

**POLITICAL SCIENCE 142D: WEAPONS OF MASS DESTRUCTION, SPRING 2019**  
**MONDAYS/WEDNESDAYS 5-6:20PM, PCYNH 106**

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**Course Description:**

This course provides an overview of the threats posed to national and international security by chemical, biological, radiological, and nuclear weapons. Students will learn about how these weapons function, why states and some non-state actors seek them, and how nations attempt to prevent proliferation. The course will do this in part by delving into the technical and policy challenges related to these weapons. It will further address how CBRN weapons shape states' national security strategies and regional security dynamics. Efforts at the international level to restrict the use and proliferation of these weapons will be discussed. We will also explore the future of WMD and CBRN terrorism. Finally, some attention will be given to emerging modes of conflict, such as "cyberwar" and growing use of automated systems ("drones"), time permitting.

**Course Requirements:**

- **Short papers** (80% of course grade, 40% each): 3-6 pages, additional details in prompt:
  - *First Short Paper:* Write a short paper detailing the WMD status or aspirations of the country you have been assigned for the two simulations to be held in class during the course. If the state does not have WMD, why not? What weapons (internal balancing) or allies (external balancing) does the country possess and how might these explain the decision not to proliferate? Did the country have a program to explore/produce nuclear or other WMD? Why did it stop? Regardless of WMD status, detail the country's view of WMD. Does it favor/oppose proliferation? How? What issues or concerns does it raise? To which WMD-related treaties does it belong (NPT, NWFZ, etc.)? Has it ever used or contemplated using WMD? Feel free to include other relevant information.
  - *Second Short Paper:* Write a paper that reviews your experiences in the first in class simulation. Outline the steps you took to prepare yourself to present the views that best reflect your assigned country's interests. To what degree were you successful in convincing other members of the group representing your country to adopt your preferred perspective, as outlined in your memo (see below)? What proposals did other members of the country group make? What actions did others take in negotiating a common agenda for the country? Did any of these work particularly well or poorly (no need to mention names, just the issues and negotiation strategies)? How did your country do in its negotiations with other nations during the simulation? What worked and what could have been improved? How did other groups fair? Were there certain countries that did an especially effective job in persuading the simulation to adopt their policies? How might you have proceeded differently knowing what you know now?

- **Simulations** (20% of course grade, 10% each): There are two in class simulations for the course. In each simulation, you will be graded based on the following items/criteria:
  - *Participation*: Attendance will be taken in each simulation (5% each, 10% total).
  - *Memo*: For each simulation, prepare a short memo (~2 paragraphs) detailing the objectives you think your country should pursue in the simulation. Make sure that the recommendations you propose are consistent with those you think your country would prefer. Credit will be given for memos that accurately represent the capabilities and interests of the assigned country (5% each, 10% total). Extra credit will be given for memos that appear to the instructors to be particularly effective in the simulation (i.e., students will be rewarded for convincing their country/world to adopt their views).
- **Final Exam** There is no final exam in this course.

**Academic Integrity:** Submitting any assignment in this course implies that you agree to UCSD's policies as listed in the [Principles of Community](#) and the [Student Code of Conduct](#). Academic misconduct includes (but is not limited to): using another person's words as your own, asking someone else to write any part of an assignment you submit as your own, failing to cite material from another source, editing/rephrasing someone else's words as your own.

The [Policy on Integrity of Scholarship](#) lists some of the standards by which you are expected to complete assignments in this course. Students needing assistance may consult with the instructor or the teaching assistants. You are encouraged to use authorized UCSD [writing resources](#), such as the [Writing Hub](#). *No other person or resource may be used to assist you in writing any assignment without express permission from the instructor.* Exceptions will be made for a disability or other personal need. Please consult with the instructor if you are unclear about this policy or believe you need the assistance of other persons or online resources. You may not use a tutor. You may not consult or collaborate with other students for writing assignments. You may not refer to online grammar or translation sources such as Google Translate or Grammarly (grammar is not graded).

### Student Requirements/Standards:

- **Plagiarism/Cheating:** You are encouraged to study and learn together. All assignments submitted for a grade must be the ***sole product*** of the person submitting the work (please see above). Tests or assignments that are suspected of containing materials that are not the student's work or not properly referenced will be referred to the academic integrity office. If you have ***any*** questions about what constitutes a violation of academic integrity, please refer to University guidelines ([Excel with integrity](#)) or consult with your TA or myself.
- **Disabilities/life issues:** It is your responsibility to apprise me of factors that may interfere with your performance in class *well in advance of scheduled assignments*. Appropriate measures for disabilities, acts of God, etc. will be taken in accordance with UC policies.
- **Grading/appeals:** All attempts to discuss grading decisions must be made in writing.

### Required Readings:

There are three required textbooks. Each is available from the UCSB Bookstore or elsewhere.

- Scott Sagan and Kenneth Waltz. 2002. *The Spread of Nuclear Weapons: A Debate Renewed, 2<sup>nd</sup> or 3<sup>rd</sup> Ed.* New York: W.W. Norton & Co. ("**Sagan and Waltz**")
- Frank Barnaby. 2004. *How to Build a Nuclear Bomb: And Other Weapons of Mass Destruction.* New York: Nation Books. ("**Barnaby**")
- Joseph Cirincione, Jon B. Wolfsthal, and Miriam Rajkumar. 2005. *Deadly Arsenals: Nuclear, Biological and Chemical Threats*, Revised Edition. Washington, DC: Carnegie

Endowment for International Peace. ([Carnegie link here](#)). (“**Cirincione**”)

DATE

TOPIC/ASSIGNMENT

*WEEK 1 (April 1): Introduction/Syllabus/Levels, Methods, and Concepts*

- Wolfgang K. H. Panofsky. 1998. "Dismantling the Concept of Weapons of Mass Destruction" *Arms Control Today* (April). Access at: [http://www.armscontrol.org/act/1998\\_04/wkhp98.asp](http://www.armscontrol.org/act/1998_04/wkhp98.asp)
- George Perkovich. 2006. "Deconflating 'WMD.'" WMD Commission. Access at: <http://www.blixassociates.com/wp-content/uploads/2011/03/No17.pdf>

*WEEK 2 (April 8): An Overview of Nuclear Policy Dynamics*

*Wednesday 10 April:* Guest speaker: **LTG Wallace "Chip" Gregson**

- Cirincione. "Global Trends." *Deadly Arsenal*s, 1-26.
- Paul Kerr. 2008. "Nuclear, Biological, and Chemical Weapons and Missiles: Status and Trends." *Congressional Research Service* (February 20). Access at: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA477531>
- Thomas C. Schelling. 2009. "A World without Nuclear Weapons?" *Daedalus*. 138(4):124-129.

*WEEK 3 (April 15): Nuclear Weapons – History and How Stuff Works*

- Atomic Archives. 2008. "The Manhattan Project: Making the Atomic Bomb." Access at: <http://www.atomicarchive.com/History/mp/index.shtml>
- Barton Bernstein. 1995. "The Atomic Bombings Reconsidered," *Foreign Affairs*, 74(1):135-152.
- Michael Mandelbaum. 1980. "The Bomb, Dread, and Eternity." *International Security*. 5(2):3-23.
- Atomic Archives. 2008. "The Effects of Nuclear Weapons," pp. 1-24, Access at: <http://www.atomicarchive.com/Effects/index.shtml>
- Barnaby. "Nuclear Weapons." *How to Build a Nuclear Bomb*, 15-39.
- Cirincione. "Nuclear Weapons and Materials." *Deadly Arsenal*s, 45-55.

*Optional reading:*

- Sarah Diehl and James Clay Moltz. 2002. "History of Nuclear Weapons and Non-proliferation." *Nuclear Weapons and Nonproliferation*. Santa Barbara: ABC-CLIO, 1-25.
- Lynn Eden. 2004. "City on Fire." *Bulletin of the Atomic Scientists* 60(1): 33-43.
- John Mueller. 2010. "Overstating the Effects." *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda*. Oxford: Oxford University Press, 17-28.

*WEEK 4 (April 22): Why States Want WMD*

*Monday 22 April:* Guest speaker: **Henry Sokolski**

- Barnaby. "What Does It Take to Make a WMD?" *How to Build...*, 63-88.
- Scott Sagan. 1996/1997. "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb." *International Security* 21(3): 54-86.
- Etel Solingen. 1994. "The Political Economy of Nuclear Restraint," *International Security* 19(2):126-169.

- Nina Tannenwald. 1999. "The Nuclear Taboo: The United States and the Normative Basis for Nonuse." *International Organization* 53(3):433-468.

*Optional reading:*

- David Albright. 1994. "South Africa and the Affordable Bomb." *Bulletin of the Atomic Scientists* (July/August): 37-47.
- Avner Cohen and William Burr. 2006. "Israel Crosses the Threshold." *Bulletin of the Atomic Scientists* (May/June): 22-30.
- Matthew Fuhrmann. 2009. "Proliferation and Peaceful Nuclear Cooperation Agreements." *International Security* 34 (1): 7-41.
- Matthew Fuhrmann. 2009. "Taking a Walk on the Supply Side: The Determinants of Civilian Nuclear Cooperation." *Journal of Conflict Resolution* 53 (2): 181-208.
- Jacques Hymans. 2001. "Of Gauchos and Gringos: Why Argentina Never Wanted the Bomb, and Why the United States Thought It Did." *Security Studies* 10(3): 153-185.
- Jacques Hymans. 2002. "Why Do States Acquire Nuclear Weapons? Comparing the Cases of India and France." In D.R. SarDesai and Raju Thomas's *Nuclear India in the Twenty-First Century*. New York: Palgrave Macmillan.
- "Israel: Nuclear Overview." 2010. Nuclear Threat Initiative. Access at: [http://www.nti.org/e\\_research/profiles/Israel/Nuclear/index.html#fn1](http://www.nti.org/e_research/profiles/Israel/Nuclear/index.html#fn1)
- Dong-Joon Jo and Erik Gartzke. 2007. "Determinants of Nuclear Weapons Proliferation." *Journal of Conflict Resolution* 51(1): 167-194.
- Matthew Kroenig, "Importing the Bomb Sensitive Nuclear Assistance and Nuclear Proliferation," *Journal of Conflict Resolution* 53 (April 2009), 161-180.
- Ariel Levite. 2002/2003. "Never Say Never Again: Nuclear Reversal Revisited." *International Security* 27(3): 59-88.
- Alexander Montgomery. 2005. "Ringing in Proliferation." *International Security* 30(2): 153-187.
- Maria Rublee. 2009. "Nuclear Decision-Making in Libya, Sweden, and Germany," *Nonproliferation Norms: Why States Choose Nuclear Restraint*. Athens: The University of George Press, 185-200.
- David Albright and Corey Hinderstein. 2005. "Unraveling the A. Q. Khan and Future Proliferation Networks." *The Washington Quarterly* 28(Spring): 111-128.

*WEEK 5 (April 29): Nuclear Strategy: Deterrence \*\*\* [FIRST PAPER DUE] \*\*\**

*Wednesday May 1: \*\*\* [FIRST IN CLASS SIMULATION] \*\*\**

- Jeffrey Lewis. 2008. "Minimum Deterrence." *Bulletin of Atomic Scientists* 64(3):38-41.
- Kier Lieber and Daryl Press. 2006. "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security* 30(4): 7-44.
- Sagan and Waltz. "Chapters 1-2." *The Spread of Nuclear Weapons*
- Robert Powell. 2003. "Nuclear Deterrence Theory, Nuclear Proliferation, and National Missile Defense," *International Security* 27(4): 86-118.

*Optional reading:*

- Kyle Beardsley and Victor Asal. 2009. "Winning with the Bomb," *Journal of Conflict Resolution* 53(2): 278-301.
- Lawrence Freedman. 2003. *The Evolution of Nuclear Strategy*. Basingstoke, U.K.: Palgrave MacMillan.
- Charles Glaser and Steve Fetter. 2005. "Counterforce Revisited: Assessing the Nuclear Posture Review's New Missions," *International Security*, 30(2):84-126.
- Paul K. Huth. 1999. "Deterrence and International Conflict: Empirical Findings and Theoretical Debates." *Annual Review of Political Science* 2: 25-48
- Joseph Nye. 1987. "Nuclear Learning and U.S.-Soviet Security Regimes." *International Organization* 41(3): 371-402.
- Keith Payne. 1996. "Introduction." *Deterrence in the Second Nuclear Age*. Lexington: University of Kentucky Press, 1-16.
- Robert Rauchhaus. 2009. "Evaluating the Nuclear Peace Hypothesis: A Quantitative Approach." *Journal of Conflict Resolution* 53, 2 (2009): 258-277.
- Sagan and Waltz. "Chapters 3-5." *The Spread of Nuclear Weapons*
- Thomas Schelling. 1966. "The Art of Commitment." *Arms and Influence*. New Haven: Yale University Press, 35-91.
- Waltz, Kenneth N. 1990. "Nuclear Myths and Political Realities." *The American Political Science Review*. 84(3):731-745.

*WEEK 6 (May 6): Chemical and Biological Weapons.*

Biological Weapons:

- Barnaby. "Biological Weapons." *How to Build a Nuclear Bomb*, 41-53.
- Cirincione. "Biological and Chemical Weapons, Agents, and Proliferation." *Deadly Arsenals*, 57-67.
- Federation of American Scientists. 2010. "Biological Threat Agents Information." Access at: <http://www.fas.org/programs/ssp/bio/resource/agents.html#rvf>

Chemical Weapons:

- Barnaby. "Chemical Weapons." *How to Build a Nuclear Bomb*, 55-64.
- Federation of American Scientists. 2010. "Types of Chemical Agents." Access at: <http://www.fas.org/programs/ssp/bio/chemweapons/cwagents.html>
- Richard Price. 1995. "A Genealogy of the Chemical Weapons Taboo." *International Organization* 49(1): 73-103.

*Optional reading:*

- Ingrid Fängmark and Lena Norlander. 2006. "Indicators of State and Non-State Offensive Chemical and Biological Programmes." WMD Commission. Access at: [www.wmdcommission.org/files/No30.pdf](http://www.wmdcommission.org/files/No30.pdf)
- Gregory Koblenz. 2004. "Pathogens as Weapons: The International Security Implications of Biological Warfare." *International Security* 28(3):84-122.

- Scott D. Sagan. 2000. "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical Weapons Attacks" *International Security*. 24(4):85–115.
- Jonathan B. Tucker. 1994. "Dilemmas of a Dual-Use Technology: Toxins in Medicine and Warfare." *Politics and Life Sciences* 13(1): 51-62.
- Kathleen Vogel. 2006. "Bioweapons Proliferation: Where Science Studies and Public Policy Collide." *Social Studies of Science* 36(5): 659-690.
- WMD Commission. 2006. "Chapter 4: Biological and Toxin Weapons," and "Chapter 5: Chemical Weapons." *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Arms*. Stockholm. Access at: [http://www.blixassociates.com/wp-content/uploads/2011/02/Weapons\\_of\\_Terror.pdf](http://www.blixassociates.com/wp-content/uploads/2011/02/Weapons_of_Terror.pdf)

*WEEK 7 (May 13): Nuclear Proliferation/Counter Proliferation*

- Sheena Chestnut. 2007. "Illicit Activity and Proliferation: North Korean Smuggling Networks," *International Security* 32(1):80-111.
- Cirincione. "The International Nonproliferation Reg..." *Deadly Arsenal*s, 27-43.
- Fuhrmann, Matthew and Sarah E. Kreps. 2010. "Targeting Nuclear Programs in War and Peace: A Quantitative Empirical Analysis, 1941-2000" *Journal of Conflict Resolution* 54(6): 831-859.
- William Langewiesche. 2005. "The Wrath of Khan," *The Atlantic Monthly*.
- Andrew Winner. 2005. "The Proliferation Security Initiative: The New Face of Interdiction," *Washington Quarterly* 28 (2): 129–143.

*Optional readings:*

- David Albright and Corey Hinderstein. 2005. "Unraveling the A.Q. Khan and Future Proliferation Networks." *Washington Quarterly* 28(20): 109-128.
- Graham T. Allison. 2006. "Flight of Fancy," *Annals of the American Academy of Political and Social Science* 607(September): 167-202.
- Cirincione. "Appendix A: The Treaty on the Non-Proliferation of Nuclear Weapons." *Deadly Arsenal*s, 421-426.
- Tom Z. Collina with Daryl G. Kimball. 2010. "Now More Than Ever: The Case for the Comprehensive Nuclear Test Ban Treaty." *Arms Control Association Briefing Book*. Available at: [http://www.armscontrol.org/system/files/ACA\\_CTB\\_Briefing\\_Book.pdf](http://www.armscontrol.org/system/files/ACA_CTB_Briefing_Book.pdf)
- James Goodby and Fred McGoldrick. 2009. "Reducing the Risks of Nuclear Power's Global Spread." *Bulletin of the Atomic Scientists* (May/June): 40-47.
- Scott Jones. 2006. "Resolution 1540: Universalizing Export Control Standards?" *Arms Control Today*. Access at: [http://www.armscontrol.org/act/2006\\_05/1540](http://www.armscontrol.org/act/2006_05/1540).
- "Nuclear Suppliers Group at a Glance." 2006. Arms Control Association. Access at: <http://www.armscontrol.org/system/files/NSG.pdf>
- Scott Parrish and Jean du Preez. 2006. "Nuclear-Weapon-Free Zones: Still a Useful Disarmament and Nonproliferation Tool?" *WMD Commission*.
- T.V. Paul. 2003. "Chinese-Pakistani Nuclear/Missile Ties and Balance of Power Politics," *The Nonproliferation Review* 10(2): 21-29.

- Jean du Preez. 2006. "Half Full or Half Empty? Realizing the Promise of the Nuclear Nonproliferation Treaty." *Arms Control Today* (December): 6-12.
- Douglas Stinnett, Bryan Early, Cale Horne, and Johannes Karreth. 2011. "Complying by Denying: Explaining Why States Develop Nonproliferation Export Controls." *International Studies Perspectives* 12(3): 308-326.

*WEEK 8 (May 20): Weapons Platforms (Ballistic/Cruise Missiles)*

- Cirincione. "Missile Proliferation." *Deadly Arsenals*, 83-117.
- Dennis M. Gormley. 2008. "Missile Contagion." *Survival* 50(4):137-154.
- Simon A. Mettler and Dan Reiter. 2013. "Ballistic Missiles and International Conflict." *Journal of Conflict Resolution* 57(5):854-880.
- WMD Commission. 2006. "Chapter 6: Delivery Means, Missile Defenses, and Weapons in Space." *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Arms*. Stockholm: WMD Commission, 140-149.

*Optional readings:*

- Jeff Kueter and Howard Kleinberg. 2007. *The Cruise Missile Challenge: Designing a Defense against Asymmetric Threats*. Washington, DC: George C. Marshall Institute.
- Thomas L. McNaugher. 1990. "Ballistic Missiles and Chemical Weapons." *International Security* 15(2): 5-34.
- Dinshaw Mistry. 2005. *Containing Missile Proliferation: Strategic Technology, Security Regimes, and International Cooperation in Arms Control*. Seattle: University of Washington Press.
- Federation of American Scientists, "Ballistic Missile Basics" Available at: <http://www.fas.org/nuke/intro/missile/basics.htm>
- Janne Nolan. 1991. *Trappings of Power: Ballistic Missiles in the Third World*. Brookings.
- Joshua Pollack. 2011. "Ballistic Trajectory: The Evolution of North Korea's Ballistic Missile Market." *Nonproliferation Review* 18(2): 411-429.

*WEEK 9 (May 27): No Class Monday (Memorial Day Holiday)*

*Wednesday 29 May: CBRN Terrorism \*\*\* [SECOND PAPER DUE] \*\*\**

- Gary Ackerman and Kevin Moran. 2006. "Bioterrorism and Threat Assessment." WMD Commission. Access at: <http://www.wmdcommission.org/files/No22.pdf>
- Graham Allison. 2004. "How to Stop Nuclear Terror." *Foreign Affairs* 83(1): 64-74.
- Matthew Bunn and Anthony Wier. 2006. "Terrorist Nuclear Weapon Construction: How Difficult?" *The Annals of the American Academy of Political and Social Science* 607(September): 133-149.
- Michael Levi and Henry Kelly. 2002. "Weapons of Mass Disruption." *Scientific American* (November). Access at: <http://www.fas.org/ssp/docs/021000-sciam.pdf>
- James M. Acton, M. Brooke Rogers and Peter D. Zimmerman. 2007. "Beyond the Dirty Bomb: Re-thinking Radiological Terror." *Survival* 49(3):151-168.

*Optional readings:*



- Gene Aloise. 2009. "Preliminary Observations on Preparedness to Recover from Possible Attacks Using Radiological or Nuclear Threats." U.S. GAO (September 29). Access at: <http://www.gao.gov/new.items/d09996t.pdf>
- Matt Bunn and Susan Martin. 2010. "Is Nuclear Terrorism a Real Threat?" In Stuart Gottlieb's *Debating Terrorism and Counterterrorism*. Washington: CQ Press, 166-200.
- Malcom Dando. 2005. "The Bioterrorist Cookbook." *Bulletin of the Atomic Scientist* (November/December).
- William Dunlop and Harold Smith. 2006. "Who Did It? Using International Forensics to Detect and Deter Nuclear Terrorism," *Arms Control Today*, 36(8). Access at: [http://www.armscontrol.org/act/2006\\_10/CVRForensics](http://www.armscontrol.org/act/2006_10/CVRForensics).
- Charles Ferguson and William Potter. 2004. "Chapters 1-2." *Four Faces of Nuclear Terrorism*. Monterey: Monterey Institute for Nonproliferation Studies.
- Mark Juergensmeyer. 2003. "Armageddon in Tokyo Subway." *Terror in the Mind of God: the Global Rise of Religious Violence*. Berkeley: U. of California Press, 106-120.
- Jonathon Tucker. 2008. "Chemical Terrorism: Assessing Threats and Responses." In Russell Howard and James Forest's *Weapons of Mass Destruction and Terrorism*. New York: McGraw Hill, 212-226.

*WEEK 10 (June 3): Cyber Conflict and UAVs*

*Wednesday 5 June: \*\*\* [SECOND IN CLASS SIMULATION] \*\*\**

- Erik Gartzke. 2013. "The Myth of Cyberwar: Bringing War in Cyberspace Back Down to Earth." *International Security* 38(2): 41-73.
- Erik Gartzke and Jon R. Lindsay. 2017. "Thermonuclear Cyberwar." *Journal of Cybersecurity* 3(1): 37-48.
- Eric Lipton, David E. Sanger and Scott Shane. 2016. "The Perfect Weapon: How Russian Cyberpower Invaded the U.S." December 13. <https://www.nytimes.com/2016/12/13/us/politics/russia-hack-election-dnc.html>
- Rid, Thomas, 2013. "Cyberwar and Peace: Hacking Can Reduce Real-World Violence." *Foreign Affairs* (Nov./Dec.): 77-87.

*Optional readings:*

- Erik Gartzke and Jon R. Lindsay. 2015. "Weaving Tangled Webs: Offense, Defense, and Deception in Cyberspace." *Security Studies* 24(2): 316-348.
- Axelrod, Robert and Rumien Iliev. 2014. "The Timing of Cyber Conflict," *Proceedings of the National Academy of Sciences*, 111(4): 1298-1303.
- Matthew Fuhrmann and Michael C. Horowitz. 2017. "Droning On: Explaining the Proliferation of Unmanned Aerial Vehicles." *International Organization* 71(2): 397-418.