

Questionnaire (version of October 2023)

Natural-Science Disarmament Courses

Course Description

Time when course was/is given (years)	2000-2021
Lecturer(s)	Jürgen Altmann
Institution (department, university)	Physics Department, TU Dortmund University
Course Title	Science, Armament and Disarmament - From the Atom Bomb to Cyber War
Type (lecture, seminar ...)	Seminar
Language(s)	German
Time (number of hours (45 or 60 minutes?) per week, no. of weeks, no. of days if block, how often per year)	2 h @ 45 minutes per week, 14 weeks Once per year
Audience (students of which disciplines, interdisciplinarity)	Physics, all other disciplines
Credits given	3 (for physics needs talk with physics focus)
- for what (oral/written exam ...)	Oral exam 20 minutes
Status in department/university/ field of study, obligatory or voluntary	Voluntary
Connection with other course(s)/ integration in field of study	-
Additional activities/material (Model UN, visits, invited speakers, videos, ...)	Videos etc. found by students
Presentations/papers available, to whom	Presentations after review by lecturer, to enlisted participants
Internet site of course	-
Curriculum/list of units (add below or attach)	See below
Filled in by	Jürgen Altmann
Date	1 Febr. 2024
Agreement to publish this	Yes

Units - List of possible topics, students choose their own, 13 in total; literature is provided

0. Overview seminar, topics (always, by lecturer)
1. Atomic bomb, hydrogen bomb: function
2. Effects of nuclear weapons
3. Nuclear winter
4. Uranium enrichment, Iran Agreement

5. Oppenheimer, Teller, Sacharov
6. Decision to drop the atomic bombs
7. Rockets (with developments in Iran, North Korea)
8. Ballistic missile defence
9. Guidance systems for missiles
10. Electromagnetic detection of covert uranium enrichment by gas centrifuges
11. Acoustic-seismic detection of missile launches for early warning
12. Detection of nuclear explosions by radioisotopes in the atmosphere
13. Remote detection of nuclear reprocessing
14. Nuclear-weapon disarmament: verification with limited knowledge
15. Nuclear tests and nuclear-test ban, test inspections
16. Satellites for verification
17. Ground sensors for verification
18. Chemical weapons and their disarmament
19. Biological weapons and their disarmament
20. Nanotechnology - military applications and preventive arms control
21. Military robots / uncrewed vehicles
22. Plutonium disposition
23. IT security, cyber forensics, cyber units of the Federal Armed Forces
24. Cyber attacks, cyber war, limits
25. Cryptography, quantum computing and military applications
26. Antineutrino detection for reactors
27. Non-lethal weapons
28. Laser weapons
29. Mine detection, with nuclear quadrupole/nuclear magnetic resonance
30. Military research and development
31. Preventive arms control
32. Joseph Rotblat and the Pugwash movement
33. The Göttingen 18 and nuclear weapons in Germany

34. Theory of just war, just peace