICES).

Additional opportunities to enhance the graduate's employment profile are built into the programme. The Joint School and Annual Symposium will be utilized to host special Courses for students to train for specific skills and accreditation which will increase their attractiveness for potential employers. Such Courses include the training leading to Federation of European Laboratory Animal Science Associations (FELASA) certification for working with animals in laboratory and field experiments, scientific diving, blue biotechnologies and business opportunities, or advanced quantitative methods. This last course consists of activities enabling students to understand, compute and implement advanced methods used for statistical data analyses, including large datasets and modelling of marine systems. In the first preparatory and promotion/awareness-raising year, EMBRC will reach its implementation phase, which will lead to a concrete and extensive list of Professional Practice and Thesis research opportunities.

IMBRSea merges two fields of sciences traditionally separated, marine biology from genes to population levels, and marine environmental sciences within a single programme, emphasizing the link between what occurs at the molecular level and the physical world. The objective is to form new specialists who can realize the potential of a sustainable blue bio-economy. One of the major additions is the capacity of the consortium to incorporate evolutionary sciences in the field of biological oceanography, understanding the role of the marine environment in the diversification and selection of life forms in the oceans. Furthermore, IMBRSea will integrate academia, industry and societal stakeholders to produce graduates that will have an extensive understanding of the potential of marine resources. For Europe to deliver on Blue Growth and to realize the potential of a sustainable blue bio-economy, skilled marine graduates are required with a specialized knowledge on marine systems. This required an increased involvement of non-educational actors (both in academic and non-academic research and application).

To the knowledge of the consortium, there is no equivalent Master programme in the world. Even the largest formation in the academic field of marine sciences, the Massachusetts Institute of Technology / Woods Hole Oceanographic Institution joint graduate programme in oceanography, applied ocean science and engineering (<http://mit.whoi.edu/>), does not offer such a large spectrum of Courses, skills and knowledge. In addition, based upon EMBRC, the IMBRSea programme challenges students in high tech research, and offers unique access to the major marine research centers across Europe, and thus to a very wide range of marine organisms, ecosystems and biotopes in all latitudes of the Northern hemisphere. Because of its implementation in both EU spaces of education and research, IMBRSea emphasizes the international aspects of marine sciences challenges in the most concrete manner. It offers, through the EMBRC network of partners, opportunities for students to interact with industrial partners and stakeholders, in all fields of marine sciences.

Since 2008, the EMBC/EMBC+ programme has attracted more than 370 Master students from 53 different nationalities, of which 23% came from outside EU countries. EMBC/EMBC+ has therefore proved the attractiveness of the scientific fields and prior consortium within the more narrow field of marine biodiversity and conservation. The IMBRSea programme should even have an increased global attractiveness by encompassing a wider variety of thematic areas embedded in EMBRC, with strong links with non-academic partners. To support and enhance attractiveness, taking advantage of the different EU platforms attached to it, IMBRSea will also set an increased advertising capacity.

A.1.5 The proposed EMJMD consortium is highly relevant with regard to internationalisation in higher education and has been designed to maximise the benefits of student and staff mobility.

How will the EMJMD support in concrete terms the internationalisation of European higher education? How will the EMJMD bring positive and long-lasting effects on the participants involved? How will students and staff improve their learning performance and competences linked to their professional profiles? In which way will the EMJMD enhance e.g. intercultural awareness, foreign language competences, and other horizontal skills?

The IMBRSea programme holds concrete structures that support internationalization of European higher education. IMBRSea follows the successful first generation Erasmus Mundus Master courses (EMMCs), where institutional cooperation proved successful in promoting the international dimension in the participating HEIs. The best achievements resulted from approaches that included a joint programme design and the inclusion of non-academic organizations in the programme design, management and implementation (EACEA synthesis report 2013 cite as EU, EACEA 2013 DOI: 10.2797/26992). IMBRSea is a new programme benefiting from the experience gained in delivering the EMBC/EMBC+ programme, specifically designed to take a multidisciplinary approach in marine

education. The new programme will enhance internationalization, and improve learning and employment outcomes through the support mechanisms already in place at the participating institutions.

Firstly, internationalization is achieved through the institutional cooperation that makes it possible to award a joint degree diploma, accredited in all the Partner university countries. The programme requires that the students study in at least two different European countries, following a balanced integrated programme based on the European Credit Transfer System (ECTS), which leads to a diploma signed by all Partners. The programme requires at least two study periods in two different HEIs in two different countries. However, it can support more mobility if the Pathway chosen by the students according to their professional project requires it. Secondly, benefiting from the EMBRC distributed infrastructure, multiple opportunities for student mobility between Partners and Associate Partners are offered. Professional Practices in Associated Partner institutes or linked industries are a significant part of the IMBRSea programme, and further support internationalization, including at the employability level. The costs associated with Professional Practices will be regulated within the consortium agreement, providing equal opportunities for mobility.

The consortium will convene a Programme board to ensure quality and consistency of learning outcomes and achievements across all the Partners, increasing the confidence of participants in the fairness of treatment and (perceived) value of the experience. The IMBRSea programme is focused on bringing positive and long lasting effects for participants, both students and (Associate) Partners, both academic and non-academic. Participation in the programme increases the exposure both for students and staff, and hosts to new experiences and cultures. The programme level activities of IMBRSea will help students to build a large international peer network, supported by scientific innovation and research, which has a strong potential to have positive and long-lasting effect on their immediate employability and future career. EMJMD alumni show higher participation in professional networks and face lower unemployment (EU 2014, DOI: 10.2766/75468, <https://esn.org/erasmus-impact-study>).

The programme will make use of the extensive online training platform MarineTraining.eu, hosted by EMBRC. This platform aims at becoming one of the major international accesses to marine educational components, hence increasing visibility and collaboration opportunities. In this sense, it will also support a database and a forum platform for the IMBRSea alumni, where surveys and follow-up of career development can be tracked. Alumni can use this opportunity to build a network including non-educational and non-academic Associate Partners to enhance employability across Europe and worldwide.

IMBRSea Partners are committed to delivering improved and effective teaching and learning practices. The programme is structured to enable students and consortium staff to improve their learning performance and competences linked to their professional profiles. Compulsory mobility is instrumental to the learning outcomes and to the success of the programme. Tremendous added value accrues since these learning outcomes are gained in Specialization Tracks at Partner universities of excellent expertise and where, through mobility, students gain different skills reflecting the geographic and socio-economic environment of their host universities. Both new and experienced lecturers will benefit from working in teams to develop the programme-level learning outcomes, learning activities, and aligned assessment methods, especially for the Fundamentals Module. This professional development will contribute to improvement in personal competence and teaching and learning quality. Through the adoption of newer educational practices, including active learning modes such as problem-solving exercises, journal clubs and team-based learning, which have been shown to improve student learning and knowledge retention. The Partners cooperating in the development and delivery of the programme will improve their teaching practices, enhance performance and competence, and will contribute to improving higher education across Europe.

Students who complete the IMBRSea programme will benefit in more than purely academic measures. The programme encourages enhanced intercultural awareness, which comes as a direct result of the mobility requirement - moving to another country and interacting with the general population. The network of different Partners links all of Europe from South to North, cutting across cultures to provide a diversity of experiences. Upon completing the programme, the students will have experienced a learning environment of multiple cultures and languages in the background. English is the language of science, science communication, and science policy. The ability to work professionally in English is needed for European competitiveness at a global scale. Students are immersed in English through active learning methods which include reading, writing, and oral presentations. They gain competences and confidence using English in a scientific and professional setting during the Professional Practices, Joint Schools, Thesis preparations and Annual Symposia. Within the curriculum there is an emphasis on critical reading, quantitative assessments, writing and other presentation skills, researching information and evaluating literature sources. There is also an opportunity for students to gain foreign language competences within a formal course setting.

Glossary

Annual Symposium: Common series of events, marking the end of each academic year, particularly hosting Thesis defense sessions for 2nd year IMBRSea students who have completed their Master Thesis and hosting a professional fair and training to enhance employability.

Associate Partner: Academic or non-academic Partner of the IMBRSea consortium that contributes to the programme next to the eight Partners.

Blue growth: Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole to achieve the goals of the Europe2020 strategy for smart, sustainable and inclusive growth.

Coordination office: Secretariat at the coordinating Partner supporting administrative matters concerning IMBRSea.

Course: A set of comprehensive classes about a particular topic as a unit of delivery of content, awarded by a number of credits (ECTS) after successfully completing the Course.

Examination board: A board of representatives of multiple Partners responsible for the assessment and evaluation of IMBRSea students and advising to the Programme board.

External advisory committee: A committee of external stakeholders advising to the Programme board on various matter concerning IMBRSea.

Fundamentals Module: Set of common core Courses providing the fundamental prerequisites to the Thematic Modules, it is delivered in the first semester by core Partners of the programme.

Joint degree: The diploma of the programme graduate is recognized and signed by all involved Partner universities of the programme.

Joint School: A set of practical Courses taking place in one of the EMBRC marine stations and being attended by all students of the programme.

Local secretariat: Local secretariat at each of the eight Partners supporting local administrative matters concerning IMBRSea.

Partner: One of the eight Partner universities of the IMBRSea consortium (UGent, UAIG, GMIT, UniOvi, UPMC, UiB, UNIVPM, UPV/EHU).

Partner Country: These countries can take part in certain Actions of the Programme, subject to specific criteria or conditions.

Pathway: A specific Pathway of Courses chosen by a student at the beginning of her/his curriculum. The choice is assisted by an online Pathway selection tool. Pathways are based on defined Thematic Modules in Specialisation Tracks but allow students to emphasize certain skills according to their Professional Practice, Thesis research project and career plans.

Programme board: A board of representatives of all Partners responsible for all programme matters of IMBRSea.

Programme Country: These countries can fully take part in all the Actions of the Erasmus+ Programme. In the case of this proposal, the Programme Countries are Belgium, France, Portugal, Spain, Ireland, Italy and Norway.

Professional Practice: A six weeks work placement or internship in a non-academic Associate Partner institute or industry.

Selection committee: A committee of representatives of multiple Partners responsible for the selection of students applying for the IMBRSea programme and advising to the Programme board.

Specialization Track: A logical organization of Thematic Modules leading to a career/subject/educational specialization. Each Specialization Track achieves specific learning outcomes in the IMBRSea programme.

Student board: A board of representatives of the IMBRSea students advising to the Programme board.

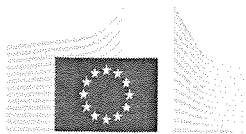
Thematic Module: A set of Courses delivered by one Partner university on one specific field of marine sciences.

Thesis: The formal report of the research performed by each student in the end of her/his curriculum, evaluated by a jury in order to complete the formation and obtain the diploma of the International Master in Marine Biological Resources.

Track: See Specialization Track.

List of abbreviations

AB	External Advisory Board
ASC	Aquaculture Stewardship Council
CO	Coordination Office
EACEA	Education, Audio-visual and Culture Executive Agency
EB	Examination Board
ECTS	European Credit Transfer System
EHEA	European Higher Education Area
EMB	European Marine Board
EMBC/EMBC+	International Master in Marine Biodiversity and Conservation
EMBRC	European Marine Biological Resource Centre
EMJMD	Erasmus Mundus joint Master Degree
EMMC	Erasmus Mundus Master Course
ERVO	European Research Vessels Operators
ESFRI	European Strategy Forum for Research Infrastructure
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FELASA	Federation of European Laboratory Animal Science Associations
FSB	Future Science Brief
GES	Good Environmental Status
GMIT	Galway-Mayo Institute of Technology, Ireland
HEI	Higher Education Institute
ICES	International Council for the Exploration of the Sea
IMBRSea	International Master in Marine Biological Resources
IOC	Intergovernmental Oceanographic Commission
LO	Learning Outcome
LS	Local Secretariat
MSC	Marine Stewardship Council
MSFD	Marine Strategy Framework Directive
NOKUT	Norwegian Agency for Quality Assurance in Education
Non-HEI	Non higher Education Institute
PB	Programme Board
SB	Student Board
SC	Selection Committee
UAlg	University of the Algarve, Portugal
UGent	Ghent University, Belgium
UiB	University of Bergen, Norway
UNESO	United Nations Educational, Scientific and Cultural Organization
UniOvi	University of Oviedo, Spain
UNIVPM	Polytechnic University of Marche, Ancona, Italy
UPMC	University of Pierre and Marie Curie, Paris, France
UPV/EHU	University of the Basque Country, Plentzia, Spain
WG	Working Group
WHO	World Health Organization



Brussels, 13. 07. 2016
EACEA/A3/KH/ (2016) 574482

Professor Anne De Paepe
UNIVERSITEIT GENT
SINT PIETERSNIEUWSTRAAT 25
BE - 9000 GENT
Belgium

**Subject: Erasmus+ Key Action 1 – Erasmus Mundus Joint Master Degrees (EMJMDs)
Call for proposals 2016 (EAC/A04/2015)**

Title: International Master in Marine Biological Resources

Ref.: 574482-EPP-1-2016-1-BE-EPPKA1-JMD-MOB

(Please quote this number in all correspondence)

Dear Professor Anne De Paepe,

You have submitted an application to the Erasmus+ programme, 2016 call for proposals for the Action specified above. The call for proposals closed on 18 February 2016. The Education, Audiovisual and Culture Executive Agency (EACEA) received **89** eligible applications for this call.

I am writing to inform you about the selection decision taken by the Head of Department of the Executive Agency, acting in her capacity as authorising officer, based on the recommendations of an Evaluation Committee assisted by external experts, who had assessed your application against the award criteria specified in the call for proposals. The selection decision is based on the quality of the proposal, its relative position in comparison with the other proposals submitted and the budget available. Applications were assessed on a scale from 0 to 100 points and were ranked according to merit.

As a result, given the available budget, the funding threshold has been set at **78/100 points**.

I am pleased to inform you that your application has been selected for EU co-funding. It received **84,5/100 points**. For your information, out of the 89 eligible applications, **27** have been selected for funding, and **3** have been placed in a reserve list.

The list of all selected projects will be published on the following website of the Executive Agency when all applicants have been notified about the selection results:

http://eacea.ec.europa.eu/erasmus-plus/selection-results_en

Attached to this letter you will find an evaluation report based on the opinion of the external experts. Please take into account that most of the evaluation reports were written by non-native speakers. The Executive Agency will not elaborate further on these assessments.

The maximum amount of funding to be awarded to your project is **2.858.000 EUR**.

Please note that taking into account the total number of scholarship requests received and the budget available, the number of scholarships you have applied for has been revised and corresponds to **45 Heading 1 EMJMD scholarships (11 Programme Country + 34 Partner Country), 10 Heading 4 EMJMD scholarships** and **3 EDF EMJMD scholarships**.

The process of awarding a grant can only be finalised once the Executive Agency has received and validated the **Bank Account File (BAF)** as requested in Annex 2. The BAF must be submitted within a period of 10 working days from the date of receipt of this letter and be sent to the functional mailbox:

EACEA-EPLUS-EMJMD@ec.europa.eu

In addition, your organisation's data and your **Participant Identification Code (PIC)** need to be validated before the Executive Agency can grant you EU-funding (see Annex 3). In case your organisation holds a validated PIC, the PIC validation process is not relevant for your organisation.

Furthermore, it is very important that you provide us with the link to your EMJMD project website as soon as this is available, so that this link can also be published on the Executive Agency's website. If you have amendments to make to the project description after publication, please let us know via the above-mentioned EMJMD functional mailbox.

The Executive Agency organises a kick-off meeting for newly selected projects every year. We would like to inform you about the organisation of the 2016 EMJMDs Coordinators' meeting, which will take place in Brussels during two consecutive days around mid-November. Your travel and accommodation costs should be covered from the project management lump-sum, subject to the signature of the Grant Agreement. Please note that for organisational reasons we cannot allow the participation of more than two representatives of your project. A full programme of the event and practical information will follow in due time.

This letter does not represent a financial or legal commitment of the Executive Agency. The offer of an award is confirmed only when the legal representative of the Executive Agency signs the Grant Agreement associated with this application.

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

Yours sincerely,



Klaus HAUPT
Head of Unit

Annexes:

- Annex 1: Evaluation report – Comments from the external experts who assessed your proposal
- Annex 2: Bank Account file: Financial Identification Form (FIF)
- Annex 3: Information for applicants about PIC validation process (if relevant)

Cc: (by email) **Dr. Tim Deprez**
tim.deprez@ugent.be

Proposal number:	574482-EPP-1-2016-1-BE-EPPKA1-JMD-MOB574482-EPP-1-2016-1-BE-EPPKA1-JMD-MOB
Proposal title:	International Master in Marine Biological Resources
Applicant organisation:	UNIVERSITEIT GENT
Contact person:	Tim Deprez

Award Criteria	<i>Score:</i> 84,5/100
A.1 Relevance of the project	
<p>The proposed EMJMD is a follow up of an existing international master of science in marine biodiversity (running since 2008) which has been upgraded and newly oriented following the EU Blue Growth strategy. The proposed training program in the thematic field of Marine Biological Resources is organized in an integrated way, offering a balanced curriculum combining jointly developed education modules. This well-prepared, thorough proposal comes from a consortium of eight Universities, five of which have a substantial history of cooperation in marine research and education, so there is confidence in their successful interaction. There is a formidable array of potential associated companies, agencies and organisations which all belong in European Marine Biological Resource Centre network (EMBRC), who's support letter is included.</p> <p>The program they put forward is very comprehensive, multidisciplinary and intersectoral. The principal objectives are highly pertinent to the overall policies of the EU in this field, as reflected in five central themes from which the students can choose their particular area of interest. It is intended that the final output will be personnel with appropriate knowledge and related skills and with the appreciation of other complementary fields.</p> <p>The program has a high degree of integration in the overall design and structure both from the academic and administrative point of view. The selection and the evaluation of the students are done via standardized procedures agreed with all the participant universities. All the activities, course construction and delivery, student recruitment, quality control and management in its various manifestations are joint actions. The proposal promotes mobility of students offering study paths via eight European HEIs. Students can undertake projects and internships at associated partners and industry. The commitment and the roles of actors are clearly presented. The proposed managing scheme and the role of the partner institutions are adequate for the effective implementation of the joint program.</p> <p>Several fundamental components of the master are jointly implemented by full and associated partners, whilst specialisation occurs at the leading-edge institution recognized for their added value in the specific area. Support structures are embedded to support successful integration. Set against this, there is concern that the structure and necessary organisation is complex and would be challenging. Some of the interactions with associated partners seem unrealistic. The students would spend significant amounts of time with at least four partners and associated partners: the year cohort would be fragmented, only coming together in a few joint schools.</p> <p>The curriculum has been jointly built by the consortium and it would be merged in the degree catalogues of partners since it is based and supported by accredited national master programs presently running in the partners' institutions. In addition to the national masters, the IMBRSea is also based and supported by a previously funded international master of science in marine biodiversity.</p> <p>It is not made sufficiently clear what the award will be: The application states that the program would result in an Erasmus Mundus Joint Master Degree: "International Master in Marine Biological Resources" which is not yet accredited. Also accredited national Master degrees are mentioned in the Application form. However, the legal governmental regulations of the countries involved in the program allow the award of a joint degree, therefore the consortium is confident that a joint degree would be delivered to successful students enrolled in the program.</p>	

The importance of marine science is of long standing in the EU. Proper conservation of this environment is critical for a number of major economic and environmental reasons. An in depth needs analysis has been conducted based on the EU and national marine policy directives and legislation. Investigations have also been made towards companies in the field. A gap does exist in the training of qualified personnel for example in the development of blue bio-economy. The seafood industry in particular, has a need for students having also a commercial background. In order to address the various identified needs, the program includes 5 specialisations responding comprehensively to those needs. Across Europe and indeed throughout the world, there are many courses at various levels dealing with the marine environment in some way. This partnership has carried out a thorough analysis of this provision in the context of several international reports on the future personnel requirements in numbers and skills.

The attractiveness of the new EMJMD is based on the previous EMMC and the cooperation with EMBRC. Also an improved marketing plan showing how the new students are reached is provided.

The academic program has several elements that would certainly increase EHEA attractiveness. The cross-disciplinary approach, the structural link with relevant stakeholders from the public and private sectors as well as the implementation of on-line educational tools would raise the competitiveness of the program. Also, in terms of employability, the five thematic specialisations proposed within the program are indeed the ones for which employers are seeking candidates. An accurate examination of the outcome of the previous international program in term of graduates origin and employability would have helped to gain insight into the real perspectives of this new program

The proposed EMJMD complies with the demand for highly qualified personnel in the blue biotechnologies in order to boost innovation and foster scientific excellence in the EU and in the thematic field. This is strengthened with the international associate partners of EMBRC consortium and diverse facilities. The learning outcomes are very well articulated, divided first into the very impressive general competences that the student is expected to acquire and then sub-divided into the more specific skills and knowledge that might be acquired through the different thematic areas. The consortium is so large and well connected that, so long as the individual student needs are attended to, there is every likelihood that the environment would challenge and foster innovation, and through this, be both attractive and competitive. The scale of this organisation should be attractive from a non-European perspective.

The competitiveness of this EMJMD program is presented against several corresponding study paths. There are, according to the Application, already 15 marine/maritime JMDs in Europe, some of them partly overlapping with this application, but none of them have the interdisciplinary approach offered by IMBRSea covering the focused specialisations domains. However, looked at from the perspective of the individual student, they cannot avail of all the options. The content does capture, however, all the skills and competences required for career development in this field. Further, the contacts, which this consortium has established with the main organisations operating in the area, do constitute an advantage for the student.

The consortium is very well connected in Europe, although it is questionable how realistic active interactions are with up to 80 institutions. Surprisingly, no non-European organisations are included. There is also a long list of potential guest lectures/visitors, including scientists from the Antipodes and North America. The program is truly international in terms of institutional cooperation and diploma awarded. In addition, the extensive use of an online training platform could increase visibility and opportunities for collaboration of both students enrolled in the program and teachers.

Since the consortium has a good European orientation in terms of student selection and associated partners, the aspects of cultural awareness and linguistic performance has been taken into account; language modules give credits. Students could benefit from a mobility scheme, which would develop their intercultural awareness by experiencing different learning environments. The teaching language would be English but local language courses are available at the host institutions. A stronger language policy should be however adopted by the consortium.

The student mobility is a core issue and well described in this application. Staff involved in the program would take advantage of the common events like the Joint School and the Annual Symposium to discuss new educational paths and strengthen links with stakeholders, in particular from the private sector. The clear mobility plan for scholars is included in the Consortium Agreement draft, which is very positive. Thus, there is likelihood of a meaningful mobility and international exposure, certainly by the students and staff in the context of training, and hopefully, in research collaboration.

B.1 Quality of the project design and implementation

This Masters program offers an impressively wide selection of specialities based on a comprehensive initial series of fundamental modules. The offering of the academic content is described in the application in a very clear and sufficient way. The topics and their execution are relevant to the program. The program is also impressive in using a variety of pedagogical approaches; a particular focus is made on problem-based learning. This wide range of teaching and learning approaches, both passive/traditional and student-centred, would maximize student participation and optimize their talents. "Learning by doing" approach can be intimidating at first but does eventually produce a more skilled and versatile product. The assessment mechanisms are also interestingly varied (continuous assessment, terminal examination, reflecting personal and professional development portfolio...) and give the students the best opportunity to display their skills.

The consortium has already built a convincing internal quality assurance cycle, which clearly describes the thorough and continuous evaluation methods for monitoring the quality of the program. It also provides a framework for improving and upgrading actions with a schedule allowing early implementation of any changes, which is very positive.

In particular external evaluation would be performed every two years by an external Advisory Board that has access to these internal evaluations. However, there is limited information on what data is to be used as the basis for these evaluations. It is unclear whether this Advisory Board has independent external membership which would ensure optimal analysis of the program and appropriate implementation of necessary change. The members of such a board should have been indicated for a better understanding of the overall evaluation process.

Compared to this multilevel internal monitoring, the genuine external evaluation is disappointing: "program would be reviewed periodically every 6 years by an EQAR-registered accreditation agency leading to a published decision" without any clear plan for corrective actions.

The organisation of the student mobility is well defined and its importance to the course objectives is clearly presented. It also allows students to have different degrees of mobility as befits their interests; they have the opportunity to perform their studies in at least two partner universities and to visit up to four additional locations where common activities (annual symposium, joint school) or professional training take place. However, there is a significant danger that the cohort could lack collegiality, and with it a degree of mutual support and stimulus. The whole cohort is splintered, coming together relatively infrequently and for short periods: not even a common initial induction phase for the whole group is apparent. This seems to run counter to the need to establish good future networking between professionals in the field.

The effective involvement of the guest lectures from industry and academic world is an essential part in the application; e.g. there is given 20 named international experts to select for one teaching module in Annex 6. There are also budget costs of 12 000€ related to guest lecture mobility, which is very positive. Because of the structure and joint nature of some modules, the opportunity for staff mobility and interaction is optimal. However since the student group is together for only short periods, this scholars' program could be compromised by time- flexibility, and exposure to these scholars might be variable.

The proposal explains in detail all relevant information provided to all students and academic staff prior to course enrolment via the extensive information package of IMBRSea program. The services offered in terms of support for accommodation, language training (Portuguese, Basque language, Italian, Spanish, Dutch, German, Irish, French, Norwegian, and English.), administrative formalities, and insurance (Annex 12) are also presented comprehensively. However, it is not made clear if students have access to a travel insurance covering their mobility during their studies. There is no centralised introduction session, but each partner university is committed to provide services and information to incoming students and lecturers through its specific support services, and that might differ between partner institutions. Thus it is constructive that a central coordinating officer attends each of the inductions at the different HEIs to demonstrate consistency across the partners.

The draft of EMJMD IMBRSea Student Agreement presented in Annex 8 covers fully the aspects of student's rights and obligations. It describes program regulation, including the management of the scholarship and is signed by each student. Also during the academic induction a representative of the coordinating office meets all the students and explains their rights and obligations from the academic, administrative and financial point. Each HEI is responsible for assessing its own courses but there is a general framework agreement which ensures there is consistency across the program. Thus the application gives outlines of the course rules and presents grading conversion table, which again states

clearly, that the students are following the local procedures. There is a very full compendium of activities designed to integrate the students not only into their local cultural milieu but also into their professional environment. This not only includes guest lecturers from local institutions and professional bodies but also site visits e.g. to the marine stations and participation in job fairs. Internships (12 ECTS) would also be available in a variety of non-academic institutions. The proposal outlines convincingly the several interaction levels and occasions between the proposed EMJMD and non-educational actors in course planning, implementation and evaluation. This is a positive aspect. The non-educational sector is to also participate actively in other joint activities and offer internships and thus be more closely integrated into the program. This would allow students to develop a professional portfolio which would be beneficial for their future employment.

B.2 Quality of the project team and the cooperation arrangements

The proposal addresses a wide field at many relevant and interacting aspects. The consortium represents well the various components of the area and therefore there is a good complementarity across the program, together with a constructive amount of overlap. This has been instrumental for the construction of the 5 program tracks proposed. Five of the applicants have a strong common history of several Erasmus projects. The IMBRSea is now enhanced with three new participants and fourteen associate partners covering all the regional Seas of Europe. This allows for a well-rounded acquisition of knowledge, and competences such that the students whilst becoming experts in certain disciplines are alerted to consequences in others. A single institution cannot deliver this degree of coverage.

The proposal describes adequately the institutional commitment of full partner organisations by signed mandates and substantial support for the program. The application specifies their roles and tasks in the EMJMD implementation well, and outlines convincingly the administrative rules and regulations as well as working mechanisms of the governing bodies and management tools. The program's working mechanisms are thus well defined. However the role of the non-educational associated partners (11) is small and limited to offering guest lectures, field trips and internships. They are participating only in the Program Board via two invited members. Offering more management duties to these participants would make their input more beneficial to the program. Also, the external advisory board would benefit from some knowledgeable members of the field but who are independent of the consortium. It is not clear why this board should only meet once a year - it might be too late to introduce any corrective measures.

The proposal describes comprehensively appropriate actions and requirements in terms of the joint criteria for student application, selection and admission with good elements such as a single online application tool and single Selection Committee. A program board and an examination board have defined a joint framework for examination and student evaluation. All the regulations are indicated in the student's agreement at the beginning of the study program. Overall an equal treatment of students would be achieved among partners. Each institution is responsible for assessing the modules it manages, so the student examination and performance evaluation is done by joint criteria only in two occasions during the study path: the reports of the Joint School and the Thesis. It would be useful for external members from one partner to attend the examination committees in another. This would ensure consistency in the evaluation of performance. The consortium has utilised their experience and the figures provided are based on actual costs of activities organized in previous years in the context of the EMBC+ program. However the students' participation costs are not clearly indicated.

Annex 11 provides a good description on how the financial resources are to be mobilised, allocated and managed within the partnership, but the final overall budget is not completely described.

Potential complementary funding and its distribution are discussed in a very limited fashion, which does not benefit the application.

B.3 Impact and dissemination

The proposal explains how the structure and activities have changed to reflect the current level of income. Some of the restrictions such as staff mobility are not positive. The proposal poorly addresses a mid/long-term development/sustainability strategy based on branding the program on the shoulders of former EMBC and EMBC+ programs. The opportunity of a substantial contribution to the project sustainability from the socio-economic world is not adequately explored. The application describes organisational visions for reaching self-paying students and reward grants but without the necessary accuracy and concrete actions for mobilising other funding sources like corporate scholarships. In addition, the opportunity of offering several courses within the program as continued professional training, as an additional funding source, is not foreseen. So there is limited information or projections

as to how the program would operate in the absence of EU funding. Having a long history of international cooperation, the applicants provide a convincing review of the very positive measurable as well as immaterial impacts of the proposed program at institutional and international levels. More interestingly, continuation of the program is extremely important for the visibility of European Marine Sciences higher education. The consortium is willing to continue its activities and increase its strategy by participating in the design of the roadmap for marine education in Europe both at the level of graduate and continued professional training. The partner HEIs offer relevant training for developing the sense of initiative of the graduates and the curriculum contains several courses and events for improving student's competencies and skills for future entrepreneurship. The consortium is well aware of the necessity of training students for competition in the job market. Some of the activities planned with the non-academic associated partners such as the joint school which contains formal training in entrepreneurship as well as the professional practice module would provide students with a first approach to the marine scientific and professional world. The involvement of the non-academic partners in the design and implementation of the program are positive attempts to introduce a business mind-set in the students.

The promotion/dissemination methods and awareness-raising strategy of the program via the networks of the partner organisations towards target groups is described adequately. All the partners are involved in this activity and a guideline on how to present news and outcomes from IMBRSea is to be developed. There is a comprehensive collection of methods put forward by which the activities and outputs of the consortium would be disseminated. All the partners are encouraged to participate in various appropriate ways but there is no clear allocation of specific tasks or activities. The appointment of a specific communications manager is constructive. The application presents this strategy as a marketing tool for attracting excellent students worldwide. Also promoting this strategy to best available technique (BAT) status, is a positive goal.

However the strategy to address the industrial stakeholders is not adequately developed.

The IMBRSea program plans to encompass the principle of Open Access and Open Science which are an essential part of knowledge creation and sharing and support the need for greater impact and optimum dissemination of research. The application gives several positive concrete actions toward this goal.

C. Relevance of the project in the targeted region(s)

Since the marine environment is a global issue the consortium well argues the interest –and almost the necessity- of setting up cooperation with HEIs or other bodies from the targeted regions. The consortium has already a wide and solid network in the targeted area via their previous cooperation projects with relevant research and monitoring stations throughout the world. The programme has received applications from and allocated support to students from a wide variety of countries.

These associations would promote the circulation of information about the programme and facilitate applications from appropriate students. They can also be the source of information about applicant qualifications; in particular the IRBSea alumni would be instrumental to attract students from those regions and they would help to disseminate the programme.

The important added value for the consortium is the access to marine biological resources, which would not be accessible without cooperation agreements. So, the cooperation with participating organisations in targeted areas is described adequately in concrete task and collaboration level. Although the interest and need towards marine biology in the areas is well covered, the methods and actions to attract students are vaguely described.

Overall comments

This proposal covers most aspects of marine resources, an area of traditional importance to the EU, and is aimed at increasing the visibility of European Marine Science internationally. The Masters curriculum would certainly provide good intersectoral interactions and appropriately- trained human resources to meet future challenges in the field. A need analysis has been performed clearly, indicating on the one hand the lack of qualified personnel in specific areas, and on the other hand the existence of several European master degrees in the field that do not respond to the market need. This program is therefore intended to fit this gap. The proposed program consortium has a wide and functional network, involving more than 20 stakeholders from all over Europe. As this proposal is the follow up of a previous European master program it would have been interesting to present the outcome of the previous experience in terms of number of graduates, origin and actual career development.

The quality of the consortium composition and management is good and their geographic distribution

allows the implementation of training activities on all European Seas. There is a very high degree of “jointness” in the design and delivery of the courses and in the many aspects of management from recruitment to joint degree. However, the organisation of the joint modules does not make for a cohesive, collegial cohort of students since they are splintered throughout the consortium.

The program is to be properly monitored by internal and external evaluation bodies, with an expected improvement over time. Despite the unquestionable competence of the participants, the limited participation of industrial partners in management is detrimental. An international outlook for the program is essential to making the additional award relevant. Collaboration with institutions from the target regions has a meaningful added value for the consortium training and research activities. Students from those regions are already attracted by the European education in the marine field and by this action. However, internationality outside of Europe is limited to a few guest lecturers/visitors, which may limit student contact due to the high degree of mobility the cohort may undergo.

The program includes a variety of pedagogical approaches including student centred learning and practical exercises that guarantee networking with the socio-economic marine environment. This allows the full expression of student talents and competences whilst preparing them for the challenges of the working environment. The involvement of the non-academic sector in teaching is good and there are positive steps towards instilling entrepreneurship and a business mind-set.

The partnership should put more emphasis on addressing the financial and sustainability issues of the program by setting specific arrangements with companies in the field. The future sustainability of the program in the absence of EU funding has not received the required attention.

Partner number	P6
Organisation name	999865234 UNIVERSIDAD DEL PAIS VASCO / EUSKAL HERRIKO UNIBERTSITATEA

Please provide a summary of relevant skills and experience of the key staff directly involved in the project, including where relevant a list of recent publications related to the domain of the project. At least one (1) person must be identified for each consortium member with a maximum of three (3). Please adapt the table according to the number of key staff per organisation. (maximum 750 characters for each person)

1) Name of staff member	Ionan MARIGOMEZ
<p>(H-index: 31; UPV/EHU Prof Cell Biol; Researcher in the CBET CRG) Director of PiE-UPV/EHU since its creation in 2012. He was head of the Dpt of Zoology and Animal Cell Biology (00-03 and 06-09). Active in research formation, he has been coordinator of UPV/EHU of Erasmus/Socrates network on "Environmental Science and Education" (89-), Director of Doctoral Programmes Biología Ambiental y calidad vida (98-present); Contaminación y Toxicología Ambientales (05-12), and Marine Environment and Resources (09-). He was Coordinator MSc Contaminación y Toxicología Ambientales (05-12) and European MSc Marine Environmental Resources (Quality Award MEC, Mundus Master since 2013 - International Coordinator-).</p>	
2) Name of staff member	Manu SOTO
<p>(H-Index: 21; UPV/EHU Professor Cell Biol; Researcher in the CBET CRG). Deputy Director of PiE-UPV/EHU since its creation in 2012. He was Vice-dean for Students & International Relationships in the Faculty of Science & Technology of UPV/EHU (05-12). Coordinator of the official masters degree in European MSc Marine Environmental Resources in UPV/EHU. Academic Board Member of Doctoral Programmes Contaminación y Toxicología Ambientales (since 2013), and Marine Environment and Resources (since 2013). Member of the Ethics Committee of the UPV/EHU (08-13).</p>	
3) Name of staff member	Ibon CANCIO
<p>(H-Index: 18; UPV/EHU Associate Prof Cell Biol; Researcher in the CBET CRG). He is coordinator of the official masters degree in Environmental Contamination and Toxicology in UPV/EHU. Academic Board Member of Doctoral Programme Contaminación y Toxicología Ambientales (since 2013). Coordinator of the Spanish Node of the European Research Infrastructure EMBRC (www.embrc.eu, European Marine Biology Resource Center) within the ESFRI roadmap, and Spanish representative in its implementation board and Responsible of the Plentzia Marine Station (PiE-UPV/EHU) Node Unit. Member of the Advisory Board for Aquaculture Strategy of the Basque Government.</p>	

Partner number	P7
Organisation name	999866689 UNIVERSITA POLITECNICA DELLE MARCHE

Please provide a summary of relevant skills and experience of the key staff directly involved in the project, including where relevant a list of recent publications related to the domain of the project. At least one (1) person must be identified for each consortium member with a maximum of three (3). Please adapt the table according to the number of key staff per organisation. (maximum 750 characters for each person)

1) Name of staff member	Prof. Roberto Danovaro
<p>Full professor of Ecology, Former President of the Italian Soc. of Ecology (SIte) and of the Italian Assoc. of Oceanography and Limnology (AIOL), President of the Zoological Station in Naples, Expert in Marine Ecology. He has been a participant in several EU financed programmes (eg CINCS, BENGAL, MATER, ADIOS, INTERPOL, MEDVEG, COORALZOO, MAP, REFREES, HERMES, SESAME, HERMIONE, DEVOTES, MIDAS). He is coordinating the H2020 project MERCES, focused on restoration of marine habitats. Editor in Chief of the International journal Chemistry & Ecology (Taylor and Francis Group). Author of 3 books and 232 papers in ISI journals (H: 53 and about 7500 citations; SCOPUS).</p>	
2) Name of staff member	Prof. Francesco Regoli
<p>Professor in Ecotoxicology and Biological & Ecological Risk Assessment. Expert in marine organisms as bioindicators of chemical pollution & environmental disturbance, with emphasis on molecular & cellular responses, emerging pollutants, trophic transfer of chemicals, oil & chemical spills, vulnerability of polar areas, impact of dredging & off-shore activities, models of ecological risk assessment. Coordinated the ecotoxicological impact of the Costa Concordia & numerous international projects. <i>Editor-In-Chief</i> of Marine Environmental Research, member of the Editorial Board of Aquatic Toxicol, Chemistry & Ecology, J. of the Brazilian Soc. of Ecotoxicology. Has over 150 publications in international journals (H: 43, ~5600 citations, SCOPUS).</p>	
3) Name of staff member	Prof. Carlo Cerrano
<p>Professor in Zoology and in Scientific Diving Methodologies, working in the fields of the autoecology and taxonomy of the zoobenthos (in particular Porifera and Cnidaria). He is involved in several international programmes and he is the Coordinator of the following EU Marie Curie Actions projects www.mmma.eu (FP7) and www.greenbubbles.eu (H2020). He is authors of 153 papers in ISI journals (H: 23 and about 2200 citations; SCOPUS). Publications include Sweet, M., Bulling, M., & Cerrano, C. (2015). A novel sponge disease caused by a consortium of micro-organisms. <i>Coral Reefs</i>, 1-13, Di Camillo CG, Cerrano C (2015) Mass Mortality Events in the NW Adriatic Sea: Phase Shift from Slow- to Fast-Growing Organisms. <i>PLoS ONE</i> 10(5): e0126689.</p>	

Partner number	P8
Organisation name	PIC 999974456 University of Bergen (UiB)

Please provide a summary of relevant skills and experience of the key staff directly involved in the project, including where relevant a list of recent publications related to the domain of the project. At least one (1) person must be identified for each consortium member with a maximum of three (3). Please adapt the table according to the number of key staff per organisation. (maximum 750 characters for each person)

1) Name of staff member	Audrey J. Geffen, PhD
<p>Professor in the Department of Biology, in the Fisheries Ecology & Aquaculture Group. She specializes in Marine Juvenile Production & headed the Aquaculture Biology Study Programme 2003-2015. Her research involves environmental effects on larval and juvenile fish growth, and theoretical and applied research on the growth and formation of fish otoliths as recorders of life history. She has broad experience in EU cooperative research projects and training networks. She is active on international steering committees and evaluation panels, and served on several journal editorial boards. Her course list includes Environmental Effects of Aquaculture, Early life history of fish, Ocean Science, Aquatic Food Production, Marine community ecology.</p>	

IMBRSea Consortium Agreement

Consortium Agreement concerning an interuniversity programme titled “International Master of Science in Marine Biological Resources (IMBRSea)” organised within the Framework of the Erasmus Mundus Master Joint Masters Degrees

Partners in this agreement:

1. Universiteit Gent, Belgium
2. Université Pierre et Marie Curie – Paris 6, France
3. Universidade do Algarve, Portugal
4. Universidad de Oviedo, Spain
5. Galway-Mayo Institute of Technology, Ireland
6. University of the Basque Country, Leioa, Spain
7. Polytechnic university of Marche, Ancona, Italy
8. University of Bergen, Norway
9. Université de Bretagne Occidentale, France

The institutes 1 to 9 are further called “Main Partners” or “Partner Universities”. Jointly they are called “Consortium”.

In addition to Main Partners, Associate Partners are also active within IMBRSea. [Annex 1](#) to this agreement provides a list of these Associate Partners.

Legal Representatives of the Main Partner universities will sign this Consortium Agreement. Associated partners are obliged to subscribe to this agreement by a formal letter of support.

This interuniversity agreement is drafted within the framework of the action entitled: “International Master in Marine Biological Resources”¹ (IMBRSea in short hereafter).

Article 1: Scope

1.1. Background

Industry and society face significant challenges to achieve growth and to further develop the blue bio-economy (all economic activities that depend on the sea) in Europe, in harmony with the EU’s Blue Growth strategy. The international, interdisciplinary and inter-sectoral nature of these challenges demands a similarly integrated approach to train the marine scientists who will be able to tackle them tomorrow. The proposed International Master in Marine Biological Resources (IMBRSea) is designed in such a way that students will graduate this program with both core and specialist competences and skills required by employers in key themes of the blue bio-economy, including fisheries and aquaculture; nature conservation; sustainability; ecosystem based management; blue biotechnology and global change.

1.2. Objectives of IMBRSea

The IMBRSea - programme aims to qualify students to a level of excellence in the field of Marine Biological Resources.

The objectives of the International Master in Marine Biological Resources (IMBRSea) are the following:

- Discipline oriented objectives:
 - Qualifying Master students to evaluate and understand how marine biodiversity varies across spatial and temporal scales, and between levels of biological organisation, in order to develop methods to detect significant changes in the marine environment.

¹ defined as “International Master in Marine *Sciences and* Biological Resources” in UPMC

- Qualifying Master students to understand theory, models and statistical tests to investigate the relationship between marine biodiversity (assessed at different levels of organisation: genetic, species, functional groups and communities) and ecosystems functioning through the integration of conceptualization and modelling exercises, comparative analyses and carefully-designed experiments.
- Qualifying Master students to understand the value of marine biodiversity and resources, and hence are able to develop the research base required to support the sustainable management of marine biodiversity and resources, including, for example, the monitoring of the health of marine ecosystems, marine aquaculture, the conservation of marine biodiversity and the commercial and recreational use of marine resources and ecosystems.
- Transferable Skills Objectives:
 - Qualifying Master students to apply the necessary communication and research skills for integrated team work.
 - Qualifying Master students to develop decision supporting systems for community policy.
 - Qualifying Master students to create an interface between researchers and stakeholders.

Students will be trained in at least two institutions in two different European countries within the IMBRSea consortium which consists of 9 partner universities from 7 European countries and associated partners from all over the world.

The IMBRSea consortium members are connected to the EMBRC network, and have been able to work jointly to identify what is needed to enable improvements in European marine biological resources education and training. The European Marine Biological Resource Centre (EMBRC) is a distributed European research infrastructure consortium that was added to the roadmap of the European Strategy Forum for Research Infrastructures (ESFRI) in 2008 as a research infrastructure of pan-European interest. The consortium builds on its experience and will extend its coverage to meet the challenges of producing the marine scientists of the next generation. IMBRSea will be an integrated flagship programme that capitalizes on the operational, research and academic strengths of its members, to provide the best possible opportunities for employability and career development of programme graduates.

Article 2: Structure and content of the programme

2.1. Structure of the programme

The IMBRSea master programme is spread over two academic years of study (4 semesters – 120 credits). The common language of instruction of the programme is English.

The full IMBRSea study programme is divided in nine blocks that run over two academic years. Each academic year commences in September/October (depending on the University and decided on a yearly basis) and finishes in June/August (depending on the thesis work progress). Students are distributed according to their chosen study pathway across several universities for the Fundamentals course package, and the Thematic course packages. Joint activities for the full cohort of students, co-organized by all partners, are identified as the Joint school and the Annual symposium.

[Annex 2](#) provides an overview of the educational responsibilities of each partner university.

[Annex 3](#) provides an overview of the full IMBRSea course programme described below.

In the first semester (30 ECTS), the Fundamentals Module, delivering basic knowledge and skills required by all programme graduates, will be taught at some of the partner universities (see [Annex 2](#)). This module contains six jointly developed courses covering the following themes: Marine policy and governance, Marine genomics, Quantitative methods in marine science, Oceanography, Marine ecology, Marine GIS and spatial planning. In addition to these six courses, students have also the opportunity to take one transferable skills Course (for example language training, scientific diving, scientific communication).

During the second semester (30 ECTS) and the third semester (30 ECTS), the students follow two Thematic Course Modules, leading to one of the five Specialization Tracks. Students are highly recommended to take two course modules within the same specialization track. Only motivated by their professional project, and upon

positive advice of the IMBRSea Educational board, students may be allowed to change specialization track during their programme. All mobilities (including changes in mobility) shall be approved by the Programme board.

The following five specialization tracks will be on offer:

1. Marine food production (#Production)
2. Management of living marine resources (#Management)
3. Applied marine ecology and conservation (#Conservation)
4. Marine environment health (#Environment)
5. Global ocean change (#FutureSeas)

The curriculum in each track is offered by at least two Partner universities with the best expertise in the field of the Track.

In the second half of the second semester, students will gain authentic experience in the work field during six weeks of Professional Practice offered by potential future employers relevant to IMBRSea. During these internships Mentor's guidance of students will be integrated with support provided by academic supervisors from the Partner universities. Professional practice guidelines are provided in [Annex 4](#).

Two activities have been identified that aim to prepare students for aspects related to the Master thesis research: a joint school organized at the beginning of semester 3 and a jointly developed course dedicated to the preparation of the MSc Thesis offered at the end of semester 3.

The first part of this preparation is a Joint School which will bring all students from the same cohort together for programme-wide training on multi-disciplinary topics. The Joint School is an integrated activity, organized and delivered by teachers representing each Partner university. Evaluations of student performance during the Joint School are also integrated: assessment criteria are common for all students and students are jointly assessed by representatives of the full consortium, based on similar evaluation criteria that are used for the Thesis.

At the end of the third semester, the students follow a jointly developed course on practical and transferable skills related to the way they will have to carrying out a research project. Topics included will be: project management, data management, research proposal writing and scientific communication.

During the 4th semester students carry out their thesis research. It can be done at any main or associate partner, or other institution providing a support for the targeted topic. Thesis research work will lead to a written report following the agreed thesis guidelines (see [Annex 5](#)). During the Annual Symposium organized at the end of the 2nd and 4th semester the thesis work will be defended by an oral presentation. A jury composed of representatives of all main partners institutions will evaluate each Thesis and examine each student according to jointly developed thesis evaluation criteria that conform to the requirements of each main Partner institutions.

Article 3: Organisational structures and responsibilities

Several governance bodies will be installed within the programme. For each governance body the responsibility and roles of the coordinator, partner universities and associate members is specified and may be further clarified during the first meetings of each of these.

The IMBRSea Master is governed by the following management structures:

3.1 Coordination Office:

This office, located at Ghent University, is supervised by the IMBRSea coordinator. This office is in charge of the overall coordination of the master programme. The following tasks are allocated to this office: application procedure, follow-up of applicants and students, outreach, collection and management of all course administration related issues (grades, changes in curriculum), financial management, contact with scholars, organisation of Annual Symposia, contact and reporting with EACEA, professional practice and thesis work follow-up, contact

with associates, organisation of board meetings, contacts with International Relations Offices (IRO) of participating HEIs.

3.2 Programme Board:

The Programme Board comprises one representative per full partner, two associate partner representatives and two student representatives. IMBRSea's coordinator represents the coordination office on this board. A chair of this board is elected from one of the full partner representatives on a 3-year basis. The board oversees the general working of the master programme (financial decisions, approval of the selections, overall organisation), is in charge of curriculum review, the MSc Thesis topic evaluation and development and educational quality assurance. The board meets at least four times per year (end of August before the start of the academic year, early October, early February and physically during the annual symposium). The programme board is advised by the examination board, the selection committee, the student board and the external advisory committee.

Decisions are where possible taken by consensus. In cases where a consensus cannot be achieved, decisions will be taken following the majority plus 1 rule.

3.3 Selection committee:

This committee consists of four representatives elected from the members of the Programme Board (excluding students) and is chaired by a full partner representative (different from the Programme Board chair and elected on a 2-year basis). All partner universities shall for the total duration of this consortium agreement take an equal share in the selection tasks. The Selection committee is in charge of establishing a selection of students applying for grants offered by the programme through the Erasmus+ framework, or through other funding schemes. The Selection committee meets once each year early April and reports the selection list to the Programme Board before the deadline for reporting to EACEA (around mid-April). The Coordination office shall assist in the administrative follow-up of the selection and is also in charge of checking the eligibility of all applicants (self-funding and grant-requesting) following the regulations as set in 5.1. Eligibility of all students as well as awarding grants needs approval from the Programme Board.

3.4 Examination Board:

This board consists of all the teachers of the programme. All teachers are invited to the deliberation meeting at the end of each academic year (end of June). Due to the international make-up of the programme, most teachers will however be excused from attending this meeting and will pass their evaluations via a representative (belonging to the same university). A second meeting will be organised electronically at the end of the second exam period (September). The examination board takes minutes of the scores given by the responsible teachers to each of the students. A full overview of the scores is generated within the central exam database of Ghent University (<http://oasis.ugent.be>). This board will also issue special awards, grades and prizes.

3.5 Student Board:

This board consists of six members elected from the student population (year 1 and year 2) and one IMBRSea alumnus. The aim of this board is to provide students with a structural involvement in the organization of the programme. Their task is to organize communication and information flow between year 1 and year 2 students, communication of student related issues to the Programme Board. The Student Board will delegate 2 of its members to communicate with the Programme Board about opinions, ideas and suggestions made by all students when needed. The Student Board meets physically once a year during the annual event.

Article 4: Educational responsibilities

4.1. The role of the partner universities in education:

Since the IMBRSea is a specialized master based on many scientific disciplines, and since the student cohorts who enter the course will be diverse, we have to ensure that the basic knowledge relevant for the thematic course modules in each specialization track will be offered in the first semester (independent of the chosen starting university).

Universities offering the fundamentals package in first semester are responsible for offering each course unit as such that the jointly agreed final competences for each course are met. In cases where no sufficient competence is present at a partner university, this will be solved via teacher mobility. Teacher mobility will be allowed by each University, as a part of their teaching load.

Partner universities delivering thematic course modules in semester 3 and 4 have to ensure that the content of the courses fits to the knowledge gained during the first semester and meets with the final competences set for each specialization track. To ensure this, for each track an academic will be appointed by the Programme Board. This person will be in charge of supervising the educational aspects and communication of these aspects with the Programme Board. Universities involved in each track should interact at a regular basis and should adapt where needed specific content of each course. On the annual basis, at the start of the second semester, it will be possible to implement these changes upon approval of the Programme Board. Administrative follow-up of this will be organized by the coordination office.

At the start of the third semester, a Joint school (6 credits) is organized. Lecturers from the nine partner universities, together with associated (non-academic) partners, are jointly responsible for the Joint school. To allow the joint responsibility to be taken, the teaching load for participating teachers will be recognized at each partner university.

During the second semester students will carry out a professional practice. For this, they will be preferably active in a non-academic structure, under the framework of a work placement. During the fourth semester students will carry out thesis research. For this they will be active in a main or associate partner. For both activities an academic mentor will be appointed. This mentor is in charge of ensuring that the work carried out is compliant with the professional practice and thesis guidelines respectively. The coordinating institution concludes the agreement for the professional practice and the thesis research between the student, the coordinating institution and the host institution of the professional practice or thesis work of the concerned student. ([Annex 4](#) & [5](#)).

4.2. Teacher mobility and involvement of teachers (scholars) external to the consortium:

The IMBRSea programme stimulates both involvement of teachers external to the consortium (so called scholars) and teacher mobility within the consortium. Both types of teacher mobility require formal approval by the Programme Board and will at each partner university also be formally recognized as such. Teacher mobility within the consortium will be regulated according to the Erasmus Mobility framework. All main partners will engage in bilateral Erasmus exchange agreements for this.

Where no alternative funding is available for teacher mobility for scholars external to the consortium, it will be funded at an IMBRSea central level. Funding for this kind of mobility will require approval of the Programme Board and will be in line with the IMBRSea financial regulations

5.1. Admission criteria

A prerequisite for admission is that applicants have a minimum of a Bachelor degree in biology, ecology, environmental sciences, oceanography, marine sciences, geography, geology, biotechnology, veterinary sciences or other equivalent degrees, with a minimum of 180 obtained ECTS.

The number of students who can register within each mobility will depend on the logistic possibilities of the involved partner universities. Logistic possibilities will be reviewed on a yearly basis (early December for the next academic year). The best ranked students (using the same criteria as explained in 5.4) will be firstly admitted to their preferred university in year 1. For the second year, mobility will be organized in accordance to the preference of the students, where needed backed up with the academic performance. Preferences of the students regarding the place of study will be taken into account as far as possible.

Knowledge of the English language is a basic requirement: A proof of sufficient knowledge of the English language is required.

The IMBRSea Programme Board can, at its own discretion waive the requirement for proof of English language skills, if English was the official language of instruction/teaching for at least one year of the previous successful Higher Education studies. Specific requirements for English Language proficiency are detailed in [Annex 11](#) and are subject to review by the Programme Board.

5.2. Application procedure

The consortium offers one coherent point of entry as regards the Master's course promotion, information regarding all formalities and application for admission. Applicants will apply to the coordinating university, Ghent University, which is hosting the IMBRSea coordination office. Interested students will find all relevant information on the IMBRSea programme website (<http://www.imbrsea.eu>): general information, admission criteria, application forms, deadlines for application, course content, information on scholarships and fees, and so on.

The application file must contain the following documents, meeting the requirements set in the Erasmus Mundus Joint Master degree Programme guide:

- a completed application form (online) where information is given about personal data, study data, linguistic skills, professional data, recommendation letters, motivation, country of preference to start with the IMBRSEA master programme
- a copy of the international passport
- at least two completed referee reports
- legal copies of diplomas and an official translation in English, if the original language is not one of the official languages of the coordinators (all languages other than Dutch, French, German, English need to be translated into English) . If the diploma is not yet obtained at the time of application (student is in their last year of Bachelor study), an original proof of enrolment and a most recent transcript of records must be provided.
- copies of diploma supplements stating courses followed and scores obtained per course and, eventually, a translation in English (see further) and official transcript of records
- copies of language tests scores and language certificates

5.3. Admission of students

All students fulfilling the diploma requirements and sufficient knowledge of English language, can be admitted by the Programme Board. Partner Universities are not allowed to have additional conflicting admission conditions for students admitted to the programme. The students will get an official letter of admission signed by the Registrar of Ghent University where the Coordination Office is located. A copy of this letter will be sent to the department responsible for enrolment of the institute receiving the student during his Study Pathway (first and second year). Enrolment is only official after paying the tuition fee by the student to the coordinator and after having performed all formalities (not conflicting with the joint programme regulations) for joining the first

hosting partner. The coordinating university will share the final list of students with the partner universities. The coordinating university will transfer the agreed budget for covering enrollment costs to the partner university account where the student is enrolled.

5.4. Selection procedure for ERASMUS MUNDUS scholarships

The selection of scholarship recipients is done by the selection committee (see 3.3) making use of the following selection criteria: academic scores (30%), reputation of the school or institute where the student has previously studied² (10%), language skills (eligible or not eligible), referee letters (15%), Curriculum Vitae (15%), and motivation (30%). Based upon these criteria an overall ranking will be made and scholarships will be proposed according to the geographic regulations set for Erasmus Mundus scholarships. Students that are not selected but that are still academically eligible for the programme will be put on a reserve list for scholarships. Upon approval of the programme board, via an electronic meeting, a list of selected students and the reserve list will be forwarded to the EU. The IMBRSea coordinator will contact selected students to commence the registration procedures and mobility arrangements (invitation letters to obtain visas).

5.5. Selection procedure for other scholarships

On a yearly basis the programme board may allocate extra scholarships obtained from alternative financial sources. The same selection procedure is used as described in 5.4

5.6. Enrolment of students in the partner universities

The coordinator will inform the partner universities about the students who choose to attend their courses in the following academic year by early May for all non-EU students and all EU students that applied by the end of the scholarship application deadline and by the end of June for EU students that applied on a self-funding basis. All students are enrolled in the coordinating university (only students that follow courses in the coordinating university have to pay the enrolment fees of the coordinating university; all other students will be enrolled as 'pro-forma' students in the coordinating university) and at least on a semester basis in the university where they perform their studies. They might as well all be enrolled at the other partner universities in a similar status as at the coordinating universities, if this is required to issue the joint diploma. In this case no additional funding will be foreseen for this additional enrollment. .

5.7. IMBRSEA programme fees

The programme fees for European students are set at 4500 euro per academic year (9000 euro for the full programme 120 ECTS).

Due to the complex nature of the administrative procedures for non-European students and to the severe assessment of the applications the IMBRSea programme fee for non-European students is set at 9000 euro per academic year (18000 euros for the full programme 120 ECTS).

The programme board decides on a yearly basis before opening the application forms on the possibility to reduce programme fees for non-scholarship holding students (partial fee waivers). A corrected participation fee (according with these waivers) will be advertised as well on the website.

Scholarships (Erasmus Mundus scholarships) of all students are paid on a separate sub account at Ghent University reserved for the functioning of the IMBRSea programme. Except for the IMBRSea programme fees, scholarships are transferred according to the scheme and rules agreed in the student agreement (see [Annex 6](#)) to the accounts of the students concerned.

The coordinator of the Consortium will transfer the agreed institutional participation fees to the accounts indicated by the respective universities upon issuing of an invoice or certificate. Joint programme elements (coordination, joint school, annual symposium, ...) will be financed by the central coordination budget. On a yearly basis a budget plan will be agreed in accordance with the IMBRSea financial rules described in [Annex 7](#).

² Reputation of school is checked using university rankings, and previous mobility experiences maintained in a central database at the coordinating university

Students who do not complete the study program by the end of the timeframe defined in the student agreement (two years), may upon approval of the programme board still enroll for a third year. Tuition fees for this extension will be calculated on a semester basis following the normal IMBRSea participation fee paid by the student for participation in previous academic years (as documented in the student agreement). In case a student does not complete the programme after an additional third year, this student will no longer be allowed to participate in the programme. In this case the student will receive an official transcript listing the courses for which he/she has obtained credits.

5.8. Education

All institutes are responsible for providing appropriate education, teaching and examination within the framework of articles 2 and 4 in this agreement.

5.9. Mobility

Student mobility is an integral aspect of the IMBRSea programme. Partner universities engage to make practical arrangements for their incoming students before and during the mobility. This includes, if applicable, instructions on visa procedures, providing a local admission letter, housing and other services for international students. Students are required to undertake a mobility period of at least one semester (30 ECTS) but can, depending on their interests, maximize their mobility opportunities. The full IMBRSea study programme is divided into nine blocks run over two academic years, as seen in the figure below. Each academic year commences in September/October and finishes in June/August (depending on the starting university and thesis defense period). Students are distributed across several universities for the Fundamentals package, and Thematic packages. Joint activities for the full cohort of students are organized during the Joint school and Annual symposium. For the thesis work, students can choose between research groups of the nine universities or associated institute. In all cases, the promotor of the thesis is one of the lecturers of the IMBRSea programme.

Year 1				Year 2				
Semester 1	Semester 2			Semester 3			Semester 4	
30 credits	18 credits	12 credits	Annual symposium	6 credits	18 credits	6 credits	30 credits	Annual symposium
Fundamentals package	Thematic package 1	Professional practice		Joint school	Thematic package 1	Thesis preparation	Thesis	
University 1	University 1 or 3			University 2				
(✂)	✂	✂	✂	✂			✂	✂

5.10. Transfer of credits

The IMBRSea curriculum is based on the ECTS. The procedure for transfer of credits, if applicable, is as follows:

- The institute where the student effectively studied, sends the obtained marks of the student to the IMBRSea coordination office (for first semester courses before March 15th, and for second semester courses before July 8th or September, 20th). For each course, the locally obtained grade per student, the total number of students following the course and the ECTS grade (or the place of the student in the ranking of all students (not only IMBRSea students) who followed that course) will be communicated.
- The IMBRSea coordination office converts the local grades to a 20 point scale according to an agreed conversion table (see [Annex 8](#)) for each participating institute. This is done to facilitate the final awarding of the degree. After approval by the programme board, converted scores will be entered in the study management platform at Ghent University.
- At the end of each academic year the secretariats of the partner universities will produce an official transcript of records per semester with an overview of already obtained credits. These transcripts of records will be made available to the students.
- When a student has obtained all necessary credits and successfully defended their master dissertation, the official diploma is issued accompanied by the diploma supplement. Students are awarded a joint degree of the consortium.

5.11. Passing exams

The partner university offering courses and hosting the students will organize the examination component (for each course) according to the local regulations. The students are bound to the examination regulations and criteria of the university where they follow the courses. At the start of each teaching period partner universities provide all students with the local examination regulations. The IMBRSea Programme Board will define and issue a common framework for examination for the programme's joint elements.

If students fail a course, at least one resit per course will be allowed. This resit will preferably take place in the partner university where the course was taught, but may also be possible in another partner university depending on the mobility of the student. Students resitting a course remain bound to the examination regulations and criteria of the university where they followed the course. At the end of each academic year the examination board will review the study performance status of each student and advises on continuation of the programme in accordance with the regulations at each university.

Students with very weak study performance (decided by the examination and programme board) may lose their scholarship or may be advised to end their study. Students who quit the IMBRSea programme early but have successfully completed courses will get a certificate stating the courses for which they have earned credits.

For the master thesis, a common evaluation procedure is developed. Dissertations (even those performed outside one of the awarding universities) are defended at the Annual Symposium (see [Annex 9](#)). Common standards are used and the thesis is defended before an examination commission³ appointed by the Programme Board and consisting of at least three academics (including the promoter) of which one belongs to another institute awarding the degree. The dissertation can only be defended when all other requirements (passing of all courses, fulfilling the mobility and participation in joint programme activities) to obtain the degree are fulfilled so that the examination commission can decide on behalf of the Programme Board on awarding the degree or not. In case of doubts, the decision can be postponed and discussed at the yearly coordination meetings of the Programme Board.

The final grade of the diploma, if applicable, is decided by the Examination Board, and communicated to the coordinating university who will prepare the joint diploma, accompanied by the diploma supplement.

5.12. Awarding the degree and the diploma

After successful completion of the IMBRSEA academic Programme, graduates shall receive a Joint Masters degree by the nine Consortium Universities. The Diploma is fully based on the ECTS system and will be accompanied by a Diploma Supplement that lists all the courses and the title of the thesis with their accompanying ECTS credit points and grades with specification of training hours, language of instruction, institution delivering the course and all other relevant details such as the ECTS system.

The Diploma will be materially issued by Ghent University, jointly with and also signed by the respective partner Universities, according to the European regulations.

The Diploma supplement will be issued according to the European regulations, following the model developed by the European Commission, the Council of Europe and UNESCO/CEPES. The Supplement provides sufficient independent data to ensure the international transparency and fair academic and professional recognition of qualification (diplomas, degrees, etc.). The Supplement will provide a description of the nature, level, content, context and status of studies pursued and successfully completed by the student.

A model of the joint diploma is provided in annex 12.

³ The thesis Examination Committee consists of three members, containing two members belonging to one of the nine IMBRSea partner institutes :

1. Reader 1 : (co-)promoter and supervisor give 1 score together (cf. evaluation form) (in case of a problem, the IMBRSea Programme Board will negotiate)
2. Reader 2 : external to the host research group
3. Reader 3 : from the IMBRSea consortium (8 universities) but external to the host institute

5.13. Joint school organisation

The joint school is organized every year between semester 2 and 3, as a part of the third semester. The organizational costs (including accommodation costs) are covered from the central coordination budget according to the regulations outlined in [Annex 7](#).

5.14. Quality Assurance

Quality assurance will be considered both at a European level for the programme as a whole and the joint programme elements and, on a local level. The local quality assurance is done by each partner university individually and typically fits in national quality assurance programmes. A quality assurance committee will monitor the program. They can monitor the added value offered by the Erasmus Mundus programme (as compared to local non-joint programs at the different partners), be involved in the comparison of the core programs at different partners, advise on industrial relevance, knowledge and skill levels required by policy makers, etc.

An External Advisory Board will be installed consisting of a representative from the EMBRC network, per specialization track one representative from the non-academic sector and one alumnus. The Board has access to the results of the internal evaluations and will be able to meet with the representatives of all full and associate partners, students and alumni. The Advisory Board meets once every two years and advises the Programme Board on issues related to the overall content and aim of IMBRSea.

In function of accreditation reviews, a programme portfolio will be created and maintained at Ghent University. The portfolio includes a description of the context of the joint programme, includes the key quality features of the programme based on the NVAO Quality Code Flanders 2015-2017, includes a 'Quality Improvement Plan' outlining the major actions that are needed in the future to ensure or increase the quality of the international joint programme, and finally includes a compilation of attachments that are available for the international study program and that address the key quality features in more detail.

Depending on the accreditation regulations for each main partner, the Programme board will ensure that the programme remains accredited in each partner and may as such decide on accreditation review procedures (joint or nationally).

5.15. Publicity material

No publicity material will be designed and distributed by any partner without prior approval of the Programme Board.

5.16. Other responsibilities

Each hosting partner university is responsible for receiving students and arranging its programme. This includes, if applicable, instructions on visa procedures, providing a local admission letter, housing and other services for international students. Each partner university further agrees to give at least to the students registered at their university, access to facilities at the same conditions as regular students enrolled at the university.

Article 6: Costs and financing

Financial and administrative coordination of the master course will be done by the coordinating institution (Ghent University) according to financial management guidelines ([Annex 7](#)) and upon decisions made by the Programme Board.

The financial arrangements will be as follows:

The coordinating university receives all incoming money (scholarship grant from EU, scholarships and tuition fees of students without scholarship) on a central account. Scholarships (monthly allowances, and mobility flat amounts) for grant-holding students will be kept on a separate sub-account. With the exception of the IMBRSea tuition fees, scholarships are transferred according to the scheme and rules agreed in the student agreement (see [Annex 6](#)) to the accounts of the students concerned. The currency of the consortium will be Euros.

From the incoming money generated from tuition fees the following costs will be covered:

- Tuition costs and course participation costs at each university where the student is following courses at: the coordinating institution will reimburse to each partner university the rate of 1500 euro per semester per student.
- All costs of jointly organized activities such as the joint school and the annual symposium (both excluding transport).
- Costs for scholar mobility in cases where no alternative funding can be found.
- The administrative costs programme (coordination costs, meetings of the board, ...).

A special account will be opened for the IMBRSea programme at each participating partner university under the control of the respective financial services. The Erasmus Mundus budget will be managed according the specific European rules but will in addition also follow the general financial regulations of Ghent University as public institution. Financial transactions are clearly earmarked, registered and saved. Proof has to be collected. By law furthermore, the finances of public universities in Flanders are supervised by a Commissioner of the Flemish Community, continuously following up the activities. The coordination office is responsible for an open accounting system to the partners allowing full transparency of money flows and internal and external control.

Detailed guidelines on the financial management are outlined in [Annex 7](#).

Article 7: Intellectual property rights

Each partner shall make the student aware of the intellectual property rights management provisions of this agreement and those in place at the University where he or she is enrolled. Such information shall include ownership rights and royalty sharing arrangements.

Results are owned by the Party that generates them. In case of results generated from work carried out jointly by two or more Parties, those results shall be jointly owned.

The joint owners shall agree in a joint ownership agreement on the allocation and terms of exercise of their joint ownership, in compliance with their obligations under this Agreement. The joint owners of results will decide whether patent applications are to be submitted for such results, and will appoint from among them the Party which will be tasked with carrying out the formalities of filing, extension and maintenance of new joint patent(s) on such results in their joint names

In case of joint ownership of results, ownership of each of the joint owners shall be determined in good faith, taking into account each owner's relative intellectual and financial contribution to the joint results.

Where no joint ownership agreement has yet been concluded:

- each of the joint owners shall be entitled to use their jointly owned results for research purposes (including sponsored research and research in cooperation with academic third parties) without commercial aim, and teaching on a royalty-free basis, and without requiring the prior consent of the other joint owner(s), and
- each of the joint owners shall be entitled to use their jointly owned results by way of direct exploitation and to grant non-exclusive licenses to third parties, without any right to sub-license, subject to the following conditions:
 - at least 45 days prior notice must be given to the other joint owner(s); and
 - compensation under fair and reasonable conditions to be discussed, must be provided to the other joint owner(s).

In any case where, in the opinion of the student and their supervisor(s), novel intellectual property has been created this must be documented as soon as possible after its creation in accordance with each Partner's invention disclosure procedures.

Article 8: Confidentiality - Dissertation and Examination

Most universities will have policies with regards to confidentiality and it is recognized that some of the information may be confidential or be required to be kept confidential. Each partner shall make the student aware of the provisions of this agreement and those in place at the Partner University he or she has matriculated. Where confidentiality of results of any work is an issue the Supervisor of the student should make their institution aware and arrange to put in place a confidentiality agreement. This need may extend to the external examination of the dissertations arising from this programme.

All information in whatever form or mode of transmission, which is disclosed by a Party (the “Disclosing Party”) to any other Party (the “Recipient”) in connection with the IMBRSea programme during its implementation and which has been explicitly marked as “confidential”, or when disclosed orally, has been identified as confidential at the time of disclosure and has been confirmed and designated in writing within 15 days from oral disclosure at the latest as confidential information by the Disclosing Party, is “Confidential Information”.

The Recipients hereby undertake for a period of 5 years after the end of the IMBRSea programme:

- not to use Confidential Information otherwise than for the purpose for which it was disclosed;
- not to disclose Confidential Information to any third party without the prior written consent by the Disclosing Party;
- to ensure that internal distribution of Confidential Information by a Recipient shall take place on a strict need-to-know basis; and
- to return to the Disclosing Party on demand all Confidential Information which has been supplied to or acquired by the Recipients including all copies thereof and to delete all information stored in a machine readable form. If needed for the recording of ongoing obligations, the Recipients may however request to keep a copy for archival purposes only.

The above shall not apply for disclosure or use of Confidential Information, if and in so far as the Recipient can show that:

- the Confidential Information becomes publicly available by means other than a breach of the Recipient’s confidentiality obligations;
- the Disclosing Party subsequently informs the Recipient that the Confidential Information is no longer confidential;
- the Confidential Information is communicated to the Recipient without any obligation of confidence by a third party who is in lawful possession thereof and under no obligation of confidence to the Disclosing Party;
- the Confidential Information, at any time, was developed by the Recipient completely independently of any such disclosure by the Disclosing Party; or
- the Confidential Information was already known to the Recipient prior to disclosure or
- the Recipient is required to disclose the Confidential Information in order to comply with applicable laws or regulations or with a court or administrative order.

The Recipient shall apply the same degree of care with regard to the Confidential Information disclosed within the scope of the Project as with its own confidential and/or proprietary information, but in no case less than reasonable care.

Each Party shall promptly advise the other Party in writing of any unauthorised disclosure, misappropriation or misuse of Confidential Information after it becomes aware of such unauthorised disclosure, misappropriation or misuse.

If any Party becomes aware that it will be required, or is likely to be required, to disclose Confidential Information in order to comply with applicable laws or regulations or with a court or administrative order, it shall, to the extent it is lawfully able to do so, prior to any such disclosure

- notify the Disclosing Party, and

- comply with the Disclosing Party's reasonable instructions to protect the confidentiality of the information.

Plagiarism of information included in thesis reports or any other reports will not be allowed and may lead to exclusion from the programme. Proper references need to be given in all documents used.

Article 9: Liability

9.1. Each partner shall be solely liable for any loss incurred by, or damage or injury to, third partners, resulting from its own actions in the execution of this agreement.

9.2. Each partner shall be fully responsible for the performance of any part of its share of the agreement and for the requirements of Insurance and Social Security for its personnel, involved herein.

9.3. With respect to any injury to any person or any damage to any property of any person occurring at any establishment of any of the partners in the course or arising out of the execution of this agreement, the partner at whose establishment the injury or damage occurs, shall be solely responsible for the payment of compensation to such extent as this partner shall be under a legal liability in respect of such injury or damage. This article shall not apply with respect to any such injury or damage, the causing of which is attributable to any act of a servant or agent of any of the partners, committed with the intention of causing harm to any person or property or with reckless disregard for the consequences of his act.

Article 10: Entry into force and termination

This agreement shall come into force as of the date of its signature (referred to as T0 no later than 30 June 2017) by all the partners and shall continue until the end of the agreements between the European Community and the Universiteit Gent within the framework of the action entitled: 'Master in Marine Biological Resources', based on the framework partnership agreement (2016-2280/001-001 – see annex 12) between the European Community and the Universiteit Gent and possible other specific agreements signed on behalf of the Consortium.

This consortium agreement is valid as long as contracts with the EU are binding the consortium partners (until 31-08-2021, for an intake of three cohorts of students (2017, 2018 and 2019)). If this is not the case anymore, the consortium partners will decide in mutual agreement to continue this agreement or not.

If a partner university wants wishes to leave the agreement before the end of the EU agreement, this partner will discuss this with the Consortium and will have to follow the rules stipulated in the EU contract. This is not the case if the partner institute should leave by force majeure.

The cooperation might be prolonged after 31-08-2021. In this case a new agreement will be designed.

Article 11: Applicable law and Competent Court

This agreement shall in all respects be construed and operate as an agreement made in Belgium and in compliance with Belgian law. The settlement of any difference or conflict arising from or in connection with this agreement shall be attempted by an amicable effort from the partners.

However, due to the international nature of this agreement, only the International Chambers of Commerce in Geneva are competent to decide on the disputes, which would remain unresolved.

Students receiving an Erasmus Mundus grant are bound to the rules and regulations from the institute at which s/he is enrolled and to the individual student contract between coordinator and each student. Students shall be informed of these rules and regulations prior to physical arrival at the partner.

Article 12: Amendments

The IMBRSea Programme Board has the mandate to add or change amendments or annexes to this agreement when necessary. For all things not stipulated in this agreement the Programme Board can decide, if applicable upon approval by the official bodies of the signing institutes and/or the European Commission.

Approved by

1. Date:

Prof. dr. Anne De Paepe, Rector
Universiteit Gent, Ghent, Belgium

2. Date:

Rector of the Universidade do Algarve

3. Date:

Rector of the Universidad de Oviedo

4. Date:

President of the Université Pierre et Marie Curie, Paris VI

5. Date:

President of the Institiúid Teicneolaíochta Na Gaillimhe-Maigh Eo

6. Date:

Rector of the Universidad del País Vasco

7. Date:

Rector of the Università Politecnica Delle Marche

8. Date:

Rector of the Universitetet I Bergen

9. Date:

Rector of the Université de Bretagne Occidentale

