

**Harvard Kennedy School
Rethinking Nuclear Deterrence
HKS IGA-233
Spring 2024
Prof. Matthew Bunn**

Time: Monday and Wednesday, 3:00-4:15 PM EDT

Location: Littauer 280

Objective and Approach

The states that possess nuclear weapons – and other states that rely on their security guarantees -- see them as essential to their security. At the same time, nuclear deterrence comes with the ever-present risk of devastating failure, posing an existential risk to much of human civilization. This course will explore a range of views on the benefits and dangers of nuclear deterrence, in the context of events including Russia's war on Ukraine and nuclear saber-rattling, China's rapid nuclear buildup, North Korea's near-constant missile testing and nuclear threats, Iran's expanding ability to produce nuclear weapons material should it ever choose to do so, an ongoing nuclear arms competition between India and Pakistan, and more. The nuclear world is becoming more multipolar, hostility between nuclear-armed states is at a fever pitch, and new technologies from hypersonic missiles to cyberweapons and artificial intelligence are making both conventional and nuclear balances more complex and potentially more dangerous.

This class will explore different concepts for managing nuclear balances and reducing their dangers; approaches to nuclear strategy and force posture; prospects for nuclear arms restraint; and ideas about what a world that no longer relied on nuclear deterrence might look like. The course will confront students with real-world and hypothetical policy dilemmas, training them in risk-informed thinking about managing these issues, through case studies, policy memos, and negotiating or crisis simulations. The course will equip students with concepts and tools for careers managing policies related to nuclear deterrence, arms control, disarmament, and nuclear risk-reduction. Indeed, past students in my other nuclear weapons-focused course are working today to reduce nuclear dangers in several U.S. government departments, in the foreign ministries of other governments, in international organizations, in think-tanks, and in academia.

This is a discussion-based class, and class participation is part of the grade. Hence, doing the readings is very important; on occasion, I will call on students to summarize particular readings or arguments from the readings. I expect all students to offer their ideas and comment on the ideas of others. I hope to work closely with students to build a class community based on inclusion and mutual respect, in which we can all learn from each other. If you find yourself disagreeing fiercely with me, with another student, with a speaker, or with a reading, feel free to say so – but please do so with respect, and help us build a learning environment that will benefit



us all. (Note that the readings cover a wide range of points of view, some of which I disagree with – but each reading offers an important perspective that students should grapple with as they consider these issues.)

Parts of this class may be emotionally challenging. It is natural to be upset by the horrifying potential human impact of nuclear war. Debates about what targets to threaten to destroy in retaliation, to convince an adversary not to attack, can seem merciless and cold-blooded. If you are having trouble, please come to see me – I welcome the opportunity to help students grapple with these issues.

Faculty

I am the James R. Schlesinger Professor of the Practice of Energy, National Security, and Foreign Policy at HKS, and I have been working on these issues for four decades, in and out of government. I have served in the White House Office of Science and Technology Policy, at the U.S. National Academy of Sciences, as the editor of *Arms Control Today*, and as an advisor to a range of U.S. government agencies and laboratories. You can find out more, and get the full text of many of my writings and presentations, on my Harvard Scholar [page](#).

Office Hours and Contact Information

I will have office hours on Tuesdays and Thursdays from 4-5:30. Students can sign up for times on-line on the course page. If those office hours are inconvenient for you, make an appointment for another time through my assistant Matthew Parent, (matthew_parent@hks.harvard.edu, phone: 413-219-8242). My phone is 617-495-9916, and my e-mail is matthew_bunn@harvard.edu. The course assistant for this class is xxx

Assignments and Grading

There are six graded assignments for this course. One is a paper on your best idea to reduce nuclear dangers; a 1-page topic outline will be due early in the semester, and a 4-5 page paper making the case for the importance and feasibility of your idea will be due late in the semester. (It's acceptable to change your initial topic idea, but please let me know if you do.) Two of the assignments are participation in class simulations, one focused on decision-making in a nuclear crisis, and one on a nuclear arms control negotiation. Students will receive somewhat different assignments for the simulations, depending on the roles they are to play. I will provide detailed instructions the week before the simulations. (*Note:* Our first simulation, on Monday, March 4, will extend well beyond our usual class time. Please make arrangements to be available until 6:00PM that day. Our second simulation, of an arms control negotiation, will occur during the week of April 8-12, and will involve extra discussions and work beyond normal class hours.) For both simulations, part of the assignment will be a short memo summarizing your takeaways from the experience. Two of the assignments are policy memos laying out options and making a recommendation related to a particular policy problem; these will be group assignments. The final assignment is a take-home final exam, which students will have a week to complete.

Written assignments must be submitted electronically by 5:00 p.m. on the dates listed below. In accordance with HKS policy, late papers will receive reduced grades, except in exceptional circumstances approved by the instructor.

- #1: February 9, April 22 Topic selection for risk-reduction memo, and final risk-reduction memo
- #2: February 23 First group policy recommendation memo (10%)
- #3: March 7 First simulation exercise and memo (10%)
- #4: March 29 Second group policy recommendation memo (15%)
- #5: April 12 Second simulation exercise and memo (15%)
- #6: May 2 Take-home final exam (25%)

The last 15% of the course grade will be based on participation in class discussion. Note that there are multiple ways to participate, including in class and by offering ideas and articles on the class web page.

Class Schedule

Class	Date:	Subject:
1	22 Jan, Mon	Introduction: Why rethink nuclear deterrence
2	24 Jan, Wed	Brute realities: Nuclear weapons and their effects
3	29 Jan, Mon	Social constructions: How different people understand the bomb
4	31 Jan, Wed	Technical background: nuclear delivery systems and defenses
5	5 Feb, Mon	What can nuclear weapons deter, and how? Deterring large-scale homeland attack, attacks on allies and partners, other challenges
6	7 Feb, Wed	U.S. deterrence ideas and practice over time
7	12 Feb, Mon	Deterrence ideas and practice in Russia, China, and elsewhere
8	14 Feb, Wed	Deterrence dangers: how nuclear wars might start
	19 Feb, Mon	Holiday—President’s Day (No Class)
9	21 Feb, Wed	An evolving world: multipolar deterrence, changing geopolitics, evolving technology
10	26 Feb, Mon	Extended deterrence – mechanisms, benefits, and dangers
11	28 Feb, Wed	What nuclear postures and doctrines, are safest? What other factors affect the risk?
12	4 March, Mon	Simulation 1: Nuclear crisis [maybe do afternoon into evening?]

13	6 March, Wed	Simulation 1 discussion
	11 March, Mon	Spring Break (No Class)
	13 March, Wed	Spring Break (No Class)
14	18 March, Mon	Moral, ethical, legal challenges of nuclear deterrence
15	20 March, Wed	Nuclear risk reduction and arms control: concepts and history
16	25 March, Mon	Nuclear risk reduction and arms control: prospects and proposals
17	27 March, Wed	Evolving technologies and risk reduction measures
18	1 April, Mon	Evolving technologies and risk reduction measures (II)
19	3 April, Wed	The broader nuclear order: nonproliferation, nuclear security, nuclear energy
20	8 April, Mon	Simulation 2: Negotiating arms control
21	10 April, Wed	Simulation 2: Negotiating arms control
22	15 April, Mon	Beyond deterrence 1: concepts and challenges
23	17 April, Wed	Beyond deterrence 2: options and pathways
24	22 April, Mon	Future challenges: addressing obstacles to nuclear change
25	24 April, Wed	Summing up – and career opportunities

Optional Additional Classes

We will offer optional additional classes and review sessions on selected Fridays, 3-4:15PM, in Weil Town Hall. (This will give you the chance to hit “Quorum Call” just afterward.) These will be announced on the Monday before or earlier.

Norms, Expectations, and Readings

HKS is a professional school, training professionals. As such, students are expected to: attend all classes; be on time; submit assignments on time; and do their best to prepare professional products for their assignments. We expect students to build a culture of cooperation and mutual respect in class, including all races, nationalities, genders, past experiences, and other characteristics. Group work will be an important element; please let us know if groups are not working well. This is a discussion-based class, and *class participation is very important*. To be able to participate in the discussion, students are expected to have done the reading *before* each class. (Students need only read the *required* readings; the recommended readings that will be available on the class page are only for those students who want to explore a particular topic further.)

To maximize learning and engagement, in this class, put your computers and personal electronics away. (On a few occasions, with advanced warning, we may ask you to use your phones for a poll or other activity.) Most classes will be a combination of lecture and discussion, sometimes

with work in small groups. I hope that all of you will participate actively, as research shows that leads to greater learning, other students can learn from your insights, and speaking up in discussions is a key professional skill. (As noted above, I also encourage students to participate in discussion on the class page, including by posting articles that may be of interest to other students.) I will not always call first on the first people to raise their hands, as I will be seeking to encourage balanced participation by all students. On occasion, I will cold call students; at the start of some classes, I will ask a few students to summarize key takeaways from particular readings, or to critique an argument from a particular reading, so be prepared. While I encourage class participation, I also discourage anyone from taking more than their share of class time; be considerate of your classmates. I encourage students to offer additional suggestions for class norms and approaches to maximize learning.

Most of the course readings are available on the internet. Those that are not will be posted on the class web page. There is no textbook for this course. If you wanted to start your journey on nuclear deterrence issues with one book, I would suggest Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy: New, Updated, and Completely Revised*, 4th ed. (London: Palgrave MacMillan, 2019). That book has excellent discussions of debates over what forces, force postures, or targeting policies best contribute to nuclear deterrence – but it does not really include fundamental challenges to the idea of nuclear deterrence.

Up-to-date information on issues regularly being shaped by new developments is an important element of policy in this area; course readings will be updated accordingly, and students are encouraged to post interesting items they encounter on the class page.

Note: the readings in this course present a range of views. I will certainly assign readings that I disagree with; indeed, some of the readings disagree with each other. Use your critical reading skills, asking whether the evidence the authors offer seems adequate to support their arguments, and what you think the risks and benefits of the policies the authors advocate might be.

An Important Reminder About Citing Sources: Students *must* be familiar with and observe Kennedy School and Harvard rules regarding the citation of sources. While policy memos in the real world would usually not have footnotes, in this academic environment, they should. Any fact or idea you got from somewhere else should have a footnote or endnote specifying the source. That note should include the usual bibliographic information: author's name, title of article or chapter, venue (book, journal, magazine, website, report, thesis, term paper, private letter), date, and page numbers if applicable. (Note: In my view, a URL by itself is not an adequate reference, as (1) it tells the reader little until the reader clicks on it to see what it is, and (2) URLs go dead frequently. Please provide author, title, date, and publication, to the extent these are available.) Including material from others in assignments, exams, or term papers without appropriate quotation marks and citations is regarded, as a matter of School and University policy, as a serious violation of academic and professional standards and can lead to serious consequences.

An Important Reminder on Using Generative Artificial Intelligence: The professional worlds you are preparing for will likely include regular use of generative AI tools like ChatGPT. Hence, you are allowed to use AI tools to help meet the learning goals of this class. For example, you might use such tools to explore concepts, brainstorm ideas for an assignment, or summarize particular arguments (though that is *not* a substitute for doing the reading). I encourage all students to use the free software package Grammarly to clean up your work before submitting it.

(I once worked as a professional editor, and I consider myself a reasonably careful writer, but Grammarly finds issues in virtually every document I write; I find it extremely helpful.) But beware: AI tools often exude confidence while making egregious factual and logical errors. You are ultimately responsible for the accuracy of any work you submit. It is typically inappropriate to use AI tools to generate first drafts of assignments, as that will usually hinder rather than aid your learning. If you *do* choose to include any AI-generated content in an assignment, it *must* have a footnote or endnote specifying that is where it came from, just as with material taken from any other source. When in doubt, please consult with me about using such tools.

Nuclear Weapons Policy News Sources

In class, we will frequently be discussing events in the news, and students should keep up with at least the biggest news stories unfolding relating to nuclear weapons, nuclear arms control, and nonproliferation. (In some cases, a news story to be discussed will be distributed before class.) Particularly useful sources for proliferation-related news include:

Project on Nuclear Issues (PONI) Nuclear Policy News. Prepared by the PONI group at the Center for Strategic and International Studies, this provides a daily update of nuclear policy news. Subscribe here: <https://nuclearnetwork.csis.org/news/>

Proliferation News. Prepared by the Carnegie Endowment for International Peace's Nuclear Policy program, this source will allow students to keep up with the most important nuclear policy news. Students can sign up for the free e-mail service, or go to the website at <http://carnegieendowment.org/publications/pronews/>.

ArmsControlWonk. Founded by Dr. Jeffrey Lewis (former executive director of the HKS Managing the Atom project), this blog provides in-depth commentary and analysis on a variety of nuclear developments. <http://www.armscontrolwonk.com>

Nonproliferation Policy Education Center Twitter Feed. Aggregates stories related to nuclear weapons, nonproliferation, and nuclear energy issues. <https://twitter.com/nuclearpolicy> and also emails a weekly summary. (Many of the sources above also have twitter feeds.)

Belfer Center for Science and International Affairs resources:

Managing the Atom <http://www.belfercenter.org/project/managing-atom>

Readings and other media (to be updated as the semester proceeds)

Class 1: 22 Jan: Introduction: Why rethink nuclear deterrence

Learning objective: Nuclear deterrence carries with it key dangers; those dangers are changing, with evolving geopolitics and technology; there are widely differing perspectives on the topic.

Required:

This syllabus.

Matthew Bunn, "Why Rethink Nuclear Deterrence," December 2023. (Available on class web page.)

William J. Perry, "My Personal Journey at the Nuclear Brink," *European Leadership Network*, 17 June 2013, <https://www.europeanleadershipnetwork.org/commentary/my-personal-journey-at-the-nuclear-brink/> (From a former U.S. Secretary of Defense, this recounts his experiences in several nuclear crises; Perry later expanded these few pages into a book.)

Madelyn Creedon, chair, *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, D.C.: Institute for Defense Analyses, October 2023), <https://www.ida.org/research-and-publications/publications/all/a/am/americas-strategic-posture>, Preface and Executive Summary, pp. v-xi. (A bipartisan commission calls for a U.S. nuclear buildup to address evolving deterrence challenges.)

Amb. Alexander Kmentt, "Keynote Address," Arms Control Association Annual Meeting, 2 June 2023, <https://www.armscontrol.org/2023AnnualMeeting/Kmentt-remarks> (A case for the Treaty on the Prohibition of Nuclear Weapons from an Austrian ambassador who has been one of the leaders of that effort.)

Manpreet Sethi, "Complexities of Achieving Strategic Stability in Southern Asia: An Indian Perspective" (Toda Peace Institute and Norwegian Institute of International Affairs, Policy Brief 90, September 2020), https://toda.org/assets/files/resources/policy-briefs/t-pb-90_manpreet-sethi.pdf (A leading Indian scholar outlines, from India's perspective, the complexities of finding a path to stable deterrence between India, China, and Pakistan.)

Rodric Braithwaite, "Epilogue: Russian Roulette," in Braithwaite, *Armageddon and Paranoia: the Nuclear Confrontation Since 1945* (Oxford: Oxford University Press, 2018), pp. 394-404.

Matthew Bunn, "A Darkening Horizon: Nuclear Challenges Around the World," presentation, October 10, 2023, https://scholar.harvard.edu/sites/scholar.harvard.edu/files/matthew_bunn/files/darkeninghorizon-10-2023.pdf (A summary of current nuclear dangers. A video of the presentation and Q&A is available [here](#) for those who are interested.)

Class 2: 24 Jan: Brute realities: nuclear weapons and their effects

Learning objective: Nuclear weapons have fearsome destructive power, but it is not true, for example, that Russia could not use them in Ukraine without major damage to Russia.

Required:

Watch Bunn video on "How Nuclear Weapons Work" on the class web page. (The YouTube version has 2.1 million views!)

Watch Erik Barnouw, "Hiroshima/Nagasaki, August 1945," (film, 15 minutes), Columbia University, 1969, <https://archive.org/details/hiroshimanagasakiagust1945#>. (A powerful 15 minutes of footage of the aftermath of the bombings. Give yourself some time for emotional recovery after watching it.)

Use the online tool "Nukemap" to observe the effects of a 15-kiloton nuclear weapon (comparable to the Hiroshima bomb) and a 400-kiloton nuclear weapon (comparable to many modern thermonuclear weapons) detonated over Boston or another major city of your choice. Try both airbursts and groundbursts. "Nukemap" is here: <http://www.nuclearsecrecy.com/nukemap>.

Yamaoko Michiko, "We Must Doubt as Well as Trust," in Lequita Vance-Watkins and Mariko Aratani, eds., *White Flash/Black Rain: Women of Japan Relive the Bomb* (Minneapolis: Milkweed Editions, 1995), pp. 71-75. (Offers a personal account of the suffering nuclear weapons inflict.)

Lynn Eden, "Complete Ruin," in Lynn Eden, *Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation* (Ithaca, N.Y.: Cornell, 2006), pp. 13-36. (A good overview of

the impact of a nuclear weapon. The entire book is recommended, offering a fascinating discussion of the organizational reasons why U.S. analyses of strategic requirements largely ignored mass fires, one of the most devastating effects of nuclear weapons.)

M.V. Ramana, "A Nuclear Blast Over Bombay," in Beatrice Fihn, ed., *Unspeakable Suffering: The Humanitarian Impact of Nuclear Weapons* (Geneva: Reaching Critical Will, 2013), pp. 94-97. (A useful brief summary of the impacts in a developing world context.)

Alexandra Witze, "How a Small Nuclear War Would Transform the Entire Planet," *Nature*, March 16, 2020. (A news story describing recent research suggesting that the smoke from burning cities in a nuclear conflict could cause major climate and agriculture impacts, greatly increasing the damage from a nuclear war.)

Class 3: 29 Jan: Social constructions: How different people understand the bomb

Learning objective: While the fearsome destructive power of nuclear weapons is a fact, people in different times and different countries have thought about that fact in many different ways; the current approach of the American national security establishment is only one of many ways to frame the problem.

Required:

Gen. Anthony J. Cotton, Commander, U.S. Strategic Command, Statement to the House Armed Services Committee, Subcommittee on Strategic Forces, March 8, 2023, <https://www.stratcom.mil/2023-Posture-Statement/>, pp. 1-19. (This is the annual posture statement from U.S. STRATCOM, reflecting the current perspective of that U.S. command on nuclear weapons and nuclear deterrence.)

"The Russell-Einstein Manifesto," July 9, 1955, <https://ahf.nuclearmuseum.org/ahf/key-documents/russell-einstein-manifesto/> (This manifesto from Bertrand Russell and Albert Einstein, also signed by some of the other leading scientists of the day, became the founding document for the Pugwash Conferences on Science and World Affairs, a non-government group of scientists whose discussions helped pave the way for key nuclear arms control agreements and which shared the Nobel Peace Prize with Pugwash co-founder Josef Rotblat in 1995; HKS Prof. John Holdren, then chairman of Pugwash's International Council, gave the Nobel acceptance speech on Pugwash's behalf.)

Stephen Walt, "Rethinking the 'Nuclear Revolution'," *Foreign Policy*, August 3, 2010, <https://foreignpolicy.com/2010/08/03/rethinking-the-nuclear-revolution/>

Alexei Arbatov, "Nuclear Deterrence: A Guarantee or Threat to Strategic Stability?" (Washington, D.C.: Carnegie Endowment for International Peace, March 22, 2019) <https://carnegieendowment.org/2019/03/22/nuclear-deterrence-guarantee-or-threat-to-strategic-stability-pub-78663> (This article, from a leading Russian arms control expert – once a legislator for the liberal Yaboloko party – argues that deterrence can only provide stability if coupled with cooperative measures such as negotiated arms accords.)

Tong Zhao, "What's Driving China's Nuclear Buildup?" (Washington, D.C.: Carnegie Endowment for International Peace, August 5, 2021), <https://carnegieendowment.org/2021/08/05/what-s-driving-china-s-nuclear-buildup-pub-85106>

(Zhao argues that Chinese leaders see political advantages in building a larger nuclear force, and believe that “the United States won’t drop its hostility against China unless its hand is forced by robust Chinese strategic power.”)

Beatrice Fihn, “International Campaign to Abolish Nuclear Weapons: Nobel Lecture,” December 10, 2017, <https://www.nobelprize.org/prizes/peace/2017/ican/lecture/> (Fihn, leader of the International Campaign to Abolish Nuclear Weapons, which won the Nobel Peace Prize in 2017, warns that humanity faces a choice between “the end of nuclear weapons” and “the end of us.”)

John Mueller, “Nuclear Weapons Don’t Matter,” *Foreign Affairs*, Vol. 97, No. 6, (November/December 2018), <https://politicalscience.osu.edu/faculty/jmueller/FAnukes2018finful.pdf> (As the title suggests, Mueller argues that nuclear weapons have not been needed to deter a Third World War and have had little impact on international politics, beyond wasting a great deal of money. This is the first article in a special issue of *Foreign Affairs* devoted to different perspectives on nuclear weapons, all of which are well worth reading.)

Olamide Samuel and Joellen Pretorius, “Africa and the Atomic Bomb: Part I,” *Inkstick*, May 26, 2021 <https://inkstickmedia.com/africa-and-the-atomic-bomb-part-i/> (A description of Africa’s role in building today’s global nuclear order.)

Class 4: 31 Jan: Technical background: nuclear delivery systems and defenses

Learning objective: Basics of the technology of missiles and aircraft for nuclear weapons delivery, their launch platforms, and the advantages and disadvantages states might perceive for each type of system; also, the basic issues of strategic air and missile defenses.

Required:

Kingston Rief and Travis Sharp, “Pruning the Nuclear Triad? Pros and Cons of Submarines, Bombers, and Missiles,” Center for Arms Control and Nonproliferation, May 16, 2013, <https://armscontrolcenter.org/pruning-the-nuclear-triad-pros-and-cons-of-submarines-bombers-and-missiles/>

Gen. C. Robert Kehler, USAF (ret.), “The U.S. Needs a New ICBM Now,” National Institute for Public Policy, Information Series, No. 444, August 16, 2019, <http://www.nipp.org/wp-content/uploads/2019/08/IS-444.pdf>

David Wright and Cameron Tracy, “The Physics and Hype of Hypersonic Weapons,” *Scientific American*, August 1, 2021, <https://www.scientificamerican.com/article/the-physics-and-hype-of-hypersonic-weapons/>

Hans M. Kristensen, Matt Korda, Eliana Johns, and Kate Kohn, “Status of World Nuclear Forces,” March 31, 2023, <https://fas.org/initiative/status-world-nuclear-forces/>.

“U.S. Missile Defense Programs at a Glance,” *Arms Control Association*, (last updated August 2019), <http://www.armscontrol.org/factsheets/usmissiledefense>

Steve Pifer, “The Limits of U.S. Missile Defense,” *The National Interest*, March 30, 2015, <https://nationalinterest.org/feature/the-limits-us-missile-defense-12503>

“U.S. Missile Defense System in Europe May Be Used Against Russia – Putin,” *TASS*, 18 June 2016, <http://tass.ru/en/politics/883251>

Laura Grego and David Wright, “Why a Missile Defense System in Space is a Bad Idea,” *Politico*, August 10, 2018, <https://www.politico.com/story/2018/08/10/space-missile-defense-system-opinion-768941>

At least two of the following:

Hans M. Kristensen and Matt Korda, “Chinese Nuclear Forces, 2023,” *Bulletin of the Atomic Scientists*, Vol. 79, No. 2 (March 2023) pp. 108-133, <https://www.tandfonline.com/doi/pdf/10.1080/00963402.2020.1846432?>

Hans M. Kristensen and Matt Korda, “Russian Nuclear Forces, 2022,” *Bulletin of the Atomic Scientists*, Vol. 78, No. 2 (February 2022), pp. 98-121 <https://www.tandfonline.com/doi/pdf/10.1080/00963402.2022.2038907?>

Hans M. Kristensen and Matt Korda, “United States Nuclear Forces, 2023,” *Bulletin of the Atomic Scientists*, Vol. 79, No. 1 (May 2022), pp. 28-52, <https://www.tandfonline.com/doi/full/10.1080/00963402.2022.2156686>

Class 5: 5 Feb: What can nuclear weapons deter, and how? Deterring large-scale homeland attack, small nuclear strikes, large conventional attacks, and more

Learning objective: Both *capability* to carry out a threat and *credibility* that a state would be willing to do so are crucial to nuclear deterrence. Nuclear weapons can only deter those adversary actions which the adversary thinks might realistically lead to nuclear weapons being used.

Heather Williams, Vipin Narang, Mark Bell, Jane Vaynman, and others, “Nuclear Deterrence 101” (Washington, D.C.: Program on Nuclear Issues, Center for Strategic and International Studies, 2021), <https://nuclearnetwork.csis.org/projects/deterrence-101/> (Video, 3 parts, 1.5 hours total.)

Joshua Pollack, “Thomas Schelling: Deterrence in Europe,” <https://www.armscontrolwonk.com/archive/1202672/thomas-schelling-deterrence-in-europe/> January 2, 2017, and “Thomas Schelling: Compellence in Asia,” January 3, 2017, <https://www.armscontrolwonk.com/archive/1202678/thomas-schelling-compellence-in-asia/> (Provides a useful overview of how American thinking on limited nuclear options and threats that “leave something to chance” were shaped by the difficulty of defending, and deterring attacks against, far-flung U.S. allies vulnerable to major conventional attacks.)

Manpreet Sethi, “Dissecting the Idea of Limited Nuclear War,” *NuClearly Put* (Delhi: Centre for Air Power Studies, 31 August 2013). https://cms.apln.network/wp-content/uploads/2023/09/CAPS_NuClearly-Put_MS_31_08_23.pdf (Another critique of the idea that a nuclear conflict could remain limited, this time from an Indian perspective.)

Jeffrey Lewis and Aaron Stein, “Who is Deterring Whom? The Place of Nuclear Weapons in Modern War,” *War on the Rocks*, June 16, 2022, <https://warontherocks.com/2022/06/who-is-deterring-whom-the-place-of-nuclear-weapons-in-modern-war/> (Outlines some of the “frustrations” faced by nuclear powers in limited conflicts, in Ukraine and more broadly.)

Eric Schlosser, “What if Russia Uses Nuclear Weapons in Ukraine? A Look at the Grim Scenarios – and the U.S. Playbook for Each,” *The Atlantic*, June 20, 2022, <https://www.theatlantic.com/ideas/archive/2022/06/russia-ukraine-nuclear-weapon-us-response/661315/> (An exploration of the implications of nuclear deterrence thinking for the current war in Ukraine.)

Class 6: 7 Feb: U.S. deterrence ideas and practice over time

Learning objective: From “massive retaliation” to today’s concepts of “integrated” and “tailored” deterrence, U.S. deterrence ideas have evolved a great deal over time – but “counterforce” targeting of adversary missile silos and other nuclear forces has been a constant. Practices have also evolved; in particular, today the United States has many fewer “tactical” nuclear weapons, and nuclear weapons are under much tighter, safer, central control than they once were.

Matthew Bunn, “Understanding Potential Pathways to Nuclear War Through the Ideas of Wohlstetter, Schelling, and Sagan,” unpublished memo, 2019. (Describes some of the ideas of key U.S. nuclear strategists about how deterrence might fail.)

Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy: New, Updated, and Completely Revised*, 4th ed. (London: Palgrave MacMillan, 2019), “No Cities,” pp. 301-318. (A description of a key 1960s debate about nuclear strategy that previews later debates about whether nuclear war could be limited and how to try to avoid getting to all-out nuclear war even once the nuclear threshold is crossed.)

William Burr, “Looking Back: The Limits of Limited Nuclear War,” *Arms Control Today*, January/February 2006, <https://www.armscontrol.org/act/2006-01/looking-back-limits-limited-nuclear-war> (Outlines debates in the Nixon administration about moving from a “Single Integrated Operational Plan” offering options only for massive nuclear attacks to planning that included options for limited nuclear strikes – and the debates, still relevant today, about whether planning for limited nuclear war is relevant or possible.)

Cheryl Rofer, “Low-Yield Nukes are a Danger, Not a Deterrent,” *Foreign Policy*, February 11, 2020, <https://foreignpolicy.com/2020/02/11/deterrence-nuclear-war-low-yield-nukes-danger-not-deterrent/>. (An argument against the Trump administration decision to deploy a low-yield submarine-launched ballistic missile (SLBM) warhead.)

Frank Miller, “Addressing Fears About the Nuclear Posture Review and Limited Nuclear Use,” *War on the Rocks*, February 28, 2018, <https://warontherocks.com/2018/02/addressing-fears-nuclear-posture-review-limited-nuclear-use/>. (A defense of the new initiatives in the Trump nuclear posture review, including the low-yield SLBM warhead, from a former Defense Department nuclear official who advised the review.)

Class 7: 12 Feb: Deterrence ideas and practice in Russia, China, and elsewhere

Learning objective: Russia, China, and other nuclear-armed states have taken different approaches to nuclear deterrence, which have also evolved over time. There is no “one size fits all” approach.

Required:

(Review the Tong Zhao reading from Class 3.)

Vipin Narang, "What Does It Take to Deter? Regional Power Nuclear Postures and International Conflict," *Journal of Conflict Resolution*, Vol. 57, No. 3 (June 2013), pp. 478-508, <https://www.jstor.org/stable/23414723> (Outlines a theory of why different regional powers adopt particular nuclear postures for their deterrence needs; the book-length version of the argument is in the recommended section.)

Michael Kofman and Anya Loukianova Fink, "Escalation Management and Nuclear Employment in Russian Military Strategy," *War on the Rocks*, September 19, 2022, <https://warontherocks.com/2022/09/escalation-management-and-nuclear-employment-in-russian-military-strategy-2/> (Based on a study of hundreds of articles in Russian military journals, provides a useful overview of Russian thinking on under what circumstances nuclear weapons might be used. The full study is in the "recommended" section.)

Dmitri Trenin, "Strategic Stability in the Changing World," Carnegie Moscow Center, March 2019, https://carnegieendowment.org/files/3-15_Trenin_StrategicStability.pdf (A view of the Russian approach from a Russian author who was then a leading Russian liberal nuclear analyst, but who has swung to an extremely hawkish view since the invasion of Ukraine.)

Kristin ven Bruusgard, "Russian Strategic Deterrence," *Survival*, Vol. 58, No. 4 (2016), pp. 7-26, <https://www.tandfonline.com/doi/full/10.1080/00396338.2016.1207945> (Summarizes how Russia thinks about nuclear weapons and deterrence – but came before both Russia's 2020 published nuclear doctrine and Russia's many nuclear threats during the Ukraine war. The author, one of the leading European experts on Russian nuclear doctrine, now leads the Norwegian Intelligence School.)

Liping Xia, "China's Nuclear Doctrine: Debates and Evolution," Carnegie Endowment for International Peace, June 30, 2016, <https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967> (Describes China's approach, sometimes described as "the minimum means of reprisal." This was written prior to the current major buildup of China's nuclear forces. Note: only the section entitled "The Key Features of China's Nuclear Doctrine" is required.)

M. Taylor Fravel, Henrik Stalhane Hiim, and Magnus Langset Traan, "China's Misunderstood Nuclear Expansion," *Foreign Affairs*, November 10, 2023, <https://www.foreignaffairs.com/china/chinas-misunderstood-nuclear-expansion>

Manpreet Sethi, "Perceptions of India's Nuclear Capability Buildup: Ghost Hunting and a Reality Check," *The Diplomat*, April 2, 2019, <https://thediplomat.com/2019/04/perceptions-of-indias-nuclear-capability-buildup-ghost-hunting-and-a-reality-check/> (Argues that India is not pursuing and should not pursue a counterforce capability to strike Pakistan's nuclear forces.)

Sitara Noor, "Pakistan's Evolving Nuclear Doctrine," *Arms Control Today*, October 2023, <https://www.armscontrol.org/act/2023-10/features/pakistans-evolving-nuclear-doctrine>

Class 8: 14 Feb: Deterrence dangers: how nuclear wars might start

Learning objective: The record of the nuclear age makes clear that in intense crises, events can get out of control; on several occasions, there was a significant danger that nuclear weapons would be used in combat again. It's possible to categorize different potential motivations for leaders to use nuclear weapons – and actions in most of those categories have been planned or considered during the course of the nuclear age. Understanding how nuclear war might start helps us understand how best to reduce the danger.

Required:

(Review the Bunn memo on the ideas of Wohlstetter, Schelling, and Sagan from Class 3.)

Matthew Bunn, “Preventing Nuclear War in a Multipolar Era of Great-Power Hostility and Evolving Technology,” presentation, October 26, 2023 (on Canvas page).

Caitlin Talmadge, “Beijing’s Nuclear Option: Why a U.S.-Chinese War Could Spiral Out of Control,” *Foreign Affairs*, Vol. 97, No. 6 (November/December 2018), <https://www.jstor.org/stable/26797931?seq=8>, pp. 44-51.

Paul K. Davis and Bruce W. Bennett, “Nuclear-Use Cases for Contemplating Crisis and Conflict on the Korean Peninsula,” *Journal for Peace and Nuclear Disarmament*, Vol. 5, Sup. 1 (2022), pp. 24-49, <https://doi.org/10.1080/25751654.2022.2053426>

Manpreet Sethi, “Nuclear Risks in Southern Asia: The Chain Conundrum,” in Wilfred Wan., ed., *Nuclear Risk Reduction: Closing Pathways to Use* (Geneva: United Nations Institute for Disarmament Research, 2020), <https://unidir.org/wp-content/uploads/2023/05/19-Aug-2020-%E2%80%94Nuclear-Risk-Reduction-Closing-Pathways-to-Use.pdf>, pp. 139-156.

19 Feb, Mon: Holiday—President’s Day (No Class)

Class 9: 21 Feb: An evolving world: multipolar deterrence, changing geopolitics, evolving technology

Learning objective: The world nuclear picture is becoming more dangerous, with Russia’s ongoing war on Ukraine; intense hostility among nuclear-armed states; a shift toward a more complex multipolar nuclear order; and evolving technologies that complicate nuclear balances and may make them more dangerous.

Madelyn Creedon, chair, *America’s Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, D.C.: Institute for Defense Analyses, October 2023), <https://www.ida.org/research-and-publications/publications/all/a/am/americas-strategic-posture>, pp. 11-24.

Ankit Panda, “Multipolarity, Great Power Competition, and Nuclear Risk Reduction,” in Wilfred Wan, ed., *Nuclear Risk Reduction: Closing Pathways to Nuclear Use* (Geneva: United Nations Institute for Disarmament Research, 2020), <https://unidir.org/publication/nuclear-risk-reduction-closing-pathways-to-use/>, pp. 56-70.

[Additional readings to come.]

Class 10: 26 Feb: Extended deterrence – mechanisms, benefits, and dangers

Learning objective: Making it credible that the United States would risk nuclear retaliation to defend its allies has always been difficult – and there are real uncertainties over what factors are most important in making extended deterrence work. Extended deterrence has real benefits – but it also carries serious dangers.

John J. Hamre and Joseph S. Nye, Jr., co-chairs, “North Korea Policy and Extended Deterrence” (Washington, D.C.: Center for Strategic and International Studies, January 2023), <https://www.csis.org/analysis/recommendations-north-korea-policy-and-extended-deterrence> (A commission involving some of the leading U.S. experts on security policy and Korea offers recommendations both on talks with North Korea and on strengthening extended deterrence – including a robust ability to attack and to defend against North Korean missiles.)

Rose Gottemoeller, “NATO Nuclear Policy in a Post-INF World,” speech, September 9, 2019, https://www.nato.int/cps/en/natohq/opinions_168602.htm. (Summarizes NATO’s nuclear policies for extended deterrence, in the years after Russia’s 2014 seizure of Crimea and the U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty, in response to Russian violations of the accord, but before Russia’s full-scale invasion of Ukraine in February 2022.)

Susan Koch, “Extended Deterrence and the Future of the Nonproliferation Treaty,” https://cgsr.llnl.gov/content/assets/docs/Security_Assurances_and_NPT_8-29.pdf (This article describes the importance of U.S. assurances that it will defend its allies to their choices not to build their own nuclear weapons.)

[Additional readings to come.]

Class 11: 28 Feb: What nuclear postures and doctrines, are safest? What other factors affect the risk?

Learning objective: Different nuclear postures – types of forces, alert rates, doctrines on when nuclear weapons might be used – carry different dangers; on some aspects, experts disagree fiercely over what approaches most reduce the risk.

Jeffrey Lewis, “Minimum Deterrence,” *Bulletin of the Atomic Scientists*, Vol. 64, No. 3 (July/August 2008), pp. 38-41 http://www.newamerica.net/publications/articles/2008/minimum_deterrence_7552 (A useful brief presentation of the argument that deterrence only requires a modest number of survivable nuclear weapons.)

McGeorge Bundy, “To Cap the Volcano,” *Foreign Affairs*, Vol. 48, No. 1, October 1969, <http://ezp-prod1.hul.harvard.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=5802706&site=ehost-live&scope=site> (A classic argument that beyond a few survivable nuclear weapons, more does not help for nuclear deterrence.)

Keith B. Payne et al., *Minimum Deterrence: Examining the Evidence* (Fairfax, Vir.: National Institute for Public Policy, 2013), Executive Summary, pp. xiii-xxv. <http://www.nipp.org/Final%20for%20Distro%207.17.pdf> (A fierce critique of the minimum deterrence argument.)

[Additional readings to come.]

Class 12: 4 March: Simulation 1: Nuclear crisis [maybe do afternoon into evening?]**Class 13: 6 March: Simulation 1 discussion**

Simulation learning objective: There are no easy answers to how to protect national interests without provoking a conflict to escalate.

11 March: Spring Break (No Class)

13 March: Spring Break (No Class)

Class 14: 18 March: Moral, ethical, legal challenges of nuclear deterrence

Learning Objective: There are serious debates about the morality and legality of nuclear deterrence, relying on weapons with such broad and indiscriminate destructive power – and with elites of only a few states making decisions about them and imposing resulting risks on everyone.

Required:

Joseph S. Nye, “Nuclear Ethics Revisited,” *Ethics and International Affairs*, Vol. 37, No. 1 (Spring 2023), pp. 5-17, <https://doi.org/10.1017/S0892679423000047>. (This article updates arguments from Nye’s 1986 book, *Nuclear Ethics*. It is the first part of a symposium, with a range of responses to Nye’s arguments.)

Maryann Cusimano Love, “The Papal Vision: Beyond the Bomb,” *Arms Control Today*, May 2020, <https://www.armscontrol.org/act/2020-05/features/papal-vision-beyond-bomb>. (A discussion of Pope Francis’ modification of Catholic doctrine: rather than accepting nuclear deterrence a necessary evil in some circumstances, Pope Francis condemns nuclear deterrence as immoral.)

Scott Sagan and Allen S. Weiner, “The Rule of Law and the Role of Strategy in U.S. Nuclear Doctrine,” *International Security*, Vol. 45, No. 4 (Spring 2021), https://doi.org/10.1162/isec_a_00407, pp. 126-166. (Leading nuclear scholars argue that U.S. nuclear strategy needs to be modified to fully meet its goal of complying with the laws of armed conflict.)

Steve Fetter and Charles Glaser, “Legal, but Lethal: The Law of Armed Conflict and U.S. Nuclear Strategy,” *Washington Quarterly*, Vol. 45, No. 1 (Spring 2022), <https://doi.org/10.1080/0163660X.2022.2054121>, pp. 25-37. (A reply to Sagan and Weiner, arguing that the law of armed conflict provides “dangerous guidance” for U.S. nuclear strategy.)

Nina Tannenwald, “The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use,” *International Organization*, Vol. 53, No. 3 (1999), pp. 433-468. (A classic article – later expanded into a book – arguing that the tradition of non-use of nuclear weapons is now so strong that it has become a “taboo,” significantly affecting state decision-making.)

Scott D. Sagan and Benjamin A. Valentino, “Revisiting Hiroshima in Iran: What Americans Really Think about Using Nuclear Weapons and Killing Noncombatants,” *International Security*, Vol. 42, No. 1 (Summer 2017), pp. 41-79, https://doi.org/10.1162/ISEC_a_00284. (In part a response to Tannenwald, survey experiments show that the American public is quite willing to support using nuclear weapons, and to support slaughtering large numbers of innocent

civilians, if the government says it is necessary to save American troops. Replications in other countries suggest that while there is some variation, Americans are not unique.)

Class 15: 20 March: Nuclear risk reduction and arms control: concepts and history

Learning objective: Negotiating with adversaries can help constrain dangerous arms competitions, manage tensions, and limit perceptions of the adversary threat. Agreements so far have had a mixed record on genuinely achieving these objectives. But in some cases, especially dark periods of relations have been followed by arms control progress.

[Readings to come.]

Class 16: 25 March: Nuclear risk reduction and arms control: prospects and proposals

Learning objective: Future nuclear arms control – if it happens at all – will have to grapple with more players and more technologies affecting strategic balances, in an environment of very high hostility and memories of violations of and withdrawals from past accords. Nevertheless, a variety of ideas have been proposed to address some of the most critical issues.

[Readings to come.]

Class 17: 27 March: Evolving technologies and nuclear dangers

Learning objective: A slew of evolving technologies – improving missile defenses, long-range precision conventional strike systems, space and counter-space technologies, cyber, artificial intelligence and weapons autonomy, hypersonic weapons, and more – will complicate future strategic balances and may make them more dangerous.

Required:

Christopher F. Chyba, “New Technologies and Strategic Stability,” *Daedalus*, Vol. 149, No. 2 (Spring 2020), pp. 151-170. (Offers an excellent framework for thinking through the impact of evolving technologies, and applies it to consider several technologies of current concern.)

Anthony Aguirre, Emilia Javorsky, and Max Tegmark, “‘Artificial Escalation’: Imagining the Future of Nuclear Risk,” *Bulletin of the Atomic Scientists*, July 17, 2023, <https://thebulletin.org/2023/07/artificial-escalation-imagining-the-future-of-nuclear-risk/> (Read and watch accompanying 8-minute video, “Artificial Escalation.” Outlines how even applications of AI that leave human beings making the final decisions could increase the pace of decision, preprocess information for the human decision-makers, and play other roles that could increase the dangers of unintended escalation.)

Adam Lowther and Curtis McGuffin, “America Needs a ‘Dead Hand’,” *War on the Rocks*, August 16, 2019, <https://warontherocks.com/2019/08/america-needs-a-dead-hand/>. (Makes the case in favor of automating the decision to launch nuclear weapons.)

James N. Miller and Richard Fontaine, *A New Era in U.S.-Russia Strategic Stability: How Changing Geopolitics and Emerging Technologies are Reshaping Pathways to Crisis and*

Conflict (Washington, D.C.: Center for a New American Security, September 2017), <https://www.cnas.org/publications/reports/a-new-era-in-u-s-russian-strategic-stability> (Provides a useful exploration of how cyber and counter-space technologies in particular may affect risks of escalation of conflicts to nuclear use, including arguments that in both domains there may be incentives to strike first, and hard, should conflict arise.)

Michael T. Klare, “Assessing the Dangers: Emerging Military Technologies and Nuclear (In)Stability” (Washington, D.C.: Arms Control Association, February 2023), https://www.armscontrol.org/sites/default/files/files/Reports/ACA_Report_EmergingTech_digital.pdf

John Borrie, “Nuclear Risk and the Technological Domain: A Three-Step Approach,” in Wan, ed., *Nuclear Risk Reduction*, pp. 71-94.

Henry Sokolski, “Commercial Interruption: Space Wargame Exposes Risk of Dangerous Escalation,” *Space News*, October 12, 2023. (Describes a war game that suggested that attacks on satellites – including commercial satellites being used in a conflict – could lead to broader conflict.)

Class 18: 1 April: Evolving technologies and risk reduction measures

Learning objective: A variety of ideas have been proposed for reducing the dangers that might be posed by evolving technologies. In many cases, however, traditional arms control that focused on large, countable items that could be verified with confidence may not be feasible or appropriate – and some adversaries may ignore agreed “rules of the road” when a crisis breaks out.

Required:

Ulrich Kühn and Heather Williams, “A New Approach to Arms Control: How to Safeguard Nuclear Weapons in an Era of Great-Power Politics,” *Foreign Affairs*, June 14, 2023, <https://www.foreignaffairs.com/united-states/new-approach-arms-control>

Ann Finkbeiner, “How Do We Prevent War in Space?” *Scientific American*, November 1, 2020.

Shannon Bugos, “Arms Control Tomorrow: Strategies to Mitigate the Risk of New and Emerging Technologies” (Washington, D.C.: Arms Control Association, May 2023), https://www.armscontrol.org/sites/default/files/files/Reports/ACA_Report_ArmsControlTomorrow.pdf

[Additional readings to come.]

Class 19: 3 April: The broader nuclear order: nonproliferation, nuclear security, nuclear energy

Learning objective: Nuclear deterrence policies are one part of a broader global order intended to limit the dangers posed by nuclear technologies. That global order has been strikingly successful – but may be weakening.

Required:

Matthew Bunn, “The Success and Resilience of the NPT.” (Memo, on the Canvas page; an argument that the nuclear Nonproliferation Treaty regime has been successful and shows strong signs of resilience.)

Alexander K. Bollfrass and Stephen Herzog, “The War in Ukraine and Global Nuclear Order,” *Survival: Global Politics and Strategy*, Vol. 64, No. 4 (2022), <https://doi.org/10.1080/00396338.2022.2103255>, pp. 7-32. (Probably the best available assessment of how Russia’s aggression against Ukraine is affecting various aspects of global governance of nuclear technologies.)

Joan Rohlfing, Samantha Pitts-Kiefer, and Andrew Bieniawski, “Global Dialogue on Nuclear Security Priorities: Building an Effective Nuclear Security System” (Washington, D.C.: Nuclear Threat Initiative, March 2016) <https://www.jstor.org/stable/resrep14248>. (A useful description of the global arrangements for ensuring that nuclear weapons, materials, and facilities are secure and accounted for and how they might be strengthened.)

International Atomic Energy Agency, “IAEA Safeguards: An Overview,” video, March 31, 2014, <https://www.iaea.org/newscenter/multimedia/videos/iaea-safeguards-overview>. (Tero Varjoranta, then the head of the Safeguards Division of the IAEA, provides a brief overview of IAEA safeguards and how they work.)

Nicholas Miller, “Why Nuclear Energy Programs Rarely Lead to Proliferation,” *International Security*, Vol. 42, No. 2 (Fall 2017), pp. 40-77.

Class 20: 8 April: Simulation 2: Negotiating arms control

Class 21: 10 April: Simulation 2: Negotiating arms control

Simulation learning objective: Experiencing the challenge of reaching accords among countries with differing interests and perceptions, over a range of issues and technologies; thinking from other countries’ perspectives.

[No required readings.]

Class 22: 15 April: Beyond deterrence 1: concepts and challenges

Learning objective: A variety of ideas for getting beyond relying on nuclear deterrence for security have been proposed over the decades – but the challenges to doing so are substantial.

Required:

George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, “A World Free of Nuclear Weapons,” *Wall Street Journal*, January 4, 2007, https://media.nti.org/pdfs/NSP_op-eds_final_.pdf (This op-ed calling for abolishing nuclear weapons, by two Republican and two Democratic former national security officials, made it clear that this idea was not solely the province of naïve leftists. The link also provides other op-eds in the series by the same authors.)

[Review the Beatrice Fihn speech from Class 3 and the Alexander Kmentt speech from Class 1.]

George Perkovich and James M. Acton, “Abolishing Nuclear Weapons,” in George Perkovich and James M. Acton, eds., *Abolishing Nuclear Weapons: A Debate* (Washington, D.C.: Carnegie

Endowment for International Peace, 2009), https://carnegieendowment.org/files/abolishing_nuclear_weapons_debate.pdf pp. 13-24, 49-75, 99-114, 133-138. (While now somewhat old, this piece explores many of the key issues that would be involved in prohibiting nuclear weapons.)

Rebecca Davis Gibbons, “The Humanitarian Turn in Nuclear Disarmament and the Treaty on the Prohibition of Nuclear Weapons,” *Nonproliferation Review*, Vol. 25, No. 1-2 (2018), pp. 11-36, <https://doi.org/10.1080/10736700.2018.1486960>. (This piece recounts how advocates of disarmament turned to emphasizing the terrible potential human consequences of nuclear war, and built a movement among non-nuclear-weapon states that produced the nuclear weapons ban treaty – now in force, but with none of the states that actually possess nuclear weapons taking part.)

Class 23: 17 April: Beyond deterrence 2: options and pathways

Learning objective: Different paths and approaches might increase the chance of building toward a world in which nuclear weapons were no longer needed – but each faces their own challenges and criticisms.

[Readings to come.]

Class 24: 22 April: Future challenges: addressing obstacles to nuclear change

Learning objective: Past efforts have managed to greatly reduce the risks once posed by nuclear deterrence. But change is difficult: the institutional momentum of current approaches to nuclear deterrence is substantial. While it’s important to be realistic, there are some reasons to be hopeful that safer nuclear worlds are possible.

[Readings to come.]

Class 25: 24 April: Summing up – and career opportunities

Learning objective: To limit nuclear dangers in the complex world that’s now arising will require a whole new generation of nuclear experts; being part of reducing the danger of nuclear war can be a very satisfying career.

[Readings to come.]

Books that students may find useful

Graham T. Allison and Philip D. Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed. (Reading, Mass.: Longman, 1999). (A classic on different models of government decision-making – and on how they can be used to understand the Cuban Missile Crisis.)

Martin Sherwin, *Gambling with Armageddon: Nuclear Roulette from Hiroshima to the Cuban Missile Crisis* (New York: Knopf, 2020). (A recent outstanding addition to the large literature on the Cuban crisis and its dangers.)

Eric Schlosser, *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety* (New York: Penguin, 2013). (A thoroughly reported account of the dangers of nuclear weapons accidents and false alarms, and the efforts to cope with them over the years.)

Scott Sagan and Vipin Narang, eds. *The Fragile Balance of Terror: Deterrence in the New Nuclear Age* (Ithaca, N.Y.: Cornell University Press, 2023). (A collection of leading American scholars ponders the dangers of a more multipolar nuclear world with evolving technologies; in most cases, they are alarmed.)

Daniel Ellsberg, *The Doomsday Machine: Confessions of a Nuclear War Planner* (New York: Bloomsbury Publishing, 2017). (A remarkable account of how dangerous U.S. policies actually were in the 1950s and 1960s, including pre-delegating authority to launch to many regional commanders and instructing them to launch if they thought nuclear war might be under way and they unable to communicate with Washington. Many other interesting details.)

For students wishing to delve deeper into the classics of deterrence theory:

Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy: New, Updated, and Completely Revised*, 4th ed. (London: Palgrave MacMillan, 2019) (A terrific description of the U.S. debates over nuclear doctrine and forces during the Cold War; the 4th edition, with Jeffrey Michaels added as co-author, provides new details and more of the story in the Soviet Union and other nuclear weapon states.)

Fred Kaplan, *The Wizards of Armageddon* (New York: Simon and Schuster, 1983). (The same topic, told in a more story-focused, journalistic style.)

Fred Kaplan, *The Bomb: Presidents, Generals, and the Secret History of Nuclear War* (New York: Simon and Schuster, 2020) (Arguably a companion to *The Wizards of Armageddon*, in this volume Kaplan describes what U.S. senior officials and officers actually planned and considered, rather than what the strategists recommended. Includes a remarkable account of U.S. consideration of a nuclear first strike on the Soviet Union during the Berlin crisis of 1961. Not yet a classic, but describes the policies affected by the classic writings.)

Bernard Brodie, ed., *The Absolute Weapon: Atomic Power and World Order* (New York: Harcourt Brace, 1946). (Written in the months just after the atomic bombings, remarkably prescient essays on the effect nuclear weapons might have on world politics. A .pdf of Gen. Eisenhower's copy of the preliminary draft is available here: <https://www.osti.gov/opennet/servlets/purl/16380564>.)

Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, Vol. 37, No. 2, January 1959. (A classic description of the danger of nuclear forces vulnerable to enemy attack;

highlights the nuclear fears of the early Cold War, and the belief, still common, that deterrence is delicate and difficult to maintain.)

Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960), <http://elcenia.com/iamapirate/schelling.pdf> (Another classic. Highlights the increased risk of war if both sides believe that if war came, they would be much better off if they were the one that struck first, a concept known as “crisis instability.” For that concept, see especially the 1st two pages of “The Reciprocal Fear of Surprise Attack” (pp. 207-208), and the 1st 13 pages of “Surprise Attack and Disarmament,” (pp. 230-242).)

Thomas C. Schelling, *Arms and Influence* (New Haven: Yale University Press, Revised Edition 2008 [original 1966]). (Many ideas influenced by the crises and conflicts of the Cold War up to that point, including explorations of “brinksmanship” and “the threat that leaves something to chance.”)

Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (1985 ed.) (Washington, D.C.: Pergamon-Brassey’s, 1985), pp. 9-31. (Originally published in 1961, this prescient volume explores most debates about deterrence and arms control that have occurred since.)

Herman Kahn, *On Thermonuclear War* (Princeton: Princeton University Press, 1960). (Outlines many deterrence concepts that influenced U.S. nuclear war planning.)

Herman Kahn, *On Escalation: Metaphors and Scenarios* (Westport, Conn.: Praeger, 1965). (This volume explored the concept of an “escalation ladder” and how states might use their willingness to escalate further to “win” in nuclear crises or conflicts.)

Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospects of Armageddon* (Ithaca, N.Y.: Cornell University Press, 1989). (Explores how nuclear weapons, which offer countries the ability to destroy their adversaries without first defeating their military forces, might change warfare and statecraft. For a discussion of these ideas 30 years later, see this roundtable in the *Texas National Security Review*: <https://tnsr.org/roundtable/book-review-roundtable-the-meaning-of-the-nuclear-revolution-30-years-later/#>)

Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984). (Argues that because survivable nuclear forces enable states to destroy each other, preparations for limited nuclear war-fighting and strikes against other countries nuclear forces are illogical and dangerous.)

Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton: Princeton University Press, 1993) [especially the chapter, “The Limits of Safety,” pp. 250-279.] (Through an exploration of particular incidents, assesses the nuclear risks that may arise accidentally, rather than by intention.)

Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton, N.J.: Princeton University Press, 1990) (A clear, careful discussion of key debates about counterforce, extended deterrence, missile defenses, and more.)

Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press, 2014). (Outlines a theory that puts regional nuclear postures and strategies in three categories: “catalytic” (designed to draw in help from a powerful outside actor such as the United States); “assured retaliation” (designed to ensure that the forces

could survive a nuclear strike and retaliate); and “asymmetric escalation” (designed to deter certain non-nuclear attacks by threatening first use of nuclear weapons against them).)

Note: Reflecting much of the writing on nuclear weapons during the Cold War, 100% of the above “classics” are by men, all but Narang’s book are by white men, and all but *The Evolution of Nuclear Strategy* are by Americans. This cultural situation and its possible impact on thinking was described in:

Carol Cohn, “Sex and Death in the Rational World of Defense Intellectuals,” *Signs: Journal of Women in Culture and Society*, Vol. 12, No. 4 (Summer 1987), pp. 687-718,
https://www.jstor.org/stable/3174209?seq=2#metadata_info_tab_contents

(Note: I was part of the group of “defense intellectuals” that Cohn observed for this article.)

Two classics from female authors include:

Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford: Stanford University Press, 1962). (The experience of Pearl Harbor deeply colored U.S. fears of a surprise attack during the Cold War, and this book was by far the most influential study of the episode.)

Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945* (Cambridge, U.K.: Cambridge University Press, 2007). (Later than the other classics noted here, but still part of the “canon” today. Tannenwald argues that the norm of avoiding the use of nuclear weapons has become so strong over time that it shapes state behavior in substantial ways.)

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