Call: EMFAF-2023-BlueCareers

Type of Action: EMFAF-PJG

Project number: 101124841

Project acronym: BOUTCAR

Co-funded by the European Union

Through EMFAF 2023 Blue Careers call

"Blue careers for a sustainable blue economy"

BOUTCAR – "Blue jobs through blue careers"

Project full title:	**BLUE JOBS THROUGH BLUE CAREERS**
Project Acronym:	**BOUTCAR**
Deliverable number:	**D4.4**
Deliverable title:	**D4.4 - Certification scheme**
Work package:	**WP 4: Development of innovative educational material**
TASK	**T4.4 - Program Certification Process and Training Content. The document will contain information on competences and acquired learning outcomes, accessible job sets, issuing and accreditation bodies, ways of obtaining the Certificate or Diploma, international level of the Certificate or Diploma, entry requirements and possibilities of access to other official accreditations.**
Due date of deliverable:	**Month 27**
Start date of task:	**Month 25**
Duration of task:	**3 months**
Author/editors:	**Laura Zambrini**
Deliverable lead:	**DEMETRA**
Contributing partners:	**Univ. PATRAS, CFFolgado, E-SCHOOL**

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INTRODUCTION - CORE PROFILE DESCRIPTION

The bridge between the sea and the future: a professional capable of integrating technical, environmental, economic, and digital knowledge to lead the sustainable transformation of the Blue Economy.

The Blue Manager is a strategic and multidisciplinary professional at the heart of the ecological and digital transition of anthropized marine environments. They direct and coordinate complex projects where international regulations, technological innovation, environmental sustainability, and social equity intersect.

This profile is an expert in maritime governance, capable of interpreting and applying national, European, and international regulations. They have in-depth knowledge of maritime and environmental law and use tools such as maritime spatial planning (MSP) and integrated coastal zone management (ICZM) to guide sustainable development. They are able to assess risks and opportunities in the political and regulatory context, anticipating scenarios and guiding strategic decisions.

With a solid foundation in marine ecology and biodiversity, the Blue Manager supports the design of environmental management systems and the conduct of impact assessments (EIA, SEA). They are at the forefront of the fight against marine pollution, protecting ecosystems, and adapting to climate change. Their skills range from environmental certifications (ISO 14001) to ecological restoration techniques, making them a guardian of ocean health.

The Blue Manager also handles economic and financial analysis, is capable of drafting business plans, managing budgets, and accessing European and national funds (FEAMPA, Horizon Europe). They integrate the principles of the circular economy and bioeconomy into business models, promoting sustainable investments and ESG reporting systems. Their vision is geared towards responsible profitability and economic resilience.

An empathetic leader and effective communicator, the Blue Manager manages multidisciplinary and multilingual teams, facilitating dialogue between public and private stakeholders. They know how to engage communities, promote environmental education, and resolve conflicts through participatory methodologies. Their ability to build relationships is crucial to the success of shared and inclusive projects.

Finally, the Blue Manager is a digital innovator, mastering advanced tools such as Artificial Intelligence, Machine Learning, GIS, and Cloud Computing. It uses precision aquaculture technologies, robotics, and IoT sensors to optimize marine operations. It protects data and infrastructure with cybersecurity strategies and promotes digital collaboration in complex environments.

In the table below are listed the skills and knowledges associated to each of the core areas of expertise identified.

Core Area of Expertise	Abilities/Skills	Knowledge	Indicators (Examination criteria)
1. Strategic and Regulatory Management	Interpret and apply national, European and international regulations related to the Blue Economy. Analyse and understand sector policies and maritime governance frameworks. Draft and implement strategic and sustainable development plans for organizations and projects. Identify and evaluate risks and opportunities related to the regulatory and political context.	Environmental legislation (e.g. EU Directives, International Conventions). Specific regulations for fishing, aquaculture, maritime logistics, marine energy. Principles of Maritime Law and Environmental Law. Maritime spatial planning tools (MSP) and integrated coastal zone management (ICZM). Sustainable Development Goals (SDGs) and the 2030 Agenda.	Critical analysis of regulatory case studies. Development of sections of a strategic plan. Design of a regulatory compliance monitoring system. Presentation of policy or intervention proposals.
2. Environmental Management and Sustainability	Design and implement environmental management systems. Evaluate the environmental impact of projects and activities (EIA, SEA). Develop and apply marine pollution prevention and control strategies. Manage and monitor water quality and the health of marine ecosystems. Propose and implement solutions for climate change mitigation and adaptation in the marine context.	Marine and aquatic ecology, biodiversity and ecosystem services. Environmental assessment methodologies and certifications (e.g. ISO 14001). Sources and types of marine pollution (plastic, chemical, acoustic). Biodiversity conservation and environmental restoration techniques. Impacts and scenarios of climate change on oceans and coasts.	Drafting an environmental assessment report for a specific activity. Proposal of a pollution reduction plan for a company. Analysis of water quality data. Development of a case study on climate adaptation measures.

3. Economics, Finance and Sustainable Development	Develop business plans and feasibility studies for Blue Economy initiatives. Manage economic and financial aspects of projects and businesses (budgeting, cost control, reporting). Identify and access funding sources (European and national calls for proposals, sustainable investments). Apply circular economy and economic sustainability principles in business models.	Principles of circular blue economy and bioeconomy. Economic and financial analysis tools (ROI, NPV). EU funding programs (e.g. Structural Funds, Horizon Europe, FEAMPA) and national ones for the blue sector. Sustainable business models and ESG reporting tools.	Drafting a business plan for a blue startup. Cost-benefit analysis of a sustainable initiative. Preparation of a project proposal for a funding call. Presentation of economic-environmental optimization strategies.
4. Human Resources Management and Stakeholder Relations	Manage multidisciplinary and multilingual teams. Develop effective communication strategies for different audiences. Build and maintain positive relationships with public and private stakeholders. Facilitate collaborative decision-making and resolve conflicts. Design and implement community engagement and environmental education programs.	Principles of human resources management and leadership. Interpersonal and mass communication techniques. Stakeholder mapping and engagement strategies. Facilitation and negotiation methodologies. Best practices of education and civic involvement in marine contexts.	Conducting a simulated meeting with stakeholders. Development of a communication plan for a project. Presentation of a SWOT analysis on a project team. Evaluation of an environmental education program.

5. Digital Technologies and Innovation	Use Data Management and Analytics tools for marine data analysis. Apply Precision Aquaculture technologies for production optimization. Integrate Automation and Robotics solutions in marine/aquaculture operations. Exploit Geospatial Technologies (GIS, remote sensing) for monitoring and planning. Use Cloud Computing and Big Data platforms for managing large volumes of information. Implement solutions based on Artificial Intelligence and Machine Learning for process optimization. Manage Digital Communication and Collaboration in complex contexts. Apply Cybersecurity principles for data and infrastructure protection.	Fundamentals of IoT (Internet of Things) and marine sensors. Principles of data acquisition, processing and visualization. Concepts and applications of AI and Machine Learning in the blue sector. Cloud architectures and databases for Big Data. GIS systems and remote sensing for the marine environment. Digital communication protocols and collaborative platforms. Cybersecurity risks and strategies for critical infrastructures in the blue sector.	Analysis of a marine dataset with specific tools. Design of a monitoring system based on sensors and IoT. Demonstration of the use of GIS software for mapping marine areas. Development of a proposal for the application of AI in an aquaculture process. Identification of vulnerabilities in an applied cybersecurity scenario.

The detailed skills identified by the partnership describe a highly specialized, strategic, and innovative professional profile. The reference **EQF** level for this professional profile is **Level 7**, as the candidate must be able to master highly specialized knowledge, address complex problems, and manage unpredictable contexts.

Area of competence	EQF criterion Level 7	Reference framework
Knowledge	**Highly specialized knowledge, some of it at the forefront of the industry.** Critical awareness of issues within a field and at the interface between different fields.	Mastery of international regulations, circular Blue Economy principles, and the fundamentals of IoT/AI and Cloud Architectures for the blue sector represents a cutting-edge body of knowledge that integrates ecology, law, finance, and digital.

Skills	**Specialized problem-solving skills** required in research and/or innovation, to develop new procedures and **integrate knowledge** from different fields.	The figure must integrate maritime law (Area 1), environmental impact assessment (Area 2), financial analysis (Area 3) and AI/GIS systems (Area 5) to develop new procedures (*e.g. Design of a regulatory compliance monitoring system, Development of a proposal for the application of AI*).
Competence	**Manage and transform complex and unpredictable work environments** that require **new strategic approaches**. Assume responsibility for contributing knowledge and/or reviewing team strategic performance.	The ability to **draft and implement strategic and sustainable development plans** (Area 1) and **manage multidisciplinary and multilingual teams** (Area 4), in a complex and unpredictable context such as the maritime economy, is a key requirement.

In short, a professional with these skills does not limit himself to carrying out procedures, but is called upon to **create strategies, integrate advanced technologies and manage the systemic transformation** of the sector, typical of **EQF Level 7**.

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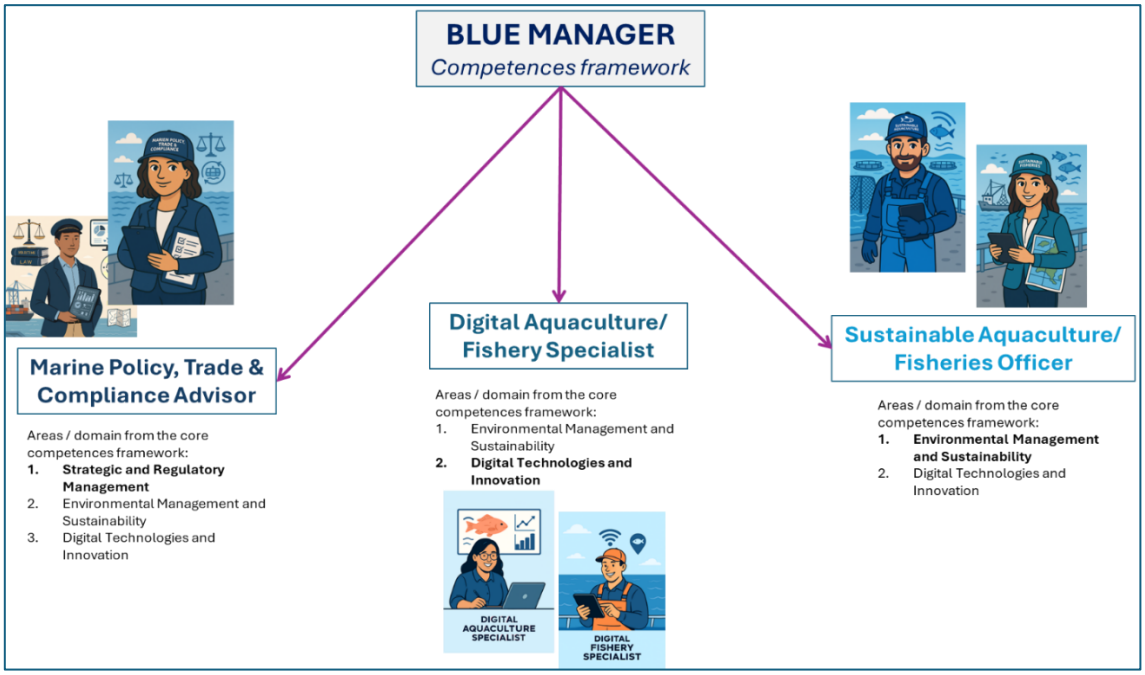
PROJECT ADOPTION OF THE CORE PROFILE

From the core profile, that would require an in depth review of different existing profiles or the creation of a new ESCO qualification, the consortium decided to focus on 3 main professional specifications that could lead to the upgrade of existing curricula and so the enrichment of professional profiles, in the logic of lifelong learning that has been strongly demanded by the stakeholders and operators in the sectors of fishery and aquaculture, in addition to be more adapt to a diversified target of trainees, the EQF level of reference has been lowered to 4 to 6 depending on the different professional profiles to be addressed.



In addition to these more vertical profiles that can be considered corresponding to EQF level 5 to 6, the consortium identified other relevant future professions in the framework of fishery and aquaculture, all of them born under the core profile of BLUE MANAGER and to which the BOUTCAR training program can be addressed to acquire new competences in line with the expectation of the labour market:

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Expert / technician involved in activities within anthropized marine environments

Expert / technician involved in the transformation of seafood products

Expert in scientific dissemination, supporting fishery and aquaculture industry and public.

Expert in the application of A.I. in the marine industries, with a focus on fish/ shellfish health management.

For the purpose of supporting the raise of these new professions, the consortium identified three training paths that will support the acquisition of specific learning objectives:

Course title	Learning outcome
Pathway for Digital Aquaculture/ Fishery Specialist	Equip participants with the skills needed to integrate digital technologies and data analysis into fishing and aquaculture processes, to optimize resource management, mitigate environmental and operational risks and improve the sustainability and traceability of the supply chain
Pathway for Marine Policy, Trade & Compliance Advisor	Train professionals capable of understanding and applying regulatory frameworks for sustainable resource management, knowing how to monitor and manage compliance, including through digital tools, and knowing international trade strategies in the maritime sector
Pathway for Sustainable Aquaculture/Fisheries Officer	Train professionals capable of promoting environmental and economic sustainability in the sector through the adoption of best operational practices and the evaluation of sustainability indicators. They will also be able to transform risk factors (such as invasive species) into economic opportunities by promoting new and derived seafood products

In integration to this matrix, trainees can also follow specific modules to acquire competences to gain a specific professionalisation in relation to the future professional profiles identified by the consortium: Blue operator, Blue seafood operator, Blue promoter and Aquaculture health data analyst.

For each of the professional profiles identified, the ideal training path is built by combining modules from the three available Pathways, aiming to develop the specialized and transversal skills required for the role.

The following table maps each profile to the most relevant modules, specifying the primary area of expertise:

PROFESSIONAL PROFILE	ROLE FOCUS	PATHWAY SUGGESTED	KEY MODULES & COMPETENCES *(to be reinforced with additional training and didactical resources)*
AQUACULTURE HEALTH DATA ANALYST	Expert in the application of **Artificial Intelligence (AI)** and **fish/shellfish health management**.	**Pathway for Digital Aquaculture / Fishery Specialist**	**AI for diagnosis**: *Module 7: Artificial Intelligence Fish Disease Diagnosis System (Disease Diagnosis Using AI Tools).* **Data and platforms**: *Module 2: Utilizing Digital Platforms for Decision-Making (Cloud, Sensors, AI/Big Data).* **Efficiency**: *Module 8: Feed Optimization in Aquaculture (Nutrition Optimization Using Digital Systems).*

BLUE MANAGER	Expert in **sustainable management** (economic, environmental, social) of fishing and aquaculture enterprises.	**All pathways**	**Sustainability & Indicators**: *Modules 5 & 8: Monitoring and Sustainability Indicators in Fisheries/Aquaculture (Selection and Application of Indicators).* **Law and regulation**: *Modules 1 & 3: Foundations of Maritime Law and Legal Frameworks for Sustainable Resource Management.* **Certifications**: *Modules 6 & 7: Certification Systems in Fisheries/Aquaculture Operations.*
BLUE OPERATOR	Technician involved in activities in **anthropized marine environments** (field operator).	**Pathway for Sustainable Aquaculture/Fisheries Officer**	**Environmental management**: *Module 3: Synergetic Actions in Fisheries: Lagoon and Coastal Management (The Role of Stakeholders and Management of Complex Ecosystems).* **Good practices**: *Module 4: Best Practices in Fisheries: Bycatch Reduction (Implementation of Bycatch Mitigation Strategies).* **Risk**: *Module 1: Risk Management in Aquaculture (Identification and Mitigation of Operational Risks).*
BLUE SEAFOOD OPERATOR	Technician involved in the **processing of fish products**.	**Pathway for Sustainable Aquaculture/Fisheries Officer** & **Pathway for Digital Aquaculture / Fishery Specialist**	**Supply chain and product**: *Module 2: Value Chain of New Seafood Products (New product development, food safety, and traceability).* **Digital traceability**: *Modules 6 & 9: Digital traceability and blockchain in the fish/aquaculture supply chain (Implementation of traceability protocols).* **Trade regulations**: *Modules 5 & 8: Import/Export Regulations, Customs, and Food Safety Standards (Interpretation of legal documentation and food safety standards).*

BLUE PROMOTER	Expert in **marketing, promotion, and sustainable development** of fishery and aquaculture products.	**Pathway for Sustainable Aquaculture/Fisheries Officer & Pathway for Fisheries and Aquaculture Law & Compliance**	**Valorisation**: *Module 2: Value chain of new seafood products (Product innovation, storytelling, and strategic marketing).* **Sustainability**: *Modules 5 & 8: Monitoring and sustainability indicators (to support credible promotional claims).* **Commercial**: *Modules 5 & 8: Import/export regulations, customs, and food safety standards (Quality and regulatory compliance in trade).* **Certifications**: *Modules 6 & 7: Certification systems in fisheries/aquaculture operations (Promotion and trust tools).*
Transversal skills	*Daily operational management and decision support.*		**Risk management, Digital platforms and Foundations of maritime law** are key skills that should be part of the training of every operator in the "Blue" sector.

In the following boxes - *in grey those originally identified by the consortium, in light blue the additional ones developed thanks to the training design* - can be found the description per each professional profile envisioned of the knowledge, skills and competences associate, in line with EUROPASS guidelines, and to which the training offered can be directed.

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BLUE OPERATOR

EQF level: 4

Knowledge

The professional must understand best practices in fisheries and the principles of risk management in aquaculture, which are specialized but applicable knowledge.

Skills

The operator must be able to implement mitigation strategies (Bycatch Mitigation Strategies) and identify and mitigate operational risks, activities that require the application of standardized procedures.

Competence

The operator works in the field, managing the operational area and immediate critical issues (risk, environmental impact) independently, but within a defined procedural framework (Risk Management and Synergetic Actions).

BLUE SEAFOOD OPERATOR

EQF level: 5

Knowledge

This profile requires mastery of the entire value chain, including new product development, food safety, and international trade regulations (import/export regulations).

Skills

The specialist not only applies but also implements digital traceability and blockchain protocols and interprets complex legal documentation. This requires analytical and process design skills.

Competence

The operator manages the critical aspects of traceability and legal compliance of processed products, assuming direct responsibility for the quality and safety of the final product entering or leaving the market.

AQUACULTURE HEALTH DATA ANALYST

EQF level: 6

Knowledge

The profile requires advanced knowledge of Artificial Intelligence (AI) and Big Data principles applied in a specialized field (aquaculture health).

Skills

The candidate must use digital platforms (Cloud, Sensors) for data collection, apply AI to diagnose diseases, and optimize processes (nutrition), demonstrating highly specialized technical problem-solving skills.

Competence

The specialist must manage the entire data flow for decision-making support (Utilizing Digital Platforms for Decision-Making) and the creation of diagnostic systems, working independently in data analysis and interpretation.

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BLUE PROMOTER

EQF level: 6

Knowledge

The Promoter must master complex concepts that intersect with strategic marketing (storytelling), sustainability indicators (Modules 5 & 8), and international trade regulations, understanding their critical application.

Skills

The Promoter must develop marketing strategies based on credible promotional claims supported by objective (scientific) indicators and compliant with regulations. This requires the ability to synthesize and solve complex problems (e.g., how to promote a sustainable product in a strictly regulated market).

Competence

The Promoter assumes responsibility for enhancing the entire value chain and using certification systems as tools for trust and promotion. They must act with a high degree of autonomy in defining and executing the ethical business plan.

MARINE POLICY, TRADE & COMPLIANCE ADVISOR

EQF level: 5

Knowledge

Specialized and critical knowledge of maritime and environmental law principles, international conventions, and EU directives on governance and marine resources. Knowledge of import/export and customs regulations, food safety standards for seafood, and voluntary and mandatory certification systems (e.g., MSC, ASC) and their impact on the market.

Skills

Ability to critically analyse maritime policies and governance frameworks, identifying regulatory risks and opportunities for drafting and negotiating contracts, compliance documents, and policy proposals. Ability to develop and implement internal monitoring systems to ensure ongoing compliance with national and international regulations.

Competence

Assume responsibility for ensuring that the organization (or sector) operates in full legal and regulatory compliance in complex and evolving commercial environments. Manage the interface between economic objectives and regulatory restrictions, turning compliance into a competitive advantage.

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SUSTAINABLE FISHERY / AQUACULTURE OFFICER

EQF level: 6

Knowledge

Advanced and critical knowledge of international regulatory frameworks (SDGs, Agenda 2030), EU directives, and sustainability protocols specific to the marine sector, as well as measurement, reporting (ESG reporting), and impact assessment (EIA/SEA) systems.

Skills

Ability to conduct impact assessments and sustainability audits, as well as the ability to design and implement environmental management systems and climate change adaptation programs, and draft and present corporate (or sector-specific) policies aimed at sustainable transformation.

Competence

Take responsibility for the systemic transformation of an organization or sector towards sustainability, managing internal and external resistance, and ensuring consistency between economic objectives and ethical/environmental performance.

DIGITAL FISHERY / AQUACULTURE SPECIALIST

EQF level: 6

Knowledge

Knowledge of the principles and applications of Cloud Computing and Data Governance systems. In-depth understanding of the concepts of Artificial Intelligence and Machine Learning and their use for process optimization, as well as knowledge of cybersecurity risks and mitigation strategies for critical maritime infrastructure and sensitive data.

Skills

Ability to design, develop, and manage the integration of IoT systems (sensors) and Geospatial Technologies (GIS) platforms for monitoring and planning. Ability to manage and analyse large volumes of marine data to extract strategic insights to support top management, proposing and overseeing the development of AI-based solutions for operational optimization and cost reduction.

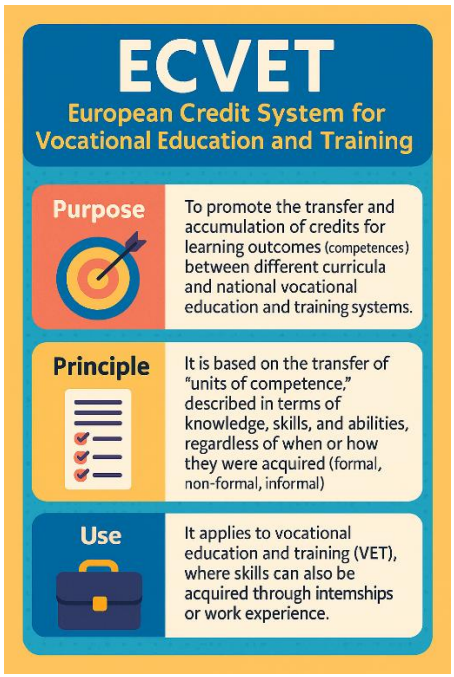
Competence

Responsible for the strategic direction of technological innovation and corporate digitalization. Assess and mitigate cybersecurity vulnerabilities in complex scenarios, as well as manage and coordinate multidisciplinary technical teams, translating business needs into scalable and compliant technological solutions.

APPLICABLE RECOGNITION SYSTEMS

Each of these paths has been structured to support the recognition of specific credits, in relation to the education and training system through which the individual accesses the proposed programs.

We can identify **two different situations** represented within the project partnership.



Key Differences

Focus:

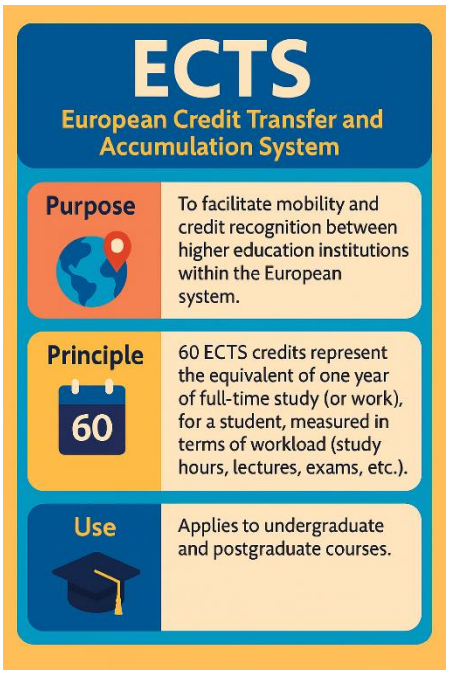
- ECTS focuses on study time and student workload.
- ECVET focuses on the acquisition of skills and learning outcomes.

Application:

- ECTS for higher education.
- ECVET for vocational education and training.

Purpose:

- ECTS for academic mobility.
- ECVET for the transfer of qualifications to the world of work.



To facilitate the recognition of training credits, the courses have been structured to be modular, following the teaching plan below:

a. **Interactive lessons via the BOUTCAR eLearning platform**. Each course includes approximately 10 hours of asynchronous lessons (5 hours for the general module and 5 hours for the specialized module).
b. **Individual study** to support skill acquisition, through the provision of in-depth learning materials for approximately 10–15 hours.

c. **Practical assessment** of learning through a final quiz (via the platform), case analysis, and group discussion. This assessment will last approximately 5 hours.

Overall, participants will have dedicated a total of 25–30 hours to each course.

If the program is undertaken through a **higher education system**, 1 ECTS credit is awarded upon completion of 25 hours of activities, and the higher education institution will issue a certificate.

In the higher education system (Universities) the above-mentioned training will be provided through a lifelong learning system. Greece's lifelong learning system transformed dramatically after EU membership in the 1980s, shifting from sparse voluntary initiatives to a complex network heavily influenced by European policies. The European Social Fund redirected priorities toward labour market needs, establishing 262 Vocational Training Centres (70% private) while marginalizing general adult education.

The Lifelong Learning Center of the University of Patras was established in 2018 with the main purpose to design, organize and operate lifelong training programs in a wide range of fields as technology, administration, health, humanities, education, art etc. Distance and blended learning are the main methods for the program's implementation, and the Center is always looking for new attractive methods and approaches for the improvement of adults' education, training and employment. The instructors and the coaches of the programs are academic and scientific staff of the University of Patras and also high-level colleagues from the private sector and the industry. The available human resources, the infrastructure and the technological equipment render the Center as one of the most powerful services of the University of Patras.

From the three modules of the program, students can choose from 1 to 3 modules, with the first module (Digital Management in Fisheries & Aquaculture) being mandatory for completing the program. The number of trainees per cycle is set at up to twenty-five (25) and the program begins when a minimum number of 5 people is reached. The maximum duration of the training is 12 weeks and corresponds to 90 hours of education.

Throughout the duration of the program, trainees have the ability to communicate with instructors for support of their studies. Trainees who successfully complete the program (attendance of sessions, completion of assignments and learning activities, and final evaluation exam) are awarded a certificate of program attendance with duration equal to the sum of hours of the modules they have chosen: 1 module = 30 hours equal to 1 ECTS, 2 modules = 60 hours equal to 2 ECTS, 3 modules = 90 hours equal to 3 ECTS. Upon completion of the program, participants are granted a Certificate of Attendance, provided that the following conditions are cumulatively met:

- Attendance of at least 80% of the hours of synchronous distance learning sessions for each module (i.e., 12 teaching hours for each module).
- Completion of one assignment, which certifies the distance study of the educational material.
- Participation in the final evaluation exam at both theoretical and practical levels.

If, alternatively, the program is undertaken through activities organized by a **vocational education and training institution**, upon completion of 30 hours and successful assessment of learning outcomes, participants may be awarded an ECVET credit and a skills and knowledge sheet detailing those that have been acquired during the specific path.

Given the diversity of the countries involved, especially in terms of the programs promoted by vocational education and training institutions, it is important to consider that the regulations supporting the certification and recognition of skills can also vary greatly from country to country.

In Greece, the certification and recognition of competences is managed by the National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP), which is responsible for the development and implementation of the Hellenic Qualifications Framework (HQF) and its correspondence with the European Qualifications Framework (EQF). Within the vocational education and training system, learning outcomes acquired through training programmes can be described and aligned with the HQF/EQF levels, ensuring transparency and portability. Recognition of competences is further supported by national procedures that allow the certification of skills gained through non-formal and informal learning, following assessment standards established by EOPPEP.

The **Italian system for the recognition and certification of skills** is governed by Legislative Decree 13/2013 and is based on a unified, national approach aimed at ensuring the transparency and applicability of qualifications throughout Italy and Europe. The objective is to validate the skills acquired by an individual not only through formal learning (school and vocational training), but also through non-formal learning (specific courses) and informal learning (work and life experience). This process is implemented through the Atlas of Work and Qualifications managed by INAPP, which defines minimum standards of knowledge (knowledge), skills (know-how), and competence for each professional profile. Identification, validation, and final certification are provided by public bodies (such as regional governments) or accredited bodies, with the goal of placing each qualification within the European Qualifications Framework (EQF) to facilitate international mobility and comparability. This system is crucial for enhancing human capital and promoting active labour policies.

The **Spanish** Vocational Training (FP - Formación Profesional) system underwent a profound transformation with Organic Law 3/2022, which created a Single and Integrated System. Unlike in the past, where there was a clear separation between school qualifications and certificates issued by the Ministry of Labor, today everything converges in a single national catalogue.

The heart of the system is the National System of Qualifications and Professional Training (SNQFP). This system is based on the National Catalogue of Professional Competence Standards, which defines what a worker must know for each sector.

The Recognition Process (Acreditación de Competencias) - regulated by Royal Decree 659/2023, of 18 July - is based on a permanent procedure called Acredita, which consists of three phases: 1. Assessment, where an expert consultant helps the candidate identify their skills and prepare a "dossier" of evidence (certificates, contracts, work samples); 2. Evaluation, which involves a commission that verifies skills through interviews, direct on-the-job observation, or simulations; 3. Accreditation and Registration (Certification): If the evaluation is positive, the candidate receives official accreditation, entered in the National Registry.

With the new law, training and certification are organized in a modular and progressive manner, making it very easy to "accumulate" small chunks of training to achieve a full qualification.

Several key bodies intervene in this system, including INCUAL (National Institute of Qualifications), which defines standards (the "building blocks" of skills) based on labour market needs; MEFP (Ministry of Education and FP), which manages the entire integrated system; and the Autonomous Communities; the regions have considerable autonomy in managing accreditation calls and training centres.

A distinctive feature of Spain is that the skills accreditation procedure is open all year round (a permanent procedure), eliminating the long waits for specific calls that characterize other European systems.

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ACCESS REQUIREMENTS

As a basic assumption, the BOUTCAR project's primary targets are those interested in developing skills in fisheries and aquaculture, whether from other professional backgrounds (reskilling) or for their first professional experience (young people completing education/training programs). It is also aimed at those already working in the two sectors who wish to acquire new skills to operate in a structured and innovative manner (upskilling).

In line with EUROPASS guidelines, the entry requirements for the recognition and subsequent certification of the training program completed by interested parties are outlined below.

Recommended requirements per each path/ profile

Path	Basic requirement	Preferential titles	Knowledge required
DIGITAL AQUACULTURE / FISHERY SPECIALIST	High School Diploma (or EQF Level 4/5 professional qualification in the maritime/agri-food sector).	Bachelor's degree (EQF 6) in a technical, scientific, or economic discipline Or Previous work experience, even brief, in the fishing, aquaculture, or food processing sectors is strongly preferred (although not always required).	Operational sector knowledge: Familiarity with basic fishing or aquaculture processes Basic knowledge of environmental sustainability principles applied to the blue sector. Digital literacy: Competence in using a PC and main software (spreadsheets, presentations). Basic understanding of modern IT concepts (e.g., what are sensors, the cloud, or data). Elementary regulatory knowledge: Basic notions of food safety and traceability systems. Knowledge of the need for risk management. Analytical skills: Ability to analyse and interpret data and indicators

MARINE POLICY, TRADE & COMPLIANCE ADVISOR	High School Diploma (or EQF Level 5 professional qualification in economic, legal, political, environmental or similar disciplines)	Higher Technical Education Diploma (ITS) or master's degree focused on quality management, logistics, or international trade. or Bachelor's degree (EQF 6) in economics, law, politics, environmental sciences, or related disciplines (e.g., Law, Political Science, Economics, Environmental Sciences, or Veterinary Sciences). or At least two years of previous experience as a Compliance Officer, Ship's Officer, Quality/Certification Manager (HACCP), or Legal/Administrative Consultant in companies in the seafood or food sector.	Fundamental legal knowledge: Basic concepts of public and international law (required to understand UNCLOS, CITES, and EU Regulations). Principles of the European Union's Common Fisheries Policy (CFP). Quality and trade knowledge: Familiarity with food safety standards and the main sanitary and phytosanitary regulations. Understanding of import/export, customs, and traceability mechanisms (TARIC, control systems). Operational sector knowledge: Knowledge of the production cycle and operational practices of both fishing and aquaculture (required to apply regulatory requirements to real-world contexts). Analytical and linguistic skills: Good understanding of English (the international body of legislation and most certifications are in English). Ability to critically analyse complex texts (laws, regulations, certification standards).

SUSTAINABLE FISHERY / AQUACULTURE OFFICER	Higher Technical Education Diploma (ITS) or Professional Qualification Certificate (EQF 4/5) in a relevant field (e.g., Agriculture, Chemical-Biological, Service Technician, or Maritime/Food Sector).	Bachelor's Degree (EQF 6) in disciplines such as Biological Sciences, Environmental Sciences, Food Science and Technology, or Veterinary Medicine. or Previous experience, even brief, in operational management, environmental monitoring, or quality control roles in fishing, aquaculture, or fish processing companies.	Scientific knowledge: Knowledge of the dynamics of coastal and lagoon ecosystems. Notions of biodiversity and ecological impact, essential for understanding the problem of Invasive Alien Species (IAS) and bycatch. Operational knowledge: Familiarity with the life cycles of the main fish and farmed species. Understanding of fishing and farming operational techniques. Basic knowledge of the seafood value chain. Notions of the concepts of traceability, food safety, and the role of certifications in market positioning. Analytical skills: Basic ability to understand and apply sustainability indicators (e.g., MSY - Maximum Sustainable Yield).
BLUE OPERATOR	High school diploma (or equivalent) or EQF Level 3/4 professional qualification in a technical field (e.g., navigation, agriculture, plant maintenance, mechanics).	Experience in operational sectors such as professional fishing, aquaculture, or shipbuilding/marine construction. Possession of any workplace safety and first aid certificates (required for risk management).	Familiarity with the maritime/aquaculture work environment and basic knowledge of fishing and/or farming equipment and techniques. Understanding of basic workplace safety principles and ability to identify immediate operational risks. Ability to read and apply standardized operating procedures (e.g., bycatch reduction protocols, materials management). Basic proficiency with industry-specific tools and equipment (e.g., basic GPS, fishing/farming gear).

BLUE SEAFOOD OPERATOR	High school diploma with a professional qualification (EQF 4) in agrifood logistics, food technology or similar.	Second-level technical education diploma (ITS) (EQF 5) in fields such as food technology, agri-food, logistics, or quality management. or At least 2 years of professional experience in quality control or logistics roles in food/fish processing companies.	Operational sector knowledge: In-depth knowledge of HACCP (Hazard Analysis and Critical Control Points) principles and related European food hygiene regulations. Knowledge of voluntary certification requirements (e.g., IFS, BRC, ISO 22000), which are essential for accessing international markets. Technical knowledge: Knowledge of fish processing processes and related contamination risks. Basic knowledge of import/export. Analytical skills: Ability to use IT management platforms (ERP or LIMS) for data flow management and compliance.

BLUE PROMOTER	Bachelor's Degree (EQF 6) or master's degree/First Level Master's Degree (EQF 7) in Marketing and Communication, or Economics and Management (with a specialization in Agri-Food), or Environmental Sciences, or Marine Sciences.	At least 1 year of experience in Marketing, Branding, Business Development, or Corporate Social Responsibility (CSR) roles is strongly recommended, preferably in the food/fisheries sector.	Strategic marketing and communications: Mastery of branding mechanisms for creating sustainability-based value propositions. Knowledge of market research techniques and consumer behaviour analysis. Sustainability and indicators: Advanced understanding of sustainability indicators (e.g., MSY, environmental impact) and their practical application to support promotional claims. Knowledge of the role and procedures of Eco-Sustainable Certifications (e.g., MSC, ASC) as tools for promoting and building trust. Legal knowledge: Knowledge of the main national and European regulations relating to labelling, food safety, and import/export regulations, to ensure that promotional strategies are legally compliant.

AQUACULTURE HEALTH DATA ANALYST	Bachelor's Degree (EQF 6) or master's degree/First level master's degree (EQF 7) in the following fields: Veterinary Sciences or Biological Sciences/Biotechnology (with a specialization in marine or aquaculture), or Computer/Electronic engineering, Management engineering.	Second level higher technical education diploma (EQF 5) in advanced IT or agri-food sectors, combined with significant work experience (2+ years) in data analysis or operational health management roles in aquaculture.	Specialized biological and health knowledge: Understanding of the main pathogens, diseases, and biosecurity protocols in fish and shellfish farms. Knowledge of the principles of nutrition and feed formulation. Data Science and IT knowledge: Understanding of basic statistical methods and predictive modelling concepts. Familiarity with the fundamentals of Artificial Intelligence (Machine Learning), cloud computing concepts, and the use of sensor data. Basic proficiency in common data analysis languages (e.g., Python or R).

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BOUTCAR – "Blue jobs through blue careers"

Project full title:	**BLUE JOBS THROUGH BLUE CAREERS**
Project Acronym:	**BOUTCAR**
Deliverable number:	**D4.4**
Deliverable title:	**D4.4 - Certification scheme**
Work package:	**WP 4: Development of innovative educational material**
TASK	**T4.4 - Program Certification Process and Training Content. The document will contain information on competences and acquired learning outcomes, accessible job sets, issuing and accreditation bodies, ways of obtaining the Certificate or Diploma, international level of the Certificate or Diploma, entry requirements and possibilities of access to other official accreditations.**
Due date of deliverable:	**Month 27**
Start date of task:	**Month 25**
Duration of task:	**3 months**
Author/editors:	**Laura Zambrini**
Deliverable lead:	**DEMETRA**
Contributing partners:	**Univ. PATRAS, CFFolgado, E-SCHOOL**

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"*The information and views set out in this document are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission can guarantee the accuracy of the data included in this study. The Commission or any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.*"

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Annex 1: Possible configuration of an educational/training path using the BOUTCAR program

Blue Manager profile

Total Workload: 90 hours (including self-study and assessment)
ECVET Equivalent: 3 ECVET credits
- → *Lectures*: *46 hours*
- → *Literature review*: *35 hours*
- → *Exercises - Self assessment focusing on the application and analysis of case studies*: *9 hours*

Assessment Methods
- ✓ *Participation & group discussion*: **30%**
- ✓ *Short written assignment or case analysis*: **30%**
- ✓ *Final quiz or reflection report*: **40%**

Pathway for Digital Aquaculture / Fishery Specialist

Total Workload: Approximately 30 hours (including self-study and assessment)
ECVET Equivalent: 1 ECVET credit
- → *Lectures: 15 hours*
- → *Literature review: 12 hours*
- → Exercises-Self assessment focusing on the application and analysis of case studies: 3 hours

Assessment Methods
- ✓ *Participation & group discussion*: **30%**
- ✓ *Short written assignment or case analysis*: **30%**
- ✓ *Final quiz or reflection report*: **40%**

Description of the modules	
Module 1: Risk management in aquaculture **Number of hours:** 1 **Method:** Study and analysis of the literature	1. Data quality is a first-order risk 2. Structured approach. Risk work follows AS/NZS ISO 31000 3. Risk perception clusters (PCA) 4. Economics drive vulnerability 5. Hazard profile (finfish) 6. Self-Assessment Quiz
Module 2: Utilizing digital platforms for decision-making. **Number of hours:** 2 **Method:** Study and interactive discussion	1. Information Technology in Fisheries 2. Cloud, sensors and Artificial Intelligence/Big Data 3. Digital monitoring 4. Real time tracking on abiotic parameters 5. Optimization and data security risks 6. Self-Assessment Quiz

Module 3: Environmental impact assessment using smart technologies. **Number of hours:** 2 **Method:** Interactive teaching and literature analysis	1. Integrated "smart" stack 2. Grade accuracy and real impact 3. Measuring abiotic parameters 4. Ecosystem-scale assessment and compliance 5. From prediction to sustainability 6. Self-Assessment Quiz
Module 4: Precision fishing technologies (GPS, sonar, sensors, drones) **Number of hours:** 1 **Method:** Case study analysis	1. Introduction to precision 2. GPS toolkit 3. Aerial, underwater and surface drones. 4. Management integration 5. From fisheries data to maps 6. Self-Assessment Quiz
Module 5: Data management and analysis for sustainable fishing **Number of hours:** 2 **Method:** Study and exercises on fisheries data	1. Why data matters 2. Core management ideas 3. Key models & methods 4. Data landscape 5. Tools & standards 6. Data exercises and self-Assessment Quiz
Module 6: Digital traceability and blockchain in the fish supply chain **Number of hours:** 2 **Method:** Study and interactive discussion	1. What is traceability in fisheries? 2. Digital traceability? 3. HACCP, traceability towards compliance 4. Pilot studies 5. Sustainability links 6. Self-Assessment Quiz
Module 7: Artificial Intelligence fish disease diagnosis system **Number of hours:** 1 **Method:** Interactive teaching	1. Goals and review 2. GIS and learning 3. Model benchmarking 4. Diagnostic architecture 5. Operational forecasting techniques 6. Self-Assessment Quiz
Module 8: Feed optimization in aquaculture **Number of hours:** 2 **Method:** Interactive tools and testing.	1. Feed is the biggest cost (often 50–75%) 2. Precision Fish Farming 3. Key tools 4. Systems and control 5. Track FCR, SGR, condition, biomass accuracy, and pellet waste 6. Self-Assessment Quiz
Module 9: Digital traceability and blockchain in the aquaculture supply chain **Number of hours:** 2 **Method:** Study and interactive teaching.	1. What is traceability in aquaculture? 2. Implementation 3. Seafood case studies 4. HACCP integration 5. Digital pilot outcomes 6. Self-Assessment Quiz

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General content for both sectors **(5 hours)**						
Title of the modules	**Nr. hours**	**E-learning (hours)**	**Learning outcomes: Knowledge**	**Learning outcomes: Skills**	**Learning outcomes: Responsibility**	**Competence**
Risk management in aquaculture.	1	Study and analysis of the literature.	Understand biological, environmental, and operational risks in aquaculture systems.	Identify, assess, and prioritize risks in aquaculture using emergency protocols.	Act with limited supervision in managing risks, ensuring biosecurity and continuity of operations.	Apply structured risk assessment and mitigation strategies in aquaculture operations.
Utilizing digital platforms for decision-making.	2	Study and interactive discussion.	Understand digital platforms used in fisheries-aquaculture decision-making.	Analyse real-time data from multiple sources to support operational decisions.	Apply digital insights to improve efficiency.	Independently use digital tools and platforms to analyse fisheries-aquaculture data.
Environmental impact assessment using smart technologies.	2	Interactive teaching and literature analysis.	Knowledge on how smart tech monitors fisheries-aquaculture impacts.	Collect and interpret environmental data to assess sustainability.	Contribute to sustainable management plans in fisheries-aquaculture.	Conduct environmental monitoring and impact assessments using digital sensors and smart technologies.
Specialized training for fisheries professionals **(5 hours)**						
Precision fishing technologies (GPS, sonar, sensors, drones)	1	Case study analysis.	Understand precision tools used in modern fishing operations.	Operate and interpret outputs from GPS, sonar, and drones to locate, track, and assess fish stocks.	Deploying technologies to support responsible, data-informed fishing practices.	Operate and interpret data from precision fishing technologies, such as GPS, sonar, and drones, to optimize fishing efforts.

Data management and analysis for sustainable fishing.	2	Study and analysis of the literature.	Knowledge of data types, sources, and standards used in fisheries management.	Organize and analyze fisheries data using basic analytical tools (e.g., excel, GIS, or open-source software).	Ensure data integrity to support evidence-based recommendations for sustainable practices.	Manage and analyze fisheries data to support sustainable fishing practices.
Digital traceability and blockchain in the fish supply chain.	2	Study and interactive discussion.	Understand how traceability systems can secure and verify fish supply chain data.	Apply traceability protocols using blockchain interfaces.	Maintain accurate records; support compliance and transparency.	Implement digital traceability systems in the fish supply chain to enhance product transparency, consumer trust, and regulatory compliance.
Specialized training for aquaculture professionals **(5 hours)**						
A.I. fish disease diagnosis system.	1	Interactive teaching.	Understand AI applications in aquaculture health, including image recognition and predictive models.	Use of AI tools to diagnose common diseases from image or sensor data.	Respond to early-warning signals.	Utilize AI-driven diagnostic tools to detect and respond to fish health issues.
Feed optimization in aquaculture.	2	Interactive tools and testing.	Knowledge of feed types, nutritional requirements, and digital tools used for optimizing feeding strategies.	Use automated feeding systems, and adjust schedules based on real-time data.	Monitor feeding operations to improve feed efficiency.	Apply digital monitoring systems and data analytics to optimize fish feeding practices.
Digital traceability and blockchain in the aquaculture supply chain.	2	Study and interactive teaching.	Understand traceability needs in aquaculture, and blockchain's role in product origin, quality, and safety.	Implement digital tagging, input lifecycle data, and use blockchain tools to track aquaculture products from "Sea to Fork."	Ensure traceable operations and product authenticity independently within the supply chain.	Develop and maintain blockchain traceability solutions in aquaculture production and distribution.

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Pathway for Fisheries and Aquaculture Law & Compliance

Total Workload: Approximately 30 hours (including self-study and assessment)
ECVET Equivalent: 1 ECVET credit

- → *Lectures: 15 hours*
- → *Literature review: 12 hours*
- → *Exercises-Self assessment focusing on the application and analysis of case studies: 3 hours*

Assessment Methods

- ✓ *Participation & group discussion*: **30%**
- ✓ *Short written assignment or case analysis*: **30%**
- ✓ *Final quiz or reflection report*: **40%**

Description of the modules	
Module 1: Fundamentals of Maritime Law and Global Standards **Number of hours:** 2 **Method:** E-learning	1. Introduction to Maritime Law 2. Key Legal Sources: UNCLOS, MARPOL, ILO, CITES 3. EU Maritime Law Foundations 4. Global Standards in Fisheries and Aquaculture 5. Highlights 6. Self-Assessment Quiz
Module 2: Digital Platforms for Compliance and Monitoring. **Number of hours:** 2 **Method:** E-learning	1. Role of Digital Technologies in Compliance 2. Key Tools: CDS, EFCA, e-logbooks, Blockchain, GIS 3. Case Studies from Spain, Italy, Greece 4. Advantages and Limitations 5. Highlights 6. Self-Assessment Quiz
Module 3: Legal Frameworks for Sustainable Resource Management. **Number of hours:** 2 **Method:** E-learning	1. Legal Principles: Precautionary Approach, Ecosystem Management 2. EU Framework: CFP, MSFD 3. International Agreements: FAO, UN Fish Stocks, RFMOs 4. Highlights 5. Self-Assessment Quiz
Module 4: Strategies for Sustainable Practices in Industrial and Artisanal Fishing **Number of hours:** 2 **Method:** Case-Based Teaching	1. Operational and Legal Differences 2. Risk Factors and Illegal Practices 3. Integration of Sustainability in Operations 4. Case Studies: Marine Reserves in Spain, MSC-certified Fisheries 5. Highlights 6. Self-Assessment Quiz

Module 5: Import/Export Regulations, Customs, and Food Safety Standards **Number of hours:** 2 **Method:** Interactive teaching	1. International Trade Framework 2. Customs Policies and Tariff Codes (TARIC) 3. Sanitary and Phytosanitary Requirements 4. Food Safety Certifications and Control 5. Highlights 6. Self-Assessment Quiz
Module 6: Certification Systems in Fisheries Operations **Number of hours:** 2 **Method:** Interactive & Applied Teaching	1. What is Certification? 2. Main Certification Systems: MSC, FOS, GLOBALG.A.P. 3. Implementation Process 4. Advantages and Challenges 5. Highlights 6. Self-Assessment Quiz
Module 7: Certification and Control Systems in Aquaculture **Number of hours:** 2 **Method:** Case-Based & Visual Learning	1. Foundations of Aquaculture Sustainability 2. Specific Certifications in Aquaculture (ASC, BAP, GLOBALG.A.P.) 3. Control and Traceability Systems 4. Implementation Steps 5. Highlights 6. Self-Assessment Quiz
Module 8: Import/Export and Food Safety for Aquaculture Products **Number of hours:** 2 **Method:** Study & Simulation	1. Key EU and International Regulations 2. Sanitary Requirements 3. Customs Procedures and Export Documentation 4. Applicable Food Safety Standards (IFS, BRC, ISO) 5. Highlights 6. Self-Assessment Quiz
Module 9: Monitoring Compliance in Aquaculture Operations **Number of hours:** 2 **Method:** Data Interpretation & Practical Tools	1. Foundations of Monitoring in Aquaculture 2. Key Indicators 3. Digital Tools and Platforms 4. Internal Audits and External Inspections 5. Highlights 6. Self-Assessment Quiz

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General content for both sectors **(5 hours)**						
Title of the modules	**Nr. hours**	**E-learning (hours)**	**Learning outcomes: Knowledge**	**Learning outcomes: Skills**	**Learning outcomes: Responsibility**	**Competence**
Foundations of Maritime Law and Global Standards.	2	Study and analysis of the literature.	Understand basic principles of maritime law, and key global maritime regulations.	Identify relevant legal frameworks applicable to fisheries and maritime zones.	Apply legal principles to basic compliance tasks.	Operate within the legal parameters of maritime environments in accordance with global standards.
Utilization of digital platforms to monitor & manage compliance.	2	Study and analysis of the literature and interactive teaching with participation of the trained group.	Understand digital tools used in monitoring and compliance.	Operate digital compliance tools; interpret data related to fisheries/aquaculture operations.	Work independently to maintain data quality.	Use digital systems to support legal and sustainability compliance efforts.
Legal frameworks for sustainable resource management.	1	Study and interactive discussion.	Knowledge of key international/national laws supporting sustainable marine resource use.	Analyze and compare laws and policies to identify gaps or overlaps in regulatory frameworks.	Contribute to compliance planning and policy assessments in a team setting.	Assist in integrating legal frameworks into operational sustainability strategies.
Specialized training for fisheries professionals **(5 hours)**						
Strategies to integrate legal and sustainable practices in industrial and artisanal fishing.	2	Interactive teaching and case study analysis with the participation of the trained target group	Understand differences in industrial vs. artisanal regulations and sustainability challenges.	Design strategies that align legal compliance with sustainable fishing practices.	Make recommendations and support decision-making in mixed-fisheries.	Contribute to integrated planning that balances compliance and ecological sustainability.

Import/export rules, customs policies & food safety standards.	2	Interactive teaching with the participation of the trained target group.	Understand trade rules, national import/export laws.	Interpret legal and safety documentation to ensure products.	Maintain regulatory documentation align with authorities.	Support trade operations by applying legal knowledge to documentation and food safety.
Implementation of certification systems in fishing operations.	1	Interactive teaching.	Knowledge of different certification schemes and audit procedures.	Apply certification criteria.	Manage documentation align with certifying bodies.	Ensure fishing operations align with standards required for certification.
***Specialized training for aquaculture professionals* (5 hours)**						
Implementation of control & certification to ensure sustainable practices.	2	Interactive teaching.	Understand control mechanisms (e.g., catch documentation schemes, traceability systems).	Design and implement tracking processes and internal control systems.	Take responsibility for maintaining compliance in sustainable practices.	Lead efforts to implement sustainability certification and traceability mechanisms.
Import/export rules, customs policies & food safety standards.	2	Interactive teaching with the participation of the trained target group.	Understand trade rules, national import/export laws.	Interpret legal and safety documentation.	Maintain regulatory documentation and liaise with authorities.	Support trade operations by applying legal knowledge to documentation and food safety.
Compliance monitoring in aquaculture operations.	1	Interactive teaching.	Knowledge of regulatory obligations specific to aquaculture.	Collect, report, and analyze abiotic and bioticcompliance data.	Monitor and report non-compliance issues within aquaculture systems.	Ensure continuous adherence to legal and environmental standards in aquaculture production.

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Pathway for Sustainable Aquaculture/Fisheries Officer

Total Workload: Approximately 30 hours (including self-study and assessment)
ECVET Equivalent: 1 ECVET credit
- → *Lectures: 16 hours*
- → *Literature review: 11 hours*
- → *Exercises-Self assessment focusing on the application and analysis of case studies: 3 hours*

Assessment Methods
- ✓ *Participation & group discussion*: **30%**
- ✓ *Short written assignment or case analysis*: **30%**
- ✓ *Final quiz or reflection report*: **40%**

Description of the modules	
Module 1: Invasive Species (IAS): Problems and Potential **Number of hours:** 2 **Method:** E-learning	1. Introduction to IAS - Definition and EU context. - Pathways of introduction (ballast waters, aquaculture escapes, trade, climate change). 2. Problems caused by IAS - Ecological impacts (competition with native species, habitat alteration, biodiversity loss). - Economic impacts (damage to fisheries, aquaculture, coastal infrastructures). - Social and health aspects (toxic species, consumer perception). 3. Management of IAS - Early detection and monitoring systems. - Control and eradication strategies. - Role of fisheries in turning IAS from problem to resource: change the minds of fishers. 4. Potential for Fisheries and Market Valorisation - Case studies of edible IAS species (e.g., blue crab, lionfish, Japanese oyster). - Market development and consumer acceptance. 5. Funding Opportunities for IAS Management - European Funding - National Funding 6. Highlights 7. Self-Assessment Quiz
Module 2: Value Chain of New Seafood Products. **Number of hours:** 2 **Method:** E-learning	1. Introduction: Emerging trends in seafood innovation 2. Processing and Product Innovation - New product development (ready-to-eat / ready-to-cook products) - Valorisation of by-products and circular economy approaches - Food safety and quality control: the traceability of the products and the role of the "food business operator" 3. Consumer and Market Dynamics - Consumer acceptance of novel seafood products. - Marketing strategies and storytelling (local, sustainable, innovative).

	- Role of certifications and eco-labels in market positioning 4. Case Studies: Successful introduction of new seafood products. 5. Highlights 6. Self-Assessment Quiz
Module 3: Synergetic actions in fisheries: Lagoon and coastal management. **Number of hours:** 2 **Method:** E-learning	1. Lagoons and wetlands: an overview on these delicate environments. 2. Ecosystem dynamics 3. Effects of habitat restoration to support fisheries: ecosystem-based management. 4. Hydrodynamics and water management. 5. Common fishing activities. 6. Main target species and life cycle. 7. Case studies and examples. 8. Good practices and management. 9. Highlights 10. Self-Assessment Quiz
Module 4: Best practises in fisheries: Bycatch reduction **Number of hours:** 2 **Method:** Case-Based Teaching	1. A definition of bycatch. 2. Fishing activities and relative impacts: a focus on trawling and longlines. 3. The challenge of multispecies fishing 4. Common bycatch species 5. Ecosystem and fish stock effects: consequences of bycatch on the marine environment and fisheries management. 6. Bycatch mitigation: Case studies and examples of effective tools such as TED and circular hooks. 7. Current EU regulations on bycatch 8. Promising solutions and recommendations. 9. Highlights 10. Self-Assessment Quiz
Module 5: Monitoring and sustainability indicators in fisheries **Number of hours:** 2 **Method:** E-learning and Interactive teaching	1. Definition of sustainability indicators in fishery and their applications. 2. Common indicators (e.g., MSY, scoring systems). 3. Application of indicators to fisheries: the iconic example of the Atlantic Bluefin Tuna fishery. 4. Highlights 5. Self-Assessment Quiz
Module 6: Best Practices in Aquaculture: New Techniques and Certifications **Number of hours:** 2	1. Introduction to best practices - EU regulatory framework - Differences between EU countries 2. New aquaculture techniques: more efficient and more sustainable - Recirculating Aquaculture Systems (RAS) - Integrated Multi-Trophic Aquaculture (IMTA) - Aquaponics and circular economy approaches

Method: Interactive & E-learning Teaching	- Low-impact farming methods 3. Biosecurity, climate changes and animal welfare - Preventive measures against diseases in fish and shellfish farming. - Problems caused by climate change and solutions undertaken so far. - Welfare protocols for fish and shellfish 4. Certifications and quality labels - Role of certifications in aquaculture - Types of certifications: ASC (Aquaculture Stewardship Council), Global G.A.P., Friend of the Sea, Organic Certifications, DOP 5. Circular economy and waste management 6. Highlights 7. Self-Assessment Quiz
Module 7: Utilization of New Species **Number of hours:** 2 **Method:** Case-Based & E-Learning	1. Drivers of diversification in aquaculture. - Market demands and climate change adaptation. - Risk management in monoculture systems. 2. Criteria for introducing new species. - Ecological compatibility and risk assessment. - Growth performance and feed conversion. - Consumer acceptance and nutritional value. 3. New species - Fish: meagre, barramundi, cobia, etc. - Shellfish: emerging bivalves and crustaceans - Algae and seaweed for food, feed, and bioproducts 4. Regulatory and environmental considerations. - Licensing for new species. - Avoiding invasive species risks. 5. Highlights 6. Self-Assessment Quiz
Module 8: Monitoring and Sustainability Indicators in Aquaculture **Number of hours:** 2 **Method:** E-learning	1. Sustainability in aquaculture: concept and dimensions. - Environmental, economic, and social pillars. 2. Indicators for evaluate the impacts of aquaculture. - Environmental impact in aquaculture: differences between shellfish farming and fish farming. - Ecosystem services provided by shellfish farming. - Certifications linked to the environmental impact and use of food and antibiotics. 3. Effects of the climate change on aquaculture - How the climate change affects the aquaculture activities. - Tools for monitoring: use of new in-situ sensors and satellite data. - Data analysis platforms. 4. Economic and social indicators. - Profitability and competitiveness of different types of aquaculture. - Contribution to local employment. 5. Highlights 6. Self-Assessment Quiz

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General content for both sectors **(5 hours)**						
Title of the modules	**Nr. hours**	**E-learning (hours)**	**Learning outcomes: Knowledge**	**Learning outcomes: Skills**	**Learning outcomes: Responsibility**	**Competence**
Biological characteristics of the invasive species.	2	Interactive teaching.	Identify the biological characteristics that make a species invasive and potential uses in aquaculture or food systems.	Assess potential risks and benefits of harvesting or farming invasive species.	Apply sustainable and ethical decision-making when proposing invasive species utilization strategies.	Identify and assess invasive aquatic species, demonstrating autonomy in recognizing their ecological roles and impacts.
Value chain of new seafood products.	2	Study and analysis of the literature and interactive teaching with the participation of the trained target group.	Understand the structure and dynamics of seafood value chains from "Sea to Fork".	Map and analyse value chain components for innovative seafood products.	Collaborate with stakeholders across the supply chain to implement value-driven strategies.	Evaluate and contribute to the design and improvement of seafood value chains.
Specialized training for fisheries professionals **(5 hours)**						
Synergetic actions in fisheries: Lagoon management.	2	Study and analysis of the literature and interactive teaching with the participation of the trained target group.	Describe the ecological and socio-economic functions of lagoon ecosystems in coastal fisheries.	Identify and evaluate stakeholder roles in lagoon ecosystems (e.g., fishers, conservation groups, policy makers).	Work under limited supervision to support lagoon management initiatives in multi-stakeholder contexts.	Evaluate on problem-solving in managing complex ecosystems.

Best practises in fisheries: Bycatch reduction.	2	Interactive teaching.	Identify the ecological impacts and economic consequences of bycatch in commercial fisheries.	Interpret data and technical documentation to evaluate the effectiveness of bycatch mitigation strategies.	Operate in frameworks to improve sustainability practices in active fisheries operations.	Implement and evaluate bycatch reduction strategies and technologies.
Monitoring and sustainability indicators in fisheries.	2	Study and interactive discussion.	Interpret monitoring data relevant to environmental, economic, and social aspects of fisheries sustainability.	Select and apply basic indicators for evaluating ecological, economic, and social sustainability in fisheries.	Support decision-making by providing reliable input from sustainability indicators.	Contribute to the implementation of monitoring systems and sustainability indicators for fisheries.
***Specialized training for aquaculture professionals* (6 hours)**						
Best practises in aquaculture: Anti-fouling.	2	Interactive teaching.	Understand biofouling processes and their impact on aquaculture systems.	Evaluate different anti-fouling strategies for effectiveness, cost, and environmental impact.	Make informed decisions on anti-fouling practices that meet environmental compliance and operational needs.	Implement and adapt anti-fouling practices in aquaculture systems.
Utilization of invasive species.	2	Interactive teaching.	Understand the economic impacts of aquatic invasive species.	Evaluate and apply methods for the safe utilization and processing of invasive aquatic species.	Work independently or within teams to assess and communicate utilization practices to stakeholders.	Develop and propose strategies for the sustainable exploitation of invasive species.
Monitoring and sustainability indicators in aquaculture.	2	Study and interactive discussion.	Understand key environmental, economic, and social indicators of aquaculture sustainability.	Design/implement a monitoring plan using appropriate sustainability indicators.	Take responsibility for monitoring and reporting sustainability metrics in aquaculture.	Apply and interpret sustainability indicators in aquaculture systems.