

Award criteria
2018 – Erasmus Mundus Joint Master Degrees (EMJMD)

1. Relevance of the project (maximum 40 points)

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

Water crises are consistently listed in the top 5 of global risks with the largest impact on human and economic development¹. Three out of four jobs worldwide are water-dependent². Water crises affect the lives of billions of people as water contributes to food supplies, energy security, human and environmental health³. The world population is growing fast and by 2050 global water demand is expected to increase by 55%³. The state of rivers, lakes, wetlands, groundwater and coastal waters is degraded in many regions of the world. Urbanisation, deforestation, inappropriate waste (water) practices, and the release of contaminants seriously impact surface water quality and aquatic ecosystems. The need for an integrated perspective on water resources is stated in the Water2015 Conference report, with one of the opening key messages being "It is essential that Member States adopt a holistic approach to managing our water systems.". The urgency of addressing water issues at a global level, led the UN to appoint 2018-2028 as the "International Decade for Action – Water for Sustainable Development". Moreover, the UN Sustainable Development Goals clearly highlight the importance of water, which despite being directly addressed in SDG 6 and 13, is transversal to all the 17th SDGs. The UN agency UNESCO established, within the International Hydrological Programme (IHP), a Strategic Plan for the period 2014-2021 on the topic of "Water Security: Responses to Local, Regional, and Global Challenges", that includes "Ecohydrology, Engineering Harmony for a sustainable world and Education; key to water security", as two of the six major themes approved by all member States. In line with this concern and approach, the EU Research and Innovation policy agenda on Nature-Based Solutions (NbS) and Re-Naturing Cities⁴ aims to position the EU as leader in 'Innovating with nature' for more sustainable and resilient societies. Ecohydrology (EH) is a NbS concept focusing on improving the resilience of aquatic ecosystems and services they provide, thus addressing the UN SDGs, UNESCO IHP and EU Research and Innovation agenda. Moreover, the Circular Economy Strategy established in 2015 by the EU aims to reduce wastes to the environment. NbS, such as Ecohydrology, are natural solutions contributing to reduce wastes, as for example, the use of vegetation to reduce fertilizer load into water bodies. The complexity of the challenge and the multiple aspects related to water, i.e. social, economic, cultural, religious, diplomatic among others, make it of **eminent importance to integrate the disciplines of water engineering, ecohydrology and integrated water management**. Water engineers have contributed to improve the state of aquatic ecosystems e.g. by designing wastewater treatment plants and environmental hydraulic structures. However, engineer solutions become rapidly overpassed in their capacity due to the increase of human and climate pressures, and alone are not able to solve the degradation of aquatic ecosystems we are facing. Ecohydrology is a discipline linked to the concept of NbS that has emerged within the UNESCO's International Hydrological Programme and uses natural ecosystem processes as tools for achieving and restoring ecosystems health. The implementation of real and effective solutions requires an integrated water management perspective, incorporating different spatial dimensions as well as integrating the human dimension at implementing and governance levels, as established by the European Water Framework Directive (2000/60/EG). While European countries have gained much experience in adopting this integrated framework of water sustainability, there is a growing interest of emerging developing countries, such as India, China, Brazil, and South Africa, to restore water resources. At this pivotal stage, the **EStEEM consortium offers a unique and innovative European Joint Master**. EStEEM will equip students with the necessary skills and knowledge to engineer, restore and manage aquatic ecosystems and their services, with positive feedbacks to Europe and elsewhere in the world by contributing through teaching, research, entrepreneurship and influencing, regional, national, and international policy-making.

References:

¹ World Economic Forum. 2018. The Global risks report 2018. 13th edition..

² WWAP (United Nations World Water Assessment Programme). 2016. The United Nations World Water Development Report 2016: Water and jobs. Paris, UNESCO.

³ WWAP (United Nations World Water Assessment Programme). 2015. The United Nations World Water Development Report 2015: Water for a Sustainable World. Paris, UNESCO.

⁴ European Commission. 2015. Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities.

*How does your proposed EMJMD reflect a **common and integrated approach** by the consortium?*

1. The consortium partners share a **common vision** that modern engineering and restoration of urban and natural water systems need to be based on the principles of ecohydrology and integrated water management, and that a transdisciplinary approach is needed for the implementation of long lasting sustainable solutions.
2. **Harmonisation of complementary approaches (thematic axes) to restoring aquatic systems in one integrated study programme:** The Ecohydrology axis focuses on a nature-based solutions (NbS) approach and provides the knowledge to restore aquatic ecosystems' carrying capacity and ecosystem services based on the dual relation between biota and hydrology. The Water Engineering axis provides advanced engineering techniques and skills, to plan, devise and implement structures and systems that can be used to restore and use ecosystems services in a sustainable manner and to reduce water-related risks to the society. The Integrated Water Management axis focuses on the coordinated and integrated development, management and restoration of the water system taking into account the ecosystem quality objectives, its multifunctional use, today and in the future, and is based on knowledge of the water system and its natural preconditions.
3. **Partners HEIs expertise in Integration:** We will thoroughly join and integrate our complementary skills, knowledge and expertise to create a thematically balanced, coherent, high-quality, innovative and competence-oriented curriculum. Staff mobility among the partner universities will further increase the integration of the courses across these three axes, which will be delivered in an integrated way by the partners:
 - a. Courses on **Ecohydrology** will be provided by the University of Algarve (UALG, Portugal) and by the University of Lodz (ULO, Poland). UALG hosts an UNESCO Chair in "Ecohydrology: water for ecosystems and societies", an UNESCO Center in Coastal Ecohydrology and already coordinated a previous Erasmus Mundus Joint Master in Ecohydrology. ULO is associated with the UNESCO Regional centre for Ecohydrology which has two decades of experience in the development of Ecohydrology techniques in Europe, Africa and Asia.
 - b. Courses on hydraulic and hydrological **water engineering** will be contributed by the Lübeck University of Applied Sciences (FHL, Germany) with a complete team of urban water, hydraulic, sanitation and hydrologic engineering experts. FHL has more than a decade of experience in building international study programs in environmental engineering.
 - c. The **Integrated water management** courses will be provided by the University of Antwerp (UAntwerpen, Belgium). UAntwerpen staff are internationally recognised experts in integrated water management, ecological engineering, urban water technology and a whole water system approach. They have more than 15 years of experience in offering international education in this field.
 - d. Actual topics and societal challenges of the **Global Water Agenda** will be introduced by UNESCO centres and chairs, and other partners engaged as associated partners. These associated partners connect students to real-life projects, applied case-studies and research questions in the field.
4. **Associated partners (UNESCO Chairs and Centres, Universities, Public and private sector)** share the same common vision as the full partners and will contribute by providing specific topics on water issues to the students, in the form of Webinars (EStEEM WEBINARS) and/or delivering short courses and/or receiving students for internships and/or participating in the module of "world of work integrated project".

ESStEEM Course Program

			lecture	practical/field	stakeholder	mobility	cooperation
1st semester - University of Algarve and Univ Lodz			30				
MANDATORY COURSES (26 ECTS)			ECTS Supporting HEIS's and other partners				
Basics in Ecohydrology	6	ULO + FHL+ Uantwerp					
Integrated project - World of work	3	ULO + FHL+ UAntwerp+ UALG stakeholders: National environment agency, water of Algarve water company, Ocean and Atmosphere Institute					
ESStEEM Webinar	3	UNESCO-IHP associated partners, stakeholders, other invited scholars and guest lecturers					
Ecohydrology modelling	4	ULO + UALG					
Applied practical field and laboratory training in Ecohydrology	10	ULO + UALG					
FIELD TRIP (5 days visit ecological relevant sites, visit companies and institutions, interact with stakeholders, learning new realities and contexts, contact with culture and foster team building)							
ELECTIVE COURSES (4 ECTS at least to select)							
Economy and entrepreneurship fundamentals	2	UALG					
Water economics and governance	2	Unesco Chair in water economics and transboundary water governance, the Australian National university					
Global Ecohydrology	2	UNESCO IHP PARIS					
Introduction to participatory processes and governance	2	UALG					
Multimedia design in water education and dissemination	2	UALG					
Environmental landscape planning	2	ULO					
Dynamics of aquatic ecosystems	6	UALG					
Quantitative Analysis of Freshwater Wetlands	2	Unesco chair in Hydroinformatics and ecohydrology, capital Normal Univ, Beijing China					
Global water for sustainability	2	Institute for Water and the Environment (InWE) of Florida International University (FIU),					
Portugese language	2	UALG					
2nd semester - University of Lubeck			30				
MANDATORY COURSES (24 ECTS)			ECTS Supporting HEIS's and other partners				
Urban water science and Technology	6	FHL+Uantwerp+ ULO+UALG					
Hydrological engineering	6	FHL					
Environmental hydraulics	6	FHL					
Integrated project - World of work	3	FHL+Uantwerp+ ULO+UALG					
ESStEEM Webinar	3	UNESCO-IHP associated partners, stakeholders, other invited scholars and guest lecturers					
ELECTIVE COURSES (6 ECTS at least to select)							
Industrial Ecology	6	FHL					
Framework for sustainability	6	FHL					
Environmental flow science and practice	2	UNESCO-IHE					
Hydraulic modelling for water risk management	2	UNESCO Chair water resource management Universita per stranieri di Perugia, Italy					
Water engineering in arid zones	2	Univ Ains Shams Egypt					
German language	2	FHL					
3rd semester - University of Antwerp			30				
MANDATORY COURSES (21 ECTS)			ECTS Supporting HEIS's and other partners				
Global water problems and integrated water management	3	UAntwerp-Ugent+ FHL					
Ecological engineering	6	UAntwerp-Ugent+ FHL+ ULO+UALG					
Integrated modeling and design of basin management plans	6	UAntwerp-Ugent					
Integrated water management case River 21 - World of work	3	UAntwerp-Ugent+ FHL+ ULO+UALG					
ESStEEM Webinar	3	UNESCO-IHP associated partners, stakeholders, other invited scholars and guest lecturers					
ELECTIVE COURSES (9 ECTS at least to select)							
Integrated assessment of water and sediment quality	6	UAntwerp-Ugent					
Sludge and sediment management	3	UAntwerp-Ugent					
Sustainable use of water: winning, distribution, use and reuse	3	UAntwerp-Ugent					
Ecosystem based adaptation to global change (only for UA thesis students)	6	UAntwerp					
Water and society -water supply and sanitation infrastructures in long term perspective	2	UNESCO Chair in sustainable water services Finland					
Water justice	2	UNESCO Chair on Water Acces and Sustainability, Univ Cincinnati USA					
Hydropolitics and water diplomacy	2	UNESCO chair in hydropolitics, Geneve Suisse					
Transversality of gender on water management	2	UNESCO chair - water, women and development, Brazil					
Dutch language	3	UAntwerp					
FIELD TRIP (7 days visit ecological relevant sites, visit companies and institutions, interact with stakeholders, learning new realities and contexts, contact with culture and habits of EU, foster team building)							
4th semester - Thesis project			30 ECTS				

The EStEEM EMJMD considers five levels of jointness:

- 1 – Academic and research jointness among partners
- 2 – Administrative jointness
- 3 – Jointness with stakeholders “world of work”
- 4 – Global jointness with water actors
- 5 – Students jointness by team-building and identification with the program

1 – Academic and research jointness among partners

The proposed European Studies in Ecohydrology for Water Engineering and Management (EStEEM) incorporates several levels of academic integration:

- a. **Thematic integration** – The course integrates the different thematic expertise of the partners. A common e-learning environment, a joint glossary of terms and syllabus, and a competence-centred education framework links each course to specific learning outcomes of the programme.
- b. **Joint Diploma** - Partners agreed to issue a Joint Diploma of EStEEM, as signed in the consortium agreement by HEIs representatives.
- c. **Course integration for curriculum coherence** – To ensure coherence and eliminate overlaps or gaps in the EStEEM curriculum, where required, disciplines will be integrated and course contents combined by several partners (keeping the requirements for accreditation).
- d. **Staff mobility for curriculum coherence** – to ensure coherence in the courses provided, the required teaching staff may move between partner HEIs to deliver courses when they are needed in the curriculum, ensuring a logic and workable sequence of learning material for students.
- e. **Effective connection with the “world of work”** – In each semester, except for the fourth which is dedicated to the master thesis, a module will be offered in partnership with private and public companies and institutions of the water sector. Students will be exposed to real-life case-studies, open research questions and applied problems. Each academic partner will team with stakeholders in his country. The consortium, as a whole, will work with associated international organisations (UNESCO) to assure a continued exposure to real world problems and societal challenges in water science.
- f. **Associated partners integration for transdisciplinary water knowledge** – A strong focus is on developing a common and international water culture among students and professors in terms of scientific methodology, work ethics and sustainability principles in water management. Through webinars and joint lecture series, students and professors will shape their common understanding of how water problems can be solved sustainably to the benefit of our society and economy, while restoring and conserving aquatic ecosystems and the services they provide.
- g. **Modern teaching** – High level education is changing with digitalization. Our consortium has a common approach to teaching. Presence teaching comes first (e.g. interactive lectures with case-studies from around the globe). We provide hands-on experience in projects following the principles of active learning by supervised doing (e.g. laboratory practical's, field work, company excursions and computer exercises). Modern digital methods are used well and in a balanced manner to facilitate learning and communication (e.g. webinars and interactive learning platform). All courses focus on the practical application of concepts in real life. Course material spans from basic definitions to the latest developments, from local problems to global solutions, and vice-versa. All EStEEM courses are linked to skills and competences that are relevant and can be applied by the future water professionals (competence-oriented learning).

2 – Administrative jointness

The partners will develop common procedures regarding **harmonised administrative processes** to ensure a fluent flow of documents and information for the benefit of the students. To improve information exchange and jointness among partners, as well as between partners and students, a **joint e-learning and course administration platform** will be established to which all partners will have access. This platform will be created by UALG, to promote faster contacts, share information and documents by administrative staff, and class materials between students and teachers, and among students. Hence, a repository of information, documents, classes, and tests will be accessible to partners and students, according to their different needs. This joint platform will assure transparency and integration of course material and content. The platform will also feature a common communication platform with forum and newsletter. All universities have a **common platform for e-learning** (Moodle). Each partner has its own software for managing credits and exams. In order to maintain the consistency of data, we will **create a meta-structure of teaching material and of credits** that retrieves data from each partner and integrates it to create a consistent view for the students and course managers. For that we will follow FHL's experience in creating an international services provider (oncampus) that is currently already providing these services to many universities in Germany, Europe and outside Europe. Based

on similar experience with joint programmes in China (CDAI, Hangzhou, ECUST, Shanghai), we will implement a **joint administration and data structure**. Staff exchange will be organized to promote mutual understanding of administration staff and structures, to learn from best practice and to facilitate communication. A joint tele-conference of course managers and of International Office staff involved will help clarify up-coming issues. A Joint Management Committee will be elected and hold a meeting once a year.

3 – Jointness with stakeholders “world of work”

The “jointness” with the real world of work is one of the major objectives of the EStEEM EMJMD, as we aim to prepare students for being productive and active contributors to solving society problems regarding water topics. Water problems are addressed on a daily basis by private and public stakeholders and we aim to expose students to real situations and to look for real “world of work” solutions. With this purpose, a course “world of work integrated project” will be incorporated in each semester (except for semester 4 dedicated to the master dissertation). The course is organized as a seminar in which stakeholders present world of work challenges and students respond to it and develop solutions. The seminar is also meant to be a “market place” where students can meet stakeholders, future employers and representatives from institutions or companies. The seminar is expected to create spin-offs such as internships or projects between stakeholders and employers.

4 – Global jointness with water actors

Furthermore, to promote excellence in water education, EStEEM will involve experts from UNESCO IHP chairs and centres as associated partners that can offer elective courses and topics for master dissertation research. These partners will also be involved in a course in the format of webinars (“EStEEM WEBINARS”), on current research questions and problems in ecohydrology, hydrologic engineering and integrated water management.

5 – Students jointness

To foster the creation of a “team spirit” and to contribute to socialization of students, the University of Algarve, welcoming University, organises:

- 1- a **launching event for the new cohort** where all HEIs will be present, as well as invited associated partners, and also where new students will present themselves (their background, personal aspects as hobbies, and expectations of the course) and that will be simultaneous with the final master thesis presentation event, for graduating students.
- 2- a **field trip** of 5 days with the students in Portugal, at the beginning of the 1st semester. The aim is to show natural (lakes, lagoons, estuaries) and impacted aquatic ecosystems as dam lakes, to meet with stakeholders and research groups, as a way to introduce some of the open research questions regarding the need for ecohydrology, water engineering and management, students will need to address.
- 3- A **field trip**, of 7 days, after the 3rd semester, will be organized by the consortium. Students are invited to participate and the tour will consider visiting research sites (long term ecological research, LTER, and UNESCO man and biosphere sites), and other examples of application of ecohydrology, engineering and management of water systems in Europe, at local, regional and global levels such as EU parliament or UNESCO IHP Head Quarters.

Apart from these elements of jointness, students will be offered online tools, such as a common social media platform to share information on courses, activities, job offers, conferences, etc, and to maintain contact after graduation.

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

The need analysis considered Global and European agendas on water and water related topics, the need for a holistic education programme to contribute to those agendas, the existence of similar courses at EU and outside EU, and the existence of similar Erasmus Mundus Master courses.

1. The need at **global level** is expressed by the UN Sustainable Development Goals, which clearly address water issues, and by the UNESCO International Hydrologic Programme that establishes **clear objectives regarding water and aquatic ecosystems**. Ecohydrology is considered one of the six major themes, approved by 195 UNESCO member States and 10 associated member States, for the period 2014-2021.

2. The need at **European level** is set by new water management frameworks that have been defined at fast pace, such as Integrated water (resource) management, European Water Framework Directive, Water Accounting, System of Environmental-Economic Accounting for Water, EU Research and Innovation policy agenda on Nature Based Solutions (NbS) and Re-Naturing Cities and the EU Circular Economy Strategy.
3. These UN and European agendas require a holistic understanding of water issues, and how ecological properties can be engineered and managed to ensure the achievement of development goals. Water research has evolved rapidly from niche-studies, such as quantitative modelling and hydrological process studies, to an integration of adjacent disciplines of biology and geosciences into biogeochemistry and ecohydrology. In contrast, the **integration of these developments into educational programmes has not been adequately realised**. As such, these international frameworks have created **a need for professionals with relevant expertise** in the water sector in many regions of the world. Especially in emerging developing countries there is definitely a need for water professionals with skills in water engineering and thorough understanding of ecohydrological principles, suitable water-related environmental engineering methods and integrated water management, to fill positions in ministries, private companies, research institutions and higher education.
4. In order to design the EStEEM EMJMD course, we have carried out a **study on similar study programmes in and outside Europe** and results show that a **course integrating ecohydrology + engineering + water management does not exist**. The fully integrated approach makes the EStEEM programme unique worldwide. Indeed, several well established programmes exist in environmental engineering (e.g. TU Munich, TH Lübeck), ecohydrology for biologists or ecologists (namely in Universities of Lodz and Algarve), as well as specialized courses in hydrology (IHE, Delft) and Water Management (RWTH Aachen), but the approach of EStEEM is unique in its focus on ecohydrology and its balanced integration of science, engineering and management.
5. Furthermore, **existing European Joint Master programmes were analysed and no overlap was found**. The programme of HydroInformatics has a different and complementary focus. Outside of Europe, there exist predominantly classical study programmes in hydrology, ecology, environmental engineering and water management. We are therefore confident that the EStEEM programme is unique in the world and will easily attract international students.

The EMJMD EStEEM's added value is to bring together, in one master programme, in an integrated way, the knowledge on ecological processes, engineering solutions and integrated water management approaches that are needed to address and solve water issues, in different contexts, e.g. urban, agriculture, rivers, estuaries, lakes, coastal areas. Engineering solutions provide good results in stable conditions, but are static and not adapted to growing population and economic water needs, and often consider ecological functioning of ecosystems as a "side aspect". The concept of sustainability involves an ability to adapt and be resilient, what only ecological features can provide. The global society thus needs a "merger" of skills to tackle water problems:

- using ecosystem properties to design long-term sustainable solutions,
- integrating these solutions with engineering concepts (as in many cases the ecosystem carrying capacity is not able to support the existing level of impacts), and
- having the management skills to involve stakeholders and society for the planning, implementation and continued support of these measures, reduction of causes, and development of solutions.

This is exactly what EStEEM EMJMD offers as added value, and is provided in an innovative programme design that:

1. integrates the three axes considered fundamentals: ecohydrology, water engineering and integrated water management;
2. combines partner's expertise in shared course modules;
3. promotes staff mobility to deliver topics when they are effectively required;
4. brings the world of work into the course curriculum and;
5. brings the understanding of different regional and local realities, that will be provided mostly by UNESCO water Chair and centres.

As shown previously, there are both needs and commitments at global and European levels regarding water issues and there is no similar course as the EMJMD EStEEM. Existing traditional courses focus on ecohydrology *or* water engineering *or* water management. However, there is the need to understand the problems and find solutions in a holistic and transdisciplinary way. This course justifies EU financial support for three main reasons:

1. the professionals educated by EStEEM will contribute to achieving the aims established by the European research, innovation and sustainability agendas,
2. the programme will also serve to educate non-European students who will contribute positively to the global water agenda in their own countries, after returning. This will highlight the excellence of European Higher Education, fulfilling the Erasmus Mundus Programme aim “to enhance the quality of higher education and promote dialogue and understanding between people and cultures through mobility and academic cooperation”;
3. the EStEEM programme would not be possible at national level as it brings together complementary European excellence centres;
4. only the European approach can cover the wide diversity of environmental conditions for aquatic ecosystem restoration ranging from humid to semi-arid Mediterranean environments.

- 1.3 The proposal defines how the EMJMD aims to increase the attractiveness of the European Higher Education Area, and to foster excellence, innovation and competitiveness in terms of academic fields/subjects targeted.

The course is based on three axes that are the main academic subjects: ecohydrology, water engineering and integrated water management. We build on existing knowledge from the partner universities that have a well-developed curriculum for each aspect.

Ecohydrology is a Nature Based Solution (NbS) that considers the understanding of the hydrological cycle at a river basin scale as a template for finding restoration solutions for degraded aquatic ecosystems. The basic concept is the dual regulation between biota and hydrology. Ecohydrology integrates knowledge of ecology and hydrology. For example, vegetation can absorb excess of fertilizers, control groundwater levels and increase evapotranspiration, contributing to increased precipitation and impacting the hydrologic cycle. The opposite is also true, by having more precipitation, more vegetation can grow and increase the fertilizers absorption at the roots. This concept can therefore be used as a NbS for pollution control (as in this examples), but above certain limits, contaminant concentrations become toxic to vegetation and this approach will not be sufficient. Thus, ecohydrology solutions need to be integrated with water engineering techniques.

Water engineering includes environmental hydraulics, namely the hydraulically stable design of revitalized and re-naturalized river sections, the hydraulic engineering for removing barriers to increase ecosystem connectivity. The engineering skills also include the design of constructed wetlands for sanitation or trapping and removing nutrients and pollutants by natural attenuation (an NbS). Finally, hydrological engineering encompasses nature-based flood protection measures by natural retention in wetlands. The focus is on developing engineering measures to improve water quality of rivers, lakes and subsurface water efficiently and timely. Ecohydrology and engineering measures are also well integrated with skills and competences to implement water management concepts such as the European Water Framework Directive, Environmental and Water Accounting and Integrated Water (Resources) Management at basin scale.

Water management component is characterised by an integrated, transboundary, holistic approach of implementing multidisciplinary projects through participation and reconciling contrasting needs of stakeholders. The water management component will cover sustainability frameworks, integrated water management and regulatory frameworks such as the European Water Framework Directive. It also includes water-related topics in environmental economy (water pricing, water accounting) and environmental law with a special focus on European water legislation. Social sciences will focus mainly on water laws, participation practice in water management and water accounting according to UN socio-economic environmental accounting standard (SEEA). This focus will allow for a streamlined programme covering all relevant fields of water science.

All the academic subjects listed are relevant in the academic field of Water Sciences and are well established sciences. However the relevance of this EMJMD course is the combination and integration of these three main subjects into a unique programme curriculum for ecohydrology and water science. The major challenge was to select the most adequate topics from each of academic subjects, in a balanced way to build the professional profile for the graduate in the EStEEM programme, that we, the HEIs from the consortium and the associated partners consider the most important, but still keeping the fundamental aspects of the three main academic subjects, related to water: ecohydrology, engineering and management.

Learning outcomes are described at different progressive levels: **knowledge** – what students will learn in different scientific disciplines, **skills** – what students will learn and be able to execute, and **competence** – combining knowledge in the key disciplines with a set of skills. EStEEM also aims at creating a working culture that combines scientific

methods with engineering responsibility and an overall integrated management framework. Specifically the expected learning outcomes for this EMJMD are:

1 – Knowledge, students know:

- principles and processes of aquatic ecosystems, their functioning and assessment, the concept of ecosystem services,
- hydrological terms, components and the processes of water flow and transport,
- major approaches of integrated and basin-oriented water management, sustainability frameworks and international programmes such as Sustainable Development Goals, water stock and flow accounting, the concept of water security in the IHPs strategic plan by UNESCO.

2 – Skills, students are able to

- Identify, analyse, describe and conceptualize the functioning of natural aquatic ecosystems and artificial water systems,
- assess ecosystems quality of these systems in terms of biological, physico-chemical, geomorphological and functional properties, and design, plan and execute water quality monitoring,
- analyse hydrometric data related to water resources, establish and assess water balances for different time and spatial scales and various hydrological systems (site, basin, water body),
- apply hydrological models for the quantitative and qualitative analysis of hydrological systems with a focus on open source packages that are applicable and valid in a broad range of climatic and hydrological environments,
- engineer and plan measures that improve the quality, sustainability and water security related to the European Water Framework Directive and other water management frameworks,
- develop master plans and implement water management frameworks, prepare data for public participation, policy briefings, engage stakeholders
- write reports and scientific papers and have presentation and moderation skills for stakeholder workshops, surveys and interviews.

3 – Competencies, students will be competent in

- restoring and remediating rivers and wetlands to reach or maintain good water quality in lakes and groundwater bodies and optimise the delivery of ecosystem services,
- assessing the water resources based on hydrological principles and devise measures for sustainable use,
- designing, planning and implementing engineering measures to improve water quality and resources,
- manage aquatic systems in a sustainable and integrated manner.

The ESStEEM proposal considers new and innovative aspects, such as:

1. **Transdisciplinary integration** - the focus on ecohydrology and the close association with environmental water engineering and integrated water management is innovative. This master programme does not separate: science (analysis), measures (engineering) and stakeholder participation (management). Instead it creates a work flow from science-based ecosystem analysis and engineering-based application, design and improvements of measures towards reaching management objectives. This is only possible by creating a clear focus on aquatic ecosystems and by focusing teaching loads on ecology, environmental engineering and integrated management;
2. **Coherence of the course curriculum** – course contents are arranged along the work flow from ecosystem analysis, through engineering towards reaching management objectives. To ensure the coherence and topic coverage, teaching staff will be moving between partner HEIs to deliver courses or participate in running courses. Additional e-learning modules developed and shared by all associated partners provide individual skills and complementary knowledge to students as they need;
3. **Promote culture on global water issues** – the association with UNESCO chairs and centres in the field of water science brings the regional expertise from different realities to create a broad understanding of the different water challenges and different societal responses, from different cultures and world regions.
4. **World of work project with stakeholders** – A “world of work integrated project” module is incorporated in each semester, in which stakeholders propose real-life problems and involve students to find solutions. Stakeholders accompany the development of the student’s work during the semester what contributes to creating a clear focus on professional relevance and application;
5. **Learning flexibility** – Students can chose elective courses from a wide range of water-related topics (offered in part by the associated partners). This allows students to get the expertise they are interested in and/or consider more relevant to their home country needs;

6. **Practical and applied teaching** – The consortium supports hands-on experience through access to demonstration projects within the UNESCO IHP, and with the International Long Term Ecological Research Network sites;
7. **Modern team-working concept** – Online infrastructure is offered to students which corresponds to modern team-working frameworks. Students will learn to work on a project in a team with supporting online tools for knowledge management and to adopt an online-based peer-review structure. EStEEM will provide a common wiki, semantic web and provide online lectures and exercises.

The innovative aspects within the EStEEM proposal contribute to excellence, independently of the high quality already existing in partner HEIs master programme on the specific academic subjects: 1) ecohydrology; 2) water engineering and 3) integrated water management. The excellence of the EStEEM programme results from the unique integration of these three academic fields. By combining the more fundamental modules of each of the running masters at each HEI, we streamline the topics and highlight how they connect to an applied work flow. The fact that teaching staff is moving to participate in modules in other HEIs, to ensure course coherence, improves excellence of the modules and the courses, as the partners HEIs are not limited to own staff expertise. The resulting excellence makes EStEEM highly competitive, also gaining from aspects as the effective connection with the world of work, interaction with UNESCO water chairs and centres and dedicated practical field and laboratory training.

The EStEEM strengthens innovation and excellence in European Higher Education Area (EHEA) as it highlights the benefits from (1) the collaboration between partner universities in the integration of modules and module contents; (2) the mobility of staff to ensure course coherence and absolute focus on the student's learning track and (3) the integration of stakeholders into the programme curriculum. These innovative features, by being successful, open room for replication in other courses and consortia, effectively improving the level of excellence in other programmes and European HEIs. This excellence, resulting from innovating integration and collaboration of HEIs with complementary expertise create a true new programme curriculum that effectively increases competitiveness of the EHEA, at a global level.

The proposal contributes to increased attractiveness and internationalisation of the EHEA because the EStEEM EMJMD responds to a major world problem, the sustainability of aquatic ecosystems and provision of water in good quality and quantity to support population's needs and water related ecosystem services. Water stress related to climate change, urbanisation, increasing population occurs mostly in developing countries, with impacts on human health, food scarcity and pollution, among many others. This programme will be extremely appealing to students from many regions that will come to learn how to effectively solve these problems by having a solid education in ecohydrology, water engineering and integrated water management. The programme also focuses on measures and solutions to applied problems and is appealing in conveying this attitude of problem solving and entrepreneurship.

- 1.4 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.

The EStEEM EMJMD supports the internationalisation of the EHEA by:

1. linking up with global networks such as UNESCO IHP, UNESCO water chairs and centres and International Long Term Ecological Research Network (ILTER), as well as other non-European partners (e.g. University Florida). The real participation of members from all world regions, of these networks, in teaching, in presentations such as webinars (EStEEM WEBINARS) and in providing training places for the master thesis or short courses, will contribute to disseminating the EStEEM EMJMD course and the Erasmus programme;
2. disseminating the EstEEM programme via webpages and in conferences and fairs;
3. stimulating the creation of an Alumni network of former students, what will maintain the flow of information regarding programme activities, such as webinars, conferences, workshops, short courses, at a global level.

The EStEEM EMJMD improves national and international visibility of the HEI partner institutions. It will be an important element in the internationalisation of their study programmes and their profile. The master programme will connect the universities of Algarve, Antwerpen, Lübeck and Lodz among themselves, to international partners and networks (UNESCO, IILTER) and will increase the collaboration with regional stakeholders. All partner universities will be able to attract and enrol well-qualified and motivated students with a specific interest in water science. The exchange of staff between the different HEIs will result in contacts for more projects, both in education as in research. The programme structure is designed to be sustainable after the funding launching period.

Students will improve the competences linked with their professional profiles by:

1. having direct contact with real-life and applied training situations (“world of work integrated projects” with stakeholders participation, seminars by experts from UNESCO IHP centres);
2. being able to select from a sufficiently large offer of electives courses to improve their professional skill-set;
3. becoming part of a large international network, having access to internships and being in touch with global programmes such as the Sustainable Development Goals and UNESCO-IHP activities (conferences);
4. being trained in a real context of water management frameworks in Europe in close collaboration with stakeholders;

Staff will improve the competences linked with their professional profiles by:

1. being involved in an interdisciplinary, competence and application-oriented programme that requires integration of content among scientists, engineers and water managers;
2. being involved in a modern teaching programme, involving e-learning, blended learning and flipped classroom methods as well as webinars and digitally integrated cooperation;
3. sharing modules, courses and thesis supervisions in project-oriented modules and research projects;
4. creating new research opportunities at the interface between science, engineering and water management.

The consortium promotes a strict multi-cultural respect and tolerance environment. A twinning and tutor system between senior and young students will be organized to help sharing information but also to improve the intercultural exchange. The close association with UN and UNESCO centres will contribute to convey the concept of jointly addressing global environmental issues as an international community. We aim at developing a working ethic among students that involves not only an empirical and rational scientific method and responsible engineering of sustainable solutions, but also an awareness and respect for cultural and socio-economic aspects of water management. Through integrated projects, students will work with stakeholders in local contexts in Portugal, Belgium, Germany and Poland and learn about the variety of cultural contexts of water management. Accompanying language courses will be offered at each university. Partners will implement a common concept and activities to contribute to the integration of students through social and common activities (field excursions to national parks, cultural activities in the different countries). This will also expose students to our European culture in Portugal, Belgium, Germany and Poland. Modules for soft skill training will be developed jointly by associated partners and distributed through a common e-learning platform to individualize learning tracks of students with different backgrounds.

2. Quality of the project design and implementation (maximum 20 points)

2.1 The proposal defines the academic programme and the learning outcomes and details how the excellent academic content will be offered.

The EStEEM curriculum is designed to guarantee academic excellence because it considers and includes:

1. **Relevant experience of the partners in the academic subjects composing the EStEEM programme curriculum** – all partners are managing high quality international master programmes in the different topics merged to create this new curriculum. They have required staff for teaching and good overall study conditions to receive international students. All partners are experienced with Erasmus Mundus projects and students.
2. **Balanced and coherent integration/sharing of the courses by the partners** – the EStEEM programme is structured to ensure coherence on thematic learning objectives. The programme is focused on the students learning outcomes. Courses are arranged to follow a work flow in terms of subject coherence and progressivity: modules will be delivered on the adequate moment for the student learning, independently of the HEI that will deliver the course what will be accomplished mostly through teaching staff mobility. Courses are oriented towards skills and competence to assure thematic coverage in learning outcomes (the programme covers all the main aspects of the three thematic axes – ecohydrology, water engineering and integrated water management – composing the new EStEEM programme). Moreover, a **common digital syllabus** will be developed, integrating all the HEI contributions into one single integrated document.
3. **Modern teaching methods** – Our concept still puts presence learning from experienced professors in the forefront but enriches courses with modern elements such as multi-media, webinars and e-learning support.
4. **Merging of already accredited courses** – partner HEIs existing Master courses, the basis to create the EStEEM programme, are accredited by national institutions. The EStEEM consortium will submit the new study programme to international accreditation.
5. **Internal and external feedback on academic quality (Quality Assurance)** – to guarantee academic quality, an evaluation board is set up to identify and propose corrections (e.g. alignment with world of work needs and

identify any topic that deserves more detailed teaching) and good practices to be followed by the consortium members. The EU Joint Research Center and the UNESCO-IHP will lead the **external quality evaluation**. Moreover, an **internal quality assurance procedure** will be set, where students and all partners, including associated, will contribute to the updating, alignment and correction of the EStEEM programme. The internal assurance procedure will be done after each semester and the external quality evaluation at the end of each academic year. Results of the evaluation will be discussed with students.

6. **Transparency in teaching** – the curriculum and modules will be collected and provided through a common learning platform and be open to assure non-redundancy and high quality. The programme will follow a common study curriculum defining knowledge, skills and competencies and learning outcomes per course.
7. **Applied learning and training of scientific methods** – courses are applied and include laboratory work and “world of work integrated projects” in each semester. It is made sure that students can always apply the content in the laboratory, in the field or in an integrated project, most of the time within a team to try out and experience their knowledge and to share or correct the learning outcome through communication.
8. **Adaptability of the content** – as the EMJMD includes a range of additional offers, short courses, webinars provided by associated partners world-wide, the programme is flexible and adaptive to new thematic areas that can easily be introduced in the programme curriculum at a later stage and within the following accreditation.
9. **Exposure to non-academic world and linkage with employers and private sector** – the academic quality and alignment with the “world of work” and its evolving needs are of utmost importance. Stakeholders are included in the EStEEM management structures and are included in the programme through the “world of work integrated projects”. This cooperation with public and private water sectors will indicate the market needs in the thematic area of water, ensuring a close connection with applied challenges, research questions and new developments.

The EStEEM teaching is student-centred and focusing on:

- Inter-disciplinarity of concepts provided to students,
- Transdisciplinary training to face real-life situations,
- Solid theoretical information assured by external quality control and evaluation,
- Progressivity of concepts taught to students, (learning tracks)
- Experimental laboratory and field training with a focus on active learning and applied methods,
- Progressive development of skills towards skill-sets and competence,
- Promotion of collaborative and group work,
- Promotion of students self-learning and active learning through integrated world of work projects,
- Promotion of students personal skills (communication, language, engineering attitude, responsibility etc.).

To achieve these objectives the EStEEM teaching staff will choose the **teaching approach** that will be the most adequate to the particular aim of each course. However each course, independently of in classroom or at distance with online facilities, will consider:

1. The **Integrated teaching approach**, where the subject in one course is linked with the subjects from the other courses, resulting in real inter-disciplinarity, will be transversally applied to all courses,
2. **Research and problem based approach** – teaching and learning are anchored on research findings for problem solving,
3. **Constructivist approach** – students are expected to construct knowledge and meaning out for what they are taught by connecting with prior and transversal knowledge,
4. **Collaborative work** – courses will consider group work, teamwork, partnerships and groups discussion for practical training, development of assignments, reporting and presentations, and
5. **Indirect-guidance approach** – the student will develop autonomous work under guidance and supervision.

As the programme is focused on real problem solving, these approaches will be achieved by using the **Direct** and the **Problem solving** learning/research methods, considering the following steps:

- a. Defining the problem and setting the rationale,
- b. Formulate the hypothesis and provide practice and training for the skills needed,
- c. Analysis, interpretation and evaluation of results,
- d. Setting conclusions,
- e. Discussion the conclusions and,
- f. Assess the learning outcomes.

In all courses, learning outcomes will be identified at progressive levels of basic knowledge, improved comprehension, successful application of methods, capacity to critically review and detect errors or inconsistencies and finally

autonomous thinking and development of own approaches that work in real-life. For each course learning levels a) knowledge, b) understanding, c) application and execution, d) connection, e) critical review and f) self-guided development will be progressively addressed. These learning levels are defined for each set of skills and skills are linked to form competence. Students will first learn and then train these skills for real problem solving in “Integrative Projects” that will run every semester and that will bring together university staff and stakeholders for setting challenges to students. The core of the programme will be based on presence teaching by experienced professors presenting interactive lectures with as much case-studies as possible, and with field and laboratory training. However, to contribute to course integration, partners will develop jointly and share e-learning modules, and will integrate modern elements of teaching such as flipped classroom, lecture capture, digital exercises and e-tutors to improve the learning experience, for distance learning. FHL’s spin-off oncampus provides e-learning services for many universities in Germany and contributes with this expertise to the project.

- 1. Thematic integration** – EStEEM innovates by integrating the fundamentals of the core disciplines Ecohydrology, water Engineering and integrated water management in a new programme.
- 2. Transdisciplinary training** – the design of long lasting sustainable solutions requires bringing together, from the start, the knowledge and methods from these core disciplines. This transdisciplinary will be practiced by students within the modules interacting with stakeholders, in the design of real world of work solutions. Students will work on real problems presented by stakeholders already during their studies.
- 3. Integration of global water issues** – The EStEEM programme benefits from the association with UNESCO IHP, what will provide global information on world-wide regional issues allowing students to have a broad perspective of water problems and also of different cultural and technical aspects they will face in the future.
- 4. Modern teaching** – partners are dedicated to modern teaching; professors, students, alumni share a digital sphere and are trained in using digital methods. An active learning concept is applied directed towards skills and competencies.

The main thematic innovation is that academic disciplines close to each other but separated by traditional faculty and department boundaries of natural sciences, engineering and management have been organized around a task – to solve problems of and restore aquatic systems and their services. To master this challenge, the programme content focuses on aquatic systems and on what is needed in terms of skills and competence to complete the work flow from analysis (of the ecosystem), through design and implementation of measures until sustainable management. This task is directly linked to international programmes such as SDGs and regulatory frameworks (European Water and Flood directives), and integrated with international organisations (UNESCO International Hydrological Programme).

The transdisciplinary training provides the vision to connect students with the main societal and global challenges by involving associated partners from the region of partner universities, and from global institutions dealing with aquatic systems. This association is real and stakeholders participate through integrated projects in which they articulate problems that are solved by students. The teaching and learning experience involves modern methods and creates a knowledge sphere in which students can choose elements to complete their profile and individualize their learning experience. This sphere will also keep alumni connected to our university network. The programme is a pilot for UNESCO and will demonstrate the potential of connecting experts among each other and towards a common objective.

Partners have developed a mobility scheme of students and professors that fits into their academic schedules but allows regular and continued opportunities for integration and cooperation among them.

2.2 The proposal describes a set of internal and external evaluation methods of the EMJMD, how they will be put into practice and used to monitor, upgrade and improve the quality of the course

The proposed EMJMD is based on existing master programmes running at the partner’s universities that are already accredited at national (and in some cases at international level), what ensures quality of the courses. Moreover, the excellence of the UNESCO centres and UNESCO chairs contributing as associated partners, was evaluated regarding their quality in teaching and research in the topic of their expertise. For the new EStEEM EMJMD programme, a thorough quality assurance will be implemented, considering two levels of evaluation:

A – Internal evaluation:

1. The consortium agreed on setting up the internal procedures for a detailed quality assurance evaluation on courses, modules and lectures, to ensure that any situation that requires correction is solved immediately and sustainably and to establish a **Quality Assurance Board**.
2. The internal quality assurance will run during the semester and a final evaluation will be done after each semester.
3. Evaluation results will be discussed with students, after each semester, or when needed.
4. The quality of courses will be monitored by a joint programme quality and evaluation board. The **Quality Assurance Board** will give recommendations and suggest improvements regularly.

B – External evaluation:

1. The quality of courses will be evaluated by the National Accreditation agencies.
2. The consortium will apply for international accreditation.
3. At each HEI an external advisory board, with stakeholders and representatives from national institutions related to the topic of the programme, will be set to suggest improvements on topics coverage.

Course and module evaluation will be conducted internally at the end of each semester, and a formal programme evaluation will be done at the end of each academic year. The outcomes will be communicated and discussed, measures to improve teaching where needed and to address problems identified will be taken.

External evaluation focusing on the feedback by stakeholders and representatives from national institutions participating in the programme and related to its topic, will take place at the end of each academic year. UNESCO chairs and centers quality is under regular evaluation of UNESCO education and science sectors. The international accreditation application will be prepared and submitted before the end of the first academic year. Stakeholders will have the possibility to report on skills needed and evaluate the programme in terms of applicability.

The evaluation of the EStEEM programme is fundamental to ensure that its aims are being addressed in an effective and productive way. The consortium is fully dedicated to providing the best possible teaching to the students, preparing them to be important contributors to solve major societal challenges related to water and aquatic ecosystem, in its multiple aspects. Therefore, the consortium will implement a thorough evaluation of the programme, to help redirecting, focusing, including new aspects in the students education. Feedback from students, staff and external partners is crucial for such evaluation. Thus, we consider to implement the following evaluation methodologies, at two levels:

Methods for internal evaluation:

1. Regular meetings with students and staff will allow evaluating in real time the progress of the programme and need for corrections.
2. A student's spokesperson and a trusted professor will be named to facilitate the identification of problems.
3. A general evaluation of the semester will be made with online questionnaires accessible through the e-learning platform and will be mandatory to be filled by students and staff members, after the end of each semester.
4. Before the beginning of the semester staff members will meet to organize and prepare the classes, articulate topics, define common objectives and discuss teaching methodologies and any comment, suggestion or correction needed will be discussed.
5. An interim meeting, at the level of consortium partners, will take place in the first third of each semester to evaluate needs for any improvement, correction and deviations to the planning set for the semester.
6. Monthly meeting will be set in the beginning of the semester. Other meetings will take place whenever needed.

Methods for external evaluation:

1. The programme will be evaluated by the accreditation national organizations.
2. An international accreditation process will be organized for the EStEEM programme before the first semester.
3. UNESCO IHP (linked to UNESCO chairs and centres) will be evaluated in terms of excellency and performance.
4. Stakeholders evaluate and report of how qualified students are to solve the problems they are facing and which skills they miss or need.

A Quality Assurance Board will be established at each HEI that will integrate a representative of the institution (Rectorate/Faculty/Department), a representative of the International Office, one representative of the academic services, one representative of the administrative staff, one representative of the students/per cohort, one representative for each national and international stakeholders involved in the project. The director of the programme at each HEI will coordinate the board. The Evaluation exercise by each HEI will be analysed at the level of the entire EStEEM

consortium, at the Joint Management Committee meeting. This meeting will take place at the end of each academic year, and is the forum for structural decisions regarding quality, harmonization and consecutiveness of the entire programme.

The outcomes of the assessment will be taken into account and strategies for implementation will be put into practice. The necessary adjustments in course development, university performance at different levels (academic or administration), staff performance, will be immediately addressed and solved. In case problems are reported related to a course or a professor, these problems are discussed and ways to solve them identified and documented. Success of these measures in terms of the evaluation will be monitored. Internal aspects will be immediately addressed at the HEI level. General issues regarding course structure and content, mobility or student satisfaction will be presented at the Joint Management Committee meeting, also to avoid problem repetitions in other HEIs and for sharing good practices. The assessment of the solutions identified to solve any issues at the Programme level will be assessed by the Joint Management Committee. For each assessment, internal or at programme level, a calendar for the implementation of the assessment outcomes will be established, that will never exceed the end of the semester.

2.3 The proposal defines how the student mobility is organised and is instrumental to the course objectives, and presents a draft strategy/planning for an effective involvement of scholars/guest lecturers

The course considers a student mobility and a staff mobility. Student mobility will be as follows:

1. First semester will focus on the **Ecohydrology axe** and will start at University of Algarve, in Faro, Portugal. Moreover, this first semester aims to leverage students' knowledge about main topics in Ecology, Hydrology and Ecohydrology. The programme also features introductory courses in which partners are involved and that are given by staff of the University of Algarve together with staff from the other HEI, Universiteit Antwerpen, University of Lübeck and University of Lodz on links to and integration of aquatic ecology and ecohydrology with principles of hydrology, economy and management. Students will have access to optional courses around water topics from associated partners that are delivered through a webinar. The first semester will include a "Field and Laboratory Training Course", which will take place at the University of Lodz, Poland, and will include the collaboration of the European Regional Center for Ecohydrology, under the auspices of UNESCO, in Poland and the International Center for Coastal Ecohydrology, under the auspices of UNESCO, in Portugal.
2. For the second semester, students will move to Lubeck University for the **Water Engineering axe**. At FHL students will follow three specialized courses on water engineering (environmental hydraulic engineering, hydrological engineering and environmental engineering), one joint course with consortium partners and one integrated project in which associated partners and stakeholders participate. A set of optional courses within the "water culture" pillar, will be offered. At the end of the second semester students will chose the general topic of their master thesis and have a half semester to refine and define it with their supervisor. They will also make preparations for travel and stay during semester 4 for the master thesis, accordingly.
3. For the third semester, students will move to University of Antwerpen for the Integrated **Water Management axe**. Three modules will be delivered by local staff, two joint courses with consortium partners and two elective courses. Again a joint course with partners and an integrated project will be offered in cooperation with associated partners and stakeholders. Also, a set of optional courses within the "water culture" pillar, will be offered.
4. The fourth semester will be for the development of the master thesis at one of the partner universities.

Apart from the "regular classes", students mobility will also include the participation at an annual re-union that serves:

- As welcome event for the new cohort of students,
- As an internal conference for the presentation of master projects and results,
- An opportunity for intermediate students to choose their topics, and
- To hold a Joint Management meeting.

Apart from students mobility, also teaching staff mobility, from the different HEIs to a partner HEIs, will take place for the participation in, at least, one joint course each semester and involving, therefore, the teaching equivalent of 2 credits per partner.

All partner HEIs have programmes for welcoming international students included in normal routine of International Offices activities (e.g. several joint activities, visits to campi, music and cooking activities, etc.).

Apart from the routine activities, the new EStEEM students will participate in a **Welcome Event at The University of Algarve** with representatives from all HEIs that will present their institutions and explain the courses that will be taking place there. Also students are asked to present briefly their background, expectations and provide some personal information such as hobbies, they would like to share, which will facilitate integration into the group. During this event all activities will be joined, such as lunches and dinners. The International office and the Director of the EStEEM at each HEI will meet with all students, in group and individually, to detect and solve any difficulties students might be facing, with funding, accommodation, bank account opening, Foreign Offices and Visas, health and other issues students want to highlight. Students will also meet the academic and administration staff that will be in direct contact with them. We clearly understand that, for many students this is a first experience far from home and families, and possibly an exposure to a very different culture (mostly for partner countries origins), so we will be very attentive to any sign of difficulties in normal life and integration. Students from a new cohort will meet with colleagues finishing the course, that will present the thesis work. This interaction will also provide important feedback to the new students on the successful completion of the course. A professor and an international student, possibly from other master programmes running at the HEI, will be dedicated as tutors for groups of 4 students.

At each other HEI, in Lübeck and Antwerpen, an introduction event will be hold where administrative matters will be solved and students introduced. Each partner has a well-functioning international office and is experienced in receiving international students for international study programmes outside of Europe and through ERASMUS.

At each partner university regular events for the students of this programme and for all international students are organized. The International Offices of the HEIs will organize administrative support to new students regarding accommodation, bank accounts, local registration and visa issues. A senior student mentor programme will link new students to senior students who can give advice and help with the integration. EStEEM students on the campuses of HEI will have opportunities to connect to students of other international courses through joint soft skills and language courses offered to international students. The alumni associations are also actively helping in hosting the new students. The consortium will provide a student social media sphere with Frequently Asked Questions and first-hand advice from previous students. Cultural activities will take place (cooking, international coffee). A common element will be that students visit national parks, protected areas and restoration projects to experience and enjoy nature in each country. Regular meetings will take place to discuss the progress of the programme and any type of difficulty they may be facing.

Students of the same cohort will share the same mobility track, until the thesis. The students from a new cohort will meet the colleagues from the previous cohort, at the Welcome event, after the first two semesters and at the end of the study programme.

Scholars and guest lecturers will play a very important role at the EStEEM programme. They will bring specific topics in water sciences, related to the programme. They will provide:

- Online lectures and webinars, such as in module “EStEEM WEBINARS” that will take place in all semesters of the programme,
- Online short courses,
- Presence classes, in case of scholars supported by the programme.

The scholars/lecturers participation will be organized around the main topics developed in each semester, as well as general topics, to increase awareness on water issues (the latter mainly via webinars).

2.4 The proposal explains in detail all relevant information provided to the students/academic staff prior to course enrolment, and the services offered in terms of support for accommodation, language training, administrative formalities (e.g. visa support), and insurance

Selection criteria will follow the EACAE guidelines and the **general coordination committee** will set the requirements and weights for the different selection criteria. Criteria include:

1. Previously obtained degree,
2. Field of degree,
3. Final grades,
4. Motivation of the student based on a motivation letter and academic and social activities,
5. Language skills as demonstrated through qualified language tests (TOEFL, IELTS),
6. Professional perspective and plans,
7. Reference information from previous supervisors or employers.

The common final criteria and weights will be agreed by the partners according to their regulations and specifications defined in the accreditation process. Student application forms and submission will be made available online through a common platform and webpage. The process of submission and handling of the applications will be organized by the programme coordinating institution. A joint meeting will be set to review applications. Each application will be reviewed in detail by at least two partners and the final ordination will be discussed and approved jointly by all partners. After notification of acceptance, students will receive an information package on visa regulation, financial matters, health matters (vaccination) and insurance, accommodation and practical information. This information will also be available on the homepage of EStEEM. The host institutions will assist with finding accommodation and inform about procedures and arrangements. Partners will also inform about language courses and language centres at their universities. Regarding visa regulations, partners will elaborate a standard procedure through which student visa arrangements will be handled.

Students and guest lecturers are informed about living conditions in the host country (visa requirements, class schedules, health certificates and vaccination requirements, weather conditions, electricity voltage, money and exchange, accommodation options, and normal living costs). This information is also available through the course webpage. Information on accommodation at University guest houses or renting options off campus will be made available to students and guest lecturers. Support to obtain a visa, if required, and to open a bank account for receiving the scholarships will be provided by the local International Offices. A handbook with information for the entire EMJMD programme will be made available online, including information about the EStEEM programme, explaining the academic content of the courses in each HEI, staff and associated partners involved, general living costs and conditions in the different HEIs cities and regions, and the contact details of coordination members and Universities offices.

The International Offices of every full partner HEI will help and support the students in taking care of required administrative matters (fiscal number, bank account, accommodation, health support and insurance, etc.). Important contacts with the bank, insurance and appointments at embassies or consulates will be facilitated by the administration. Students will actively be encouraged to learn the different country's languages. Language courses will be made available at each host HEI. Apart from the "official" administration, the community of international students also provide help, advice and give informal support through social groups.

Insurance will cover students from the moment they start the displacement for the first mobility until they return home after the completion of their studies. A seamless insurance scheme will be provided and students are advised how to use it. The insurance covers all mobility tracks and student activities within the framework of the course in every HEI where they enrol. Insurance will not cover activities and travels out of the scope of the programme – conditions and limits of insurances will be communicated and students will be advised to seek complementary insurance when necessary. Apart from this overall insurance provided by the consortium and programme, students will be covered by national partner insurance for medical services.

The consortium will carefully observe equity issues. All partner universities have a responsible for equity that is involved in the selection process and that will be consulted in case of doubt. In case of equal qualifications, under-represented groups will be given preference in the selection procedure. Students with special needs will receive equal treatment and all HEIs are prepared to receive students in any condition of mobility or other disability. All partners also have a position in their administration to supervise equal treatment of applicants or staff with special needs. Information documents provided to the students highlight the importance of gender equity.

2.5 The proposal clearly outlines the course rules, student rights and obligations concerning the academic, administrative and financial aspects of EMJMD implementation

Joint programme rules will be harmonized as much as possible, respecting each HEI's internal regulations. A table with equivalence of grades from partner HEIs using different scales will be agreed among consortium members. Equivalence in modules will be granted to the modules and ECTS values from the other partner universities to fulfil each national legislation requirements for the concession of the Master Degree. Students will have exam periods, with the option of resit. In case the student fails the resit exam and is moving to another HEI according to the set mobility track the exam will be sent to the coordinator of the programme in the HEI where the student will be at that time, to avoid the costs of returning to the previous HEI for a re-examination.

Students have the right to be provided with high quality teaching, to have access to all required laboratory facilities and equipment, to study in a healthy and safe environment, to be respected for their culture and religion, to get support

regarding their administrative needs, to receive punctual payment of the scholarship and to get access to immediate health care.

Students have to fulfil ethically the rules of the HEI where they are enrolled in and respect the decisions of the consortium. Rules of ethical conduct, of scientific conduct and conduct as a student of our HEIs will be written down and communicated. These rules include the principles of equality, fundamental rules of free expression of thought and religion and tolerance as well as rules of scientific conduct as specified by the HEI. It will clearly be stated that any type of proven plagiarism entails loss of grades and certificates, the rules and procedures for which are specified in the examination regulation. Details of the relation between the students and the consortium will be formalized in a contract.

The EMJMD coordinating HEI will receive the funding from the EACEA and will transfer immediately, to the partners where students are enrolled, the amounts due for the scholarships so that there is not any disruption in funding. The coordinating HEI already managed several EMJMD and is well experienced in these procedures. Each HEI also supports the students in opening a bank account to receive the funding.

2.6 The proposal describes the envisaged activities/facilities to ensure the effective integration/networking of the EMJMD students within their socio-cultural and professional environment

The programme includes several measures to promote the interaction of students with the socio-cultural/economic and professional environment related to the field of studies:

1. Mandatory modules of “World of Work Integrated Projects” in each semester at all partner HEIs. Within this module, stakeholders will propose real-life work situations to the students who will develop solutions or measures during the semester, supported by HEIs staff members. The stakeholders will meet the students, one time per month to discuss the progress of the work. The projects will be presented openly, at the end of the semester, and stakeholders will be asked to also contribute to the evaluation, as in real business life conditions.
2. Visits to private and public companies where students will be exposed to the real professional environment. The contacts with the social and cultural components of each country will be established with field visits to companies, institutions and NGOs, where students will learn from the local/regional existing socio-cultural and economic realities and perspectives.
3. Guest lectures from professionals of the private and public sectors, institutions and organisations (as UNESCO Chairs and Centers) will promote the contact with students and contribute to the creation of a professional profile for the students. These guest lectures will be announced and advertised as “EStEEM WEBINARS”.
4. Visits to UNESCO and LTER (Long Term Ecological Research) demonstration sites, in different regions and countries will expose students to various socio-cultural/economic professional environments.

The consortium supports the organisation of internships for students. Contact with stakeholders and potential institutions and companies is provided through the “World of Work Integrated Project” each semester. Students are encouraged and supported to arrange internships with stakeholders during the lecture-free periods. Associated partners from UNESCO centres will also advertise and offer positions for internships for students on the EStEEM intranet. A regular window for internships is kept free of any other activities at the end of the second semester. A list of details about internships and reports from previous years is provided through an internal forum. At each university, one representative is responsible for matching students with stakeholders and for maintaining contacts.

The EStEEM consortium will support networking:

1. During the programme – The consortium will divide tasks and responsibilities, such as for quality assurance, administration, e-learning, etc. Information will be shared at a regular basis and, whenever needed, meetings will be set, in presence or online. Face to face meetings with the consortium partner HEIs will take place during the kick-off and Welcome event, at the beginning of the programme, and at the end, during the closing and thesis work presentation event, and for selection of candidates. Other issues, such as guest lecturers and scholars selection will be done using online platforms. Meetings will take place as per request of any of the partners. An online platform for exchanging information among partners, both academic and administration issues will be created.
2. Through the partners - the EStEEM programme benefits from a rich and divers range of associated partners connected to a large network of UNESCO centres and chairs world-wide. We will use this advantage to develop our network and present the EStEEM consortium as an excellence cluster for ecohydrological engineering and management. We will dedicate special care and attention to develop and maintain a long-term relationship with our students and keep them connected to our EStEEM sphere through social media, summer

school for professional capacity building and integration into our UNESCO network and 'family'. Consortium partners will also further develop their relationship and exchange to strengthen the network for future research cooperation.

Associate partners and guest lectures will:

1. Offer/deliver course modules in their area of expertise in order to contribute to a broad thematic coverage of the EStEEM programme, closing any thematic gap or bringing new emerging/very interesting specific issues to the programme,
2. Receive students for internships, according to their possibilities,
3. Involved in the "world of work integrated project" will contribute to the design and selection of topics to be addressed,
4. Collaborate in the supervision of the thesis work,
5. Take part in the coordination meetings to ensure their effective participation in the programme development, and
6. Help with the evaluation of the learning outcomes by giving feedback on the students skills.

2.7 The proposal clearly outlines the interaction between the EMJMD and non-educational actors in course implementation

Non-educational actors will be involved in the EStEEM programme by providing:

1. Feedback on the programme, fundamental to refine and adjust the set of skills and competencies needed in the applied water science sector. These results will be fed back into the improvement of the syllabus of EStEEM courses,
2. Themes, accompanying the development, and participating in the evaluation of the "world of work integrated project",
3. Proposals of topics and co-supervision of the master thesis,
4. Guest lectures included in the "EStEEM WEBINARS" module,
5. Dissemination of the course through their professional networks,
6. Financial contribution to the organisation of dedicated events, such as conferences.

3. Quality of the project team and the cooperation arrangements (maximum 20 points)

3.1 The proposal clearly shows the fields of expertise of the involved partners/staff and how they are complementary and of added value for the EMJMD implementation. Where applicable, the proposal describes how existing cooperation agreements have been enhanced to meet the EMJMD's objectives.

Consortium Institutional expertise

All full partner HEIs are experienced in teaching international master programmes in the scientific areas relevant to this proposal. All consortium universities are running international master programmes and are experienced in coordinating and/or co-organizing Erasmus Mundus master programmes. The International Offices existing in all the HEIs are experienced in dealing with all academic and institutional issues related to hosting international students (e.g. visa, bank accounts, accommodation). The Academic Offices cooperate efficiently on the enrolment of students and transfer of documents (e.g. transcripts of records).

The partner HEIs will contribute their networks, focusing on different world regions and thematic areas, which will be merged in the EStEEM programme. This creates added value both for the institutions as well as for these regions, because we will be able to effectively educate qualified professionals to can address global water problems and implement solutions to restore degraded aquatic ecosystems and the services they provide to our societies and economy.

The EStEEM programme also includes associated partners from high quality Universities and recognized European and global institutions, organisations and networks. Partners are from:

1. world or work sector, private and public stakeholders;
2. academia and research, including water related UNESCO chairs and centers and;
3. international and global institutions organisations and networks.

They contribute added value to the socio-economic component of the programme by applying the knowledge from EStEEM courses in the context of the world of work.

Partner's professional experience

The partners are internationally recognised experts in the three main axes of the EStEEM programme: 1) Ecohydrology – Universities of Algarve and University of Lodz; 2) Water Engineering – University of Lubeck, and; 3) Integrated Water Management – Universiteit Antwerpen. The added value of the EStEEM programme is to bring these three complementary components together to create a new and unique curriculum, focusing on a holistic understanding of the complexity of global water problems and the practical skills needed for analysing and solving them.

University of Algarve (UALg) will be responsible for the Ecohydrology topic in the EStEEM programme, in partnership with the University of Lodz. The UALg academic key staff expertise in this topic is supported by:

- UALg previous coordination of an Erasmus Mundus master course in Ecohydrology (2010-2016);
- UALg is a holder of an UNESCO Chair in “Ecohydrology: water for ecosystems and societies”;
- UALg hosts the International Centre for Coastal Ecohydrology, under the auspices of UNESCO.

University of Lodz will be responsible for the intensive field course on ecohydrology and will coordinate the field work and training in ecohydrology of rivers. University of Lodz will be responsible for the education of biologists in nature-based solutions, demonstration facilities. As it is the National Centre for Ecohydrology in Poland and widely recognized in the community in Europe and in Eastern Europe it will connect to the environmental education and research in Eastern European Countries and Ukraine, Belorussia, Armenia.

Lübeck University will be responsible for the engineering aspects of environmental hydrology and ecohydrology. It will receive students during the second semester and provide basic engineering education in environmental hydraulic engineering, hydrological engineering and modelling and urban drainage. It will also offer a variety of fields for specialisation in nature-based engineering and ecohydrological or environmental engineering through a series of eligible courses related to water such as sanitation, innovative urban drainage and stormwater management, groundwater management and industrial ecology. The experience of the team in Lübeck is proven by:

- International research projects by all participating professors on water research,
- International study programmes with U.S. and pioneering education programmes with China since more than 10 years in applied science.

Universiteit Antwerpen is responsible for the integrated water management topic in EStEEM and the expertise of the staff is proven by :

- The interfaculty Institute of Environment and Sustainable Development (IMDO) is experienced in offering interdisciplinary international master programmes in the field of water science;
- Key teaching staff hold the Chair of Integrated Water Management at IMDO since 1995;
- Large realised projects in the Scheldt estuary that exemplify the implementation process and the interactions with stakeholders to students.

Cooperation is well established between two of the EStEEM partners (UALG and ULO) that have collaborated in a previous a EMJMD in Ecohydrology. UAntwerpen and ULO have a Memorandum of Understanding on joint research and teaching activities in preparation. All four consortium partners have signed the consortium agreement supporting the EMJMD EStEEM. The consortium agreement anticipates to reduce any difficulties with administration, academics, staff and students during with the implementation of EStEEM. All partners made Erasmus Bilateral Agreements to support staff and student mobility. The former partnership was built offer an EMJMD on Ecohydrology. However, the partners realized that there was a need to widen the thematic scope by adding the engineering (University of Lübeck) and integrated water management axis (Universiteit Antwerpen). With these new partnerships, the consortium creates a unique master programme with a clear structure, and has also become more sustainable in the long term. In the EStEEM programme, there is much more in-depth integration between partner HEIs (e.g. by teaching modules together) and the course coherence increased (e.g. due to staff mobility between HEIs). The fact that complementary thematic disciplines are merged , will allow all “sectorial” partners of the partner HEIs to find a “link” with this new master programme.

The curriculum was designed to offer a coherent programme, with progressive learning, and integration of the ecohydrology, water engineering and water management axes (FIG 1). The consortium designed the programme curriculum based on:

1. the evaluation of existing international master programmes;
2. the thematic expertise of the partners;
3. the integration of the thematic axes to ensure course coherence and achieve teaching objectives;
4. the expertise of associated partners and stakeholders from the “world of work” (Annex I – course structure)

The academic strengths of each partner are reflected in a balanced way and integrated in the programme curriculum:

- The first semester focuses on Ecohydrology with classes delivered by partners with expertise in Ecohydrology and based on the existing master programmes in Ecohydrology and Urban water cycle at University of Algarve and Ecohydrology at University of Lodz.
- The second semester focuses on water engineering, delivered by University of Lubeck, and based on the existing master in Environmental Engineering.
- The third semester, focusing on Integrated Water Management, at Universiteit Antwerpen, based on the Advanced Master Technology for Integrated Water Management.

The expertise of associate partners in specific water topics (recognized by International organisations) will additionally strengthen the curriculum in all three semesters.

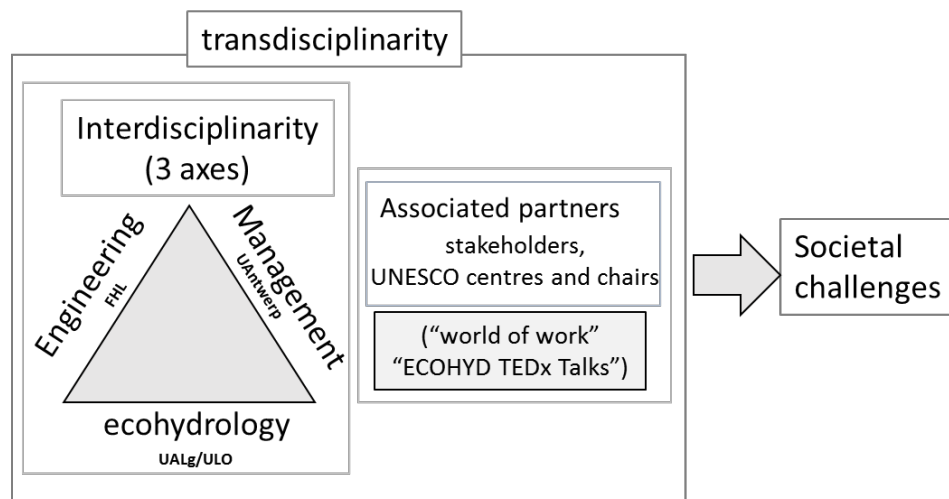


Fig 1 – Scheme of the EStEEM thematic and institutional integration to address societal changes related to water.

Guest scholars and lecturers of associated partners bring expertise complementary to the full partners, by focusing on particular topics related to water management and sustainability solutions, society and ecosystems, from different socio-economic, cultural and regional realities. Also, scholars and guest lecturers from private companies and other relevant stakeholders will contribute topics considered relevant to enlarge the student's perspectives as well as their professional skills.

3.2 The proposal describes the institutional commitment of each partner, specifies their role and tasks in the EMJMD implementation, and outlines the working mechanisms of the governing bodies and management tools in place

The consortium committed to deliver a joint master degree as it is explicitly stated in the consortium agreement, approved by all partners (see annex in other relevant annexes). The academic, administrative and financial procedures are already available at each partner HEI to implement the EStEEM programme. Information will continuously be exchanged between the partners on all aspects of the programme and full transparency will be applied regarding the discussion of scholars, budget, evaluations, etc. All rules for the efficient and transparent functioning of the EStEEM programme are defined in the Consortium Agreement and Student Agreement (see annex in other relevant annexes). The academic, administrative and financial procedures will be clearly described in a digital handbook that will be produced with the participation of academic and administrative staff.

The consortium HEIs will be responsible for the different thematic components of the course curriculum. Partners are responsible for:

1. implementing and ensuring high quality of the academic programme,
2. cooperating with the associated partners and guest scholars and lecturers,
3. all administration aspects related to hosting the students,
4. the financial issues,
5. the quality assurance process,
6. adhering to the requirements of national and international accreditation agencies,
7. the issuing of the Joint Master Degree.

Management Structure



Fig 2 – Scheme of the EStEEM thematic and institutional integration to address societal changes related to water.

The associate partners will contribute by:

1. providing specific short course and guest lecture,
2. collaborating in defining topics for the “World of Work Integrated project”,
3. proposing improvements to programme objectives to reflect professional reality,
4. reflect on the feedback from students and staff during the quality assurance evaluation,
5. contribute to the dissemination of the EMJMD EStEEM,
6. co-supervision of master thesis,
7. providing internships,
8. financially supporting student activities, if possible.

Partner’s roles and responsibilities are defined in the consortium agreement and are set in the commitment letters of associated partners. Partners have agreed to the organise EStEEM and are responsible for courses in their thematic areas and in assuring the overall quality of the programme. Roles will be harmonized so that the consortium works as one unit. An internal online platform for the consortium will be developed for this purpose.

Tasks and duties will be shared among partners and communication in all relevant decision will be shared. Partners will jointly working in:

1. implementing and ensuring the high quality of the academic programme (responsible: UALg),
2. articulating with the associated partners and guest scholars and lecturers (responsible: UALg),
3. practical training courses (responsible: ULO),
4. financial and administration issues (responsible: UALg),
5. quality assurance procedures (responsible: ULO),
6. international accreditation (responsible: FHL),
7. implementation of the Joint Master Degree (responsible: FHL),
8. dissemination, marketing, promotion (responsible: UAntwerpen),
9. welcome and final thesis presentation events (responsible: UALg),
10. interaction with stakeholders and students internships (responsible: UAntwerpen),
11. financial resources and extra funding (responsible: UALg).

The project considers the following management structure (see figure). Students will elect their representatives to all bodies.

3.3 The proposal describes, *inter alia*, the joint criteria, principles and requirements for student application, selection and admission requirements, student examination and performance evaluation

Student’s application e-forms, dates, requirements, contacts, and instructions will be published online on the EMJMD EStEEM webpage, which will be created by the coordinating HEI. The application page will provide all the required information about the programme, scholarships, insurance, mobility track, consortium HEIs, mandatory and optional courses and living conditions in each HEI.

The consortium decided agreed the following selection criteria:

1. Academic qualifications (max 60):
 - 1.1 GPA (all previous degrees) (max 40),
 - 1.2 relevance of degree to the topic of the EMJMD (max 5)
 - 1.3 additional course work (extra courses, trainings, internships (max 5))
 - 1.4 publications and academic research experience (max 5)
 - 1.5 academic awards (max 5)
2. Professional experience (max 20)
 - 2.1 Practical experience (lab and field work) (max 15)
 - 2.2 Relevance to the topic of the EMJMD (max 5)
3. Motivation (max 20)
 - 3.1 Motivation letter (max 10)
 - 3.2 Recommendation letters (max 10)

Applicants rated with less than 48 points do not qualify for admission. Admission procedures will follow each HEI’s internal regulations and will be managed by the International Offices.

Academic performance consists of academic achievement and of the acquisition of knowledge, skills, and competencies considering persistence and retention. The student's performance will consist of the following assessment instruments:

1. Academic achievement – course and assignment grades,
2. Attainment of Learning Outcomes - problem solving, critical thinking, writing skills, and knowledge of science concepts and principles,
3. Persistence and retention - persistence refers to degree progress and retention to failing of courses,
4. Level of engagement with University activities – academic and social integration,
5. Satisfaction - assesses student's access and use of institutional resources and opportunities provided for their learning and development,
6. Self-efficiency - student's ability to engage in self-regulated learning.

The academic performance outcomes performance will be balanced against students expectation and class average values. The common methods for examination are:

1. written and oral assignments as tests, reports and exams on theoretical and practical issues,
2. reports on practical field and laboratory experiments; and
3. ability to perform field and laboratory experiments.

The dissertation is evaluated on the basis of the written reflection as well as the public defence of the dissertation. During this public defence, the students present their research results (maximum of 20 minutes). Subsequently, the jury members interview the students on their research and their output (maximum of 30 minutes).

All Master's dissertations are evaluated by a reading committee consisting of one or two dissertation supervisors and two members of the dissertation reading committee, being one from a partner HEI, to ensure consistency in the topics and grading. A chairperson and a secretary are appointed. They have to watch over the procedures and have to take care that all students are treated equally.

- 3.4 The proposal explains how the student participation costs have been calculated, and provides a description on how the financial resources including complementary funding will be mobilised, allocated and managed within the partnership.

For the financial needs analysis, the following items were considered (see also table below):

- Number of students
- Partner universities fees
- Insurance costs
- Training course
- Dedicated staff
- Dedicated equipment for laboratory and field experiments
- Opening and closing events
- Webpage and e-platform setting and maintenance
- Participation in events for dissemination of the course
- Quality assurance costs
- Accreditation costs

Participation costs include the HEIs' running costs including teaching activities, quality assurance, international accreditation, acquisition of consumables and equipment, maintenance of equipment, acquisition of software, support to field visits and training activities dissemination and advertisement, EMJMD webpage and technical assistance, insurance, organisation of welcome and thesis events student and staff attendance to conferences, contribution to publications (e.g. special volumes with students thesis works) and language courses.

Each partner contributes the teaching and administrative staff costs, laboratories and equipment, technicians, access to facilities such as canteens, libraries, medical services and transport services. Support from associated partners will be mainly be *in kind*, by offering guest lectures and online courses and contributing to field training events.

Students participation costs allocation				
	EDITION 1	EDITION 2	EDITION 3	EDITION 4
a) Number of students from partner countries	12	12	12	12
Participation costs (Euros)	108000	108000	108000	108000
b) Number of students from programme countries	3	3	3	3
Participation costs (Euros)	13500	13500	13500	13500
Total participation costs (income) (Euros)	121500	121500	121500	121500
Running costs per edition (in Euros):				
- Insurance costs	13500	13500	13500	13500
- Field and laboratory training course (ULO, ERCE, ICCE)	25000	25000	25000	25000
- Opening and closing (with thesis project presentation) events	12000	12000	13000	13000
- Webpage and e-platform setting and maintenance	10000	8000	8000	8000
- Participation in events for dissemination of the course (fairs, congresses)	10000	12000	15000	15000
- Quality assurance costs	12000	12000	12000	12000
- Accreditation costs	10000	0	0	0
- Dedicated equipment for students laboratory and field experiments	16000	0	0	0
- Welcome field trip (visit in Portugal) – 1 st semester	10000	10000	10000	10000
- Field visit (visit in EU regions) – after 3 rd semester	20000	20000	21000	21000
Total costs of project	121500	121500	121500	121500
Net balance (SUM=0)	-17000	9000	4000	4000

The lump sum for the consortium management will be used to hire a dedicated administrative staff member to ensure the adequate and timely contact between universities administrations, support students, actualize the webpage and help in all administrative issues related to the consortium management. Moreover, the lump sum will be distributed between the partner HEIs to cover expenses with meetings and local coordination expenses. This distribution can be changed after consortium auto evaluation.

		INTAKES 1, 2, 3 AND 4		
		<i>(2019/20; 2020/21; 2021/22; 2022/23)</i>		
		YEAR 1	YEAR 2	
				TOTAL
PROJECT COORDINATION	preparatory year (2018/19)	PROJECT COORDINATION		
preparation of international accreditation	7500	ESTEEM administrative dedicated secretariat	6900	6900
dissemination (webpages, advertisement in fairs and congresses)	5000	Dissemination costs (webpage, launching and closing events)	2000	2000
preparatory meetings	3000	General coordination; meetings, dedicated equipment, etc)	2000	2000
UALG coordination	15500	UALG coordination	10900	10900
ULO coordination	1500	ULO coordination	1500	1500
FHL coordination	1500	FHL coordination	1500	1500
UANTWERP coordination	1500	UANTWERP coordination	1500	1500
TOTAL COSTS	20000	SCHOLARS GRANT		
TOTAL ESTEEM INCOME	20000	scholars grant/week	1200	1200
		n° of scholars	2	2
		n° of weeks	4	4
			9600	9600
		ESTEEM PROJ COSTS/INTAKE	25000	25000
		EU ESTEEM BUDGET/INTAKE		
				19200
				50000
				50000

Financial support from UNESCO IHP, UNESCO chairs and centres as well as the private sector will be pursued. The programme is well suited to assist governments with capacity building of their staff. We aim at embedding our programme in technical cooperation projects by German Technical Cooperation (GIZ) or the Belgian Development Agency (CTB) and acquire funding from them and from governments investing in capacity building to reach the SDGs. Furthermore, the programme will be advertised to professionals who want to complete a high-level master to advance their professional careers.

Participation costs will be transferred to each HEI prior to students' mobility to avoid any disruption in scholarship payment. Consortium management funds will be transferred in the beginning of every edition of the EMJMD to each partner HEI. These financial agreements are endorsed in the consortium agreement.

4. Impact and dissemination (maximum 20 points)

- 4.1 The proposal offers a convincing mid/long-term development/sustainability strategy and makes realistic projections beyond the EU funding period, and the ways to mobilise other funding sources for scholarships and self-funded students

The consortium is determined to create a long-term sustainable master programme. We look for setting the basis for a long-term cooperation of the consortium now established. We will use the EACEA funding to consolidate the programme in terms of integration of courses. We will use the Erasmus Mobility funding for staff mobility, as we have already signed bilateral Erasmus mobility agreements among all consortium partners. This intention is clearly stated in the consortium agreement, signed by the partners HEIs. In medium term, after the EU funding period, the consortium anticipates a drop in the number of candidates, mostly from developing countries. Actions will be taken to counteract this including being highly attractive to candidates from Europe and abroad. To this end, the consortium counts on the UNESCO IHP network that links all 195+10 associates UNESCO member states and the International Hydrologic Programme National Commissions, Universities hosting water chairs, and UNESCO water centres.

The international accreditation of the programme will be kept. The consortium will continue to issue a Joint Degree. The same administrative and academic cooperation is foreseen, unless adjustments are considered necessary. The cooperation with the world of work and global organisations will allow the consortium to keep the EStEEM curriculum updated in terms of changing global water challenges.

1. The consortium will look for funding opportunities for students by linking up with embassies as well as national and international funding agencies,
2. The consortium secretariat will provide information and assistance to students in applying for scholarships,
3. The consortium intends to attract more stakeholders and to create a regular internship period. Internships are also low level commitments and precede applied projects. After the initial phase also funding of students by companies or institutions is envisaged.
4. The consortium partners are well aware of the post-funding phase and will prepare activities during the funded phase to attract self-funded students, such as summer courses, participation in conferences, participation in field trips. These activities will be, as much as possible, open to interested candidates who can experience the EStEEM programme, and possibly enrol in the future,
5. Dissemination activities, such as participation in education fairs, congresses, and special editions in scientific journals with excellent thesis research will contribute to highlighting the quality of the course
6. We will foster networking with the associated partners and other networks to advertise the programme. We will link with these partners in activities where it is possible the disseminate of the programme and the students' achievements.
7. The partners already signed bilateral agreements to ensure staff mobility between HEIs in order to maintain the level of cooperation initiated during the funding phase.

To mobilise self-funded students, the consortium will:

1. FHL already has experience with self-funded programmes and runs them successfully with Shanghai, Hangzhou and as an international master programme. We therefore know, that it is key to have an attractive study programme and to make students, institutions and funding agencies aware of it.
2. Therefore, we will have a proactive dissemination policy, using web tools such as an EStEEM programme webpage, facebook and twitter.
3. Create a digital newsletter that will be send to Universities and Institutes around the world, and disseminated through the UNESCO IHP network, with news from the programme activities, guest lectures and events organized by the consortium staff and students.
4. Actively link with the UNESCO IHP global network member states and partners to disseminate the programme and attract students.
5. Organize online lectures and conferences on water issues that will be disseminated worldwide.
6. Participate in education fairs and events to disseminate the programme.

To mobilise funding the consortium partners will:

1. Contact private companies and public funding institutions, such as national science and education foundations, looking for specific funding opportunities.
2. Organize events for donors and donors candidates, such as participation in the Welcome and closing events.
3. Establish a "Donor. best student award" to be offered, by funding Donors.

4.2 The proposal explains how the EMJMD will generate impact at institutional level (faculty/university), and how it enhances the internationalisation strategy of the consortium partners towards relevant stakeholders at national/European/international level.

For each partner HEI, the EStEEM programme will:

1. Increase the visibility in teaching and research – the programme will contribute to the recognition of each of the HEIs excellence in teaching and research, at the global level, and this will promote the education and research at the HEIs. The contacts established within this project will enable a better cooperation with the private sector and will contribute to create a better link between education and needs of the world of work.
2. Create opportunities for cooperation and integration – the programme will contribute to increases cooperation at national and international levels in the topic of water, as it an earmark of EU high quality . Cooperation with the professional sector, both private and public, will facilitate to open “doors” for future employment of EStEEM students. Moreover, it creates possibilities for further cooperation, also in other topics, with the HEIs departments and faculties.
3. Improve administrative academic service procedures – the programme will contribute to the harmonization of good administration practices among the HEIs, in terms of financial and academic procedures.
4. Financial impact – the funding from EU will allow to initiate this master programme with a quality label of excellence. This “seed” funding will help the HEIs to start and consolidate the EStEEM EMJMD. Moreover, the participation costs provided by the EU will be useful to attract more students and to establish a long-term sustainable programme.

For the EStEEM consortium, the programme will enable and support exchange of teaching and research experiences, knowledge, expertise and skills. It will create opportunities for joint research and academic projects. The EStEEM programme will link our universities in one topical field and represent a major step in the internationalisation of this newly integrated thematic field. The experience and expertise gained in the exchange of students will reflect on the entire universities and be a blue print for advancing European cooperation also in other departments and thematic fields.

All partner HEIs operate in a global society and therefore aim to stimulate the international orientation of all students and staff members. They have developed an internationalisation strategy with the aim of:

- promoting student exchanges,
- fostering an open global vision among students,
- developing international training components and study programmes,
- attracting talented students from abroad.

All partners HEIs are dedicated to create the best possible master programme. We are aware of the innovation behind this new master programme, that effectively integrates courses from different European HEIs, creating unified courses, shared by several HEIs. The administrative aspects also require some harmonisation, but all partner HEIs are experienced in international academic collaboration. Therefore, we all will articulate and adapt our regulations to comply with our main goal. This will is made explicit by the Consortium Agreement already signed by all rectors. We are open to adapt and to improve any aspects related with teaching and administration, and this will be considered an opportunity to improve services at HEIs. The need for such adaptation will arise from staff, students and from quality assurance evaluation. To facilitate the communication between administrations, an online platform we will created for fast and dedicated sharing of information and documents. To adapt to other HEIs requirements, teaching and administration staff will be in contact, and meet at least at the launching event meeting.

The ability to create an effective unified European master course in the topic of water sciences will contribute to the outreach of the EStEEM programme:

1. At international level - by demonstrating the international scope and the quality of the programme and of the HEIs incorporating the consortium.
2. At national level, by facilitating cooperation with institutions from private and public sectors due to the recognition of the quality of the programme.

The impact on the EHEA are expected at two levels:

Internally in EHEA

- Institutional harmonisation – EStEEM demonstrates to the EAHEA, the effective harmonisation of a master programme and the ability of HEIs to integrate teaching.

- Thematic integration – EStEEM shows the EAHEA that by integrating different scientific disciplines it is possible to create a new generation of educational programmes, which are because of their holistic and transdisciplinary more adapted to the global challenges society is facing.

Externally to EAHEA

- EAHEA as example of jointness – the level of integration in EStEEM will be considered as example for the development of education programmes in other regions,
- Increased attractiveness of EStEEM and other EU education and research programmes – the uniqueness of the EStEEM will call the attention to the EAHEA and will increase the visibility and attractiveness of the EAHEA to other world regions

The EStEEM programme will educate qualified water professionals, with the vision and skills to understand the problems related to the degradation of aquatic ecosystems and effectively implement solutions to these water problems. As such, future graduates will have a positive impact on our society, economy and environment. The master programme will most likely have a strong impact as eco-hydrology is an emerging science with relevant applications and especially because students will not only learn to understand but also to act, engineer and manage. We want to capacitate our students to actively work on restoration and remediation of aquatic systems through well designed, well-managed and efficient measures. There is an imminent task to be solved – improve sanitation, improve supply, achieve water-related measures SDGs. We have involved stakeholders and actors and therefore anticipate that the programme and its students will have a lasting impact on this process. The partnership with various stakeholders will be beneficial to the students but also to the companies and institutions that will gain from the vision and approach to problems proposed by students in the “world of work integrated project”.

The results of the EStEEM programme outside the academia will be measured by:

- Stakeholders replies to questionnaires,
- Feedback (evaluation) from associated partners receiving or supervising students,
- Follow up of alumni’s professional trajectories and career development after graduation,
- Number of scholarships from self-paid students and regional coverage of the applications.

We will also report to UNESCO IHP and be part of and involved in the process of monitoring SDG progress and progress in the implementation of ecohydrology. We will maintain cooperation and will have information about projects achieved, publications, reports and case studies.

4.3 The proposal describes how the proposed EMJMD encourages entrepreneurship and a sense of initiative, describes how employers will be involved in course implementation in order to improve students competencies and skills and thereby enhance the employability of graduates

The consortium will expose the student to the professional environment and entrepreneurship by:

1. offering a module on “Economy and entrepreneurship fundamentals”, at the University of Algarve, already in the first semester,
2. connecting students to the world of work in several mandatory courses, where they will interact directly with stakeholders from public and private sectors,
3. inviting entrepreneurs from the water sector to participate as guest lectures in the “EStEEM WEBINARS” module,
4. articulating with stakeholders, as much as possible the possibility to welcome students in internships, as **spin-off of the module** “World of Work Integrated Project”
5. inviting stakeholders and representatives from institutions and organisations related to the topic of the course for the welcome and closing events and for any activities that disseminate the work of the students or the quality of the programme.

The EStEEM programme links closely to the world or work. Close contact with stakeholders, companies, organisations and institutions operating in the sector will be proactively set to obtain feedback on the adequacy of the programme content to employer’s needs. This will result from employer’s participation in the “world of work integrated project” and from the participation of stakeholders at the Joint Steering Committee. The alignment with major water related strategies, at European and global levels, will be provided by the EU Joint Research Center and by the UNESCO IHP.

The consortium will:

- 1 Set an Advisory board that will constitute a platform for stakeholders to provide strategic advice on the programme adequacy.
- 2 Invite stakeholders from the private and public sectors to participate in the development of the “World of work integrated project” module, that will run at the University or as internship at the stakeholders’ company or institution. As such, stakeholders are closely involved in the programme and therefore able to evaluate the students’ skills. Based on such feedback the consortium will correct the gaps that are considered, by all, as important for the education of the students.

4.4 The proposal describes the types and methods of promotion/dissemination mechanisms, its target groups, and the concrete tasks of the partners in the awareness-raising strategy of the EMJMD. It explains how it plans to attract excellent students worldwide.

The project will raise global awareness by:

1. Having a dynamic and dedicated webpage,
2. Advertising and disseminating webinars within the Module “EStEEM WEBINARS” that will be disseminated worldwide,
3. Disseminating the course programme, activities such as conferences and short courses through the associated partners network (e.g. the UNESCO IHP, ILTER), which includes partners from all world regions.
4. Developing a digital newsletter that will (twice a year) be sent to all partners with the information on programme activities, students, staff and partners interviews and/or articles.

The consortium partners will carry out four main tasks to implement the EMJMD promotion:

1. Develop web interfaces, such as dedicated webpage, facebook, twitter;
2. Create an online flyer and handbook with information about the course,
3. Produce an online newsletter on the EMJMD activities to be disseminated at the beginning of each edition and at the end of every semester.
4. Implement a Welcome event for each edition’s new students - the “EStEEM day” – where also the students from former editions present their thesis works and meet the new students who are officially welcomed.

The consortium will target professionals from public and private sectors, in the area of management and restoration, as well as staff from NGOs and other networks dealing with water issues, mainly from developing countries. The consortium will address ministries of the environment directly, partner universities it is linked to. The consortium will approach UNESCO IHP to advertise the master world-wide as a pioneering integrated master programme.

Project dissemination will be achieved using online tools, newsletters, contacts with associated partners and their networks, that are of global coverage. Project results will be assessed from quality assurance procedures, by interaction and feedback from associated partners and stakeholders, by analysis of alumni career progress and by the number and regions for self-funded applications. These results will be analysed at the Joint Steering Committee level, as corrective or further supporting actions will be taken as needed in order to strengthen the programme offered. The divulgation of the programme, the level of integration and the successful outcomes for the students, will contribute to transfer this approach to other contexts.

4.5 If relevant, the proposal describes how the materials, documents and media produced will be made freely available and promoted through open licences, and does not contain disproportionate limitations.

All the text documents produced within this EMJMD such as lectures, photos, reports, videos on guest lectures, will be made completely available to the students and all partners. An online platform using open access software will be created for sharing all course materials and documents, both academic and administration, to the specific users.

Projects/activities implemented by the consortium organisations in relation with the proposal and **Skills and expertise** of key staff involved in the project

Projects/activities implemented by the consortium

Partner number	<i>Pn 1</i>
Organisation name	<i>999863003 Universidade do Algarve</i>

The University of Algarve (UAlg) is a Portuguese public higher education institution founded in 1979, located in the southernmost region of Portugal, the Algarve.

With approximately 8000 students registered in 2017/18, UAlg has teaching and research as its core activities in different scientific areas: science and technology, management and economy, earth and marine sciences, social sciences and more recently health.

UAlg offers 48 graduate and 93 postgraduate programmes (70 MSc and 23 PhD) and has a permanent teaching and research staff of 809 people that developed a significant number of research projects. The scientific groundwork of UAlg along with all international cooperation projects and research work aim at developing innovative ideas that contribute to the excellence of the University.

In terms of mobility programmes, UAlg takes part in the Erasmus programme since 1993 and holds an Erasmus Charter. The internationalization of UAlg is well proven with the successful coordination and partnerships in numerous projects in the framework of the Erasmus+ Programme (KA1, KA2 and KA3), and the former programmes Lifelong Learning (Erasmus, Leonardo da Vinci, Grundtvig, Comenius), Erasmus Mundus (EMA1 and EMA2), Tempus, Alfa, Atlantis, Edulink. UAlg has also signed more than 250 bilateral agreements with HEIs all over the world.

Skills and expertise of key staff

Partner number	<i>Pn 1</i>
Organisation name	<i>999863003 Universidade do Algarve</i>
1) Name of staff member	<i>Prof. Dr. Luis Manuel Zambujal Chícharo</i>
<p>Luis Chícharo is Professor of Ecohydrology at University of Algarve. He coordinated the Erasmus Mundus Master Course in Ecohydrology. He is the Chair holder of the UNESCO Chair in Ecohydrology: water for ecosystems and societies and acting Director of the International centre for Coastal Ecohydrology, under the auspices of UNESCO. He published 3 books, 2 journal special issues and more than 60 papers the topic of ecohydrology. He is member of the Portuguese National Water Council, by Governmental appointment, and also Vice-chair of the UNESCO steering Committee for the Ecohydrology program. He is editor of the journals: Estuarine and Coastal Shelf Science and Ecohydrology and Hydrobiology.</p>	
2) Name of staff member	<i>Prof^a. Dr. Manuela Moreira da Silva</i>
<p>PhD in Environmental Sciences and Technology, MSc in Applied Ecology, Grad. in Biology. Director of Master in Urban Water Cycle. Director of Sanitary Engineering Laboratory at UAlg. Expert invited of National Agency for Assessment and Accreditation of Higher Education. Member of UNESCO Chair in Ecohydrology, Water for Ecosystems and Societies. Since October President of Scientific Council of Institute of Engineering- University of Algarve. Research on Water Quality; Phytotechnologies and Metal Remediation; Urban Water Management.. More than 20 years of experience in consultancy in Water Quality and Sanitary Engineering, more than 40 publications in international journals, conference proceedings and book chapters.</p>	
3) Name of staff member	<i>Prof .Dr. Flavio Martins</i>
<p>Flávio Martins develops research and consultant activities in hydrodynamics, water quality and ecological modelling. The study domains range from coastal and estuarine to riverine, natural and artificial reservoirs. The focus of his research is on Mathematical Modelling and on information systems (Visualization, Databases, GIS, etc.). The main tool used is the MOHID modelling system, an integrated model developed by the MARETEC group with contribution from the University of Algarve. Main topics are: hydrodynamics of estuarine and coastal regions; sediment transport; water quality; ecology; river basin processes. He has more than 25 years of experience in research and consultant activities, including FP7 and H2020 projects, 27 papers in peer review scientific journals and more than 60 articles in scientific conferences. https://orcid.org/0000-0002-9863-6255</p>	

Partner number	FHL
Organisation name	Lübeck University of Applied Sciences
<p>The role of FHL in the EStEEM consortium will be to offer advanced courses and training on environmental, hydraulic and hydrological engineering courses for nature based solutions for aquatic system restoration. The team at Lübeck University of Applied Sciences (FHL) is already offering international master courses in environmental engineering. The master of environmental engineering (MaEE, master-environmental-engineering.de) is an international master program with excellent laboratory facilities for applied training and research and strong e-learning support for blended learning. The civil and environmental engineering departments of FHL have excellent laboratory facilities including an environmental hydraulics laboratory with several experimental flumes, an experimental waste-water treatment plant and an environmental hydrology laboratory. Students will be offered field and laboratory training in all aspects of water-related environmental engineering. FHL is a pioneer in successful double degree programs in applied engineering with the United States (since 15 years) and in China (since 10 years). International double degree engineering programs have been developed with Shanghai/China (E-CUST), ZUST Hangzhou and Milwaukee/U.S. The team of environmental and water engineers at FHL is also involved in several international research and education programs: Prof. Külls, Prof. Grottker and Prof. Oertel have worked are working in water-related research programs in Afrika (Namibia, Tanzania, Ruanda, Burundi), in South America (Brazil: Ceará, Piauí, Sao Paulo). In Europe pioneer water resources studies at national scale have been carried out in the Eastern Mediterranean in Greece, Cyprus, Spain, Portugal and Jordan with European funding (INCO-DC, ERBIC18-CT97-0143, ERANET MED3). FHL is one of the leading providers of blended learning and e-Learning services. This expertise will be used to support communication and integration of modern teaching and e-learning methods in the course program.</p>	

Skills and expertise of key staff

Partner number	FHL-K
Organisation name	Lübeck University of Applied Sciences
4) Name of staff member	Prof. Dr. Christoph Külls, hydrological engineer
<p>Prof. Dr. C. Külls is a senior hydrologist with more than 20 years of work experience in hydrology and environmental engineering world-wide. He is study coordinator for environmental engineering. His key areas of research and teaching are applied methods of nature-based hydrological engineering. He has coordinated large, international projects on water resources assessment, restoration and remediation of rivers and groundwater in dry to humid climates. He has co-authored an international text book on environmental hydrology (Leibundgut, Maloszewski & Külls, Tracers in Hydrology. Wiley). His lectures at Lübeck, Hangzhou/China and TU Darmstadt provide first-hand insight into application of hydrological engineering methods for restoration of aquatic systems. He has published more than 50 papers with > 850 citations.</p>	
5) Name of staff member	Prof. Dr. Mario Oertel, environmental engineer
<p>Prof. Dr. habil Mario Oertel is an environmental hydraulics specialist. In his lectures on environmental hydraulics students learn engineering skills to implement the European Water Framework directive by improving the geomorphological and structural properties of rivers with hydraulic engineering methods. He is running an environmental hydraulics laboratory with several flumes in which different methods of improving the continuity in rivers for fish and aquatic organisms are investigated. Courses are given directly in the laboratory and are applied, providing hands-on practice and experience in hydraulic calculation, design and modelling. His research focus is on combined numerical and experimental hydraulic modelling.</p>	
6) Name of staff member	Prof. Dr. Matthias Grottker, sanitation engineer
<p>Prof. Dr. Matthias Grottker is an experienced civil engineer with a focus on sanitation and urban drainage design. He has developed and runs an experimental waste-water treatment plant in which new methods for waste water treatment and sanitation can be applied and tested. He coordinates several research projects on innovative storm-water modelling and design and innovation in waste water monitoring and treatment. Prof. Grottker has experience in Africa (Tanzania), Asia (China) and in the Middle East (Saudi-Arabia) and in adapting technological solutions to new social, cultural and technical frameworks.</p>	

Partner number	<i>Pn 3</i>
Organisation name	999863488 UNIWERSYTET LODZKI
<p>ULO hosts average 1000 foreign students per year which is usually about 2 % of the total number of Polish students. In last 3 years ULO participated in 37 LLP EU programmes. EMJMD EStEEM at ULO is projected at the biggest in Poland Faculty of Biology and Environmental Protection with the close cooperation of researchers and teachers from the European Regional Centre for Ecohydrology Polish Academy of Sciences (ERCE PAS). At the ULO the curricular plan for the EStEEM is established on the basis of courses given in the frame of the master programme: University of Lodz Magister in Environmental Protection – specialty Ecohydrology (MA in Ecohydrology). Selected courses, mainly related to the Ecohydrology as a potential ecological tool for sustainable development, were incorporated in 2010 in the Erasmus Mundus Master of Science in Ecohydrology (ECOHYD) and in the University of Lodz Master of Science in Governance for Sustainable Development (GAVA, LLP – CD development). The Socrates/Erasmus – Master of Inland Water Quality Assessment and the Socrates Erasmus –LLP – Thematic Network - AQUA-TNET Aquaculture, Fisheries and Aquatic Resources Management is relevant for EStEEM. Since 2010, at ULO 33 ECOHYD students from 22 countries and 136 foreign students from other EU mobility programmes joined the MA Ecohydrology courses. ULO hosted also students from Erasmus Mundus Action 2: (EMBER - Erasmus Mundus Broadening Educational Opportunities; EFFORT - Education Force: Driving Mobility for EU-East Europe cooperation; EURICA - EUrope and ameRICA: Enhancing University Relations by Investing in Cooperative Actions; IANUS II - Inter-Academic Network ErasmUs MunduS II). ULO conducts one Erasmus Mundus joint master degree - Master of Arts in Media Arts Cultures (http://www.mediaartscultures.eu/mediaac/), issuing joint diplomas.</p>	

Partner number	3
Organisation name	999863488 UNIWERSYTET LODZKI
1) Name of staff	<i>Prof. Maciej Zalewski</i>
<p>Professor, Head of ULO Department of Applied Ecology, Director of European Regional Centre for Ecohydrology PAS. Founder of ecohydrology concept under the framework of the UNESCO-IHP. Coordinator of urban projects: “Sustainable Water Management Improves Tomorrow’s Cities’ Health” (SWITCH), LIFE08ENV/PL/000517 "Ecohydrological rehabilitation of a recreational Arturowek (Lodz) as a model approach to the rehabilitation of urban ecosystems” and LIFE14CCA/PL/000101"Adaptation to climate change through sustainable management of water of the urban area in Radom City”. Author of 198 scientific publications (IF), 32 book chapters, editor of 10 books, co-author of 21 scientific expertises concerning restoration of rivers and reservoirs. Founder and editor-in-chief of international ELSEVIER journal Ecohydrology & Hydrobiology (www.journals.elsevier.com).</p>	
2) Name of staff	<i>Dr. Iwona Wagner</i>
<p>Area of expertise in ecohydrology and in urban ecohydrology including stormwater management and planning strategies and city adaptation to global climate change, coordination and facilitation in multi-stakeholder platforms, management and implementation of innovative transdisciplinary projects. For several years Scientific Secretary of the Ecohydrology Project of the UNESCO-IHP and liaison for the International Environmental Technology Centre of the United Nations Environment Programme. Author of 16 publications in international journals, 15 chapters and co-editor of 6 international books, author of over 100 oral presentations at international conferences. Participation in grants: SWITCH (www.switchurbanwater.eu) and Life + EH-REK (www.arturowek.pl) and EKOROB (www.ekorob.pl). Teacher in ERASMUS MUNDUS Master of Science in Ecohydrology (ECOHYD).</p>	
3) Name of staff	<i>Dr. Małgorzata Łapińska</i>
<p>PhD in Biological Sciences and over 25 years works as a researcher and tutor in the Department of Applied Ecology at ULO. Area of expertise: ecohydrology, freshwater ecology, fish-based assessment and river restoration. 25 scientific publications. Participation in scientific grants: FAME (fame.boku.ac.at), SWITCH (www.switchurbanwater.eu) and Life + projects: EH-REK (www.arturowek.pl), EKOROB (www.ekorob.pl), LIFERADOMKLIMA-PL (http://life.radom.pl) and Horizon 2020: AMBER 2016-2020: Adaptive Management of Barriers in European Rivers, (https://amber.international/). Participation in educational projects: 2009-2010: University of Lodz Master in Environmental Protection in scope of Ecohydrology; 2009-2016: ERASMUS MUNDUS Master of Science in Ecohydrology (ECOHYD, www.ecohyd.org).</p>	

Partner number	P4
Organisation name	Universiteit Antwerpen (UAntwerpen)
<p>UAntwerpen is a young university at the 13th position in the "Top 150 under 50". Students come from all over the world: 16% are international students, 116 nationalities are represented. It participates in several European education programmes (2 EMJMD's) and is a member of the prestigious Utrecht Network, YERUN and AURORA. One of the 'Frontline Research Domains' in which UAntwerpen is recognised as world leader is 'Ecology and Sustainable Development'. The faculty of Science has 3 Centres of Excellence, including the Global Change Ecology excellence centre joining 3 research groups in the Department of Biology, including the group of Prof. Meire. Also, the interfaculty Institute of Environment and Sustainable Development (IMDO) plays a crucial role in stimulating interdisciplinary research. Moreover, IMDO has more than 30 years of expertise in environmental education and the study of water problems is one of the key topics with a strong education-research nexus. IMDO offers international education in sustainable water management since 2006, including short trainings for professionals from developing countries with scholarships from the Flemish Interuniversity Council (VLIR-UOS). The role of UAntwerpen in the EStEEM consortium is to offer advanced courses on Integrated Water Management, selected based on relevance from the curriculum of the advanced master Technology for Integrated Water Management. These interdisciplinary courses are an interuniversity cooperation between UAntwerpen and Ghent University. Teaching staff of Ghent University contributes to the courses as defined in an interuniversity cooperation agreement and are committed to EStEEM as Associated Partner. Every lecturer is an expert in the field he/she is teaching and they are authorities in their respective research domains. Applied case-studies in their courses are based on national and European funded research projects (LANDMARK, TIDE) and collaborations with governments, companies and NGO's.</p>	

Skills and expertise of key staff

Partner number	P4
Organisation name	Universiteit Antwerpen
1)Name of staff member	Prof. Dr. Patrick Meire
<p>Prof. Meire heads the Ecosystem Management Group and since 1995 he holds the chair of Integrated Water Management at IMDO. He has a long standing record of conducting research and coordinating large projects on the management and restoration of aquatic systems. Prof. Meire developed the “Lippenbroek” controlled reduced tidal area as large scale field experiment. In 2017, he received the lifetime achievement award of the Belgian section of the International Water Association and a sluice was named after him in the large controlled flooding area “Polder of Kruibeke” to honour his pioneering work in restoring the Scheldt ecosystem. He has >200 publications in peer-reviewed journals, edited 3 books and (co-)authored >300 scientific reports.</p>	
2)Name of staff member	Prof. Dr. Ir. Stefan Van Damme
<p>Prof. Van Damme is professor in ‘Integrated Water Management’ with more than 20 years of experience in interdisciplinary research in estuaries, rivers and lakes. He is specialized in working out large-scale, multidisciplinary, holistic, clear management targets and practices, taking into account morpho-hydrology, sedimentology, biogeochemistry (carbon and nutrient cycles) and biology (biodiversity and trophic production). He has ample knowledge of aquatic systems worldwide, ranging from European estuaries (Elbe, Seine, Scheldt) to more exotic systems in the Arabic Peninsula and Africa. He specialises in reconciling the needs of stakeholders (ports, safety managers and ecologists) through scientific functional (multi-) system analyses.</p>	
3)Name of staff member	Prof. Dr. Ir. Siegfried Vlaeminck
<p>Prof. Vlaeminck’s research is driven by the concept of circular economy. He heads a team of 20 scientists developing microbial cleantech tackling societal challenges in water cycling and food production, on Earth and even in Space. He coordinated the FP7 project ManureEcoMine and the Flanders region funded project MicroNOD. He is (co-)PI of several projects for the European Space Agency (ESA). He served as consultant for the environmental engineering industry (>15 parties). He contributed to >60 WoS indexed papers, and his R&D projects often occur in collaboration with companies (e.g. Colson, Suez Environnement) and municipalities (e.g. Waterschap Brabantse Delta, DC Water). Prof. Vlaeminck is associate editor for Microbial Biotechnology.</p>	

Other EU grants

Programme or initiative	Reference number	Beneficiary Organisation	Title of the Project ☒
ERASMUS+ KA1	2017-1737/001-001- EM II-EMMC	University of Algarve	CHIR-Erasmus Mundus Master in Chemical Innovation and Regulation
ERASMUS+ KA1	2016-1920/001-001- EM II-EMMC	University of Algarve	CHIR-Erasmus Mundus Master in Chemical Innovation and Regulation
ERASMUS+ KA1	2015-1975/001-001- EM II-EMMC	University of Algarve	CHIR-Erasmus Mundus Master in Chemical Innovation and Regulation
ERASMUS +KA1	2014-0747/001-001- EM II-EMMC	University of Algarve	CHIR-Erasmus Mundus Master in Chemical Innovation and Regulation
ERASMUS+ KA1	2014-0821/001-001- EMI-EMMC	University of Algarve	ECOHYD-Erasmus Mundus Master of Science in Ecohydrology
ERASMUS+ KA1	574482-EPP-1-2016-1-BE-EPPKA1-JMD-MOB	University of Ghent	IMBRSea - International Master in Marine Biological Resources
ERASMUS+ KA1	2017-1934/001-001- EMMC	University of Oviedo	NURSING-Erasmus Mundus Joint Master Degree in Emergency and Critical Care Nursing
ERASMUS+ KA1	2016-1966/001-001- EMMC	University of Oviedo	EMECC NURSING - Emergency and Critical Care Nursing
ERASMUS+ KA1	2015-2058/001-001- EMMC	University of Oviedo	EMECC NURSING - Emergency and Critical Care Nursing
ERASMUS+ KA1	2014-0755/001-001- EMMC	University of Oviedo	EMECC NURSING - Emergency and Critical Care Nursing
ERASMUS+ KA1	2017-1722/001-001- EMMC	University of Barcelona	EMQALII-Erasmus Mundus Master in Quality in Analytical Laboratories
ERASMUS+ KA1	2016-1926/001-001- EMMC	University of Barcelona	EMQALII-Erasmus Mundus Master in Quality in Analytical Laboratories
ERASMUS+ KA1	2015-1992/001-001- EMMC	University of Barcelona	EMQALII-Erasmus Mundus Master in Quality in Analytical Laboratories
ERASMUS+ KA1	2014-0717/001-001- EMMC	University of Barcelona	EMQALII-Erasmus Mundus Master in Quality in Analytical Laboratories
ERASMUS+ KA1	2017-1918/001-001- EMMC	University of Bolonha	WACOMA-Erasmus Mundus Joint Master Degree in Water and Coastal Management
ERASMUS+ KA1	2016-1891/001-001- EMMC	University of Cadiz	WACOMA-Erasmus Mundus Joint Master in Water and Coastal Management
ERASMUS+ KA1	2015-1983/001-001- EMMC	University of Cadiz	WACOMA-Erasmus Mundus Joint Master in Water and Coastal Management
ERASMUS+ KA1	2014-0758/001-001- EMMC	University of Cadiz	WACOMA-Erasmus Mundus Joint Master in Water and Coastal Management
ERASMUS+ KA1	2015-1621/001-001- EMJD	Ghent University	MARES-Doctoral Programme in Marine Ecosystem Health and Conservation
ERASMUS+ KA1	2014-0692/001-001- EMJD	Ghent University	MARES-Doctoral Programme in Marine Ecosystem Health and Conservation
ERASMUS+ KA1	2015-1626/001-001- EMJD	University of Cadiz	MACOMA-Erasmus Mundus PhD in Marine and Coastal Management

ERASMUS+ KA1	2014-0693/001-001-EMJD	University of Cadiz	MACOMA-Erasmus Mundus PhD in Marine and Coastal Management
ERASMUS MUNDUS	2012-2742/001-001-EMA2	University of Turku	EMA2 Lot 5 MID -Mobilities for Innovation and Development (Armenia, Georgia, Belarus, Moldova, Ukraine)
ERASMUS+ KA1	2017-1-PT01-KA107-035562	University of Algarve	Consórcio Erasmus+ MARE MOSTRUM
ERASMUS+ KA1	2016-1-PT01-KA107-022660	University of Algarve	Consórcio Erasmus+ MARE MOSTRUM
ERASMUS+ KA1	2017-1-PT01-KA107-035465	New University of Lisbon	Consórcio Erasmus+ MERGING VOICES
ERASMUS+ KA1	2016-1-PT01-KA107-022521	New University of Lisbon	Consórcio Erasmus+ MERGING VOICES
ERASMUS+ KA1	2017-I-PT01-KA107-035575	University of Minho	Consórcio Erasmus+ JAMIES
ERASMUS+ KA1	2015-1-PT01-KA107-012767	University of Algarve	ICM Ualg/Marrococ
ERASMUS+ KA2	573512-EPP-1-2016-1-FR-EPPKA2-CBHE-JP	Université de Bretagne Occidentale	SCOLA MAR - Innovative training for Smart coastal management and Sustainable blue growth
ERASMUS+ KA2	561742-EPP-1-2015-1-PT-EPPKA2-CBHE-SP	University of Algarve	NURSLING – National Qualifications Frameworks: Guidelines for Development and Recognition of Qualifications
ERASMUS+ KA2	561877-EPP-1-2015-1-IT-EPPKA2-CBHE-JP	Università degli studi Roma Tre	ENEPLAN – Developing skills in the field of integrated energy planning in Med Landscapes
ERASMUS+ KA2	562653-EPP-1-2015-1-IT-EPPKA2-SSA	Fondazione per la Ricerca e L’Innovazione	VECTOR – A Vocational and Educational Curriculum Design from a Sector Skills Alliance on Tourism
TEMPUS IV	544528-TEMPUS-1-2013-1-MA-TEMPUS-JPGR	Université Hassan 1er	RECET - REforcement des Compétences en Evaluation insTitutionnelle
TEMPUS IV	544191-TEMPUS-1-2013-1-PT-TEMPUS-JPCR	Instituto Superior de Espinho	Licence Masters professionnels en management des activités hôtelières pour le développement de l’industrie touristique en Géorgie, Azerbaïdjan et Moldavie - LMPH
ERASMUS+ KA2	573897-EPP-1-2016-1-BG-EPPKA2-CBHE-JP	South-West University "Neofit Rilski"	Erasmus + KA2 - Licence, Master professionnels en formation ouverte et à distance pour le développement du tourisme durable en Chine, au Vietnam et au Kirghizstan
ERASMUS+ KA1	2017-1-PT01-KA103-035561	University of Algarve	ERASMUS +
ERASMUS+ KA1	2016-1-PT01-KA103-022474	University of Algarve	ERASMUS +
ERASMUS+ KA1	2015-1-PT01-KA103-012486	University of Algarve	ERASMUS +
ERASMUS+ KA1	2016-1-PT01-KA103-022445	University of Évora	Consortium Erasmus+ OutCOME
ERASMUS+ KA1	2015-1-PT01-KA103-012463	New University of Lisbon	Consortium Erasmus+ OutCOME
ERASMUS+ KA1	2014-1-PT01-KA103-000413	University of Évora	Consortium Erasmus+ OutCOME
ERASMUS+	2017-1-PT01-KA103-	Catholic University of	Consortium Erasmus+ AETC

KA1	035296	Portugal	
ERASMUS+ KA1	2016-1-PT01-KA103-022308	Catholic University of Portugal	Consortium Erasmus+ AETC
ERASMUS+ KA1	2015-1-PT01-KA103-012558	Escola Superior de Hotelaria e Turismo do Estoril	Consortium Erasmus+ AETC
ERASMUS+ KA1	2014-1-PT01-KA I 03-000789	Catholic University of Portugal	Consortium Erasmus+ AETC
ERASMUS+ KA1	2017-1-PT01-KA103-035448	Polytechnic Institute of Beja	Consortium Erasmus+ AlSud
ERASMUS+ KA1	2016-1-PT01-KA103-022492	University of Évora	Consortium Erasmus+ AlSud
ERASMUS+ KA1	2015-1-PT01-KA103-012681	Polytechnic Institute of Setúbal	Consortium Erasmus+ AlSud
ERASMUS+ KA1	2014-1-PT01-KA103-000411	University of Évora	Consortium Erasmus+ AlSud
ERASMUS+ KA2	575690-EPP-1-2016-1-DE-EPPKA2-KA	Hochschule für nachhaltige Entwicklung Eberswalde	TRIANGLE - Tourism Research Innovation And Next Generation Learning Experience
ERASMUS+ KA2	2016-1-BE01-KA204-016280	Perspectives	4CDE- Code, content creation and culture for digital education
ERASMUS+ KA2	16-204-021604	University of Ljubljana	Old Guys Say Yes to Community
ERASMUS+ KA2	2015-1-PT01-KA202-015341	University of Algarve	MILAGE - Interactive Mathematics by implementing a Blended-Learning model with Augmented Reality and Game books
ERASMUS+ KA2	2015-1-FR01-KA202-015341	AGCnam de Lorraine	EURE.K - Validation des compétences-clés européennes
ERASMUS+ KA2	15-203-012695	Maribor University	E-RESPLAN - Innovative Educational Tools for Energy Planning
ERASMUS+ KA2	2014-1-PL01-KA203-003629	University of Lower Silesia	EDUPRO - Promoting LLL in HE by implementing innovative practices in RPL
ERASMUS+ KA2	2014-1-HR01-KA200-007181	IRENA	EC-MAP (Energy Efficiency in Historic Buildings Concept Map
ERASMUS+ KA2	2014-1-UK01-KA203-001842	University of Warwick	EMPLOY - Enhancing the Employability of non-traditional students in HE
ERASMUS+ KA2	530863-LLP-2012-NL-KA2-KA2MP	University of Algarve	PETALL – Pan European Tasks for Language Learning
ERASMUS+ KA2	2017-1-UK01-KA201-036665	University of Southampton	REHARE – Reaching the Hard to Reach
ERASMUS+ KA3	580416-EPP-1-2016-1-IT-EPPKA3-IPI-SOC-IN	Fondazione Hallgarten-Franchetti Centro Studi Villa Montesca	EUROPE – Ensuring Unity and Respect as Outcomes for the People of Europe
ERASMUS+ KA3	592247-EPP-1-2017-IT-EPPKA3-IPI-SOC-IN	Fondazione Hallgarten-Franchetti Centro Studi Villa Montesca	FRIENDS - Fostering Resilience-Inclusive Education and Non-Discrimination in Schools

Programme concerned	Amount requested
ERASMUS+ KA1 (FCT-UA1g) 2017-1737/001-001- EM II-EMMC (ChIR)	757757.000,00 €
ERASMUS+ KA1 (FCT-UA1g) 2016-1920/001-001- EM II-EMMC (ChIR)	806.000,00 €
ERASMUS+ KA1 (FCT-UA1g) 2015-1975/001-001- EM II-EMMC (ChIR)	635.000,00 €
ERASMUS+ KA1 (UB) 2017-1722/001-001- EM II-EMMC (EMQAL II)	629.000,00 €
ERASMUS+ KA1 (UB) 2016-1926/001-001- EM II-EMMC (EMQAL II)	673.000,00 €
ERASMUS+ KA1 (UB) 2015-1992/001-001- EM II-EMMC (EMQAL II)	526.000,00 €
ERASMUS+ KA1 (UO) 2017-1934/001-001- EM II-EMMC (NURSING)	1.620.000,00 €
ERASMUS+ KA1 (UO) 2016-1866/001-001- EM II-EMMC (NURSING)	459.990,00 €
ERASMUS+ KA1 (UO) 2015-2058/001-001- EM II-EMMC (NURSING)	389.992,00 €
ERASMUS+ KA1 (UB) 2017-1918/001-001- EM II-EMMC (WACOMA)	3.089.000,00 €
ERASMUS+ KA1 (UCA) 2016-1891/001-001- EM II-EMMC (WACOMA)	648.000,00 €
ERASMUS+ KA1 (UCA) 2015-1983/001-001- EM II-EMMC (WACOMA)	544.000,00 €