

Questionnaire (version of October 2023)

Natural-Science Disarmament Courses

Course Description

Time when course was/is given (years)	From 2022/23
Lecturer(s)	Prof. Emilio Parisini
Institution (department, university)	Dept. Chemistry, Università di Bologna
Course Title	Chemical & Biological Weapons
Type (lecture, seminar ...)	lectures
Language(s)	English
Time (number of hours (45 or 60 minutes?) per week, no. of weeks, no. of days if block, how often per year)	12 hours (4 lectures of 3 hours each). Lectures are given within 1 week once a year.
Audience (students of which disciplines, interdisciplinarity)	PhD students in Chemistry (but open to PhD students from other disciplines (STEM, social sciences, etc.)). Can attend in presence or on line
Credits given	None - will be introduced in 2025
- for what (oral/written exam ...)	Attendance required (>80% of the lectures)
Status in department/university/ field of study, obligatory or voluntary	Voluntary
Connection with other course(s)/ integration in field of study	N/A
Additional activities/material (Model UN, visits, invited speakers, videos, ...)	N/A
Presentations/papers available, to whom	PowerPoint presentation and scientific papers
Internet site of course	N/A
Curriculum/list of units (add below or attach)	See syllabus below
Filled in by	Prof. Emilio Parisini
Date	18/06/2024
Agreement to publish this	yes

Chemical and Biological warfare agents, disarmament and non proliferation

Instructor: Emilio Parisini

Teaching material: powerpoint presentations

Course duration: 12 hours

Content of the course: the course covers the main scientific and technological aspects related to chemical and biological weapons, the use of chemical and biological weapons in history and the main international treaties that prevent their development and proliferation.

The course is designed not only for chemistry and biology students but also for students with a basic scientific background. Although some chemical and biological competences are useful, the course can be followed with profit also by students with a background in social sciences and international relations.

Acquired competences: at the end of the course, the students will acquire a good understanding of the modes of action of the main chemical and biological warfare agents, as well as an overview of their use in history and knowledge of the international treaties that limit the risk of proliferation of chemical and biological weapons and their use in conflicts. Students will therefore develop critical skills that will allow them to contextualize chemical and biological notions with respect to current aspects of the international geopolitical scene.

Program of the course:

Chemical weapons

- General principles (toxicity, volatility, modes of dispersal, etc.)

Classes of chemical weapons

- Choking agents
- Blister agents
- Blood agents
- Nerve agents
- Incapacitating agents
- Riot-control agents
- Vomiting agents
- Others

- Mode of action of chemical weapons and their interaction with biological tissues

- Chemical weapons convention: history, articles and updates (Conferences of States Parties)
- International role of the Organization for the Prohibition of Chemical Weapons (OPCW)

Biological weapons

- General principles
- DNA recombinant techniques: PCR, CRISPR-Cas9

Classes of pathological agents

- Bacteria
 - Viruses
 - Other organisms and toxins
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- Biological weapons convention: history, articles and updates (Conferences of the State Parties)

Teaching method: Face-to-face lessons in English

Bibliography:

- Eric Croddy: Armi chimiche e biologiche (In Italian, Ed. Bollati Boringhieri, 2004)
- Ramesh Gupta (Ed.): Handbook of toxicology of chemical warfare agents (Ed. Elsevier, 2020)
- Edward M. Spiers: Agents of war: a history of chemical and biological weapons (Ed. Reaktion books, 2021)
- Michael Crowley, Malcolm Dando, Lijun Shang (Ed.): Preventing Chemical Weapons: Arms Control and Disarmament as the Sciences Converge (Ed. Royal Society of Chemistry, 2018)
- Specific scientific literature
- Teaching material provided by the Organization for the Prohibition of Chemical Weapons (OPCW)