INSTITUTE FOR INTERNATIONAL SCIENCE AND TECHNOLOGY POLICY
ELLIOTT SCHOOL OF INTERNATIONAL AFFAIRS
GEORGE WASHINGTON UNIVERSITY

International Affairs 6153 Online only
Spring 2021; CRN 11658 Mondays: 7:10-9:00PM

Science, Technology, and National Security Policy

Instructor

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Course Description

A broad, complex, and multidimensional set of factors contribute to the ability of states to use science and technology to advance their national security. This course examines how effectively states, and the United States in particular, develop policies designed to translate science and technology into strategic advantage. To assess these factors, the course addresses a range of issues including innovation, revolutions in military affairs, globalization and international economic integration, technology transfer and export controls, changing global security dynamics, and the impact of emerging technologies on defense industries and military power. While there is general agreement on the fundamental contributions of science and technology to national security, the field of security studies still lacks a coherent and foundational body of literature that addresses these interrelationships in a systematic and comprehensive way.

Our analysis begins with the interwar period, considering how effectively the great powers adapted to rapidly changing technology and assessing analytical frameworks for addressing these issues. The course subsequently addresses many of the key historic and current science, technology, and national security policy issues including science and technology in World War II, developing thermonuclear weapons, missile and satellite technology, airpower, counterproliferation, robotics, cyberpower, and governance of science and technology. Because there is no accepted canon of literature in this field, your readings for this course are quite wide-ranging and will require your focused attention and active engagement to synthesize.

Major themes addressed throughout the course would form parts of any integrative framework for understanding the interplay between science, technology, and national security policy. Some of the themes related to this framework include:

- Tradeoffs between the costs and effectiveness of technology versus military personnel
- Balancing the need for secrecy in military technology with the benefits of scientific openness
- Evolutionary and revolutionary paths to technology development and adoption
- Strategic-level interactions between technology, grand strategy, and military strategies

- Tactical- and operational-level interactions between technology and doctrine
- Balancing economic efficiency with military effectiveness
- Processes to translate technological potential into operational capability
- Criteria and processes for making sound choices among competing technologies
- The role of culture, personalities, education, and training in developing and implementing national security policy
- The role of technology in sensing time, distance, and interactions as well as the role of human cognition in perceiving and structuring this data
- The role of culture and perceptions in assessing threats and opportunities
- Interactions between technology, organizations, and bureaucratic politics
- Information age policies for issues such as dual-use technologies, technology transfer, export controls, the defense industrial base, and educating strategists for tomorrow's challenges
- Assessment criteria for evaluating whether potential benefits of restraint in developing new dual-use or weapons technology outweigh the potential benefits from these developments
- Assessment criteria for balancing privacy and civil liberty concerns against the growing ability to collect, analyze, and store personal information in the pursuit of security

Course Goals

The overarching objective of this course is for each student to be able to articulate and defend their understanding of the interplay between science, technology, and national security policy. This requires discernment in evaluating and integrating a range of materials including background readings, written assignments, and a mixture of lectures and discussion designed to cover each week's topic. This course is a seminar; students are expected to read and come to class ready to discuss the substantial amount of assigned material for each week. At the beginning of the course, the instructor will lecture during most of the seminar time; by the end of the course, it is expected that student-led discussions will predominate and directly contribute to the overarching course objective.

Learning Outcomes

Students will be able to understand the role of both historic and current science and technology developments in shaping the creation and implementation of U.S. national security strategy and policy. They will also understand how additional factors including personalities, domestic politics, and the global security environment influence the ways science and technology inform national security policy. Based on this understanding, students will be able to articulate and support policy-relevant assessments about the prospects for developing and successfully implementing current science and technology initiatives that could shape major aspects of national policy.

Class Policies

Attendance and active participation in each seminar are expected of all students. Please inform your instructor in advance if you cannot attend a seminar. Late written assignments normally will

not be accepted unless there are extenuating circumstances. If you run into difficulties completing an assignment, at least one week prior to the due date, coordinate a new submission date with your instructor.

Out-of-Class and Independent Learning Expected per Week

In this three credit graduate course students are expected to work for 450 minutes per week (this includes 100 minutes of time spent in class per week); totaling to 112.5 hours of work over the duration of the 15-week semester.