



Università di Roma Tor Vergata

INTERNATIONAL CBRNe MASTER COURSES

Chemical, Biological, Radiological, Nuclear and explosive
Department of Industrial Engineering and School of Medicine and Surgery

International Master Courses in “PROTECTION AGAINST CBRNe EVENTS”

1st Level Course

EDITION 2015-2017

120 ECTS

TIMELINE

ESSENTIAL

INFORMATION

Official Course

Language

English

International CBRNe Master Courses

Department of Industrial Engineering, University of Rome "Tor Vergata"

Via del Politecnico 1, Roma, Italy - Zip Code 00173

Phone: 0039 0672597201 - Mail Address: info@mastercbrn.it



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The evolution of and increase in Safety and Security threats at an international level place remarkable focus on the improvement of the emergency systems to deal with crisis, including those connected to ordinary and non-conventional events (Chemical, Biological, Radiological, Nuclear, and explosives).

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 know-how, but also expertise in the relevant areas.

Given the global interest in these issues, the Department of Industrial Engineering and the Faculty of Medicine and Surgery of the Tor Vergata University organize the international Master Courses in “Protection against CBRNe events”: I Level Master Course in “Protection against CBRNe events” (120 ECTS) and II 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 specifically focusing 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 organized also in cooperation with the following Italian Public Entities:

- Presidenza del Consiglio dei Ministri (Prime Minister’s Office)
- Ministero della Difesa (Ministry of Defence)
- Ministero dell’Interno (Ministry of The Interior)
- ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)
- Istituto Nazionale Geofisica e Vulcanologia (National Institute for Geophysics and Vulcanology)
- Istituto Superiore di Sanità (National Health Institute)
- Comitato Parlamentare per l’innovazione tecnologica (Parliamentary Committee for Technological Innovation)
- University consortia CRATI, MARIS and SCIRE

And together with the following International Entities:

- OPCW (Organization for the Prohibition of Chemical Weapons)
- NATO Joint Centre Of Excellence (Czech Republic)
- NATO SCHOOL of Oberammergau (Germany)
- HotZone Solutions Group (The Netherlands)
- VVU-026 Sternberk (Czech Republic)
- Seibersdorf Laboratories GmbH (Austria)
- Chernobyl Centre (Ukraine)

All the above-mentioned organizations have signed official cooperation agreements with the University of Rome Tor Vergata.

Both Master Courses have been officially granted the “NATO selected” status and have been included in the NATO Education and Training Opportunities Catalogue (ETOC) and also they are supported by OPCW.

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In order to participate in the 1st Level Master Course and obtain the final degree (which has legal value according to the Italian law), candidates must have a 180-ECTS point Bachelor's degree or equivalent.

“Equivalence” of degrees such as Military, Police, Fire- fighters Academy degrees etc., will be assessed on a case-by-case basis by the University's competent bodies and the Master Course's Steering Committee.

The I level Master Course aims at training “First Responders” and providing them with suitable technical and operational skills in the following areas:

- CBRNe threats and risks
- Analysis of CBRNe agents
- Effects of CBRNe agents
- Diffusion and dispersion of CBRNe
- Software and codes for CBRNe emergencies
- Detection of CBRNe agents: equipment and techniques
- CBRNe protection
- CBRNe decontamination
- International emergency systems in case of CBRNe events
- Sanitary rescue and psychological approach to emergencies in case of CBRNe events
- Critical infrastructure
- Investigation and mitigation
- Communication and information in case of CBRNe events
- Practical activities and training at four specialized European Facilities: NBC School of Rieti (Italy), VVU-026 Sternberk (Czech Republic), Chornobyl Centre (Ukraine), Seibersdorf Laboratories (Austria).

The most important private entities operating in the CBRNe safety and security field support the Master Courses with their expertise and are involved in the teaching activities through their experts. Among our teachers are also subject matter experts from the University of Rome Tor Vergata and from all the Entities that 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, and the preparation of the Master Theses (the best ones will be selected for publication in scientific journals).

The University cooperates also with the companies and the students to publish the best work during the Master and the companies can have, for free, students from the Master for a period of stage on one topic that you propose.

You can visit the website of the Master (www.mastercbrn.com) to see all the initiative connected to our courses.

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FIRST YEAR

ACTIVE LECTURE



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MODULE 1

INTRODUCTION TO CBRNE RISKS - THE POINT OF VIEW OF FIRST RESPONDERS

Rome (Italy)

14-18 March 2016

Area responsible: CDR. Gaetano Carminati, Didactical Board

The aim of the introductory module is to provide a preliminary and common CBRNe background to the attendees. It supplies information about roles and competences of first responders in case of CBRNe events and to focus on best practices and international emergency response scenarios. This module will also provide a comprehensive overview of the different aspects relevant to CBRNe events prevention and response. The Civilian and the Military reference frameworks are introduced and the attendees will familiarize with the concept of operational and tactical level.

Subjects

- Introduction to the I level CBRNe master course/Module Introduction
- CBRNe: introduction to the threat
- CBRN and Terrorism
- CBRNe terminology
- CBRN in Military environment
- CBRN in Civil Defence environment
- CBRN the NATO doctrine
- CBRN in Law Enforcement environment
- What is a first responder - Roles and Duties
- CBRN and Medical Management

Test: written, short answers (time: 2 hrs)

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MODULE 2

RADIOLOGICAL AND NUCLEAR AGENTS and EVENTS and OPERATIONS

Rome (Italy)

21-25 March 2016

Area responsible: Prof. Carlo Bellecci

The purpose of this module is to give a detailed definition of radiological and nuclear agents and associated risks arising from the conventional and unconventional use of such agents. The key objective is to understand clearly the differences between Radiological and Nuclear risks, achieve a good knowledge of dosimetry and biodosimetry. The attendees will also acquire theoretical and practical skills on the techniques and instruments for radiological detection and identification, and will familiarize with protective equipment and decontamination procedures for first responders and victims. Finally, attendees will receive background information on the international regulatory framework concerning nuclear and radiological agents use, transport and stockpiling.

Subjects

- Nuclear and Radiological Risk - Generality
- Ionizing Radiation characteristic
- Nuclear weapon/Dirty Bomb - Difference, Characteristic, Effect
- Introduction of R/N effects on human body
- Generality on Radioprotection
- The Dosimeter -Type, Characteristic and practical use
- Principles of detection
- Physical Protection and Decontamination in Radiological environment
- Storage and disposal of radioactive waste
- Transport of Radioactive Material and irradiated nuclear fuel
- First response in Dirty Bomb incident (case study)
- First response in Nuclear Plant incident (case study)

Test: oral examination (time: 10 minutes)

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MODULE 3

BIOLOGICAL AGENTS, EVENTS AND OPERATIONS

Rome (Italy)

20-24 June 2016

Area responsible: Cap. Fabrizio D'Amico, Dr. Orlando Cenciarelli, Dr. Mariachiara Carestia

Module 3 provides information on Biological agents and their implication in Biological Warfare Agents production and use; natural outbreaks, epidemics and pandemics and consequences for first responders. Detection, Decontamination and Protective equipment for first responders are among the topics addressed. Finally, part of the didactic activity will focus on specific case studies for the analysis of gaps and best practices.

Subjects

- Biological Risk-Generality
- Biological Convention-Generality
- Biological Agent- Type and Characteristic
- Physical Protection and Decontamination in B environment
- Identification and detection of biological agents
- Biological Laboratory - Type Characteristics and security level
- Bio-containment transport
- First response during BIO event (case study)
- Bio sampling procedures - Generality
- Ebola Outbreak (Case Study)

Test: oral examination (time: 10 minutes)

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MODULE 4

CHEMICAL AGENTS, EVENTS AND OPERATIONS

Rome (Italy)

27 June-1 July 2016

Area responsible: Dr. Alessandro Sassolini

This module introduces the Chemical risk related both to conventional (industrial or man-made incidents) and unconventional events. It provides a description of the different agents; their way of action; prevention and treatment. The module also investigates the international regulation related to the illicit production and use of chemicals as weapons as well as other regulations on the production, use and transportation of chemical agents and their precursors. Attendees will familiarize with techniques and instruments for chemical agents detection, sampling and identification; risks for first responders and exposed personnel, personal and collective protective equipment, and decontamination.

Subjects

- Chemical Risk - Generality
- Chemical Weapon Convention - Generality
- Chemical Agent- Type and Characteristic
- Physical Protection and Decontamination in C environment
- Detection and Identification of Chemical Agents
- Toxic Industrial Chemicals
- Dangerous Goods Regulation
- First response during a Chemical Event (case study)

Test: oral examination (time: 10 minutes)

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MODULE 5

EXPLOSIVES AGENTS, EVENTS AND OPERATIONS

Rome (Italy)

19-23 September 2016

Area responsible: Dr. Coppe, Dr. Massimo Pedemonte

Module 5 relates to the use of explosives as a mean to spread Chemical, Biological and Radiological agents. This module provides a technical overview of the different explosives agents and precursors and information that are relevant for first responders including their interplay with explosives professionals from civilian and military organizations.

Subjects

- Explosives – Military and Civilian – an overview about them from history and media
- Explosives Ordinance Disposal (EOD)
- Improvised Explosives Devices (IOD)
- Dirty Bombs (DB)
- Toxic Industrial Materials (TIM) and Toxic Industrial Chemicals (TIC)
- Home Made Explosives (HME) and Precursors
- Explosive detection
- Disposal operation and render safe procedures – EU rules – Legal rules

Test: oral examination (time: 10 minutes)

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MODULE 6

DETECTION, PROTECTION AND DECONTAMINATION

Rome (Italy)

26-30 September 2016

Area responsible: Dr. Salvatore Corrao, Arch. Giovanni Ferrari, CDR. Gaetano Carminati

This module provides theoretical and practical information on detection, protection and decontamination of and from CBRNe agents, in relation to on-field activities of first responders and other involved professionals from civilian and military organizations. The module will also provide information on operational and tactical procedures for emergency planning, common best practices and international roles in case of CBRNe events.

Subjects

- Physical Protection and Collective protection
- Physical and psychological effect
- Tactical procedure on use of PPE
- Detection, Identification and Monitoring (DIM) - generality
- DIM operational procedure
- Decontamination
- Overview of CBRN detection system
- Overview of CBRN decontamination system

Test: oral examination (time: 10 minutes)

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MODULE 7

MEDICAL FIRST AID and MEDICAL MANAGEMENT

Rome (Italy)

14-18 November 2016

Area responsible: Dr. Paolo Maurizio Soave MD

Module 7 deals with medical aspects related to CBRNe events ranging from first aid to best practices and protocols for the management of medical CBRNe emergencies. This module is not only dedicated to professionals already working in the medical field but most and foremost to provide all the first responders with a clear overview of the mechanism governing the response to a CBRNe events from a medical point of view. This aspect is crucial to smoothen cooperation between first responders working in and out of the potentially contaminated area in close contact with health care personnel.

Subjects

- Hazardous material epidemiology: Hazmat happens
- Hospital CBRNe preparedness
- Department of Health competences in Hazmat/CBRNe events and the National Antidotes Stockpile (SNA)
- Establishing and organizing a Hazmat/CBRNe Response Team
- Medical management of Hazmat Victims
- Medical Management of Chemical warfare agent Event Victims
- Medical Management of Radiological Event Victims
- Medical Management of Biological Event Victims
- Study spare time

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MODULE 8

DSS, Software

Rome (Italy)

21-25 November 2016

Area responsible: CDR. Gaetano Carminati

Decision Support Systems are a key tool in the hands of first responders and decision makers. First responders have the duty to report information that are crucial for providing input data to DSS that will be used by decision makers to manage the scenario. Through module 8, attendees will familiarize with different software for CBRNe hazards prediction; CBRN agents diffusion and disaster management. They will get to know related limits and opportunities and will also practice on some of these tools to understand their working principle.

Subjects

- Generality on CBRN Prediction
- Metereology
- Dispersion models
- What is a DSS software
- Hot-Spot
- HALOA
- WISER
- CBRN-Analysis (Ask to BMD a free software license for didactical porpouse)
- Study spare time

Test: DSS Software Exercise (HotSpot – HALOA – Wiser) (time: 2 hours)

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MODULE 9

INVESTIGATION, COMMUNICATION AND PSYCHOLOGY

Rome (Italy)

23-27 January 2017

Area responsible: LTC Domenico Cipollone

Communication and psychology are key issues to help prevent, face and manage CBRNe events and their consequences on population as well as operators on the field. First responders are the first to arrive on the scene, and are those that will have a direct contact with the victims of a CBRN event as well as with the components of other teams on the hotspot. Having a good knowledge of the issues affecting psychology and communication at operational and tactical level are key components of an effective response. Investigation will also be addressed in this module, to gain awareness on investigative requirements on the scene of a CBRN event (be it of natural, industrial or malevolonet cause), and minimize the impact of first responders operations on investigative issues. Practical activities will complement frontal lessons.

Subjects

- Investigation techniques
- Investigation activities
- Cognitive Psychology
- Analysis and evaluation of threats
- Intelligence Skills
- Communication skills
- Communication of a Journalist

Test: oral examination (time: 10 minutes)

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SECOND YEAR

PRACTICAL PHASE



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MODULE 10

PRACTICAL TRAINING ON CHEMICAL AND RADIOLOGICAL AGENTS

Location: Vyskov (Czech Republic)

2017 – 9-12 May

This module, that is composed of a two weeks training, will be carried out at two different facilities for training on simulant and live agents. The attendees will practice with chemical warfare agent VX, SARIN and Yprite and with simulants of other CBRN agents at VVU in Czech Republic and Sibersdorf laboratories in Austria (HotZone Solutions Group, leader in CBRN training activities is the organizer of this module).

Test: oral examination (time: 10 minutes)

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MODULE 11

ARMS CONTROL, NON-PROLIFERATION AND DISARMAMENT AGREEMENTS RAISING AWARENESS AND TRAINING ON PROTECTION AGAINST CBRN MATERIALS

LOCATION: ICI Les Bons Villers- Belgium

2017 – 15-19 May

The course provides frontal lecture about non Proliferation and Disarmament Agreements, Chemical, Investigation of alleged use of chemical weapons the Biological and Toxin Weapons Convention, biological and radiological training and education, Practical examples of Trg tools (simulants, glo germ...), Crisis Management and crisis center Incident Commanders Tool DEMO.

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MODULE 12

TESTING AND TRAINING WITH CBRN MATERIALS

LOCATION: Vinca, Serbia

2017 – 3-7 July

The course will foreseen the following activities:

- Introduction to Testing and Training with CBRN materials
- Training with Toxic Industrial Chemicals and Chemical Warfare Agents
- Training with Radioactive emitters (sealed/unsealed)
- Testing with Toxic Industrial Chemicals and Chemical Warfare Agents

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MODULE 13

COURSE AT NBC SCHOOL OF RIETI

Rieti (Italy)

2017 – 10-14 July

The purpose of this module is to introduce the attendees of the 1st level Master to the practical phase. Attendees will get experience on how which piece of protective equipment to use according to the specific scenario, to put protective equipment on and off and will also practice on decontamination of people and equipment, and recovery of contaminated areas. This module includes indoor and outdoor exercises.

Test: TBD

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FINAL TRAINING TEST AND THESIS DEFENCE

LOCATION: TBD

2018 – TBD

The final assessment for the attendees of the First Level Master Course will be based on two distinct activities. The first one will be a practical activity where the attendees will show the effectiveness of the practical training they have received during the course. The second activity will be the defence of a final thesis. The subject of the thesis will be selected by the attendees from the topics proposed by the Area Responsible of each module.

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SICC 2017

1ST SCIENTIFIC INTERNATIONAL CONFERENCE ON CBRNe

**LOCATION: Istituto Superiore
Antincendi, Rome**

2017 – 22-24 May

Why attend?

Meet

Worldwide Public, Military, Private, Research and Academic CBRNe experts

Learn

Different approaches to the CBRNe safety and security cultures

Publish

Scientific papers in internationally recognised peer-reviewed journals

Visit

One of the most beautiful cities in the world

www.sicc2017.com

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STRUCTURE OF THE I LEVEL MASTER COURSE

The Master Course consists of Modules and Internships, for a total duration of two academic years. However, depending on each individual's plan, it could last up to three years.

The overall educational and training activities will account for 120 ECTS points, that is, a total of 3,000 hours that each student shall devote to classes (580 hours) – which are the same for all participants – and practical training (180 hours) at International specialised facilities.

Moreover, each student shall devote at least:

- 50 hours to operational laboratory activities, supported by teachers of University of Rome Tor Vergata and external experts and tutors;

- 50 hours workshops, held by University of Rome Tor Vergata and external subject-matter experts.

Furthermore, each student shall carry out an internship at one of the supporting organisations and companies, under the supervision of a personal tutor. Besides, all students shall write and defend a Master Thesis.

ADMISSION CRITERIA

This Master Course targets people with at least a 3-year Bachelor's Degree in technical-scientific disciplines, or any title considered as equivalent for admission purposes by the Board of Industrial Engineering Department. It also targets people with a Bachelor's Degree in other disciplines, to be authorised by the Master's Steering Committee.

The Master's Steering Committee might also recognise other vocational certified training and practical activities carried out by applicants after obtaining the Degree allowing them to participate in the Master Course (including individual courses attended in the framework of wider educational programmes), if they are consistent with the subject matters of the Master Course. Such activities might be attributed a number of ECTS points – up to a maximum of- 40 – which the relevant student could use to obtain the final Degree of the Master course.

The CBRNe Master Course shall have a maximum of 40 and a minimum of 16 participants.

Applicants that wish to register for this Master Course cannot be simultaneously attending any other university course.

An excellent level of English is requested.

APPLICATIONS

Candidates shall be admitted based on the assessment of their CVs by the Master's Steering Committee.

A maximum of 40 and a minimum of 16 people can participate in each Master Course.

Applicants are requested to pre-register online **by March 4th, 2016**, by filling in the attached application file and sending it to-the mail address: info@mastercbrn.com

together with the following records:

- CV;

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- Bachelor's Degree self certification, showing the marks obtained for each exam and the final grade;

The list of admitted applicants shall be published on **14/03/2016**, on the <http://www.uniroma2.it> and www.mastercbrn.com web sites together with the instructions for the tuition fee payment.

FEES AND CHARGES

The overall tuition fee and charges amount to € 15,162.00, which shall be paid as follows:

- € 3,896.00 upon registration, by March 25th 2016 (this amount also includes € 16.00 tax and € 130.00 charge).
- € 3,750.00 by June 23rd, 2016
- € 3,766.00 by January 12th, 2017
- € 3,750.00 by June 22nd, 2017

Students admitted have to register by 25/03/2016.

Should a student's personal plan last longer than two academic years, the student under consideration shall pay an additional € 2,016.00 fee (including all charges) by January 12th, 2018.

Students can attend single modules of the course.

For the application to a single module the deadline is 25/03/2016

For further info please contact info@mastercbrn.it

SPECIAL TERMS

Students with at least 66% certified and documented disability shall only pay € 896, that is, 5% of the overall fees and charges.

People who meet the aforesaid requirements, shall include the relevant information in their Applications.

After being communicated their admission, they shall then hand in the records attesting their disability to the Master Course Secretariat.

The Faculty Board may – in compliance with the provisions of the Internal Rules – grant special financial terms to individual students.

START

Classes of the Master Course in Protection against CBRNe Events shall start on **14/03/2016**.

ATTENDANCE AND FINAL DEGREE

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

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The final Degree shall only be obtained by students who have attended at least 80% of all classes, lectures and activities and passed the Module-related and final exams. At the end of the Master Course, all students who have attended at least 80% of all classes, lectures and activities, have passed the Module-related exams as well as the final exam (with Thesis and dissertation), and have duly paid all fees and charges, shall obtain the educational qualification **“1st level University Master Course in Protection against CBRNe Events (120 ECTS)”** (*Master Universitario di I livello in Protezione da Eventi CBRNe under the Italian Law*)”.

All students shall defence the Thesis within the last session of the second Academic Year following the latest registration year. After that, it will not be possible to obtain the Degree.

INFORMATION

For information, please contact:

- Teaching Activity Coordinator: **Dr. Andrea Malizia** (malizia@ing.uniroma2.it).
- Master Course Secretariat: **Ms. Colomba Russo; Ms. Valentina Gabbarini** (info@masterCBRN.it). Telephone: +39 0672597201 (Monday through Friday from 9.00 a.m. to 1:00 p.m.)

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