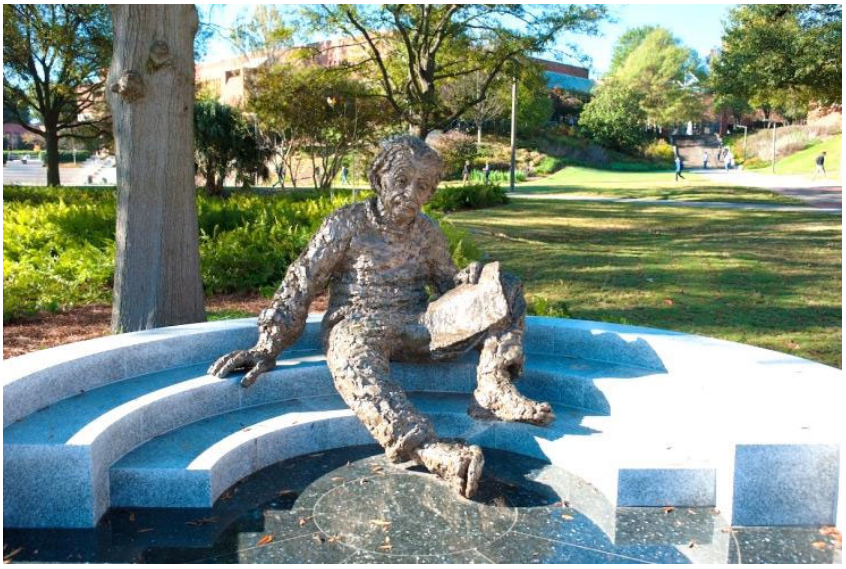
INTA 8001: Science, Technology & International Affairs II
SNSP Seminar
Spring 2019



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3 credits
Tu 12:00-2:45 PM
Ivan Allen College/Habersham G-17

Office hours: *TBD*
& by appointment
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Overview

The course, as part of the Sam Nunn Security Program (SNSP), will explore and enable better understanding of the interactive roles; the effect of science and technology; and the economic, institutional, policy, and social contexts in which science and technology may implemented. This will be accomplished through extensive and intensive in-class discussions, guest lectures by experts, individual and group projects, and off-site visits to policy-making and policy–executing organizations, agencies, and institutions.

In this course, we will examine the relation between science and technology and international affairs, with an emphasis on national and international security. Rarely does science or technology (S&T) itself drive foreign or national security policy; the potential security, economic or other national-level consequences of the application of science to human endeavors is where technology intersects with policy predominantly. Science & technology can be causal, intervening, or determinant factors. The ability to recognize,

communicate, and identify nodes for intervention, change, or influence are strategic requirements for effective use of S&T domestically and internationally.

The ways in which governments act as proponents and sustainers, as well as consumer of S&T, vary significantly. These issues reflect important questions about the relationship between science, technology, and policy. Is scientific and technological development governable, and if so, who is responsible for governance? Is more and better science necessary for policymaking? Who is the best judge of the value of scientific research programs and the validity of scientific findings? Is the furtherance of scientific understanding and technological development always socially benign, and who decides?

Technological changes are anticipated to occur over the ensuing decades in a globalized world characterized by complex security challenges. While emerging technologies promise scientific breakthroughs, they also generate skepticism and controversies. How will these S&T developments impact stability, and what are the potential security threats? How will such emerging technologies affect the overall international security discourse?

This course introduces theories and methodologies for science and technology policy analysis. Students will learn how science and technology policy is made, with specific attention to the roles of government agencies, expert advisory committees, and the public. This analytic toolkit will be drawn from literature in a range of disciplines, including political science, public policy, economics, sociology, and history.

This course will provide:

- Background on the science & technology policy formation, with an emphasis on US systems and security policies
- A multidisciplinary toolkit for thinking about science & technology policy and security, including an understanding of social science methods, theories, and approaches to science & technology policy and security.

Learning Objectives

1. Students will demonstrate the ability to describe the causal and determinant relationships between science and technology (S&T) and security across different topic areas.
2. Students will demonstrate ability to apply concepts and multiple methodologies to explain phenomena in security related to S&T.
3. Students will understand and be able to assess relationships among organizational institutions & structures at the local, national, regional & global level and S&T.
4. Students will become familiar with multiple major governance entities (e.g., international agreements and institutions) relevant to S&T and security.
5. Students will understand and learn about how S&T shaped history, promising S&T developments (such as information and communications technology, cognitive and biological sciences, robotics, and nanotechnology), and pressing S&T challenges for the future in an international context.

6. Students will practice effective communication skills. Students will be able to express their arguments clearly and effectively both in written reports and in their research and oral presentations.
7. Students will learn valuable team working skills. Students will be able to work in small groups in a way that demonstrates respect for their colleagues and efficiency in working collaboratively towards projects and goals.

Class Requirements

1) Attendance & participation, including field trip to DC (30%)
2) Year-long project (70%)
    a. Revised/updated proposal, due week 2
    b. Status report
    c. Draft paper
    d. Final document
    e. Final presentation

Attendance and Participation

You are expected to make reasonable efforts to attend all classes and participate actively. I recognize that both anticipated and unanticipated events may overlap with the regularly scheduled class.

Academic Integrity

For all assignments, materials, and exams, you are expected to maintain the highest academic integrity.

While academic integrity takes many forms, one of the most common violations is plagiarism. Per the Georgia Tech Honor Code, plagiarism is an act of academic misconduct. The Georgia Tech Honor Code specifies: "'Plagiarism' is the act of appropriating the literary composition of another, or parts of passages of his or her writings, or language or ideas of the same, and passing them off as the product of one's own mind. It involves the deliberate use of any outside source without proper acknowledgment."

Plagiarism ranges from the blatant, such as purchasing a term paper or copying on an exam, to the subtle, e.g., failing to credit another author with the flow of ideas in an argument. Simply changing a few words from the writings of other authors does not alter the fact that you are essentially quoting from them and appropriating their ideas. Paraphrasing of this sort, where you use the words of another almost verbatim without acknowledging your source, is the most common form of plagiarism among students and in general. When you state another author's viewpoint, theory, or hypothesis – especially when it is original or not generally accepted – you must also include a reference to the originator. In general citations are unnecessary when the information is considered common knowledge or a matter of widespread agreement or controversy.

For more information on the Georgia Tech Honor Code, please see http://www.honor.gatech.edu.

In short: just don't cheat.
This is one instance when asking forgiveness
*rather than permission is *not* a good strategy.*

Accommodations for Students with Disabilities

Per Georgia Tech policy: if you have a significant disability, special arrangements will be made to accommodate documented needs (through the ADAPTS office). Please contact the professor after class or at your earliest convenience.

THE SYLLABUS IS DYNAMIC AND IS LIKELY TO BE UPDATED THROUGHOUT THE SEMESTER.

Course Calendar and Content

Readings will be assigned and distributed in hard copy or via T-Square in a timely manner throughout the semester.

Week 1 – 8 January

- Semester scope & overview of the semester
- Progress review & next steps on "*The Future of Conflict Deterrence: The Multidimensional Nature of Conflict Prevention and Readiness*" projects
  - Hypothesis, DV, & IVs in-class exercise
- DC trip preliminary info & planning
  - Group messaging app
- SNSP Challenge coin update
- Scenarios

Reading:

- White House, *National Strategy for Countering Weapons of Mass Destruction Terrorism*, December 2018, https://www.whitehouse.gov/wp-content/uploads/2018/12/20181210_National-Strategy-for-Countering-WMD-Terrorism.pdf
- Anthony DeCapite, "Biostorm: A Story of Future War," *Small Wars Journal,* http://smallwarsjournal.com/jrnl/art/biostorm-story-future-war
- Angela Wilkinson and Roland Kupers, Living in the Futures, *Harvard Business Review,* May 2013, https://hbr.org/2013/05/living-in-the-futures
- Yuna Huh Wong "Approaching Future Offsets" http://www.rand.org/blog/2016/12/approaching-future-offsets.html

Optional/further reading

- CSBS, "On Scenarios: The Search for Foresight," *The Antidote,* 1999, http://en.laprospective.fr/dyn/anglais/memoire/antidote.pdf

Week 2 – 15 January

- Revised project proposals due electronically NLT 10AM 15 January directly to MEK with cc to snsp2018-2019@t-square.gatech.edu. Be prepared to present and discuss during first half of class.
- Continued discussion of scenario process and development of cohort scenarios for "*The Future of Conflict Deterrence: The Multidimensional Nature of Conflict Prevention and Readiness*" project

Week 3 – 22 January

- DC trip planning

- Weapons of Mass Destructions (WMD), i.e., nuclear, chemical, and biological agents and weapons
  - Nonproliferation, arms control, and disarmament
  - International institutions – the NPT, CWC, & BWC +

Readings

Nuclear

- George Shultz, William Perry, Henry Kissinger, & Sam Nunn, "Next Steps in Reducing Nuclear Risks," *WSJ*, 5 March 2013, http://online.wsj.com/article/SB10001424127887324338604578325912939001772.html or http://www.nti.org/analysis/opinions/next-steps-reducing-nuclear-risks-pace-nonproliferation-work-today-doesnt-match-urgency-threat/
- Keir A. Lieber & Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security,* Spring 2017, pp 9-49, https://www.belfercenter.org/publication/new-era-counterforce-technological-change-and-future-nuclear-deterrence
- John Mueller, "The Essential Irrelevance of Nuclear Weapons: Stability in the Postwar World," *International Security,* Fall 1988, pp 55-79, https://politicalscience.osu.edu/faculty/jmueller/ISESSIRR.PDF
- Anne Harrington de Santana, "Nuclear Weapons as a Currency of Power: Deconstructing the Fetishism of Force," *The Nonproliferation Review,* 16:3, 2009, pp 325-345, https://doi.org/10.1080/10736700903255029
- Richard G. Lugar, "Nunn-Lugar: Science Cooperation Essential for Nonproliferation Efforts," *Science & Diplomacy*, March 2012, http://www.sciencediplomacy.org/perspective/2012/nunn-lugar
- Matthew Harries, "The Real Problem With a Nuclear Ban Treaty," Carnegie Endowment for International Peace, 15 March 2017, http://carnegieendowment.org/2017/03/15/real-problem-with-nuclear-ban-treaty-pub-68286
- Max Fisher, "European Nuclear Weapons Program Would Be Legal, German Review Finds," *New York Times,* 5 July 2017, https://www.nytimes.com/2017/07/05/world/europe/germany-nuclear-weapons.html
- Browse: Tracking the German Nuclear Debate, Carnegie Endowment for International Peace, 15 August 2018, https://carnegieendowment.org/2017/09/07/tracking-german-nuclear-debate-pub-72884

Chemical and Biological

- Gregory D. Koblentz, "Regime Security: A New Theory for Understanding the Proliferation of Chemical and Biological Weapons," *Contemporary Security Policy*, 2013, 34:3, pp 501-525, https://doi.org/10.1080/13523260.2013.842298
- M.E. Kosal, "Chemical Weapons Destruction and the Public Response," in *Towards the Elimination of the Chemical Weapons,* Haru, E. and Thakur, R. eds., UN University Press, Netherlands, 2006, pp 118-149 *(distributed in class/electronically)*

- Kavita M. Berger & Jennifer Roderick, *National and Transnational Security Implications of Big Data in the Life Sciences*, AAAS Report, November 2014, http://www.aaas.org/report/national-and-transnational-security-implications-big-data-life-sciences
- Kathleen M. Vogel, "Revolution Versus Evolution? Understanding Scientific and Technological Diffusion in Synthetic Biology and their Implications for Biosecurity Policies," *BioSocieties,* Nov 2014, pp 365-392, http://www.ingentaconnect.com/content/pal/biosoc/2014/00000009/00000004/art00002
- Ann M. Becker, "Smallpox in Washington's Army: Strategic Implications of the Disease During the American Revolutionary War," *The Journal of Military History*, April 2004, pp 381-430; http://muse.jhu.edu/journals/jmh/summary/v068/68.2becker.html
- Central Intelligence Agency, Directorate of Intelligence, "The Darker Bioweapons Future," OTI SF 2003-108, 3 November 2003, http://www.fas.org/irp/cia/product/bw1103.pdf

Optional/further readings

- OTA, *Technologies Underlying Weapons of Mass Destruction* (Washington, DC: OTA 1993), http://www.fas.org/spp/starwars/ota/934406.pdf
- *Prism* special issue on Countering WMD, May 2018, http://cco.ndu.edu/PRISM-7-3/

Week 4 – 29 January

- Cohort scenarios due
- DC trip planning
- WMD *(continued)*

Readings

- Geoffrey Chapman, Hassan Elbahtimy, & Susan B. Martin, "The Future of Chemical Weapons: Implications from the Syrian Civil War," *Security Studies,* 27:4 (2018): pp 704-733. https://doi.org/10.1080/09636412.2018.1483640
- Karim Makdisi & Coralie Pison Hindawi, "The Syrian Chemical Weapons Disarmament Process in Context: Narratives of Coercion, Consent, and Everything in Between," *Third World Quarterly,* 38:8, 2017, pp 1691-1709, https://doi.org/10.1080/01436597.2017.1322462
- Ambassador Kenneth Ward, Remarks at the Fourth Special Session of the Conference of States Parties to Review the Operation of the Chemical Weapons Convention (REVCON IV), 22 November 2018, https://www.state.gov/t/avc/rls/287517.htm

Optional/further readings

- Stefano Costanzi, John-Hanson Machado, and Moriah Mitchell, "Nerve Agents: What They Are, How They Work, How to Counter Them," *ACS Chem. Neurosci.,* 2018, 9:5, pp 873-885, https://pubs.acs.org/doi/10.1021/acschemneuro.8b00148

Week 5 – 5 February

- WMD *(continued)*
- WMD Terrorism

Readings

- Rolf Mowatt-Larssen, "Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality?" January 2010, http://belfercenter.ksg.harvard.edu/files/al-qaeda-wmd-threat.pdf
- Gregory D. Koblentz, "Predicting Peril or the Peril of Prediction? Assessing the Risk of CBRN Terrorism," *Terrorism and Political Violence,* 2011, 23:4, pp 501-520, https://doi.org/10.1080/09546553.2011.575487
- Jenna Jordan, "When Heads Roll: Assessing the Effectiveness of Leadership Decapitation," *Security Studies,* 2009, pp 719-755, https://www.tandfonline.com/doi/abs/10.1080/09636410903369068
- Rohan Gunaratna, "Aum Shinrikyo's Rise, Fall and Revival," *Counter Terrorist Trends and Analyses*, 10:8, August 2018, pp 1-6, https://www.jstor.org/stable/26481827

Optional/further reading

- James J.F. Forest, "Framework for Analyzing the Future Threat of WMD Terrorism," *Journal of Strategic Security,* Winter 2012, pp 51-68, http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1193&context=jss
- H. J. Jansen, F. J. Breeveld, C. Stijnis, and M. P. Grobusch, "Biological Warfare, Bioterrorism, and Biocrime," *Clinical Microbiology and Infection*, June 2014, pp. 488-496, http://onlinelibrary.wiley.com/doi/10.1111/1469-0691.12699/pdf
- Stephanie Kane and Pauline Greenhill, "A Feminist Perspective on Bioterror: From Anthrax to Critical Art Ensemble," *Signs*, 33:1, Autumn 2007, pp 53-80, https://www.journals.uchicago.edu/doi/abs/10.1086/518261
- Jonathan Tucker (editor), *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, MIT Press, 2000
- CDC | Bioterrorism - Emergency Preparedness and Response Webpages, http://www.bt.cdc.gov/bioterrorism/
- *Biotechnology Research in an Age of Terrorism*, 2004, National Academies Press, Washington DC, http://www.nap.edu/catalog.php?record_id=10827

General resources and more readings on terrorism

- Bruce Hoffman, *Inside Terrorism* (2006 edition)
- Marc Sageman, *Leaderless Jihad*
- Jessica Stern, *Terror in the Name of God: Why Religious Militants Kill*
- Michael Scheuer (previously "Anonymous"), *Through Our Enemies' Eyes: Osama bin Laden, Radical Islam, and the Future of America*, (2006 edition)
- Audrey Kurth Cronin, "How al-Qaida Ends: The Decline and Demise of Terrorist Groups," International Security, Summer 2006, 31, pp 7-48
- F. Gregory Gause III, "Can Democracy Stop Terrorism?" *Foreign Affairs,* September/October 2005, 84, pp 62-76
- Max Abrahms, "Why Terrorism Does Not Work," *International Security*, Fall 2006, 31, pp 42-78

- Robert F. Trager and Dessislava P. Zagorcheva, "Deterring Terrorism: It Can Be Done," *International Security,* Winter 2006/07, pp 87-123

Week 6 – 12 February

- DC Bureaucracy and Policy-Making Orientation for S&T and Security

Readings
- *TBD*

Updated briefing books due NLT noon Thursday, 14 February

Week 7 – 19 February

Guest lecture, ADM James "Sandy" Winnefeld, USN, ret, former Vice Chairman of the Joint Chiefs of Staff

Readings
- Bio and assorted short writings by ADM Winnefeld, https://www.thecipherbrief.com/experts/admiral-james-sandy-winnefeld, particularly recommend "Wield Creativity as a Weapon against China, Russia & Complacency" https://www.thecipherbrief.com/column/expert-view/wield-creativity-weapon-china-russia-complacency
- "Five Things You Should Know: A Conversation With Admiral Winnefeld, BSAE;" 30 April 2015, https://ae.gatech.edu/news/2016/02/five-things-you-should-know-conversation-admiral-winnefeld-bsae-78

Week 8 – 26 February

- Guest lecture TBC

Updated briefing books due NLT noon Thursday, 28 February

Week 9 – 5 March

SOCOM Update – Via VTC
Updated briefing book pages due to MEK NLT Sunday, 3 March at noon.

Guest lecture, Dr. Liz Sherwood-Randall, former Deputy Secretary of Energy.
Short bio: https://www.energy.gov/contributors/dr-elizabeth-sherwood-randall

Readings
- Elizabeth Sherwood-Randall. *Alliances and American National Security,* Strategic Studies Institute, November 2006, http://ssi.armywarcollege.edu/pdffiles/pub730.pdf

Week 10 – 12 March

- Preparation for Washington, D.C. trip
- DC Bureaucracy and Policy-Making Orientation for S&T and Security III
- Professionalisms
- International scientific controversies

Readings

- Dyna Rochmyaningsih, "Did a study of Indonesian people who spend most of their days under water violate ethical rules?" *Science,* 26 July 2018 , http://www.sciencemag.org/news/2018/07/did-study-indonesian-people-who-spend-their-days-under-water-violate-ethical-rules
- David P. Fidler, "Influenza Virus Samples, International Law, and Global Health Diplomacy," *Emerg Infect Dis.,* January 2008, 14:1, pp 88-94, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2600156/
- Emily Baumgaertner, "China Has Withheld Samples of a Dangerous Flu Virus," *NYT,* 27 August 2018, https://www.nytimes.com/2018/08/27/health/china-flu-virus-samples.html [Not just US, btw, e.g., Aisha Majid, "Disease X: China ignores UK request to share samples of flu virus with pandemic potential," *The Telegraph* (UK), August 2018, https://www.telegraph.co.uk/news/2018/08/29/disease-x-china-ignores-uk-request-share-samples-flu-virus-pandemic/]
- Shan Juan and Wang Xiaodong, "China sharing virus samples, WHO says," *China Daily,* 01 September 2018, http://www.chinadaily.com.cn/a/201809/01/WS5b89d85ca310add14f388fa8.html
- Martin Enserink, "Controversial Studies Give a Deadly Flu Virus Wings," *Science,* 02 December 2011, 334:6060, pp 1192-1193; http://science.sciencemag.org/content/334/6060/1192
- Dennis Normile, "CRISPR bombshell: Chinese researcher claims to have created gene-edited twins, *Science,* 26 November 2018, https://www.sciencemag.org/news/2018/11/crispr-bombshell-chinese-researcher-claims-have-created-gene-edited-twins
- Jon Cohen, "Draw clearer red lines around human gene editing, say leaders of Chinese and U.S. science academies," *Science,* 13 December 2018, https://www.sciencemag.org/news/2018/12/draw-clearer-red-lines-around-human-gene-editing-say-leaders-chinese-and-us-science
- "How to respond to CRISPR babies," *Nature,* 5 December 2018, https://www.nature.com/articles/d41586-018-07634-0
- Sheila Jasanoff & J. Benjamin Hurlbut, "A Global Observatory for Gene Editing," *Nature,* 22 March 2018, pp 434-436, https://www.nature.com/articles/d41586-018-03270-w
- Ewen Callaway, "Ban on 'gene drives' is back on the UN's agenda — worrying scientists," *Nature,* 15 November 2018, https://www.nature.com/articles/d41586-018-07436-4

- Ewen Callaway, "Gene drive' moratorium shot down at UN biodiversity meeting, *Nature,* 21 December 2016, https://www.nature.com/news/gene-drive-moratorium-shot-down-at-un-biodiversity-meeting-1.21216
- Kathleen M. Vogel and Sonia Ben Ouagrham-Gormley, "Anticipating Emerging Biotechnology Threats: A Case Study of CRISPR," *Politics and the Life Sciences,* 37:2, Fall 2018, pp 203-219, https://doi.org/10.1017/pls.2018.21

Week 11

Spring Break

March 17-21
- Washington, D.C. Trip

Week 12 – 26 March

No Class (ISA Meeting)

Week 13 – 2 April

- Discussions of DC visit
- Guest lectures by
  - LTC Octavia Coleman (GT Army War College Senior Service Fellow) on "Rebalancing the U.S. Military, Army, Logistics to Meet the Demands of Large Scale Ground Combat Operations"
    &
  - Lt. Col. Chris Sheffield (GT Air Force Senior Service Fellow) on "Geostrategic Impact of an Independent American Space Force"
- Draft papers due 1 April

Week 14 – 9 April

- Yearlong project presentations: *The Future of Conflict Deterrence: The Multidimensional Nature of Conflict Prevention and Readiness*
- Feedback on draft papers due 8 April

Week 15 – 16 April

- Yearlong project presentations: *The Future of Conflict Deterrence: The Multidimensional Nature of Conflict Prevention and Readiness*
- Year wrap-up, "hot-wash," and synthesis of year

Final papers due 19 April. Late papers accepted without penalty through noon, Thursday, 2 May.

One More Thought

Collaboration, sharing ideas, etc.

"Talk about your ideas. Help your colleagues work out their problems. Pay attention to what other people are doing, and see if you can learn something, or if you can contribute.

"Other than the mundane goal of getting your degree, you are in school to push back the frontiers of knowledge. You do this by generating and exploring new ideas. There is no way that you will ever be able to explore all of the ideas that you generate, but some of those ideas that you discard might be just what some of your colleagues are looking for.

"Human nature tends to make us want to hoard our own ideas. You have to fight against that. Human nature also tends to make us treat other people's ideas with disrespect. The closer the idea to our own area of research, the more likely some part of our brain will try to find fault with it. Fight against that even harder.

"You will find many people in academia who give in to the dark side. These Stealth Researchers never discuss what they are working on, except in vague and deceptive terms. They are experts at finding fault with the work of their colleagues. The Stealth Researcher writes papers that make very grand claims, but you can never quite figure out what they've accomplished and what they haven't. He is a master at omitting the key detail of the design or process that would enable others to follow his work. The Stealth Researcher is a knowledge diode, a roach motel for information. He has replaced the fundamental goal of discovery and publication with the twin evils of ego and empire.

"Be open about what you are working on. Be honest about what you've done, and even more honest about what you haven't. Don't ever hide an idea for fear that someone will steal it, even if you are talking to a Stealth Researcher. With patience, maybe we can cure them."

Prof Kristofer S.J. Pister
Electrical Engineering and Computer Science, UC Berkeley