

CALL FOR APPLICANTS			
Course Mode	Blended Intensive Programme (BIP)		
Course Title	Towards a sustainable water management		
Admission Profile	Bachelor's or Master's degree students with technical training who wish to acquire a specialization or updated practical training in water management		
Hosting Institution	University of Extremadura (UEX, Spain)		
Participant Institutions	<p>Organizer Institution: University of Extremadura (UEX, Spain)</p> <p>Co-organizers Institutions: University of Evora (UE, Portugal) University of Gävle (HiG, Sweden) University of Oradea (UO, Romania) Wrocław University of Environmental and Life Sciences (UPWR, Poland)</p> <p>Partners Institutions: University of Angers (UA, France) Atlantic Technological University (ATU, Ireland) Otto von Guericke Universität Magdeburg (OVG, Germany) University of Parma (UNIPR, Italy)</p>		
Total number of participants per institution:	<p>The numbers of participants agreed by the program partners are the following:</p> <ul style="list-style-type: none"> - University of Angers 3 students - Atlantic Technological University 3 students - University of Evora 3 students - University of Gävle 3 students - Otto von Guericke Universität Magdeburg 3 students - University of Parma 3 students - University of Oradea 3 students - Wrocław University of Environmental and Life Sciences 3 students - University of Extremadura 3 students <p>Note: The BIP is open to a maximum of 27 participants. In case one of the above Universities should have less students than the maximum allowed, the places left will be made available to other universities in order to reach the planned number of participants.</p>		
Number of ECTS	6		
Language of the Programme	English		
Teaching Hours in Presence Mode	66%		
Teaching Hours in Virtual Mode	34%		
Start and End Date of the Virtual Part	5 th – 9 th Jun 2023 19 th – 27 th Jun 2023	Place	Campus Virtual (UEX) https://campusvirtual.unex.es/portal/
Start and End Date of the in-Presence Part	12 nd – 17 th Jun 2023	Place	Faculty of Sciences (UEX, campus BA)

Introduction

The University of Extremadura jointly with the University of Evora, the University of Gävle, the University of Oradea and the Wroclaw University of Environmental and Life Sciences, offer their students the opportunity to participate in a Blended Intensive Program. The Blended Intensive Program is officially approved by the EU in the framework of the ERAMSUS+ 2021/2027 and is developed in the framework of the EU GREEN Alliance.

BIPs are one of the new and innovative formats of student mobility introduced by the new Erasmus+ 2021-2027 Program. These programs, jointly developed by multiple higher education institutions, feature advanced and innovative pedagogical approaches that combine short-term face-to-face (physical) mobilities with virtual learning.

BIPs are inherently transnational and transdisciplinary, as curricula are developed and taught together by partner institutions in different countries. The combination of in-person and virtual learning spaces allows students and professors to experience and exchange highly collaborative, challenge-based, and research-steeped methods of teaching and learning.

Summary

Availability of water of adequate quality to meet environmental, economic, and human needs requires active water resources management. Today, water management faces major challenges such as climate change and the effects of human activities of an ever-growing population. To best meet these challenges, knowledge of all aspects of water management are required. In this context, this course focuses on three particular aspects of water management which represent three modules of study.

The course is divided into three modules whose learning outcomes are described as follows

Module 1.- Water interactions in agro-ecosystem

Learning outcomes

- Become familiar with the concepts of radiation balance and energy balance; air temperature and sensible heat flux; air humidity and latent heat flux; wind and turbulent transport; diurnal variability of soil temperature and meteorological parameters; dew and frost. Climate classification
- Become aware of the properties of soil that influence soil water balance and the distribution of water in different types of soil in agricultural land, the effect of soil parameters on crop plants (soil salinity, water deficit, drainage and irrigation)
- Become familiar with the role of microorganisms in the atmosphere, in plants and in soil
- Become familiar with water transport in plants and how the presence/absence of water influences plant physiology and plant pathology
- Analyze soil water balance and flow; soil water distribution on agricultural land; soil salinity; water requirements and their relation to crop productivity, irrigation deficit and water scarcity
- Assess water movement in plants, plant water status, photosynthesis and respiration, the intersection of radiation and crop productivity, growth regulators, photoperiodism and vernalization; physiological response of plants to the action of climatic factors, etc
- Know how climate and climatic factors affect the development of different crops

Module 2.- Water quality and ecosystem integrity, water pollution assessment

Learning outcomes

- Become familiar with aspects related to the grey water footprint and new types of water pollution
- Become familiar with environmental legislation on water quality at EU level
- Knowledge about WQI models and their importance as a tool to classify the water resources
- Be able to analyze some physical and chemical parameters in the laboratory to characterize surface waters

Module 3.- Water and wastewater treatment

Learning outcomes

- Become familiar with conventional and advanced processes in the treatment of drinking water
- Become familiar with conventional and advanced processes in the treatment of wastewater
- Become familiar with water desalination technologies

- Understand how Nature-Based Solutions (NBS) such as bioretention facilities, constructed stormwater wetlands, and outfall retrofits may be used to capture and treat stormwater in urban areas
- Understand how to use stormwater as a resource to create resilient and livable cities
- Understand water reclamation and reuse technologies

Contents

Module 1 - Water interactions in agro-ecosystem (2 ECTS)

Number of hours (VT.- Virtual Theory, VP. - Virtual Practice, PT.- in Presence Theory, in Presence Practice)	VT	VP	PT	PP
1. Fundamentals of surface-atmosphere interactions and climate <ul style="list-style-type: none"> - Lecture M1.1.1- Prof. Maria João Costa (UE) - Lecture M1.1.2 - Prof. Miguel Potes (UE) - Lecture M1.1.3 - Prof. Prof. Maria João Costa (UE) - Lecture M1.1.4 - Prof. Miguel Potes (UE) 	2			2
2. Fundamentals of plant-soil-water relationships. The role of microorganisms in these processes <ul style="list-style-type: none"> - Lectures M1.2.1-M1.2.5 - Prof. Sandra Wright (HiG) - Practice M1.2 - Prof. Sandra Wright (HiG) 	3	1	2	
3. The role of microorganisms in the processes occurring in the soil. Impact of climate change on crops. <ul style="list-style-type: none"> - Lectures M1.3.1-M1.3.6 - Prof. Isabel Brito (UE) 	3		3	

Module 2 - Water quality and ecosystem integrity, water pollution assessment (1 ECTS)

1. New types of pollution: emerging contaminants, nanoparticles, microplastics, antibiotic resistance bacteria and genes <ul style="list-style-type: none"> - Lecture M2.1.1 - Prof. Juan Luis Acero (UEx) - Lecture M2.1.2 - Prof. Ana Dordio (UE) 	2			
2. Water Framework Directive: ecological quality and ecosystem integrity <ul style="list-style-type: none"> - Lecture M2.2.1 - Prof. Manuela Morais (UE) - Lecture M2.2.2 - Prof. Helena Novais (UE) 	2			
3. Water quality standards and water quality index (WQI) <ul style="list-style-type: none"> - Workshop M2.3 - Prof. Pedro Álvarez (UEx) 				1
4. Determination of physical, chemical, and biological parameters in water <ul style="list-style-type: none"> - Lecture M2.4.1-M2.4.2 (biological parameters). - Prof. Jonas Rönnander (HiG) - Lab session M2.4 - Prof. Juan Fernando García, Prof. J. Luis Acero, Prof. F. Javier Rivas, Prof. Pedro Álvarez (UEx) 	2			3

Module 3 - Water and wastewater treatment (3 ECTS)

1. Drinking water treatment <ul style="list-style-type: none"> - Lecture M3.1.1 - Prof. Juan Luis Acero (UEx) - Lecture M3.1.2 - Prof. Pedro Álvarez (UEx) - Workshop M3.1 - Prof. F. Javier Rivas (UEx) - Lab session M3.1- Dr Ana Rey, Mr Miguel Ángel Jiménez (PhD student) (UEx) - Field trip 1 - Visit to a water treatment plant - Prof. Juan Luis Acero; Prof. Pedro Álvarez; Prof. J. Fernando García; Prof. F. Javier Rivas (UEx) 	1 1			2 2 2,5
2. Wastewater treatment <ul style="list-style-type: none"> - Lecture M3.2.1 - Prof. Ana Dordio (UE) - Lecture M3.2.2 - Prof. Ana Paulo Pinto (UE) - Lecture M3.2.3 - Prof. Alfredo Carvalho (UE) - Workshop M3.2 - Prof. F. Javier Rivas (UEx) - Lab session M3.2- Prof. Juan Luis Acero (UEx), Mr Juan Carlos Aldana (PhD student), - Field trip 1 - Visit to a wastewater treatment plant - Prof. Juan Luis Acero; Prof. Pedro Álvarez; Prof. J. Fernando García; Prof. F. Javier Rivas (UEx) 	1 1 1			2 2 2,5
3. Water desalination <ul style="list-style-type: none"> - Lecture M3.3.1-M3.3.2.- Prof. Pantea Emilia (UO) 			2	

- Lecture M3.3.3-M3.3.4.- Solar desalination- Prof. Pedro Horta (UE)			2	
4. Application of phytoremediation in wastewater treatment - Lecture M3.4.1-M3.4.2 - Prof. Cristian Domuta (UO)			2	
5. Storm-water collection and treatment: Nature-Based Solutions for managing the quality and quantity of rainwater runoff in urban areas Planning and design of nature-based solutions in urban areas - analysis based on selected case studies - Lecture M3.5.1 - Prof. Ewa: Burszta-Adamiak (UPWr) - Workshop M3.5 - Prof. Ewa: Burszta-Adamiak (UPWr)	1			2
6. Wastewater reclamation and reuse - Lecture M3.6.1 - Prof. Pedro Álvarez (UEx) - Lab session M3.6 - Dr Ana Rey, Dr Elena Rodríguez, Prof. Pedro Álvarez (UEx)			1	2
Selection Criteria	<p>To apply for this program, students must be regularly enrolled at one of the participating universities.</p> <p>Participation to the program is open to students of any discipline connected with contents related to the BIP.</p> <p>At the time of the application submission, applicants must demonstrate proof of English language competence at the B1/B2 level. This can be certified by the applicant's home University (Level B2 will be a preferential criterion).</p> <p>Selected students must communicate their acceptance or withdrawal within 5 days from the publication of the selection results by contacting their university program coordinator. Selected students will be contacted with further instructions upon completion of the selection procedures.</p>			
How to Apply	<p>Students interested in participating should fill out the application form by 19th MAY 2023, as well as send the required documents to the address eugreen_uex@unex.es</p> <p>The application form must contain the following attachments:</p> <ol style="list-style-type: none"> 1.- Copy of valid ID or passport 2.- Transcript of Records (A certificate of enrolment at the home University with a list of passed exams and grades) 3.- Language certificate 4.- Motivation letter (containing, if any, experiences abroad) 			
Selection criteria and procedures	<p>An appointed Committee formed by Prof. Raquel Pérez-Aloe, Prof. Pedro Modesto Álvarez (UEx), Prof. Manuela Morais (UE), Prof. Sandra Wright (HiG), Prof. Emilia Pantea (UO) and Prof. Ewa Burszta-Adamiak (UPWr) will carry out the selection procedures. Selection is based on the following criteria:</p> <ul style="list-style-type: none"> - Academic performance - Motivation - English language competence - Evaluation of further qualifications and skills <p>Students should expect to hear back about the result of their application by 24th MAY 2023. Selected students must communicate their acceptance or withdrawal within 5 days from the publication of the selection results by contacting their university program coordinator. Selected students will be contacted with further instructions upon completion of the selection procedures.</p>			
Financial Support	<p>The attendance of the Blended Intensive Programme may be covered by an ERASMUS+ SMS Short Mobility Grant for all mobile students (excluding students from the hosting University). This financial support may only be guaranteed by the selected student's home University. The University of origin of each selected student is fully responsible for the management of the financial aspects of the mobilities in accordance with the provisions of the competent ERASMUS+ National Agency.</p>			

	<p>No financial support is foreseen for University of Extremadura students as they will not be travelling for the purposes of participation in this program (non-mobile participants).</p> <p>Please refer to your local coordinator or Erasmus/International Relations Office for any further information related to the financial support made available</p>
Contacts	<p>University of Extremadura (Coordinators) Prof. Raquel Pérez-Aloe eugreen_uex@unex.es Prof. Pedro M. Álvarez pmalvare@unex.es</p> <p>University of Évora Prof. Manuela Morais mmorais@uevora.pt</p> <p>University of Gävle Prof. Sandra Wriqth Sandra.Wright@hig.se</p> <p>University of Oradea Prof. Emilia Pantea emipantea@gmail.com</p> <p>Wroclaw University of Environmental and Life Sciences Prof. Ewa Burszta-Adamiak ewa.burszta-adamiak@upwr.edu.pl</p>