

**DRAFT**

11/14/22

## **Nuclear Policy**

**Harris School Course #33510**

Winter 2023

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**Office hours:** By appointment

### **Course Description**

“With the unleashing of atomic energy, everything has changed save our way of thinking, and thus we drift toward catastrophe beyond comprehension.” Albert Einstein made this observation in 1953, when the United States and the Soviet Union were pitted against each other in the most dangerous arms race in history with the potential, at its peak, to destroy human civilization and lay waste to the planet. At the same time, the United States and the Soviet Union were also developing peaceful uses of nuclear energy for life-saving medical treatments and for generating electricity. While issues arising from technologies that have both military uses and civilian applications are not new, the nearly incomprehensible damage from nuclear weapons focuses the mind as few other dual-use technologies can.

This course will review the development of nuclear energy for both military and civilian uses. We will examine plans for fighting and avoiding nuclear war, as well as the effects on societies of using nuclear weapons. We will briefly review the history of the international proliferation of nuclear technology and material and explore efforts to curtail the spread of weapons. The second part of the course focuses on the development of civilian nuclear power, its benefits and risks, and on efforts to reduce accidents and dispose of nuclear waste materials. Finally, we will consider the role of citizens in nuclear policymaking.

The course is organized around in-class lectures, readings, video and podcasts (to be found on Canvas), and small group discussions in a weekly three-hour format. Students will submit **two (2)** 2,000-2,500 word essays based on the readings and lectures in response to Essay Questions posed by the instructor. **The first essay is due on February 2, and the second essay is due on March 3, 2023.**

### **Course Readings**

**Required** (Please purchase the following books.)

*Nuclear Weapons: A Very Short Introduction*, Joseph M. Siracusa (Oxford University Press, 2015)

*Nuclear Choices for the Twenty-First Century: A Citizen's Guide*, Richard Wolfson and Ferenc Dalnoki-Veress (MIT Press, 2021)

*Hiroshima*, John Hersey (New York: Bantam Books, 1946, 1986)

*The Bomb: Presidents, Generals, and the Secret History of Nuclear War*, Fred Kaplan (Simon and Schuster, 2020)

*Voices from Chernobyl*, Svetlana Alexievich. Translated by Antonina W. Bouis (Arum Press, 1999)

***Recommended***

*The Making of the Atomic Bomb*, Richard Rhodes (Simon and Schuster, 1986)

*Command and Control: Nuclear Weapons, the Damascus Incident, and the Illusion of Safety*, Eric Schlosser (Penguin Press, 2013)

*Midnight in Chernobyl*, Adam Higginbotham (Simon and Schuster, 2019)

All other course readings and materials are available on Canvas or on the web and through the University of Chicago online journals library.

**Consult these sites for additional information and useful analysis:**

*Bulletin of the Atomic Scientists* at [www.thebulletin.org](http://www.thebulletin.org). Sign up for the electronic newsletter delivered to your inbox.

*Arms Control Today* at [www.armscontrol.org](http://www.armscontrol.org)

International Atomic Energy Agency at [www.iaea.org](http://www.iaea.org)

Nuclear Threat Initiative at <https://www.nti.org/analysis/articles/overview-of-the-nuclear-disarmament-resource-collection/>

**Course Requirements**

**1. Participation in class discussions will count for 25% of your grade.**

Attending and preparing for weekly discussions is a priority.

**2. Two essays will count for 70% of your grade.**

Each student will write two (2) 2500- to 3000-word essays based on the readings and lectures in response to questions posed by the instructor. **The first essay is due on February 1; the second essay is due on March 3 through Canvas.**

**3. Meeting with the instructor by zoom at least once during the quarter will count for 5% of your grade.**

The instructor will meet with each student by zoom at a mutually convenient time at least once during the quarter to discuss essays, course material, and answer questions.

**Grading**

**Class participation: 25%**

**Two written essays: 70%**

**Zoom meeting with instructor: 5%**

## ADA Student Accommodations

Any student who believes they may need assistance should inform the Harris Dean of Students office by the end of the first week of class. The Dean of Students office will coordinate any student accommodations with Harris instructors.

## Academic Dishonesty: Statement and Penalties

All University of Chicago students are expected to uphold the highest standards of academic integrity and honesty. Among other things, this means that students shall not represent another's work as their own, use un-allowed materials during exams, or otherwise gain unfair academic advantage. All students suspected of academic dishonesty will be reported to the Harris Dean of Students for investigation and adjudication. The disciplinary process can result in sanctions up to and including suspension or expulsion from the University. In addition to disciplinary sanctions, I will impose a grade penalty of "F" for students who have committed academic dishonesty. The Harris policy and procedures related to academic integrity can be found at <https://harris.uchicago.edu/gateways/current-students-policies>. The University of Chicago Policy on Academic Honesty and Plagiarism can be found at <https://studentmanual.uchicago.edu/academic/policies/academic-honesty-plagiarism/>

## Teaching and learning in person

This course is planned as an in-person experience, and students are expected to attend class at the Keller Center, with some exceptions as discussed below. Our practices and expectations include the following:

- Wearing face masks to prevent transmission of Covid-19 is optional. Please respect those who do wish to wear masks. If University guidance changes during the quarter, I will inform you about any new requirements.
- We ask that students limit eating and drinking to break times and in spaces outside of the classroom.
- Please display your name tent every class so that I can more easily call on you by name.

That said, of course, public health and/or personal health circumstances vary across individual members of the University community and may change abruptly with limited notice. Students, TAs, and instructors may need to participate remotely for a short time or, in some limited instances, for the entire quarter. To guide expectations and plans, please note the following:

- **If you are experiencing COVID-19 symptoms or are required to isolate, do not come to class!**
  - As soon as possible, contact me or the TA by email if you cannot attend class for this reason. You should **not** send me medical information / doctors' notes or the results of any COVID-19 test.
  - Students are expected to abide by the University's [COVID-19 health requirements](#) AND its specific [Protocol for Addressing Confirmed or Suspected COVID-19 Exposures](#). Note that the Protocol, which addresses self-monitoring, testing, and isolating requirements, represents evolving guidance and is subject to change.
  - Any member of the University community who tests positive for COVID-19 should inform the University contact tracing team at [C19HealthReport@uchicago.edu](mailto:C19HealthReport@uchicago.edu).

- Students missing class for short spells during the term are encouraged to watch class on Zoom either live or via recordings of class sessions, and otherwise participate in class as fully as possible, health permitting.
- **A limited number of students may have permission to participate remotely for the entire quarter.**
  - The Harris Dean of Students Office makes these determinations and informs instructors of enrolled students with permission.
  - Enrolled students with remote status are encouraged to participate in class via live streaming, watch Zoom recordings of class sessions, and otherwise participate in class as fully as possible, health permitting.
- **If I find that I cannot teach in person at some point during the term, I will communicate this as soon as possible to all the relevant stakeholders, including students.**
  - Health permitting, I will teach remotely via Zoom on such occasions.
  - Students can attend class in the Keller Center but would participate via Zoom on such days. Students can also attend remotely from home (or any other location that is devoid of distractions).
  - I will be in touch with the TA, HSIT, and ASA to make sure things work smoothly.

### **Video and Audio Recordings**

By attending course sessions, students acknowledge that:

i. They will not:

- (i) record, share, or disseminate University of Chicago course sessions, videos, transcripts, audio, or chats;
- (ii) retain such materials after the end of the course; or
- (iii) (iii) use such materials for any purpose other than in connection with participation in the course.

ii. They will not share links to University of Chicago course sessions with any persons not authorized to be in the course session. Sharing course materials with persons authorized to be in the relevant course is permitted. Syllabi, handouts, slides, and other documents may be shared at the discretion of the instructor.

iii. Course recordings, content, and materials may be covered by copyrights held by the University, the instructor, or third parties. Any unauthorized use of such recordings or course materials may violate such copyrights.

iv. Any violation of this policy will be referred to the Area Dean of Students.

## Course Outline: Readings and Assignments

### Week 1: Introduction

Joseph M. Siracusa, *Nuclear Weapons: A Very Short Introduction*, pp. 1-38

Wolfson and Dalnoki-Veress, *Nuclear Choices for the Twenty-First Century*, pp. 255-280.

For the basics of nuclear fission and radiation, see pp. 7-80.

View the documentary *The Day After Trinity* by Jon Else.

<https://www.youtube.com/watch?v=xosmgrYF9K8>

**Recommended:** Report of the Committee on Political and Social Problems to the U.S. Secretary of War, June 1945. (Also known as the Franck Report) <https://fas.org.sgp/eprint/franck.html/>

**Special note:** For the history of the origins of the atomic bomb at the University of Chicago, take a tour of the Main Quad and the “Sites of the Manhattan Project.” Use the “Ranger in Your Pocket” feature at the Atomic Heritage Foundation and find the University of Chicago at [www.atomicheritage.org](http://www.atomicheritage.org) Highly recommended!

**Class Discussion Question: What considerations went into the decision to drop atomic bombs on Hiroshima and Nagasaki at the end of World War II?**

### Week 2: Developing Nuclear Bombs

Fred Kaplan, *The Bomb*, entire

Siracusa, *Nuclear Weapons*, pp. 39-59

Wolfson and Dalnoki-Veress, pp. 305-338

Listen to *At the Brink*, Season 1, Episode 4, Modernizing Doomsday: The True Cost of Our Nuclear Arsenal (podcast)

**Class Discussion Question: How did the massive destruction of nuclear bombs change war-fighting strategy? If nuclear bombs are so destructive, why did the United States and the Soviet Union manufacture and deploy so many?**

### Week 3: Effects of Using Nuclear Weapons

John Hersey, *Hiroshima*, entire

*At the Brink*, Episode 8, Hibakusha: Survivors of the Bomb (podcast)

Wolfson and Dalnoki-Veress, pp. 281-304

Lynn Eden, “City on Fire,” *Bulletin of the Atomic Scientists*, January/February 2004, pp. 32-27, 40-43 <https://www.tandfonline.com/doi/abs/10.1080/00963402.2004.11460746>

Alan Robock and Owen Toon, "Self-Assured Destruction: The Climate Impacts of Nuclear War," *Bulletin of the Atomic Scientists* 68, No. 5 (September 1, 2012): 66-74.  
<https://www.tandfonline.com/doi/full/10.1177/0096340212459127>

Alan Robock and Owen Brian Toon, "Local Nuclear War," *Scientific American*, January, 2010  
<http://climate.envsci.rutgers.edu/pdf/RobockToonSciAmJan2010.pdf>

Alex Wellerstein, Nukemap, <http://nuclearsecrecy.com/nukemap/>

**Class Discussion Question: What are the effects of nuclear weapons on people, cities, and the environment? Given the destruction brought about by nuclear weapons, under what conditions should they be used?**

#### Week 4: Deterrence and Avoiding Nuclear War

Siracusa, *Nuclear Weapons*, pp. 60-117

Wolfson and Dalnoki-Veress, pp. 339-362 and 383-409

Eric Schlosser, "World War Three, By Mistake," *The New Yorker*, December 23, 2016  
<https://www.newyorker.com/news/news-desk/world-war-three-by-mistake/>

James E. Doyle, "Inhumanity of Nuclear Deterrence," *Bulletin of the Atomic Scientists* 75:2, 85-91 (<https://doi.org/10.1080/00963402.2019.1580893>)

Richard Clarke, Nuclear Weapons and Cyber Security

<https://www.nti.org/news/new-video-breaks-down-the-cyber-nuclear-threat/>

*At the Brink*, Season 1, Episode 1, "Seek Immediate Shelter: Nuclear False Alarms" (podcast)

**Class Discussion Question: How does nuclear deterrence work? What are the consequences if deterrence fails?**

#### Week 5: Restraint and Reducing Risks from Nuclear Weapons

Wolfson and Dalnoki-Veress, pp. 411-467

Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security* Vol 29 Issue 4 Spring 2005, pp. 5-49

Sanders-Zakre, Alicia, "Nuclear Weapons Ban Treaty to Enter into Force,"  
<https://www.armscontrol.org/act/2020-11/features/nuclear-weapons-ban-treaty-enter-into-force-whats-next>

Erasto, Tytti, "The NPT and the TPNW: Compatible or Conflicting Nuclear Weapons Treaties?"  
<https://www.sipri.org/commentary/blog/2019/npt-and-tpnw-compatible-or-conflicting-nuclear-weapons-treaties>

**Recommended:** Alexei Arbatov, "Saving Nuclear Arms Control, *Bulletin of the Atomic Scientists*, April 2016 [www.tandfonline.com/doi/full/10.1080/00963402.2016.1170393](http://www.tandfonline.com/doi/full/10.1080/00963402.2016.1170393)

**ESSAY QUESTION #1: Should political leaders rely on deterrence to prevent nuclear war, but risk nuclear weapons use due to miscalculation, misperception, or accident; or should they reduce nuclear weapons by strengthening treaties, norms of restraint, and international cooperation, but risk the acquisition and use of these weapons by outlaw countries?**

**ESSAY DUE: FEBRUARY 1**

Week 6: Developing Civilian Nuclear Power

Wolfson and Dalnoki-Veress, pp. 85-228

**Recommended:** Wolfson and Dalnoki-Veress, pp. 229-251 on nuclear fusion technology

International Atomic Energy Agency, *Energy, Electricity and Nuclear Power Estimates for the Period up to 2050*. Vienna: IAEA. [https://www-pub.iaea.org/MTCD/Publications/PDF/RDS-1-42\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/RDS-1-42_web.pdf)

**Class Discussion Question: How does nuclear power compare to other sources for generating electricity? What are the prospects for increased nuclear power over the next twenty years?**

Week 7: Benefits and Risks of Nuclear Energy

Alex Glaser and Robert Socolow, "Balancing Risks: Nuclear Energy and Climate Change," *Daedalus*, Fall 2009, pp. 1-14 [http://www.princeton.edu/~aglaser/2009aglaser\\_daedalus.pdf](http://www.princeton.edu/~aglaser/2009aglaser_daedalus.pdf)

Elisabeth Eaves, "Can North America's Advanced Nuclear Reactor Companies Help Save the Planet?" *Bulletin of the Atomic Scientists* Vol. 73:1, 27-37, December 2016. <https://doi.org/10.1080/00963402.2016.1265353>

Svetlana Alexievich, *Voices of Chernobyl*, entire

**Recommended:** Adam Higginbotham, *Midnight in Chernobyl* (Simon and Schuster, 2019)  
(Also a six-part Netflix series based on the book, "Midnight in Chernobyl.")

**Class Discussion Question: Do the risks of building more nuclear power plants to provide energy outweigh the risks? Will new safer plant designs reduce the costs and the risk of accidents enough to make nuclear power acceptable to the public?**

Week 8: Controlling Nuclear Technologies and Materials

Tatsujiro Suzuki, "Deconstructing the Zero-Risk Mindset: The Lessons and Future Responsibilities for a post-Fukushima Nuclear Japan, *Bulletin of the Atomic Scientists*, 67:5, 9-18 <https://doi.org/10.1177/0096340211421477>

Laura Rockwood, "How the IAEA Verifies if a Country's Nuclear Program is Peaceful or Not: The Legal Basis," *Bulletin of the Atomic Scientists* 2015 Vol. 71:2  
<https://doi.org/10.1177/0096340215571909>

Listen to *At the Brink*, Season 1, Episode 6, The Iran Deal: Blocking a Persian Bomb (podcast)

**ESSAY QUESTION #2: Should countries build more nuclear power plants to provide a major energy source without further disrupting the climate, but risk more accidents and proliferation of nuclear weapons to more countries; or should they phase out nuclear power to prevent accidents and the further spread of nuclear weapons, but risk continued climate change?**

**ESSAY DUE MARCH 3.**

Week 9: Public Opinion and Nuclear Policy

Jonathan Baron, Rebecca Davis Gibbons, and Stephen Herzog, "Japanese Public Opinion, Political Persuasion, and the Treaty on the Prohibition of Nuclear Weapons," *Journal for Peace and Nuclear Disarmament*, December 13, 2020. <https://doi.org/10.1080/25751654.2020.1834961>

Listen to *At the Brink*, Season 1, Episode 2: The Biscuit and the Football (podcast)

**Class Discussion Question: What role should citizens have in policymaking about nuclear weapons? Is the sole authority of the U.S. president to launch nuclear weapons compatible with democratic governance?**

Paul Slovic (2012) The perception gap: Radiation and risk, *Bulletin of the Atomic Scientists*, 68:3, 67-75. <https://doi.org/10.1177/0096340212444870>

Jonathan Baron and Stephen Herzog, "Public Opinion on Nuclear Energy and Nuclear Weapons: The Attitudinal Nexus in the United States," *Energy Research and Social Science*, April 2020. <https://doi.org/10.1016/j.erss.2020.101567>

**Class Discussion Question: What role should citizens have in decisions about nuclear power? What information would they need to participate in policymaking?**