

SA.501 (TECHNOLOGY AND INNOVATION)

Courses

SA.501.100. News Media & International Affairs. 4 Credits.

The purpose of this course is to provide deeper understanding of the interaction between the operations of the news media and the conduct of international relations. This will include an emphasis on how rapidly the major medium of exchange has passed in barely 50 years from newspapers to broadcast to the internet. The instruction will be through a combination of lectures, guest lectures, student discussion and papers. There will be an emphasis on clear and good writing. Student evaluation will be based on participation in discussion and papers.

Prerequisite(s): Students may not register for this class if they have already received credit for SA.600.755[C]

SA.501.104. Artificial Intelligence: The Science, Ethics, and Politics. 4 Credits.

Artificial intelligence (AI) and machine learning (ML) have emerged as increasingly significant areas of inquiry and debate in science, technology, and society. From search engines, advertising, and chatbots to autonomous weapon systems, driverless vehicles, financial risk management, law enforcement, and medical diagnosis, AI and ML are being integrated within many services and products across a range of industries. At the same time, AI-enabled technologies are facilitating discrimination, raising questions on privacy and transparency, fueling fears about labor shortages, and feeding competition on the international stage. The challenge of today and tomorrow is taking a human-centered approach to filling the gap between technology, ethics, and policymaking. We will review and discuss industry use cases to better understand the complexity and evolution of AI. Students will work on a semester-long group research policy project on a topic of their choice.

SA.501.105. Technology and Geopolitical Risk Practicum. 4 Credits.

From the printing press and nuclear reactor to the internet, advancements in technology have historically been major drivers of geopolitical shifts. Today, technologies such as blockchain, artificial intelligence, and nanotechnology, have become indistinguishable from national and interstate interests. This course gives students the tools to understand and integrate disruptive technologies in their analysis of geopolitical risks in the twenty-first century; examine how technology affects our societies, international development, and the use of force; and the demands on regulatory institutions in a world increasingly reliant on machines. The course is interactive and employs a suite of learning techniques, including academic scholarship, business case studies, and discussion with subject-matter experts. Simultaneously, students collaborate on a group consulting project with an outside client related to a relevant set of social, political, and/or economic risks concerning a technology solution. Findings are presented as an oral pitch and final whitepaper. Students aspiring for careers in government, technology, or political risk consulting will find this practicum especially beneficial.

SA.501.106. Technology, Innovation, and Public Policy. 4 Credits.

Technology and governance are in perpetual tension. Relative power and wealth can be created, destroyed, enabled, denied, checked, and balanced when technologies emerge, and governments react. In this course students will prepare and present business case studies focusing on the role of governments in each case and how policy related to innovation altered the trajectory of markets, domestic politics, and international relations. The case studies will be a starting point for discussions of alternative strategies that firms and states might have employed to their respective advantage and any case specific lessons with broader application for innovators, investors, policymakers, and citizens.

SA.501.107. Clashing Information Orders. 4 Credits.

People thought until recently that global information flows would lead to the global spread of liberal values and democracy, as social media platforms allowed citizens to talk and organize freely. Now, we are starting to understand that global information politics doesn't have predetermined winners. States - both democratic and authoritarian contending with each other over who should set the rules for information flows, each trying to impose its own national information order on others. In this class, we will examine where the different information orders of the major powers—the U.S., the E.U. and China—come from, and how each sees the politics of information as bound up with the survival of its own regime. We will examine the different vulnerabilities of democracies and autocracies to global information flows, and how each looks to shore up these vulnerabilities, as well as how each tries to project and spread its own approach to information to other countries, creating a new realm of global power politics.

SA.501.108. Media Wars. 4 Credits.

Is social media making our politics more extreme? How does the circulation of “fake news” differ from propaganda efforts of the pre-digital age? Does it affect our politics in the long-term? How are states using media today not only to inform their own citizens, but as a weapon in larger geo-political contests? Are algorithms racists, and what does that say about the future we are building? This course will take a critical look at the production, circulation, and consumption of media in the contemporary world. We'll particularly focus on the development of technology, surveillance, cyberwar, militarized media, social movements, and the social life of algorithms. We will explore cases through the Americas, Europe, Middle East, and Africa.

SA.501.109. Technology, Innovation and Strategy. 4 Credits.

The class intends to help students understand the connection between strategy, technology and innovation. The class relies on the literature in international relations and security studies, management science and economics as well as on policy reports and business cases. The multidisciplinary focus of the class stems from the need to understand complex processes and dynamics characterizing an age of great powers competition (strategy) focused on technological superiority (technology) pursued and advanced by start-ups and Big Tech companies (innovation). After deepening the meaning of strategy, technology and innovation, the class looks at the interaction between strategy and technology, technology and innovation as well as innovation and strategy both at the abstract or theoretical level and through empirical or historical instances. The ultimate goal of the class consists of preparing students for understanding the challenges that private or public organizations may face when working in competitive environments characterized by rapid technological change and the need to generate or adopt innovations.

SA.501.110. Data Analytics and Visualization (using R). 4 Credits.

Data analytics and visualization skills are in high demand in today's complex international affairs, geopolitics, and public policy more broadly. This course introduces students to the fundamentals of data science using the R statistical software. The course consists of three main components. The first part builds fluency in basic data manipulation, description, and analysis. The second part focuses on the principles and practical applications of data visualization. In the third part, students generate, analyze, and visualize a large dataset to answer a research question of their choice.

SA.501.111. Introduction to Trust and Safety. 4 Credits.

In an era where digital and social media platforms shape global interactions, a field referred to as "trust and safety" has emerged inside primarily US technology companies aimed at identifying and addressing the risks and harms individuals face online, including but not limited to fraudulent activities, cyberbullying, misinformation, hate speech, identity theft, privacy breaches, and exploitative content. This course explores the evolving landscape of trust and safety (T&S) within technology companies, including the history of the field, contemporary challenges, and tying it to the practice of global affairs. Through a multidisciplinary lens, students will explore how T&S intersects with topics such as national security, foreign policy, and tech policy, gaining insights into the complex dynamics shaping digital governance and online safety. Students will examine the strategies employed by T&S practitioners to anticipate, manage, and mitigate these risks, critically evaluating their efficacy in safeguarding digital spaces and fostering a climate of trust and integrity. This course will also explore the cultural, regulatory, and ethical considerations that inform T&S practices. Students will delve into the legal and regulatory frameworks that govern trust and safety practices in various jurisdictions, including laws such as Section 230, General Data Protection Regulation (GDPR), The Digital Services Act (DSA), Children's Online Privacy Protection Act (COPPA), and their implications for content moderation and user privacy. By examining case studies and real-world examples, students will see what it is like to attempt to address thorny questions facing content moderators, policy makers, product managers, and leaders at technology companies.

SA.501.113. Information Policy Strategy and Design in the Age of AI. 4 Credits.

Information and digital technologies have transformed the way modern societies operate over the last 20 years and introduced unprecedented opportunities as well as thorny policy challenges such as privacy, ethics, data rights, and competition. The meteoric rise of artificial intelligence in the last year has reinvigorated many of these recurring information policy challenges, and heightened tensions between the drive for rapid innovation alongside calls for regulation. Students will develop a foundational understanding of key concepts within information policy issues and apply it to information-intensive emerging technologies including AI/Generative AI, digital platforms and social media, smart devices/Internet of Things, and AR/VR/Metaverse. Students will build technical knowledge necessary to diagnose and remedy policy issues at hand, be able to discuss the ethical tradeoffs and nuances of contested issues from multiple perspectives, and curate a toolkit of policy approaches and regulatory options available for emerging tech. Relevant current events and technological developments will be incorporated into the course throughout the semester, and students will be expected to interact with many of the technologies discussed throughout to spark class discussion and inform future practice. This course will leave students with knowledge that will allow them to feel equally comfortable traversing the boardrooms of Silicon Valley and corridors of power within Washington DC.

SA.501.114. Technology and International Competition. 4 Credits.

This course would focus on technology, particularly military technology and dual use technology, as a variable in international relations. It will consider questions such as how does technology drive security competition and how does it create or obstruct opportunities for cooperation. The course will identify attributes of technology that impact the coercive application of military power in world politics, from damage imposition to coercive leverage in bargaining. The analytic approach will be grounded in case studies of several major technology categories, most likely (1) nuclear technology, notably atomic weapons and power plants; (2) rockets, including precision strike capabilities, hypersonics, ballistic missiles, and space launch vehicles; (3) space systems, primarily satellites and other orbital platforms such as spacecraft and anti-satellite (ASAT) weapons; (4) chemical and biological and (5) artificial intelligence.

SA.501.115. Digitalization and Decarbonization of the Energy Systems. 4 Credits.

This course will examine two concurrent megatrends: the digitalization and decarbonization of the energy sector. With a particular emphasis on artificial intelligence approaches, students will engage in an in-depth exploration of the evolving dynamics within energy generation, transportation, consumption, and storage. Topics of study will encompass a wide spectrum, including the utilization of autonomous and electric vehicles, the assessment of energy consumption in data centers, the digital monitoring of emissions, cybersecurity threats to energy infrastructure, and various strategies for managing energy demand and implementing demand response initiatives. Furthermore, the course will critically assess the policies and frameworks necessary to facilitate robust digital solutions for achieving decarbonization objectives.

SA.501.116. Artificial Intelligence & Epistemic Security. 4 Credits.

This course will explore how the emergence of generative AI is affecting issues of epistemic security (misinformation, influence operations, media consumption, academic integrity, etc.) and how advances in AI could shape our epistemic futures. Students will learn the basics of how foundation models, LLMs, image generation models, and multimodal models work, and how choices across the AI lifecycle, from development to deployment, can cause harmful outputs and/or could contribute to epistemic decline (e.g.: quality of sources on the Internet, issues with model confabulations, academic integrity). Furthermore, students will apply their knowledge of influence operations and misinformation gained from previous courses to understand how malicious actors could use AI to threaten epistemic security, as well as learn more about the current AI malicious actor ecosystem (for both state and non-state actors). Lastly, the course will delve deep into potential solutions to mitigate epistemic crises, from technical mitigations within AI models, content authentication approaches, to broader whole of society efforts (participatory governance, information literacy, etc.). Students put themselves in the shoes of various actors in the current AI ecosystem, specifically: large AI developers, social media platforms, and policymakers across the US government, to produce targeted outputs for the course. In addition, students will engage with and use generative AI tools to understand various types of harms and will also learn unique insights into the challenges of trust & safety in the AI space. Course outputs could include: an internal policy enforcement protocol for disinformation for a large AI developer, a policy memo for the Director of OSTP on AI and information integrity, an exercise to generate known mis/disinformation narratives using generative AI models, and more.

SA.501.117. The Intersection of Space Systems Engineering and International Public Policy. 4 Credits.

This course straddles the boundary between engineering and public policy related to Outer Space. It presents space policy and the effects that policy has on engineering decisions. It presents the underlying space systems engineering principles that necessitate space policy. Space is a highly technical and nonintuitive domain. Professionals working in any space-related field should have a basic understanding of the relationship between engineering and international public policy.