



B-READI

MODULES FOR THE RENOVATION/INTRODUCTION OF THE DEGREES/TRACKS



UNIVERSITÀ
DEGLI STUDI
DELL'AQUILA



Middlesex
University
London



Co-funded by the
Erasmus+ Programme
of the European Union



MODULES FOR THE RENOVATION/INTRODUCTION OF THE DEGREES/TRACKS

Modules designed and created by the B-READI partners for transdisciplinary training in the European academic environment in the track of “Prevention Manager” (European Prevention Manager - EPM) and the “Emergency Manager” (European Crisis Emergency Manager - ECEM).

The modules are ordered by the proponent partner institution: University of L’Aquila, Universitat de Girona/University of L’Aquila, Universitat de Girona, University of the Azores, EDIMAS, and Middlesex University. Partner institutions provided the module designation and its content, teaching method to be used, students’ assessment, and learning outcomes to be achieved.



University of L'Aquila

MODULE: **Integrated Health Emergencies**

PROFILE: **ECEM**

Pre-requisites
Knowledge of Medicine, First Aid, and Intensive Care.
Description & Contents
<p>The course aims to train participants to deal with medical-assistance problems relating to health emergencies in the intra and extra-hospital environment.</p> <p>The didactic and training plan is aimed at qualifying:</p> <ul style="list-style-type: none"> • in the knowledge of the problems related to the environment and natural disasters; • in the knowledge of the physiological and pathophysiological problems of the organism in difficult; • in the management of health emergencies in a hostile environment; • in the use of monitoring and therapy systems already at the accident site; • in the management of the patient; • in the communication with the patient and with the media; • in the new technologies and techniques at the service of emergencies; • in the knowledge of the new technologies applicable to the emergency / max emergency.
Activities & Methodology
<p>Expositive sessions.</p> <p>Presentation of class works (e.g. poster session, slide show, ...).</p> <p>Practices.</p>
Evaluation / Assessment
Class works 45% Practices 55%.
Learning outputs (Competences)
<p>ECEM C1.2 Demonstrate knowledge of the health skills required in critical scenarios.</p> <p>ECEM C1.3 Demonstrate in depth understanding of the role of each health system unit in crisis scenar.io</p> <p>ECEM C2.1 Knowledge and ability to coordinate the medical entities (public and private) in an emergency scenario.</p>



University of L'Aquila / Universitat de Girona

MODULE: **Data Acquisition and Visualization**

PROFILE: **EPM**

Pre-requisites
Basic knowledge of computer programming.
Description & Contents
<p>In emergency prevention and management scenarios there will be received data from sensors, geolocalization of equipment and personnel, etc. These could represent huge volumes of information, in some cases raw data that can be incomplete or containing errors. These data must be prepared for its analysis.</p> <p>Also, these data must be adequately presented to help in the decision-making process.</p> <ul style="list-style-type: none">• Sources of Data in emergencies and its acquisition.• Data Quality Evaluation.• Data cleansing.• Data preparation for their use in Data Science.• Introduction to the visualization of information.• Types of graphics and visualization strategies.• Advanced and interactive visualization.
Activities & Methodology
<p>Expositive sessions.</p> <p>Presentation of class works (e.g., poster session, slide show, ...).</p> <p>Practices (development of a small project).</p>
Evaluation / Assessment
Class works 35% Practices 65%.
Learning outputs (Competences)
<p>EPM B2.2 - Knowledge of and capacity to properly use the main tools.</p> <p>EPM B3.1 - Recognize and understand the importance of the role played by monitoring and EWS.</p> <p>EPM B3.2 - Recognize and understand the main elements that govern the design of EWS.</p> <p>EPM B3.5 - Recognize and understand the variety and complexity of existing monitoring and EWS "Early Warning Systems" and their use in a multi-hazard perspective.</p>



Universitat de Girona

MODULE: **Cyber Security Risks and Data Protection**

PROFILE: **EPM**

Pre-requisites
Basic knowledge of computer programming, and computer networks.
Description & Contents
<p>Most of the modern services and infrastructures (telecommunications, energy, water supply, transportation, <i>etc.</i>) rely on electronic and computer systems which can be attacked. It is of major importance to maintain these services working properly.</p> <ul style="list-style-type: none">• Introduction to cryptography.• Security in Data Bases and Operating Systems.• Security in Networks and Internet Services.• Security in Sensors and Data Acquisition.• Application of Blockchain solutions and Smart Contracts.
Activities & Methodology
<p>Expositive sessions.</p> <p>Presentation of class works (<i>e.g.</i> poster sessions, slide show, <i>etc.</i>).</p> <p>Practices (programming, analyzing, <i>etc.</i>).</p>
Evaluation / Assessment
Class works 40% Practices 60%.
Learning outputs (Competences)
<p>EPM B2.1 - Identify the coordination methodology processes and tools, according to the selected prevention plans.</p> <p>EPM A1.2 - The policies and legal constrains, related to risks management (<i>e.g.</i> labour risks, cyber risk, natural risk, <i>etc.</i>).</p> <p>EPM A4.1 - Critically reflect on the impact of relevant legislation and policies for Integrated Strategic Multidisciplinary Territorial Planning for Risk Prevention.</p>



University of the Azores

MODULE: **Monitoring and Warning Systems**

PROFILE: **EPM / ECEM**

Pre-requisites
None.
Description & Contents
<p>Monitoring and Early Warning Systems are essential for the mitigation of hazards. The module addresses the implementation of a warning system according to the type of hazards to be monitored and the necessary resources for that purpose. It also explains how the information is generated, transformed into warning messages, and disseminated using resources to the various communication systems.</p> <p>Topics of the module include:</p> <ul style="list-style-type: none"> • Identification of natural hazards; • Introduction to monitoring and warning systems; • Monitoring methods and strategies; • Data acquisition and transmission; • Monitoring systems (<i>i.e.</i>, Gas emissions – CO₂ (discrete and continuous measurements) and radon (²²²Rn); Water analysis – Physical and chemical parameters measured in situ and in the laboratory; Seismic monitoring; (*) Visit to seismic stations and epicenter calculations. Geodetic landslide monitoring – using a total station method.); • Warning systems. (<i>i.e.</i>, (*) Visit to the landslide early warning system array of meteorological stations.); • Communication of information warning systems to authorities, organizations, and the population.
Activities & Methodology
<p>Expositive sessions (oral presentation of topics using slides, illustrative diagrams, photographs, videos, <i>etc.</i>).</p> <p>Practices (development of a small project and (*) observation of data acquisition centers and transmission systems.</p> <p>(*) Activities to be held in São Miguel Island, Azores</p>
Evaluation / Assessment
Class works 40% Practices 60%.
Learning outputs (Competences)
<p>EPM B1.1 - Recognize the importance of timely dissemination of information.</p> <p>ECEM B1.2 - Recognize the importance of timely and competent information to the citizens.</p> <p>EPM B3.2 - Understand the main elements that govern the design of an early warning system.</p> <p>EPM B3.5 - Recognize and understand the variety and complexity of existing monitoring and early warning systems and their use in a multi-hazard perspective.</p> <p>EPM B3.6 - Know and understand the different monitoring and early warning systems applied to reduce / mitigate natural, anthropic, and modern risks.</p>



University of the Azores

MODULE: **Civil Protection Structures and Agents**

PROFILE: **EPM / ECEM**

Pre-requisites
None.
Description & Contents
<p>The different organizations, structures and civil protection agents are discussed regarding the structure, organization, competences, and duties.</p> <p>Topics of the module include:</p> <ul style="list-style-type: none"> • Public Civil Protection policies; • International organizations and structures; • National Civil Protection authority; • Civil Protection structure; • Civil Protection agents.
Activities & Methodology
The module operates with the collaboration of leaders from different organizations, structures, and entities.
Evaluation / Assessment
Class works 40% Practices 60%.
Learning outputs (Competences)
<p>EPM A1.3 - The legal framework that determines public policies in terms of civil protection services.</p> <p>EPM A2.4 - Identify and characterize international civil protection institutions and related organizations and structures, the key actors in charge.</p> <p>ECEM A2.2 - Identify and characterize international civil protection organizations and structures.</p> <p>EPM A2.6 - Know the key actors of the civil protection system.</p>



University of the Azores

MODULE: **Natural and Technological Risks**

PROFILE: **EPM / ECEM**

Pre-requisites
None.
Description & Contents
<p>The module aims to provide an integrated view of natural and technological risks, so the learning objectives of this module are situated, fundamentally, both around the strengthening of notions and principles, and of a better perception of public policies in the field of risk prevention, whether in their construction or implementation.</p> <p>Topics of the module include:</p> <ul style="list-style-type: none">• Hazard, vulnerability, value, and risk;• Multiple hazards and risks;• Risk assessment (natural hazards, and environmental and technological risks);• Public policies.
Activities & Methodology
The module operates on a seminar basis with the collaboration of experts, from the public and the private sector, on risk management.
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%) on a topic of the module.
Learning outputs (Competences)
<p>EPM A1.4 - The relevant legislation, public policies to mitigate natural and anthropic risks.</p> <p>ECEM A1.5 - Know public policies to reduce natural and anthropic risks in crisis management.</p> <p>EPM A3.2 - Identify preventive measures to mitigate risk and recognize the difficulties inherent in their implementation.</p> <p>ECEM A3.2 - Identify measures to reduce/mitigate risk in crisis management and recognize the difficulties inherent in their implementation.</p> <p>ECEM A3.1 - Understand the level of complexity of risk assessment processes for the best emergency planning.</p>



University of the Azores

MODULE: **Crisis Management and Response Mechanisms**

PROFILE: **EPM / ECEM**

Pre-requisites
None.
Description & Contents
<p>Throughout history, there have been several successful and failed examples related to crisis management. This module addresses facts that contribute to complex problems to solve in the different phases of disaster management during a crisis.</p> <p>Topics of the module include:</p> <ul style="list-style-type: none">• Introduction to crisis management;• Disaster management phases;• Dissemination of information;• Case study.
Activities & Methodology
<p>Theoretical activities: Presentation of illustrative diagrams/photographs of the objects, concepts and processes targeted for analysis.</p> <p>Practical activity: Design an exercise.</p>
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%).
Learning outputs (Competences)
<p>EPM D1.3 - Recognize the close link among the different phases of risk prevention management.</p> <p>ECEM D1.2 - Recognize the close link among the different phases of emergency management.</p> <p>EPM D2.2 - Knowledge and understanding of the factors including approaches and skills that condition the success of crisis/emergency management (planning).</p> <p>ECEM D1.3 - Understand the factors that condition the success of crisis/emergency management.</p>



EDIMAS

MODULE: **Agenda 2030 and Emergency Management**

PROFILE: **EPM**

Pre-requisites
None.
Description & Contents
<p>Environment, socioeconomics, and social security (civil defence, public health, social welfare, and civil protection) are the areas of intervention of the European Emergency Management.</p> <p>This module addresses the immersive interconnections between the integrated strategic prevention of the UN 2030 Agenda and the innovative approach to the governance of the complexities related to crises and emergencies.</p> <p>Module topics include:</p> <ul style="list-style-type: none"> • Introduction to the UN Agenda 2030; • Phases of integrated strategic planning; • information on European Prevention Management and Emergency Management; • Study cases.
Activities & Methodology
<p>Theoretical activities: Presentation of the projects, concepts, and process cycles object of the analysis.</p> <p>Practical activity: Design an exercise.</p>
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%).
Learning outputs (Competences)
EPM A3.1 Ability to identify and apply the proper regulations to each specific Multi Risk scenario.
EPM D1.1 Capacity to identify the prevention plan/s referred to Major Events and related Risks.



EDIMAS

MODULE: **National and European Civil Protection**

PROFILE: **EPM**

Pre-requisites
None.
Description & Contents
<p>The module provides knowledge about of “European Civil Protection system” and the characteristics that this “public service” has in the Member States.</p> <p>It also provides information on the European civil protection Mechanism to which European and foreign States can request support in case of need.</p> <p>Particular attention is paid to the functioning and “integration of public and private functions in local, territorial, national, and European governance structures.</p>
Activities & Methodology
<p>Theoretical activities: Presentation of the public and private bodies that contribute to the European civil protection system, of their functioning within the Member States.</p> <p>Practical activity: Design an exercise.</p>
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%).
Learning outputs (Competences)
EPM A1.3 The legal framework that determines public policies in terms of civil protection services.
EPM A1.4 The relevant legislation, public policies to mitigate natural and anthropic risks.



EDIMAS

MODULE: **National and European Civil Protection**

PROFILE: **ECEM**

Pre-requisites
None.
Description & Contents
<p>The training module provides knowledge of the "European civil protection system" and of the characteristics that this "public service" has in the Member States. Particular attention is paid to:</p> <ul style="list-style-type: none"> - the activation processes of the European Civil Protection Mechanism when a European State or a foreign State makes a request for support. - the functioning and activation of the "Operational Modules" of the European Civil Protection Mechanism.
Activities & Methodology
<p>Theoretical activities: Presentation of functional and process cycles within the European civil protection system.</p> <p>Practical activity: Design an emergency context exercise.</p>
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%).
Learning outputs (Competences)
ECEM A1.2 Analyses and evaluate the present rules concerning the tasks and roles of each body in charge of crisis governance and emergency management.
ECEM A1.5 Know public policies to reduce natural and anthropic risks in crisis management.



EDIMAS

MODULE: **The Communication**

PROFILE: **ECEM**

Pre-requisites
None.
Description & Contents
The module offers the ability to differentiate the tools and methods of communication strategies according to the different targets: - recipients affected by the event / average / experts / institutions.
Activities & Methodology
Theoretical activities: Presentation of communication strategies and methodologies. Practical activity: Design an exercise.
Evaluation / Assessment
A written paper (60%) and its oral presentation (40%).
Learning outputs (Competences)
ECEM D2.1 Describe the structure and roles of a multi-disciplinary team that is formed to manage crisis/emergencies.



Middlesex University

CST4220: Blockchain Anatomy and Analytics	
EPM A3.2	Collate evidence from various sources to maintain an audit trail
EPM B1.3	Deploy appropriate tools and techniques to carry out an investigation
EPM B2.1	Techniques to identify suspects
EPM B2.2	Measures to facilitate seizure
EPM B4.2	Blockchain artefacts in the context of a digital investigation of cryptocurrencies and crime
EPM B4.3	Application of open-source investigation techniques in cryptocurrency and blockchain investigations
ECEM B1.1	Cryptocurrency / blockchain visualization and analytics
ECEM B3.1	Techniques to identify suspects
ECEM B3.3	Measures to facilitate seizure
ECEM B3.4	Appraise the developments in criminal techniques within domain
ECEM D3.1	Deploy appropriate tools and techniques to carry out an investigation
CST4230: Digital Forensics & Incident Management	
EPM B1.3	Procedures of examining digital evidence collection and seizure with the possible limitations in the context of constantly changing technologies
EPM B2.1	Procedures and models for establishing and maintaining a physical "chain of custody" and critically evaluate their effectiveness in a variety of digital crime scenarios
EPM B2.2	Appropriate tools to carry out digital forensics search and seizure independently and as part of a team
EPM B4.2	Maintain a comprehensive audit trail for the production of reports and statements to be used in a court of law
EPM B4.3	Investigative guidelines for digital investigations
ECEM A3.1	Documentation, reporting and analysis of digital e-crimes using case scenarios
ECEM B1.1	Appropriate tools to carry out digital forensics search and seizure independently and as part of a team
ECEM B3.1	Forensic environment requirements
ECEM B3.3	Incident response methodology
ECEM B3.4	Information hiding techniques, detection and solutions
ECEM D3.1	Techniques and valid procedures to carry out digital forensic investigations on current and emerging technologies
CST4240: FinCrime Risks from Emerging Technologies	
EPM A1.2	Relevant regulatory frameworks for financial services, and the practice of regulatory compliance in corporate organisations
EPM B1.3	Changing financial crime typologies from new emerging technologies
EPM B2.1	New technologies for vulnerability to financial crime and develop prevention strategies



EPM B2.2	RegTech: the use of technology to address financial crime risk
EPM B4.2	Future readiness strategy development
EPM B4.3	Impact assessment of new technologies in practice
ECCEM A3.1	Policy documents and to give advice on matters regarding compliance and crime from new emerging technologies
ECCEM B1.1	New technologies for vulnerability to financial crime and develop prevention strategies
ECCEM B3.1	Financial crime concepts and types of crime
ECCEM B3.2	Opportunities and vulnerabilities of adopting emerging technology for business
ECCEM B3.4	Understanding regulation of financial services
ECCEM D3.1	Assessment of new technologies
CST4250: Open-Source Intelligence Techniques	
EPM A1.2	The application of investigative guidelines, ethical practices and legislation
EPM A1.3	The application of investigative guidelines, ethical practices and legislation
EPM B1.3	Evaluate open-source data gathering intelligence techniques and collection methodologies
EPM B2.1	Various techniques for advanced searching and data gathering methods
EPM B2.2	Various techniques for advanced searching and data gathering methods
EPM B4.2	The application of investigative guidelines, ethical practices and legislation
EPM B4.3	Advanced techniques to gather intelligence and evidence
ECCEM A1.3	Application of investigative guidelines, ethical practices and legislation
ECCEM B1.1	Open-source data gathering intelligence techniques and collection methodologies
ECCEM B3.1	Various techniques for advanced searching and data gathering methods
ECCEM B3.3	Appropriate tools (open source and specialist tools) to carry out open-source intelligence gathering
ECCEM B3.4	Evaluate data sources and understand their limitations
ECCEM D3.1	Apply advanced techniques to gather intelligence and evidence
CST4550: Penetration Testing and Digital Forensic	
EPM A3.2	Information gathering, reconnaissance and the penetration testing process
EPM B1.3	Identify and solve problems, both individually and working in groups
EPM B2.1	Formulate appropriate methods for troubleshooting
EPM B2.2	Design and plan a penetration test in accordance with current standards and legal / ethical issues
EPM B4.2	Evaluate the design of countermeasures for computer and network flaws found as a result of penetration tests
EPM B4.3	Evaluate the design of countermeasures for computer and network flaws found as a result of penetration tests
ECCEM A3.1	Apply relevant theoretical concepts to Identify and solve problems
ECCEM B1.1	Attack tools, application usage and development, including writing exploits and payloads
ECCEM B3.1	Evaluate research and different types of information & evidence arguments critically



ECEM B3.3	Apply relevant theoretical concepts to Identify and solve problems
ECEM B3.4	Design and plan a penetration test in accordance with current standards
ECEM D3.1	Systematically and critically evaluate the design of countermeasures for computer and network flaws found as a result of penetration tests
CST 4560: Network Security and Services	
EPM A3.2	Security threats and the available security mechanisms for combating security breaches
EPM B1.3	Design and implementation of security mechanisms for a given network
EPM B2.1	Security policies, services and mechanisms
EPM B2.2	Hardware and software security applications
EPM B4.2	Security policies, services and mechanisms
EPM B4.3	Solutions for real world current and future security threats, including the implementation of innovative solutions
ECEM A3.1	Security threats and the available security mechanisms for combating security breaches
ECEM B1.1	Authentication and authorisation, intrusion detection and information security techniques
ECEM B3.1	Technical security systems
ECEM B3.2	Security mechanisms for a given network
ECEM B3.3	Security policies, services and mechanisms
ECEM B3.4	Solutions for real world current and future security threats, including the implementation of innovative solutions
ECEM D3.1	Security policies, services and mechanisms
CST 4590: Cyber Security and Legal Regulations	
EPM A3.2	Risk Assessment Process
EPM B1.3	Incident response planning
EPM B2.1	Security programs, policies, procedures, standards and guidelines
EPM B2.2	Prepare and test plans for contingencies and disasters
EPM B4.2	Assess and manage risk in enterprise systems and networks
EPM B4.3	Framework for cyber security and industrial IT
ECEM A3.1	Risk Assessment Process
ECEM B1.1	Disaster recovery planning
ECEM B3.1	Prepare and test plans for contingencies and disasters
ECEM B3.2	Design awareness, training and education programs
ECEM B3.3	Identify common threats to applications, systems and networks
ECEM B3.4	Assess and manage risk in enterprise systems and networks
ECEM D3.1	Develop security programs, policies, procedures, standards and guidelines appropriate for corporate environments
BIS3228: Digital Evidence	
EPM A1.1	Law foundations in relation to forensic computing
EPM A4.1	Computer related crime / Sources of legal information



EPM B4.1	Investigation techniques
EPM B4.3	Investigation techniques
EPM D4.2	E-Crime detection / Crime interception
ECEM A1.6	Law foundations in relation to forensic computing
ECEM A1.7	The role of the computer forensic professional
ECEM A3.3	Incidence handling
ECEM D2.3	Incidence handling
ECEM D3.1	Evidence presentation
Risk Management Principles (no module code)	
EPM A3.3	Risk management frameworks and governance concepts (IRGC and ISO guidance)
EPM B1.3	Social impacts and vulnerability to flooding (western Europe)
EPM B2.1	Introducing flood warning and emergency response
EPM B2.2	Introducing flood warning and emergency response
EPM B3.6	Introducing flood warning and emergency response
EPM D1.2	Preventative health and safety
EPM D1.2	Risk assessment challenges
EPM D1.2	Tolerability of risk including frameworks and concepts such as ALARP/ALARA
EPM D1.2	Built environment risk management
EPM D1.3	Risk communication (perception, world views, values, biases)
EPM D2.2	Business continuity
EPM D4.2	Stakeholder engagement and planning
ECEM B2.1	Flood defence approach, monitoring for maintenance UK
ECEM B2.2	Introducing flood warning and emergency response