

SEA-EU Module description

Module offers for the SEA-EU 'Virtual Modules'

General Information

Module/Course Name	Green biotechnology and intelligent mariculture	
Module/Course Code		
Field of Education	Generic programmes and qualifications	☐
	Education	☐
	Arts and humanities	☐
	Social sciences, journalism and information	☐
	Business, administration and law	☐
	Natural sciences, mathematics and statistics	x
	Information and Communication Technologies	☐
	Engineering, manufacturing and construction	☐
	Agriculture, forestry, fisheries and veterinary	x
	Health and welfare	☐
	Services	☐
Study programme	International Master in Marine Biotechnologies	
Number of ECTS and total student workload	2	
Contact hours and Independent study hours	14 hrs contact hours, 30 hours individual work	
Typology of contact hours	Delivered lecturers hours 24 hours	
Academic Year	2026/2027	
Semester / Specific period	1st semester (for SEA-EU between Sept 2026 to Dec 2026)	
Teaching Language	English	
Delivery mode	Hybrid (in person at UBO, fully online for SEA-EU partners)	
Responsible Lecturer	Prof. Concetta M. Messina concetta.messina@unipa.it	

Other lecturers	Name: Pr Claire Hellio E-Mail: claire.hellio@univ-brest.fr
Learning outcomes	• In lectures, to provide a framework for understanding contemporary constraints and opportunities for sustainable and modern use of marine biomasses for food and non-food products within a framework of integrated culture and sustainable production • In paper analysis and small group work, develop skills in critical analysis and provide confidence in working with complex concepts in biology and society; • In oral presentations, promote skills in succinct oral communication of science; • In essays, promote scientific writing skills and to encourage the use of library, archival, electronic and other reference sources.
Course contents	The unit will focus on the expected changes in society and technology, ranging from the shift in the supply of resources, the growing need for efficiency and sustainability of the production systems, changing consumer perception and behaviour and changing mariculture systems and practices. Many of these changes are expected to speed up the transition from a fossil-based to a bio-based economy and society. The module provides an understanding of the use of raw materials such as water, energy and land/coastal waters in industry and transport. It lays the foundation for further in-depth studies of ways in which biotechnology can support recycling, reuse of existing materials and in the generation of new supplies of raw materials. During lectures and workshops, the following topics will be covered : Chapter 1: status of fishery and aquaculture and intelligent maricultures approaches (IMTA) Chapter 2: role of blue biotechnologies in marine production and sustainability Chapter 3: form quality of fish to marine biotechnology applications and valorization in food, feed, nutraceuticals, pharmaceuticals Chapter 4 : integrated multitrophic aquaculture (IMTA).
Prerequisites and/or recommended academic background	Chemistry, biochemistry, ecology

Assessment	The students having followed this course will have acquired minimal knowledge for engineer in the understanding contemporary constraints and opportunities for modern use of marine biomass for food and non-food products within a framework of integrated culture. A 2 hours examination (unseen) (50%) in which two questions are to be answered. One review essay (30%) (3000 words). Students (working by pair) will deliver a 20 min oral presentation presenting a LCA analysis (20%). Topics covered for the examination: (i) industrial sustainability, (ii) risk (perception and assessment) and safety in biotechnology, (iii) environmental impact of biotechnology, (iv) integrated agri-aquaculture systems (IAAS).
Main bibliography	G. Acquaah. Understanding Biotechnology: An Integrated and Cyber-Based Approach 1st Edition. Publisher: Pearson Prentice Hall. ISBN-13: 978-0130945006 . A. Scragg. Environmental biotechnology. 2nd edition. Publisher: Oxford University Press. ISBN-13: 9780199268672

Organisational Information

Maximum number of SEA-EU participants
25
Learning Management System
email
Course schedule (date and time)
15/09 2-4 pm 22/09 9-12 am 25/09 9-11 am 13/10 9-12 am 20/10 9-12 am 27/10 9-12 am 26/11 9-12 am 30/11 9-11 am 01/12 9-12 am Exam: 15/12 8h30-12h00 am
Application deadline
15 th Sept, 12:00 CEST