

Questionnaire (version of October 2023)

Natural-Science Disarmament Courses

Course Description

Time when course was/is given (years)	Since 2019, still active. A similar course (“ICT and international security”) was given by GPS in the period 1999-2008 at the Computer Science Dept. - University of Pisa (IT)
Lecturer(s)	Gian Piero Siroli (GPS), Giampiero Giacomello (GG)
Institution (department, university)	Political and Social Science Dept. - Univ. of Bologna (IT)
Course Title	Cybersecurity and cyberwarfare
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)	40 hours. Two module of 20 hours each during 2 nd semester (February-June)
Audience (students of which disciplines, interdisciplinarity)	Mostly political and social science students but also computer science students. Course deeply inter-disciplinary
Credits given	8
- for what (oral/written exam ...)	Written exam (paper)
Status in department/university/ field of study, obligatory or voluntary	Voluntary
Connection with other course(s)/ integration in field of study	Computer science, cybersecurity
Additional activities/material (Model UN, visits, invited speakers, videos, ...)	Cybersecurity technical demo
Presentations/papers available, to whom	Students of University of Bologna
Internet site of course	https://www.unibo.it/en/teaching/course-unit-catalogue/course-unit/2023/484243
Curriculum/list of units (add below or attach)	See below
Filled in by	Gian Piero Siroli
Date	4.11.23
Agreement to publish this	Yes

Units

Class Topics (tentative, it is subject to frequent changes following the fast technical and political evolution)

1. Introduction to the Class: structure of the class, references, method of evaluation (i.e. exams); the topic; what we mean by CS; brief excursus on the theory of war, terrorism and asymmetric warfare. (G.Giacomello + G.P. Siroli)

2. Network Theory & Analysis (Social Network Analysis with Gephi) (GG)
3. Threat Modelling Analysis and Social Engineering (GG)
4. Critical Infrastructures (GG)
5. Cyberwar (theory)- cyberwarfare (application) vs. Infowar(fare) nation-state (strategic Level) (GPS)
6. Cyberwarfare: the Actors (GPS)
7. Asymmetric Warfare (state and non-state actors; resources) (GPS)
8. Cyberweapons: Stuxnet and its siblings (Operational Level) (GPS)
9. Information Warfare (IW) & Psychological Ops (GPS)
10. Digital battlefield (Operational and Tactical levels; drones, autonomous systems; nuclear weapons vulnerabilities. (GPS)
11. Military applications of Artificial Intelligence; Lethal Autonomous Weapons Systems (LAWS) (GG)
12. NSA leaks & CIA leaks (GPS); Topics for the final paper due
13. Surveillance (PRISM, TOR, GCHQ, Cambridge Analytica) (GPS)
14. Myths and Reality of Cybercrime Today (GG)
15. Myths and Reality of Cyberterrorism Today (GG)
16. Privacy & Data Protection: Cryptography (symmetric and asymmetric keys) (GG)
17. Cyber Arms Control & Disarmament (the international framework, UN/GGE, EU; Italy) (GPS)
18. Laboratory 1: Wireshark, Win network commands, Kali (penetration) (GG+GPS)
19. Laboratory 2: Tails & Tor (anonymization), Buscador (OSIN), Deep Web (GG+GPS)
20. Conclusions and wrapping-up (GG+GPS)