

Frederick S. Pardee School of Global Studies, Boston University
Nuclear Governance
IR315/ PO358/ HI335
Fall 2018: Tuesdays & Thursdays, 12:30-1:45 PM, CAS 233

Professor Jayita Sarkar

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Course Description

What are the causes and consequences of nuclear weapons and their related technologies? How are nuclear technologies, equipment and materials managed at the international, regional and national levels? What is the 'global atomic marketplace' and how can it be controlled to contain proliferation threats? What are the tools of nonproliferation and counterproliferation that have been historically adopted by the United States and its allies? What policy lessons can be derived from those past policies? How has radioactive poisoning from nuclear tests, nuclear facilities and accidents affected lives, and how have effective mitigation been? These are some of the questions that this course will examine. No background in nuclear issues is required for taking this course.

Course Learning Objectives

By the end of this course, students will have achieved the following course learning outcomes:

- Demonstrate a strong basis of knowledge of the politics, history and technologies surrounding nuclear weapons and nuclear energy.
- Demonstrate an understanding of dominant explanations for nuclear proliferation, nonproliferation, nuclear trade and nuclear latency.
- Demonstrate the ability to do historical research and analysis, including the use of primary sources.
- Develop the ability to effectively collaborate within and across teams with a problem-solving approach to contemporary security problems

Instructional Format, Course Pedagogy, & Approach to Learning

This is a lecture course organized around required weekly readings. Students are expected to come prepared with the required readings, and participate in class discussions. The instructor will lecture for half of the duration of each session. The other half is kept for class discussions.

Occasionally, the instructor will circulate primary source material (i.e. declassified government document) relevant to the course content, and the students will examine this material during the session, and engage in class discussion. Please note that students are not required to come prepared with items mentioned under 'additional/optional readings'. Additional readings are resources for students to use to write their policy memo and op-ed assignments for this course.

Books & Courseware

There are no required textbooks for this course. There are required readings that will be made available to the students through Blackboard and course reserves at BU's Mugar Library. Below is a list of movies/documentaries that students are required to watch as part of this course:

1. The Day After Trinity, 1980
2. Hiroshima, 2005
3. Fail-Safe, 1964
4. Dr. Strangelove, 1964
5. The Battle of Chernobyl, 2006
6. Command & Control, 2016
7. Silkwood, 1983

Assignments

1. Policy Memo (25%): Students are required to write a policy memo of no longer than 3000 words (2000-2500 words approximately) in which they will identify a contemporary policy scenario, offer 3-5 policy options, identify one best option, and provide a data-driven justification for it. The policy scenario must relate to one or more of the themes in this course. The policy memo will be addressed to a top policymaker, and will be written keeping in mind official etiquette and political realities in mind. This assignment is broken down into two steps in order to help students to obtain feedback on their writing and analysis. The two steps are explained below.

a. Draft Memo (10%): Students will submit a draft memo during Week 5, which should be at least 60% complete. The policy scenario, main policy options and the data must be clearly identified with at least 1200 words written. Students will receive feedback and guidance from the instructor on the memo at this stage.

b. Final Memo (15%): Students will submit the final policy memo during Week 9. No resubmission is permitted. The final policy memo should incorporate all the elements that are mentioned under (A).

2. Simulation (30%): On Week 10, there will be a simulation on a nuclear policy problem. The simulation assignment will have three steps: preparation (role assignments, forming country delegations and research on the policy problem at hand), participation in the simulation session, and a response essay of no more than 750 words (at least 600 words). The response essay is due on Week 11. The assignment is worth 30% and each step is worth 10% each.

3. Op-Ed (25%): Each student will write one op-ed of approximately 1200 words (1000-1500 words is the range) on a contemporary or past policy question. If it is a past policy question, it needs to be represented in current-day perspective. Op-ed guidelines will be circulated in class.

4. Attendance & Participation (20%): Regular attendance in class is mandatory. Attendance and regularly active class participation based on critical analysis of the assigned readings will account for 20% of the total grade.

Grading Criteria & Scale

Explanation of grades and GPA at Boston University can be found by following this link: <https://www.bu.edu/reg/academics/grades-gpa/>

Attendance and Participation	20%	A	93 - 100
Simulation	30% (10+10+10)	A-	90-92
Policy Memo	25% (10+15)	B+	87-89
Op-Ed	25%	B	83-86
		B-	80-82
		C+	77-79
		C	73-76

Class and University Policies

1) Course members' responsibilities

This is a screen-down class. So, laptops, cellphones and tablets are not permitted in class except on the week of simulation. Students who need laptops for accommodation/accessibility purposes for note taking must contact the instructor with official notification from appropriate authority (see 'Accessibility'). Students are expected to be punctual in class. Late arrivals will affect class participation grade. The instructor will respond to emails within 24 hours of receiving them, except on weekends. If the student is dissatisfied with their grade, please wait 48 hours from receiving the grade, and then meet the instructor.

2) Attendance & Absences

Students' attendance in this class is mandatory. If a student cannot attend a session, they must email the instructor in advance in order to excuse themselves. Any more than two absences during the semester will result in a deduction in the participation grade by one grade letter. Students who must be absent from class for religious observance must notify the instructor as early as possible, and at least two weeks in advance.

3) Assignment Completion & Late Work

All assignments must be sent by email to the instructor before 5pm (Eastern Standard Time) on the day it is due. Late work without adequate justification will be penalized by one letter grade for that assignment. Students who will miss examinations for unforeseen factors or factors beyond their control must contact me as early as possible so that makeup assignments can be scheduled.

4) Academic Integrity

Plagiarism is a serious offence, and will not be tolerated. The members of this class will follow the "Academic Code of Conduct" of Boston University, accessible here: <https://www.bu.edu/academics/policies/academic-conduct-code/>

5) Accessibility

Boston University is committed to providing equal access to our coursework and programs to all students. In order to be sure that accommodations can be made in time for all exams and assignments, please plan to turn in your accommodations letter as soon as possible and no later than 14 days from the first exam/assignment. After you turn in your letter, please meet with your professor to discuss the plan for accommodations so we can be sure that they are adequate and you are supported in your learning. If you have further questions or need additional support, please contact the Office of Disability Services (access@bu.edu).

DETAILS OF CLASS MEETINGS

PART I: Politics, History & Technologies

Week 1-3

WEEK 1

Sep. 4: Managing Weapons of Mass Destruction

- Outrider: <https://outrider.org/nuclear-weapons>

Sep. 6: Nuclear Fission in History

- Pre-World War II to the Manhattan Project
 - Documentary: The Day After Trinity (1980)
- Atomic Bombings of Japan
 - Documentary: Hiroshima (2005)
- Sagan, Scott D. and Benjamin A. Valentino. "Revisiting Hiroshima in Iran: What Americans Really Think About Using Nuclear Weapons and Killing Noncombatants." *International Security* 42, no. 1 (Summer 2017): 41-79.

WEEK 2

Sep. 11: How do Nuclear Weapons Work?

- Fissile Materials & Significant Quantity
 - Key Nuclear Explosive Materials by Institute for Science & International Security: http://www.isis-online.org/publications/fmct/primer/Section_I.html
- Nuclear 101: How do Nuclear Weapons Work? Parts 1 & 2 by Matthew Bunn
 - <https://www.youtube.com/watch?v=zVhQOlx:b1Mc>
 - <https://www.youtube.com/watch?v=MnW7DxsJtb0>
- Atmospheric & Underground Testing
- Miniaturization & Delivery Vehicles

Sep. 13: The Utility of Nuclear Weapons in Foreign Policies

- Dissuasion, Deterrence and Compellence
 - Bell, Mark "Beyond Emboldenment: How Acquiring Nuclear Weapons Can Change Foreign Policy." *International Security* 40, no. 1 (Summer 2015): 87-119.
- U.S. Nuclear Posture Reviews
 - Executive summaries of NPR 2010 & 2018

WEEK 3

Sep. 18: Atoms for Peace & N+1 problem

- Global Atomic Marketplace
 - President Eisenhower's Speech at UN General Assembly, 8 Dec. 1953
- Nuclear Reversal & Denuclearization
 - Levite, Ariel. "Never Say Never Again: Nuclear Reversal Revisited." *International Security* 27, no. 3 (2002/03): 59-88.
- Proliferation Cascades & Intelligence Assessments
 - National Intelligence Estimate No. 4-2-64, October 1964
 - CIA Research Memo, "Managing Nuclear Proliferation: The Politics of Limited Choice," 1975

Sep. 20: Demand & Supply Sides of Proliferation

- Horizontal vs. Vertical Proliferation
- Proliferation Optimism vs. Proliferation Pessimism
- Sagan-Waltz Debate

- Sagan's Three Models & Solingen's Nuclear Logics
 - Sagan, Scott D. "Why Do States Build Nuclear Weapons?: Three Models in Search of a Bomb." *International Security* 21, no. 3 (1996-1997): 54 - 86.
 - Solingen, Etel. "The Political Economy of Restraint," *International Security* 19, no. 2 (Fall 1994): 126-169.
- Supply Side Logics & Outcomes

Optional

Miller, Nicholas L. "Why Nuclear Energy Programs Rarely Lead to Proliferation." *International Security* 42, no. 2 (Fall 2017): 40-77.

PART II: Managing Risks

Week 4-6

WEEK 4

Sep. 25: Proliferation, Nonproliferation & Counterproliferation, I

- Multilateral Institutions & Treaties
- Carrots: Umbrellas, Guns, Money
- Sticks: Sanctions, Threats, Preemptive Strikes, Aid Withholding, Sabotage
 - Gavin, Francis J. "Strategies of Inhibition: U.S. Grand Strategy, the Nuclear Revolution, and Nonproliferation." *International Security* 40, no. 1 (Summer 2015): 9- 46.
 - Miller, Nicholas L. "Nuclear Dominoes: A Self-Defeating Prophecy?". *Security Studies* 23, no. 1 (2014): 33-73.

Sep. 27: Proliferation, Nonproliferation & Counterproliferation, II

- Technological Diversion
 - Krige, John and Jayita Sarkar. "American Technological Collaboration for Nonproliferation: Key Evidence from the Cold War," *Nonproliferation Review*, 2018.
- Nuclear, Space & Cyber Technologies
 - Lindsay, Jon R. "Stuxnet and the Limits of Cyber Warfare." *Security Studies* 22, no. 3 (2013): 365-404.

WEEK 5

Oct. 2: International Nuclear Institutions: IAEA & NPT

- IAEA
 - Roehlich, Elisabeth. "The Cold War, the Developing World, and the Creation of the International Atomic Energy Agency (IAEA), 1953–1957." *Cold War History* 16, no. 2 (2016): 195-212.
- NPT
 - Krige, John. "The Proliferation Risks of Gas Centrifuge Enrichment at the Dawn of the NPT." *The Nonproliferation Review* 19, no. 2 (2012): 219-27.
 - Text of the Treaty on Nuclear Nonproliferation, 1968. Available online at <http://www.un.org/en/conf/npt/2005/npttreaty.html>

Optional:

NPT Extension, 1995: https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/1995-NPT/pdf/NPT_CONF199503.pdf

Oct. 4: Regional Nuclear Institutions: EURATOM & URENCO

- Krige, John "Euratom and the IAEA: The Problem of Self- Inspection." *Cold War History* 15, no. 3 (2015): 341-52.

- “Euratom Debates NPT Safeguards,” CIA Weekly Summary, 21 April 1967.
Available online at:
https://www.cia.gov/library/readingroom/docs/DOC_0005284699.pdf

**Draft Policy Memo due by 5 pm by email*

WEEK 6

No class on Oct. 9. Monday's Schedule

Oct. 11: Nuclear Trade Controls: ZC & NSG

- Burr, William. "A Scheme of 'Control': The United States and the Origins of the Nuclear Suppliers' Group, 1974–1976." *The International History Review* 36, no. 2 (2014): 252-76.
- Antsey, Isabelle. "Negotiating Nuclear Control: The Zangger Committee and the Nuclear Suppliers' Group in the 1970s." *The International History Review* advance access (2018).

Optional

Salisbury, Daniel. "Why do entities get involved in proliferation? Exploring the criminology of illicit WMD-related trade," *The Nonproliferation Review* (2018).

NSG & Trigger List (with reference to France-Pakistan, 1970s):

<http://digitalarchive.wilsoncenter.org/document/112846>

PART III: Crises & Proliferation

Weeks 7-11

WEEK 7

Oct. 16: Nuclear Crises: 1962 Cuban Missile Crisis & 1983 Able Archer

- Hershberg, James G. "The Cuban Missile Crisis" in Leffler, M.P. and O.A. Westad (eds.) *The Cambridge History of the Cold War Vol 2*. (New York: Cambridge University Press, 2010).
- Jones, Nate and J. Peter Scoblic. "The Week the World Almost Ended," *Slate*, Apr. 2017:
<https://slate.com/news-and-politics/2017/06/able-archer-almost-started-a-nuclear-war-with-russia-in-1983.html>

Oct. 18: Group-led in-class discussion on lessons from the Cuban Missile Crisis

- Movie: Dr. Strangelove, 1964
- Movie: Fail-Safe, 1964
- Cohen, Eliot A. (Winter 1985/6). "Why We Should Stop Studying the Cuban Missile Crisis." *The National Interest* (2): 3-13.

WEEK 8

Oct. 23: Nuclear Latency: Japan and Iran

- Volpe, Tristan A. "Atomic Leverage: Compellence with Nuclear Latency." *Security Studies* 26, no. 3 (2017): 517-44.
- Jervis, Robert. "On the Road to Yes with Iran: How to Read the Nuclear Deal." *Foreign Affairs*, 29 November 2013.

Optional:

Belfer Center's "The Iran Deal: A Definitive Guide," p. 1-16:

<http://belfercenter.ksg.harvard.edu/files/IranDealDefinitiveGuide.pdf?webSyncID=e36797e7-3cdb-2173-817c-40ea389c2238&sessionGUID=29ce3007-d04b-2e7d-5030-ba01ecdc259>

Oct. 25: Nuclear Rogues: North Korea, Iraq, Libya & Syria

- Braut-Hegghammer, Målfrid. *Unclear Physics : Why Iraq and Libya Failed to Build Nuclear Weapons*. Cornell Studies in Security Affairs. Ithaca: Cornell University Press, 2016: [Introduction chapter & Webcas](#)
 - <https://www.wilsoncenter.org/event/unclear-physics-why-iraq-and-libya-failed-to-build-nuclear-weapons>
- Hecker, Sigfried S., "What I Found in North Korea", *Foreign Affairs*, December 9, 2010.

WEEK 9**Oct. 30: Proliferation Cascade in Asia: China, India, Pakistan**

- Sarkar, Jayita. "The Making of a Nonaligned Nuclear Power: India's Proliferation Drift, 1964-1968." *The International History Review* 37, no. 5 (2015): 933-50.
- Sumit Ganguly. 1999. "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program." *International Security* Vol. 23 No. 4, 148-177.

Optional:

Ganguly, Sumit, "Nuclear stability in South Asia," *International Security* 33, no. 2 (Fall 2008): 45-70.

Nov. 1: A.Q. Khan & Its Lessons

- Khan, Feroz Hassan. *Eating Grass: The Making of the Pakistani Bomb*. Stanford, CA: Stanford University Press, 2013.
 - Chapter 7: Mastery of Uranium Enrichment
 - Chapter 8: Procurement Network in the Grey Market

Optional:

Craig, Malcolm M. "Nuclear Sword of the Moslem World?: The United States, Britain, Pakistan, and the 'Islamic Bomb', 1977-80." *The International History Review* 38, no. 5 (2016): 857-79.

** Final Policy Memo due by 5 pm by email*

WEEK 10**Nov. 6: Deterrence Stability in South Asia: India-Pakistan-China**

- Nuclear South Asia, online Stimson Center course videos will be used. Handouts will be circulated

Nov. 8: *Simulation Day – in-class event

- *Deterrence Stability in Action: Crisis Scenario Simulation*
- More documents will be circulated earlier in the week.

WEEK 11**Nov. 13: Nuclear Opacity: Israel**

- Rabinowitz, Or. *Bargaining on Nuclear Tests : Washington and Its Cold War Deals*. First Edition. ed. Oxford, United Kingdom: Oxford University Press, 2014. [Chapter on Israel](#)
- Israel as a Nonproliferation Agent
 - Hegghammer, Malfrid-Braut. "Revisiting Osirak: Preventive Attacks and Nuclear Proliferation Risks." *International Security* 36, no. 1 (2011): 101-32.

Nov. 15: Nuclear Security: New Technologies & Insider Threats

- Volpe, Tristan A. "Internet of Nuclear Things: Managing the Proliferation Risks of 3-D Printing Technology." *Bulletin of the Atomic Scientists* 74, no. 2 (2018): 102-13.
- Bunn, Matthew, and Scott Douglas Sagan. *Insider Threats*. Cornell Studies in Security Affairs. Ithaca ; London: Cornell University Press, 2016.
 - Chapter 6: Worst Practices Guide to Insider Threats

**Simulation Write-Up due by 5pm by email*

PART IV: Consequences & Oppositions

Weeks 12- 14

WEEK 12

Nov. 20: America's Missile Heartland

- Heefner, Gretchen. *The Missile Next Door: The Minuteman in the American Heartland*. Cambridge, MA: Harvard University Press, 2012.
 - Introduction
 - Chapter 5: Nuclear Heartland
- Movie: Command & Control (2016)

No class on Nov. 22 for Thanksgiving recess.

WEEK 13

Nov. 27: Radioactive Poisoning: United States & Former Soviet Union

- Brown, Kate. *Plutopia: Nuclear Families, Atomic Cities, and the Great Soviet and American Plutonium Disasters*. Oxford, UK: Oxford University Press, 2013.
 - Chapter 5: The City Plutonium Built
 - Chapter 22: Managing a Risk Society
- Movie: Silkwood (1983)

Nov. 29: Radioactive Poisoning: Kazakhstan and South Africa

- Stawkowski, Magdalena. "Radiophobia Had to Be Reinvented." *Culture, Theory and Critique*. 58, no. 4 (2017):357-374.
- Hecht, Gabrielle. "The Work of Invisibility: Radiation Hazards and Occupational Health in South African Uranium Production," *International Labor and Working Class History* 81 (Spring 2012): 94-113.

WEEK 14

Dec. 4: Nuclear Safety: Chernobyl & Fukushima

- Brown, Kate. "Life in a Real Nuclear Wasteland," *Slate*, Apr. 18, 2013:
http://www.slate.com/articles/health_and_science/medical_examiner/2013/04/nuclear_contamination_in_former_ussr_radioactivity_in_muslomovo_on_techa.html
- Movie: The Battle of Chernobyl, 2006

Dec. 6: Nuclear Disarmament

- Schelling, Thomas C. "The Role of Deterrence in Total Disarmament." *Foreign Affairs* 40, no. 3 (1962): 392-406.
- Four WSJ op-eds by the 'Four Horsemen' between 2007 and 2011:
https://www.nti.org/media/pdfs/NSP_op-eds_final_.pdf?_=1360883065

Optional

Wittner, Lawrence S. "The Forgotten Years of the World Nuclear Disarmament Movement, 1975-78." *Journal of Peace Research* 40, no. 4 (2003): 435-56.

**Op-Eds due by 5pm on the last day of class*

Nuclear Governance (Fall 2018), IR315/ PO358/ HI335, Syllabus Outline

PART I: Introduction to Politics, History & Technologies

Weeks 1-3

1. Managing Weapons of Mass Destruction
2. Nuclear Fission in History

3. How do Nuclear Weapons Work?
4. The Utility of Nuclear Weapons in Foreign Policies

5. Atoms for Peace & the N+1 Problem
6. Demand & Supply Sides of Proliferation

PART II: Managing Risks

Weeks 4-6

7. Proliferation, Nonproliferation & Counterproliferation I
8. Proliferation, Nonproliferation & Counterproliferation II

9. International Nuclear Institutions: IAEA & NPT
10. Regional Nuclear Institutions: EURATOM & URENCO

**Draft Policy Memo due by 5 pm by email*

11. *No class. Monday's schedule*
12. International Nuclear Frameworks: Zangger Committee, NSG, UNSCR 1540, & Proliferation Security Initiative

PART III: Crises & Proliferation

Weeks 7-11

13. Nuclear Crises: 1962 Cuban Missile Crisis & 1983 Able Archer
14. Lessons from the Cuban Missile Crisis

15. Nuclear Latency: Japan and Iran
16. Nuclear Rogues: North Korea, Iraq, Libya & Syria

17. Proliferation Cascade in Asia: China, India, Pakistan
18. A.Q. Khan & Its Lessons

** Final Policy Memo due by 5 pm by email*

19. Deterrence Stability in South Asia: India-Pakistan-China
20. **Deterrence Stability in Action: Crisis Scenario Simulation*

21. Nuclear Opacity: Israel
22. Nuclear Security: New Technologies & Insider Threats

**Simulation Write-Up due by 5pm by email*

PART IV: Consequences & Oppositions

Weeks 12- 14

23. America's Missile Heartland
24. *No class. Thanksgiving recess.*

25. Radioactive Poisoning: USA & Former USSR
26. Radioactive Poisoning: Kazakhstan & South Africa

27. Nuclear Safety: Chernobyl & Fukushima
28. Nuclear Disarmament

**Op-Eds due by 5pm on the last day of class*