Università di Roma Tor Vergata

MASTER CBRNe

Chemical, Biological, Radiological, Nuclear and explosive

Department of Industrial Engineering and School of Medicine and Surgery

Academic Year 2019-2020 | 10th EDITION

TIMELINE

International Master Course in

"Protection Against CBRNe Events"

60 ECTS

2nd Level Course - ADVANCED

Official Course Language **ENGLISH**

INDEX

COURSE DESCRIPTION – 2nd Level (ADVANCED) CBRNe Master

The evolution of Safety and Security threats and their increase at an international level place remarkable focus on the improvement of emergency systems to deal with crises, including those connected to ordinary and non-conventional events (Chemical, Biological, Radiological, Nuclear, and explosive). In every industrial country there are multiple entities with specialized teams in very specific fields, but the complexity of the events requires professionals that not only have specific CBRNe know- how, but also expertise in relevant areas.

Given the global interest in these issues, the Department of Industrial Engineering and the Faculty of Medicine and Surgery of the University of Rome Tor Vergata organize the international Master Courses in "Protection against CBRNe events": 1st Level Master Course in "Protection against CBRNe events" (120 ECTS) and 2nd Level Master Course in "Protection against CBRNe events" (60 ECTS).

These courses aim at providing attendees with comprehensive competences in the field of CBRNe Safety and Security, through teaching and training focused on real needs.

Both Master Courses are designed according to the spirit of the Bologna Process for Higher Education, the Italian law and educational System.

- The Master Courses are organised also in cooperation with: LINK.
- The Master Courses are sponsored by: LINK.
- The training centers cooperating with the Master Courses are: LINK.

The 2nd level Master Course has officially granted the "NATO selected" status

The 2nd level Master Course is included in the NATO Education and Training Opportunities Catalogue (ETOC)

The 2nd level Master Course won the OPCW – The Hague Award 2017

The 2nd level Master Course is officially supported by OPCW through a Cooperation agreement

The 2nd level Master Course is officially part of the CEPOL Training Network

- **The Master Course Directive Board is composed by: LINK.**
- **The Master Course Didactic Board is composed by: LINK.**
- **The Master Course Scientific Board is composed by: LINK.**

The 2nd Level Master Course aims at providing participants with appropriate technical, cognitive and operational skills in order to educate and train key figures in the field of CBRNe risk. In order to participate to the Master Course and obtain the official title, candidates must have a 300-ECTS Master degree or equivalent. "Equivalence" of degrees such as Military, Police, Fire-fighter Academy degrees etc., will be assessed on a case-by-case basis by the University competent bodies and the Master Course Steering Committee.

This Course aims at training professional "**CBRNe Advisors of Decision Makers**".

At the end of the Course, attendees will obtain a "**2nd Level Master Course in Protection Against CBRNe Events (60 ECTS)" degree**.

The most important private companies operating in the CBRNe safety and security field support the Master Courses with their expertise. They are involved in the didactic activities thanks to their experts and host the students for the period of the internship.

Among our lecturers, there are also subject matter experts from the University of Rome Tor Vergata and from all the institutions that are officially involved in the Master Courses activities.

Classroom lessons are complemented with laboratory activities, case studies to be dealt with in working groups, visits, internships at collaborating international entities and the preparation of the master's theses (the best ones will be selected for publication in scientific journals).

Please, **note that the modules may be subjected to a few changes** (dates, numbering of the modules, etc.) according to the availability of the lecturers involved and of the training centres cooperating with the Master Course.

Visit the website of the Master

(www.mastercbrn.com)

to see all the initiative connected to our courses.

PHASE 1 – MODULES

MODULE 1 – CBRNe threats between past and current challenges

30 March-3 April 2020 (University of Rome Tor Vergata)

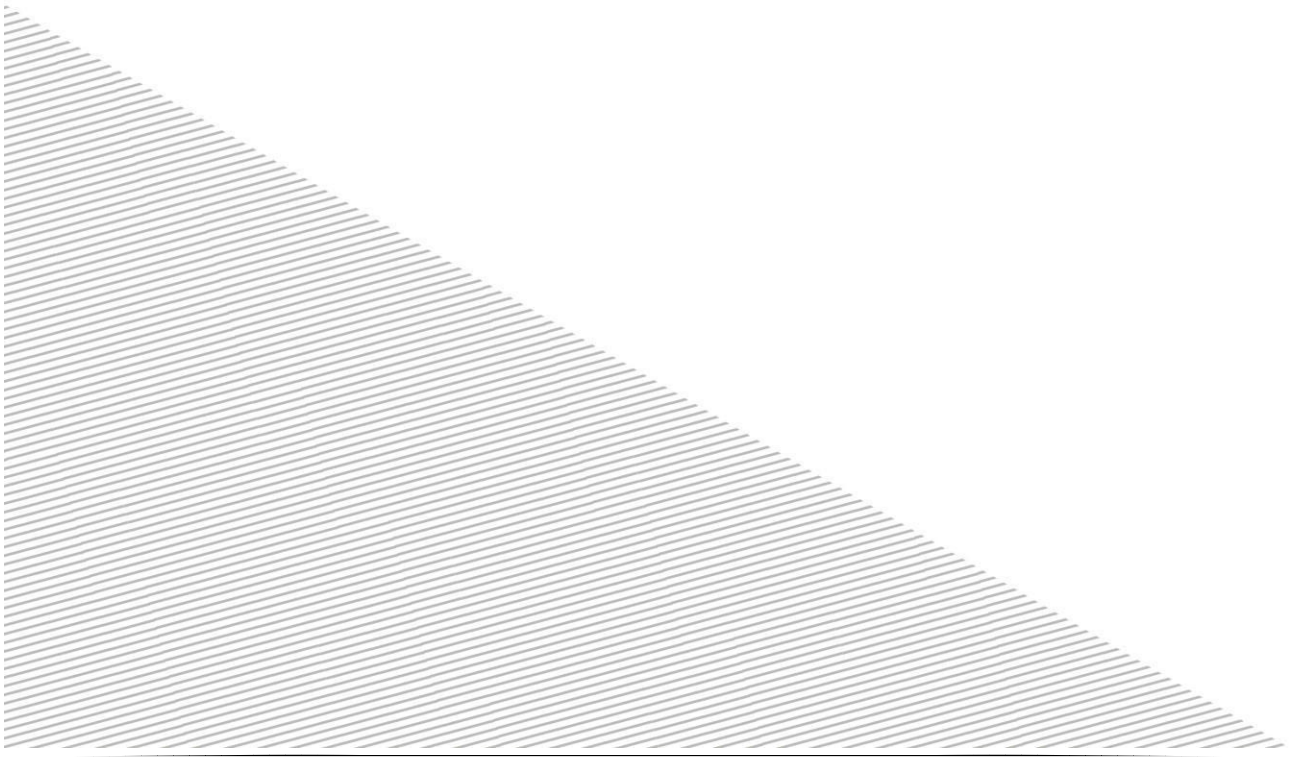
The aim of the module is to provide the student with basic concepts for the management of crises, emergencies, disasters and CBRNe events.

The documents provided at the end of the module facilitate the development of schemes and mental models that the student should use to organize and simplify their knowledge and classify concepts and notions. These conceptual structures help students to fill in the gaps to get a comprehensive and well-organized educational background and a common level of knowledge on these specific aspects to attend further modules of the curriculum.

MODULE 1 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 - INTERNATIONAL COOPERATION FOR EMERGENCIES AND DISASTERS PREPAREDNESS AND MANAGEMENT — OVERVIEW
By the end of the module, the student should be able to describe in broad terms main international organizations involved in the management of possible emergencies and disasters and their roles and responsibilities. **TEACHING POINTS** – Civil and military management of crisis and emergencies – International Organizations in emergencies and disasters preparedness and management – International cooperation for emergencies and disasters management
LO 2 – CBRNe EVENTS MANAGEMENT - OVERVIEW
By the end of the module, the student should be able to illustrate the main characteristics and effects of CBR agents release and principles to take into consideration for the management of CBRNe events. **TEACHING POINTS** – CBRNe defence fundamentals, threats, and hazards – Policy and international cooperation – CBR agents and unconventional weapons overview – Principles of CBRNe events management

LO 3 —EMERGENCY RISK COMMUNICATION — OVERVIEW
By the end of the module, the student should be able to describe in broad terms main principles of emergency risk communication and explain main aspects to take into consideration for the development of an effective communication plan in case of emergencies. **TEACHING POINTS** - Principles of the Communication and Mass Media - Emergency Communication and populace awareness - Emergency Communication Techniques and Procedures overview



MODULE 2 – International Cooperation for Crises, Emergencies & Disasters Preparedness and Management

25-29 May 2020 (University of Rome Tor Vergata)

The aim of the module is to provide the student with all aspects of the emergencies and disasters preparedness planning and management in the context of international cooperation activities and initiatives.

MODULE 2 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — CIVIL AND MILITARY MANAGEMENT OF CRISES, EMERGENCIES AND DISASTERS
By the end of the module, the student should be able to explain the Civil and Military emergency preparedness planning process, consequences management, main differences and cooperation activities. **TEACHING POINTS** – Civil emergencies preparedness and consequences management – Military emergency preparedness and consequences management – Comprehensive approach and Civil- Military Cooperation
LO 2 — ROLES AND RESPONSIBILITIES OF INTERNATIONAL ORGANIZATIONS IN CRISES, EMERGENCIES AND DISASTERS PREPAREDNESS AND MANAGEMENT
By the end of the module, the student should be able to illustrate the Organizations involved in the management of emergencies, their role and responsibilities, the cooperation initiatives and projects. **TEACHING POINTS** – International Law and Human Rights – History of IOs and overview of the International framework – UN-OCHA role and responsibilities – WHO role and responsibilities – EU-ERCC role and responsibilities – OSCE role and responsibilities – NATO role and responsibilities – GOs, NGOs and other organizations – Cooperation initiatives and projects

LO 3 — GENERAL ASPECTS AND CHALLENGES DURING EMERGENCIES

By the end of the module, the student should be able to explain the main aspects to be taken into account in the management of emergencies, introducing the basic principle on Incident Command. Who is doing what, and how many caps can one person have. Working in a multi-jurisdictional field how to handle work and communicate.

TEACHING POINTS

- Operations management & coordination
- Medical response to mass casualties
- Logistics aspects
- Psychological effects on the population
- Legal aspects
- Current ops, LLs & Case Studies

MODULE 3 – Management of Chemical Releases Scenarios

15-19 June 2020 (OPCW)

The aim of the module is to provide the student with a comprehensive overview of current and emerging chemical hazard, risks and threats within the context of international policies response measures and capabilities to face possible releases of chemical agents.

MODULE 3 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — CHEMICAL AGENTS OVERVIEW

By the end of the module, the students should be able to explain chemical agents, their classification, characteristics and effects.

TEACHING POINTS

- The history of chemical weapons
- Classification and characteristics of agents, CWA, TIC and dual-use
- Chemical agents effects on health

LO 2 — INTERNATIONAL POLICY, CHEMICAL SAFETY AND SECURITY

By the end of the module, the student should be able to describe the risks, hazards, threats of chemical agents, the CHEM safety and security within the context of international policy and main initiatives.

TEACHING POINTS

- Chemical risks, hazards and threats
- Basic Terrorism awareness, Chemical terrorism
- Overview of international policy, principles and main organizations
- CW treaties, non-proliferation initiatives, transnational course of actions for illicit trafficking & CWA disablement
- Chemical threats and preparedness
- Security measures and cyber defence of critical infrastructures and laboratories
- Safety measures and procedures
- Legal considerations on chemical agents

LO 3 — MANAGEMENT OF CHEMICAL RELEASES SCENARIOS

By the end of the module, the student should be able to illustrate the capabilities and procedures to defeat, mitigate and manage chemical agents threats and possible releases.

TEACHING POINTS

- Chemical detection & identification and developments in CHEM technology
- Warning & reporting in case of release
- Chemical sampling and analysis
- Physical protection
- Hazard management & decontamination
- Prophylaxis and treatments of victims
- Management of releases & casualties
- Case studies and lessons learned

MODULE 4 – Management of Outbreaks and Biological Releases Scenarios

13- 17 July 2020 (University of Rome Tor Vergata)

The aim of the module is to provide the student with a comprehensive overview of current and emerging biological hazard, risks and threats within the context of international policy, biological response measures and capabilities to face possible biological releases and outbreaks.

MODULE 4– LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — BIOLOGICAL AGENTS OVERVIEW

By the end of the module, the student should be able to explain biological agents, their classification, characteristics and effects.

TEACHING POINTS

- The history of biological weapons
- Classification and characteristics of agents, BWA, TIB and dual-use
- Biological agents effects on health

LO 2 — INTERNATIONAL POLICY, BIOLOGICAL SAFETY AND SECURITY

By the end of the module, the student should be able to describe the risks, hazards, threats of biological agents, the BIO safety and security within the context of international policy and main initiatives

TEACHING POINTS

- Biological risks, hazards and threats
- Basic Terrorism awareness, BIO terrorism
- Overview of international policy, principles and main organizations
- BW treaties, non-proliferation initiatives & transnational COAs for illicit trafficking
- Biological threats and preparedness
- Security measures and cyber defence of critical infrastructures and laboratories
- Safety measures and procedures
- Legal considerations on biological agents

LO 3 — MANAGEMENT OF OUTBREAKS AND BIOLOGICAL RELEASES SCENARIOS

By the end of the module, the students should be able to illustrate the capabilities and procedures to defeat, mitigate and manage biological agents threat and possible releases.

TEACHING POINTS

- Biological detection & identification and developments in BIO technology
- Warning & reporting for outbreaks
- Biological sampling and analysis
- Physical protection
- Hazard management & decontamination
- Prophylaxis and treatments of victims
- Management of outbreaks & victims
- Case studies and lessons learned

MODULE 5 – Management of Nuclear Events and Radiological Scenarios

07 11 September 2020 (University of Rome Tor Vergata)

The aim of the module is to provide the student with a comprehensive overview of current and emerging nuclear and radiological hazard, risks and threats within the context of international policies, response measures and capabilities to face possible nuclear events and radiological scenarios.

MODULE 5 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — RADIATIONS, NUCLEAR WEAPONS AND NUCLEAR POWER OVERVIEW
By the end of the module, the student should be able to explain the radiological sources classification, characteristics and effects and describe the historical developments in nuclear energy technologies. **TEACHING POINTS** - History of radiations discoveries, nuclear weapons and nuclear power technologies - Classification and characteristics of radiological sources, TIR and dual-use - Effects of radiations on health
LO 2 — INTERNATIONAL POLICY, NUCLEAR SAFETY AND SECURITY SCENARIOS
By the end of the module, the student should be able to describe the risks, hazards, threats of radiations and nuclear weapons, safety and security of critical infrastructures and international policy and initiatives. **TEACHING POINTS** - Radiological risks, hazards and threats - Basic Terrorism awareness, Nuclear terrorism and radiological dispersal devices - Overview of international policy, principles and main organizations - Nuclear treaties, non-proliferation initiatives and - COAs for illicit trafficking - Threats and preparedness - Security measures and cyber defence of critical infrastructures and laboratories - Safety measures and procedures - Legal Considerations

LO 3 — MANAGEMENT OF NUCLEAR EVENTS AND RADIOLOGICAL SCENARIOS

By the end of the module, the student should be able to illustrate the capabilities and procedures to defeat, mitigate and manage radiological threats and possible scenarios.

TEACHING POINTS

- Radiological detection & identification
- Warning and reporting of events
- Physical protection
- Hazard management, exposures records and decontamination
- Prophylaxis & treatments after exposure
- Management of Nuclear/Rad events
- Case studies from real events

MODULE 6 – Investigation

12-16 October 2020 (University of Rome Tor Vergata)

The aim of the module is to highlight and emphasize main aspects on investigation techniques management providing the student with basic concepts and procedures to be taken into consideration and applied during emergencies and CBRNe events.

MODULE 6 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — PRINCIPLES OF THE INVESTIGATION
By the end of the module, the student should be able to explain the principles and concepts about the investigations **TEACHING POINTS** – Principles of investigation – Investigation effectiveness – Crime scene or CBRNe scene – Investigation activities on CBRNe scene
LO 2 — EMERGENCY COMMUNICATION AND POPULATION AWARENESS
By the end of the module, the students should be able to describe main principles and techniques for an effective communication activity and planning for emergencies and CBRNe events management. **TEACHING POINTS** – Investigation: challenges during emergencies and population awareness – Emergency communications in disasters – Planning of investigation strategies to face unexpected situations – How to avoid Hot Spot contamination – EU international initiatives & cooperation – Case studies & best practices, TTX
LO 3 — PRACTICAL APPLICATION OF INVESTIGATION TECHNIQUES AND PROCEDURES
By the end of the module, the students should be able to apply techniques and procedures, develop an effective investigation. **TEACHING POINTS** – Introduction to the scenario – Roles, responsibility and procedures – Situation & communication Plan Analysis – Investigation in different scenarios – Hot wash up, final comments and closing

MODULE 7 – Crisis and Emergency Risk Communication

16-20 November 2020 (University of Rome Tor Vergata)

The aim of the module is to highlight and emphasize main aspects on communication and information management providing the student with basic concepts and procedures to be taken into consideration and applied during emergencies and CBRNe events.

MODULE 7 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — PRINCIPLES OF COMMUNICATION AND MASS MEDIA
By the end of the module, the student should be able to explain the principles and concepts about the communication and information management and sharing. **TEACHING POINTS** – Principles of communication – Communication effectiveness – Internal and external communication – Mass Media, new Media and public perceptions
LO 2 — EMERGENCY COMMUNICATION AND POPULATION AWARENESS
By the end of the module, the student should be able to describe main principles and techniques for an effective communication activity and planning for emergencies and CBRNe events management. **TEACHING POINTS** – Communication with the public: challenges during emergencies and population awareness – Information management and sharing – Emergency communications in disasters – Planning of communication strategies to face unexpected situations – Communicating in the first hours: pre-events standard messages and materials – EU international initiatives & cooperation – Case studies & best practices
LO 3 — PRACTICAL APPLICATION OF EMERGENCY COMMUNICATION TECHNIQUES AND PROCEDURES
By the end of the module, the student should be able to apply techniques and procedures, develop an effective communication, work with media and use standard key-messages and materials before, during and after an emergency. **TEACHING POINTS** – Introduction to the scenario – Roles, responsibility and procedures – Situation & communication Plan Analysis – Communication in different scenarios – Hot wash up, final comments and closing

MODULE 8 – CBRNe Events Management

11-15 January 2021 (University of Rome Tor Vergata)

The aim of the module is to provide the students with main and common aspects of CBRNe events preparedness and management in the context of international cooperation activities and initiatives.

The specific aspects of CBRNe scenarios are the focus of modules 4 (CHEM), 5 (BIO) and 6 (RAD- NUC).

MODULE 8 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

LO 1 — GENERAL ASPECTS OF CBRNe DEFENCE

By the end of the module, the student should be able to explain the main principles and aspects of CBRNe risks, hazards and threats, CBR agents characteristics and possible main effects.

TEACHING POINTS

- Overview of CBRNe risks and threats
- CBRN Terrorism a basic Terrorism awareness class should be taught (political violence and radicalisation leading to terrorism).
- CBRNe terrorism
- CBRNe Intelligence
- CBRNe forensics and law enforcement
- CBRNe principles and response measures

LO 2 — MAIN ASPECTS FOR CBRNe AGENTS MANAGEMENT

By the end of the module, the student should be able to describe and explain general aspects, techniques and procedures in the management of agents.

TEACHING POINTS

- Detection, identification and monitoring techniques overview
- CBRNe warning and reporting during
- CBRNe events
- Individual and collective CBRNe protection and dress levels
- CBRNe hazard management overview
- Individual, collective and material CBRNe decontamination techniques
- Medical aspects in CBRNe scenarios

LO 3 — CBRNE POLICY AND INTERNATIONAL COOPERATION

By the end of the module, the students should be able to illustrate the international policy, main references, Civil-Military CBRNe preparedness & consequence management, cooperation initiatives and projects.

TEACHING POINTS

- International CBRNe policy
- International non-proliferation initiatives and conventions
- Civil-Military CBRNe events preparedness and consequences management
- International CBRNe cooperation initiatives and projects

PHASE 2 – TABLE TOP EXERCISE (TTX); INTERNSHIP AND THESIS

MODULE 9 – Table Top Exercise for Crises, Emergencies, Disasters and CBRNe Events Management

8-12 February 2021 (University of Rome Tor Vergata)

The aim of the Table Top Exercise (TTX) is to provide the students with different scenarios in order to put notions learned during previous modules into practice, and apply techniques and procedures for the management of specific aspects and consequences of crises, emergencies, disasters and CBRNe events, in the context of international policies and main references.

MODULE 9 – LEARNING OBJECTIVES AND MAIN TEACHING POINTS

(MODULES 1-2-3-4-5-6-7-8) - CRISES, EMERGENCIES, DISASTERS AND CBRNE EVENTS MANAGEMENT
By the end of the curriculum, in reference to the notions acquired, the students should be able to manage emergency situations effectively providing advice to decision makers and finding solutions to specific aspects, possible effects and consequences in the context of international policy and procedures. **TEACHING POINTS** – Introduction to the situation – Landslide and mudslide management – Flood management – Earthquake management – Accidental TIM release management – Natural outbreaks and epidemic management – Sabotage of industrial unit and consequent release of TIM (TIB/TIC/TIR) and management – Intentional release of CBR agents management – Intentional release of radiological sources (RDDs) management – Sabotage in a Nuclear Power Plant (NPP) and consequent fall out and management of exposures – Cyber-attack to critical infrastructures and consequent CBRNe events management – After Action Review and conclusions

INTERNSHIP

January – March 2021 (University of Rome Tor Vergata)

The internship can be requested in one of the Institutions/Entities cooperating with the International Master Courses in Protection against CBRNe events.

FINAL THESIS

April – June 2021 (University of Rome Tor Vergata)

Students shall attend at least 80% of all classes, lectures and activities.

At the end of the Master Course, only the students who have attended at least 80% of all classes, lectures and activities, have passed the exams and defended the final thesis and have duly paid all fees and charges, shall obtain the educational qualification "**2nd level University Master Course in Protection against CBRNe Events (60 ECTS)**" (Master Universitario di II livello in Protezione da Eventi CBRNe under the Italian Law)".

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REMEDIAL SESSIONS

Dates to be defined (University of Rome Tor Vergata)

SECRETARIAT OF THE INTERNATIONAL MASTER COURSES IN

PROTECTION AGAINST CBRNe EVENTS

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