

Carnegie Mellon Institute for Security and Technology

Audrey Kurth Cronin, Director, Trustees Professor of Security and Technology

Location: Posner Hall 385A
www.cmu.edu/cmist (<http://www.cmu.edu/cmist/>)

Carnegie Mellon University (CMU) launched a major new interdisciplinary institute, the Carnegie Mellon Institute for Security and Technology (CMIST) (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/www.cmu.edu/cmist/>), in 2023. CMIST is a university-wide initiative devoted to the wise development, use, and governance of new and emerging technologies that are changing the national and international security landscape.

The home for Carnegie Mellon University's (CMU) study of Political Science and International Relations, CMIST hosts academic programs that enable students to wrestle with a wide range of issues, including the future of democracy, the relationship between technology and politics, the drivers of war and peace, domestic politics across countries, and the formulation of effective foreign policies. Our students and faculty investigate issues in security and technology, grand strategy and national security, cybersecurity and international conflict, military strategy and doctrine, the politics of key regions of the world, international political economy and economic policy, representation and voting rights, climate change and development, repression and human rights, international law and diplomacy, political psychology and public opinion, and social change and revolution. Our graduates embark on a variety of careers in government, law, public policy, intelligence, national defense, consulting, international development, and more.

CMIST is where we address the challenges of new and emerging technologies through a political science lens, focused on maximizing the benefits and reducing the risks to human beings, national security, and global stability. Taking advantage of the intellectually rich Carnegie Mellon setting, CMIST draws upon the university's strengths in computer science and engineering and its distinctive tradition of collaborative, cross-university, cross-disciplinary research. CMU is ranked #1 in the subfields of artificial intelligence, computer engineering, cybersecurity, information systems, and software engineering. It has leading research institutes in areas such as robotics, machine learning, natural language technologies, human-computer interaction, engineering and public policy, and public policy and management—all designed to reach across disciplinary boundaries to solve key problems and address the highest-priority challenges facing humanity. CMIST ties Carnegie Mellon's strengths in building new technologies to crucial questions of strategy, security, ethics, and policy, with a social science approach.

In its focus on Political Science and International Relations, CMIST offers the following undergraduate degree programs and initiatives:

- o BS International Relations and Political Science (primary and additional major);
- o BS Economics and Politics (primary and additional major);
- o International Relations and Political Science Minor;
- o Cybersecurity and International Conflict Minor;
- o Military Strategy and International Relations Minor;
- o Politics and Public Policy Minor; and
- o The Carnegie Mellon University Washington Semester Program.

Bachelor of Science in International Relations and Political Science

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The Bachelor of Science in International Relations and Political Science (IRPS) is for students who want to learn how to think systematically

and develop foundational knowledge about international and domestic politics. It is an interdisciplinary major that is rooted firmly in political science and draws on strengths and insights from decision science, economics, history, modern languages, and other fields. BS IRPS students wrestle with a wide range of issues including the future of democracy, the relationship between technology and politics, the drivers of war and peace, domestic politics across countries, and the formulation of effective foreign policies. IRPS graduates embark on a variety of careers in government, law, public policy, intelligence, national defense, consulting, international development, and more.

Core disciplinary courses for the IRPS major establish a strong foundation in the study of political science and enable students to better understand the workings of political institutions, political behavior across countries, the decision-making of political leaders, the making national and international policy, and prevailing challenges to the international system, among other topics.

Core methodology courses train IRPS students in the social science tools and communications skills needed to analyze and write persuasively about international relations and politics. Students pursuing an IRPS major learn to use a wide range of analytic tools including statistics and data science, qualitative analysis, game theory, and behavioral decision-making models as they study politics and strategy. Students also learn how to effectively communicate their analyses to affect public policy.

A rich set of electives allows students to investigate issues in security and technology, grand strategy and national security, cybersecurity and international conflict, military strategy and doctrine, the politics of key regions of the world, international political economy and economic policy, representation and voting rights, climate change and development, repression and human rights, international law and diplomacy, political psychology and public opinion, and social change and revolution.

Recognizing the importance of language and culture in understanding politics and international relations, students are required to complete the intermediate (200) level, or its equivalent, in a modern language other than English. Advanced-level study is strongly encouraged.

Open to all Carnegie Mellon undergraduates, the Carnegie Mellon University Washington Semester Program (CMU/WSP) (<https://www.cmu.edu/ips/cmuwsp/>) allows students to study politics and public policy, and to spend a semester interning in Washington, DC. Courses taken through CMU/WSP count toward the policy seminar core requirement and electives for the IRPS major.

Double Counting: Students may double count a maximum of four courses with another major or minor.

Curriculum

Disciplinary Core Courses

Students must complete all of the following disciplinary core courses.

84-104	Decision Processes in American Political Institutions	9
84-110	Foundations of Political Economy	9
or 73-102	Principles of Microeconomics	
or 73-103	Principles of Macroeconomics	
or 73-104	Principles of Microeconomics Accelerated	
84-226	International Relations	9
84-275	Comparative Politics	9
84-450	Policy Seminar	6

Methodology Core Courses

Students must complete all of the following methodology core courses.

84-250	Writing for Political Science and Policy	9
84-266	Research Design for Political Science	9
84-267	Data Science for Political Science	9
or 36-202	Methods for Statistics & Data Science	
84-369	Decision Science for International Relations	9

Language Requirement

Students are required to complete a course at the Intermediate II level or higher of a modern language other than English. Advanced level study is strongly encouraged. Students who successfully pass a language placement

exam on campus, at the intermediate II level or higher, are required to take an advanced language course to satisfy the language requirement.

Electives

Students must complete 54 units (usually six courses) from the elective lists below. At least four courses (36 units) must be taken from the Carnegie Mellon Institute for Security and Technology (84-xxx). Most courses listed below are 9-unit courses, but some are fewer. When students choose courses offered for fewer than 9 units, they must remember that a minimum of 54 units is still required and thus plan to take one or more additional courses to fill out that minimum number. In other words, the key requirement is the number of *units* (54), not the number of *courses*.

CMIST Electives

84-200	Security War Game Simulation	6
84-252	Briefing in the Policy World	6
84-303	International Human Rights	6
84-304	In the News: Analysis of Current National Security Priorities	6
84-306	Latin American Politics	9
84-307	Economic and Political History of Contemporary China	9
84-310	International Political Economy	9
84-312	Terrorism in Sub-Saharan Africa	6
84-313	International Organizations and Law Taught in Washington, DC, through CMU/WSP	6
84-315	Political Economy of International Migration	9
84-316	Political Economy of Transatlantic Partnership	9
84-317	Defense Resourcing: From Strategy to Execution	6
84-318	Politics of Developing Nations	9
84-319	Civil-Military Relations	9
84-322	Nonviolent Conflict and Revolution	9
84-323	War and Peace in the Contemporary Middle East	9
84-324	The Future of Democracy	9
84-325	Contemporary American Foreign Policy	9
84-327	Repression and Control in Dictatorships	9
84-328	Military Strategy and Doctrine	9
84-329	Asian Strategies	6
84-330	The Shading of Democracy: The Influence of Race on American Politics Taught in Washington, DC, through CMU/WSP	6
84-331	Money, Media, and the Power of Data in Decisionmaking Taught in Washington, DC, through CMU/WSP	6
84-334	The History and Practice of Economic Statecraft Taught in Washington, DC, through CMU/WSP	6
84-335	US China Relations Taught in Washington, DC, through CMU/WSP	6
84-336	Implementing Public Policy: From Good Idea To Reality Taught in Washington, DC, through CMU/WSP	12
84-337	Biomedical Science Research, Policy, and Governance Taught in Washington, DC, through CMU/WSP	6
84-339	Seminar in Public Policy Research Taught in Washington, DC, through CMU/WSP	12
84-340	Making Change: How Organized Interests Work in Washington Taught in Washington, DC, through CMU/WSP	12
84-348	Advocacy, Policy and Practice Taught in Washington, DC, through CMU/WSP	6
84-352	Representation and Voting Rights	9
84-354	The American Experiment: Unravelling the US Electoral System	6
84-360	CMU/WSP: Internship Seminar Taught in Washington, DC, through CMU/WSP	12
84-362	Diplomacy and Statecraft	9
84-365	The Politics of Fake News and Misinformation	9
84-370	Nuclear Security & Arms Control	9
84-372	Space and National Security	9
84-373	Emerging Technologies and International Law	9
84-374	Technology, Weapons, and International Conflict	9
84-380	US Grand Strategy	9
84-383	Cyber Policy as National Policy	6
84-386	The Privatization of Force	9

84-387	Remote Systems and the Cyber Domain in Conflict	9
84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-390	Social Media, Technology, and Conflict	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9
84-405	The Future of Warfare	9
84-421	Advanced Topics in American Politics	9
84-440	Collaborative Research in Political Science	Var.

Additional Electives

19-452	EPP Projects II	12
70-342	Managing Across Cultures	9
70-365	International Trade and International Law	9
70-430	International Management	9
73-332	Political Economy	9
76-318	Communicating in the Global Marketplace	9
79-203	The Other Europe: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990	9
79-205	20th Century Europe	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-227	Modern Africa: The Slave Trade to the End of Apartheid	9
79-229	The Origins of the Palestinian-Israeli Conflict, 1880-1948	9
79-230	The Arab-Israeli Conflict and Peace Process since 1948	9
80-136	Social Structure, Public Policy & Ethics	9
79-257	Germany and the Second World War	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-264	Tibet and China: History and Propaganda	9
79-265	Russian History: Game of Thrones	9
79-266	Russian History and Revolutionary Socialism	9
79-267	The Soviet Union in World War II: Military, Political, and Social History	9
79-275	Introduction to Global Studies	9
79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
79-301	History of Surveillance: From the Plantation to Data Capitalism	6
79-302	Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems	9
79-313	"Unwanted": Refugees, Asylum Seekers, and Patterns of Global Migration	6
79-314	How Do We Remember? The Politics and Cultures of Memory	9
79-318	Sustainable Social Change: History and Practice	9
79-320	Women, Politics, and Protest	9
79-343	Education, Democracy, and Civil Rights	9
79-377	Food, Culture, and Power: A History of Eating	9
79-385	Out of Africa: The Making of the African Diaspora	9
80-135	Introduction to Political Philosophy	9
80-136	Social Structure, Public Policy & Ethics	9
80-249	AI, Society, and Humanity	9
80-335	Social and Political Philosophy	9
80-348	Health, Human Rights, and International Development	9
80-447	Global Justice	9
82-3xx	82-3xx or 4xx Advanced Level Modern Language Class	
88-281	Topics in Law: 1st Amendment	9
88-284	Topics of Law: The Bill of Rights	9
88-411	Rise of the Asian Economies	9

NOTE: Some courses have additional prerequisites.

Sample four-year plan

These sample curricula represent a plan for completing the requirements for the B.S. in International Relations and Political Science. International Relations and Political Science (IRPS) students are encouraged to spend a semester studying and interning in Washington, DC, through the CMU/WSP (<http://www.cmu.edu/ips/cmuwsp/>), and/or study abroad. The plan below demonstrates that a semester off-campus fits well into the curriculum. As

with most majors in the Dietrich College, the IRPS major can be completed in as few as two years of undergraduate study, not that it must be. Students may declare the BS in International Relations and Political Science as early as the second semester of the freshman year and should consult frequently with the deputy director (see above) about their course of study. Please note that this is only a sample plan of study and not the only possible plan of study. The IRPS major and Dietrich College General Education curricula provide a high degree of flexibility in sequencing and coursework. Double counting between the major and the General Education requirements is unlimited. The plan below shows a very conservative view of double counting.

First-Year		Second-Year	
Fall	Spring	Fall	Spring
84-104 Decision Processes in American Political Institutions	84-110 Foundations of Political Economy	84-226 International Relations	84-267 Data Science for Political Science
36-200 Reasoning with Data	84-250 Writing for Political Science and Policy	84-266 Research Design for Political Science	Language Course*
Grand Challenge Seminar	84-275 Comparative Politics	Language Course*	General Education
First-Year Writing	Disciplinary Perspectives: Humanities	General Education	General Education
Language Course*	Language Course*	IRPS Elective	IRPS Elective
99-101 Computing @ Carnegie Mellon			

*If starting a Modern Language at the Elementary I level, four semesters of language study are required for the IRPS major. AP credit or a language placement exam may allow students to begin at CMU in a level higher than Elementary I and have fewer required semesters of language study.

Third-Year		Fourth-Year	
Fall	Spring	Fall	Spring
84-369 Decision Science for International Relations	CMU/WSP or STUDY ABROAD*	IRPS Elective	84-450 Policy Seminar
IRPS Elective	Explore	IRPS Elective	IRPS Elective
General Education	Explore	IRPS Elective	General Education
General Education	Explore	General Education	Explore
Explore	Explore	General Education	Explore

*All students are strongly encouraged to participate in the CMU/WSP (<http://www.cmu.edu/ips/cmuwsp/>) and/or in a study abroad program. Spring semester of the junior year is a popular semester to study off-campus. However, International Relations and Political Science majors may instead choose to participate in the CMU/WSP or study abroad in spring of sophomore year, fall of junior year, or fall of senior year. Students should consult the deputy director when planning their curricular program. **Students who participate in the CMU/WSP (<https://www.cmu.edu/ips/cmuwsp/>) will complete the Policy Seminar while studying in Washington, DC. Students who do not participate in the CMU/WSP will take the Policy Seminar in the spring of the senior year in Pittsburgh.

Additional Major

Students who elect International Relations and Political Science as an additional major must fulfill all of the requirements of the BS in International Relations and Political Science primary major.

Bachelor of Science in Economics and Politics

Politics and economics are deeply interconnected. Political institutions and decision-making impact economic growth, income distribution, and many other aspects of economic life. Both fiscal and monetary policies affect the economy, but these policies are often employed with political considerations in mind and can influence political activity. For example, while the United Nations is often thought of in purely political terms, the Security Council can and does impose sanctions on countries—an example of an economic policy used for political change.

The Economics and Politics major is offered jointly between the Undergraduate Economics Program (<https://www.cmu.edu/tepper/programs/undergraduate-economics/>) (UEP) and the Carnegie Mellon Institute for Security and Technology (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/www.cmu.edu/cmist/>) (CMIST). Students are equal members of both academic units and receive advising from both units. The major will appeal to any student interested in the design, evaluation, and political implementation of policy. It will be especially

attractive to students considering careers in politics, government agencies, political and business consulting, lobbying, or the law.

The BS in Economics and Politics is an interdisciplinary major. The major will develop the political context and underpinnings of economic policy making. It will explore how political institutions resolve the tradeoffs and disagreements associated with policymaking and how they can facilitate or impede desirable economic outcomes.

CMIST strengths lie in topics such as emerging technology, national security, and grand strategy. Economic policy is one facet of grand strategy, through which governments pursue domestic and international goals. It will enable students to understand economic statecraft from a broad perspective. This major will address key issues such as how multilateral economic institutions such as the IMF and World Bank use economic coercion. Whether coercion is successful or not depends not only on the levers of power but also on variations in regime structures, alongside complex linkages in the international economy. For example, the viability of the “Euro Zone” depends on whether the political-economic agreements necessary to mitigate institutional weaknesses are politically feasible or destined to failure. In short, international economics affects everything from human rights practices to global compliance with climate change treaties.

Economics and Politics is available as both a primary and an additional major. The requirements are the same for both.

Curriculum

Students must earn a grade of "C" or better in all courses taken in the Department of Economics (73-xxx).

Mathematics

Students must complete all of the following courses.

21-120	Differential and Integral Calculus	10
or 21-112	Calculus II	
21-256	Multivariate Analysis	9
or 21-259	Calculus in Three Dimensions	

Foundations (36 units)

Students must complete all of the following courses.

73-102	Principles of Microeconomics *	9
or 73-104	Principles of Microeconomics Accelerated	
73-103	Principles of Macroeconomics	9
84-104	Decision Processes in American Political Institutions	9
84-275	Comparative Politics	9

***Students who place out of 73-102 based on the economics placement exam will receive a pre-req waiver for 73-102 and are waived from taking 73-102**

Core (63 units)

Students must complete all of the following courses.

73-230	Intermediate Microeconomics	9
73-240	Intermediate Macroeconomics	9
73-265	Economics and Data Science	9
73-274	Econometrics I	9
84-226	International Relations	9
84-266	Research Design for Political Science	9
84-310	International Political Economy	9

Communication (9 units)

Students must complete one course from the following list.

73-270	Professional Communication for Economists	9
84-250	Writing for Political Science and Policy	9

Electives (27 units)

Majors are required to take 27 units (three courses) from the elective lists below. At least one course (9 units) must be taken from Economics (73-xxx) and at least one course (9 units) must be taken from the Carnegie Mellon Institute for Security and Technology (84-xxx). Students may complete electives through coursework in the Carnegie Mellon University Washington Semester Program (CMU/WSP) (<https://www.cmu.edu/ips/cmuwsp/>).

Economics Electives

73-328	Health Economics	12
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73-332	Political Economy	9
73-338	Financial Crises and Risk	9
73-352	Public Economics	9
73-353	Financial Regulation in the Digital Age	9
73-359	Benefit-Cost Analysis	9
73-365	Firms, Market Structures, and Strategy	9
73-421	Emerging Markets	9
73-427	Sustainability, Energy, and Environmental Economics	9
International Relations and Political Science Electives		
84-200	Security War Game Simulation	6
84-252	Briefing in the Policy World	6
84-303	International Human Rights	6
84-304	In the News: Analysis of Current National Security Priorities	6
84-306	Latin American Politics	9
84-307	Economic and Political History of Contemporary China	9
84-312	Terrorism in Sub-Saharan Africa	6
84-313	International Organizations and Law <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-315	Political Economy of International Migration	9
84-316	Political Economy of Transatlantic Partnership	9
84-317	Defense Resourcing: From Strategy to Execution	6
84-318	Politics of Developing Nations	9
84-319	Civil-Military Relations	9
84-322	Nonviolent Conflict and Revolution	9
84-323	War and Peace in the Contemporary Middle East	9
84-324	The Future of Democracy	9
84-325	Contemporary American Foreign Policy	9
84-327	Repression and Control in Dictatorships	9
84-328	Military Strategy and Doctrine	9
84-329	Asian Strategies	6
84-330	The Shading of Democracy: The Influence of Race on American Politics <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-331	Money, Media, and the Power of Data in Decisionmaking <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-334	The History and Practice of Economic Statecraft <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-335	US China Relations <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-336	Implementing Public Policy: From Good Idea To Reality <small>Taught in Washington, DC, through CMU/WSP</small>	12
84-337	Biomedical Science Research, Policy, and Governance <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-339	Seminar in Public Policy Research <small>Taught in Washington, DC, through CMU/WSP</small>	12
84-340	Making Change: How Organized Interests Work in Washington <small>Taught in Washington, DC, through CMU/WSP</small>	12
84-348	Advocacy, Policy and Practice <small>Taught in Washington, DC, through CMU/WSP</small>	6
84-352	Representation and Voting Rights	9
84-354	The American Experiment: Unravelling the US Electoral System	6
84-360	CMU/WSP: Internship Seminar <small>Taught in Washington, DC, through CMU/WSP</small>	12
84-362	Diplomacy and Statecraft	9
84-365	The Politics of Fake News and Misinformation	9
84-369	Decision Science for International Relations	9
84-370	Nuclear Security & Arms Control	9
84-372	Space and National Security	9
84-373	Emerging Technologies and International Law	9
84-374	Technology, Weapons, and International Conflict	9
84-380	US Grand Strategy	9
84-383	Cyber Policy as National Policy	6
84-386	The Privatization of Force	9
84-387	Remote Systems and the Cyber Domain in Conflict	9

84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-390	Social Media, Technology, and Conflict	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9
84-405	The Future of Warfare	9
84-421	Advanced Topics in American Politics	9
84-440	Collaborative Research in Political Science	Var.

Additional Electives

19-411	Science and Innovation Leadership for the 21st Century: Firms, Nations, and Tech	9
19-425	Sustainable Energy for the Developing World	9
70-365	International Trade and International Law	9
70-430	International Management	9
79-280	Coffee and Capitalism	9
79-318	Sustainable Social Change: History and Practice	9
80-135	Introduction to Political Philosophy	9
80-136	Social Structure, Public Policy & Ethics	9
80-321	Causation, Law, and Social Policy	9
80-335	Social and Political Philosophy	9
80-348	Health, Human Rights, and International Development	9
80-447	Global Justice	9
88-323	Policy in a Global Economy	9
88-366	Behavioral Economics of Poverty and Development	9
88-419	International Negotiation	9
88-444	Public Policy and Regulations	9

CAPSTONE (15-21 units)

Students must complete all of the following courses.

84-450	Policy Seminar	6
73-497	Senior Project or Senior Honors Thesis	9

Note: Students in the BS in Economics and Politics who complete a Dietrich or Tepper Honors Thesis in economics may use 73-497 (Senior Project) as an economics elective.

DOUBLE-COUNTING RESTRICTION

A maximum of four courses may double count with another major or minor.

SAMPLE Four Year Plan

These sample curricula represent a plan for completing the requirements for the B.S. in Economics and Politics. Economics and Politics students are encouraged to spend a semester studying and interning in Washington, DC, through the CMU/WSP (<http://www.cmu.edu/ips/cmuwsp/>), and/or study abroad. The plan below demonstrates that a semester off-campus fits well into the curriculum. Students may declare the BS in Economics and Politics as early as the second semester of the freshman year and should consult frequently with the Economics and Politics advisors about their course of study. Please note that this is only a sample plan of study and not the only possible plan of study. The Economics and Politics major and Dietrich College General Education curricula provide a high degree of flexibility in sequencing and coursework. Double counting between the major and General Education requirements is unlimited. The plan below shows a very conservative view of double counting.

First-Year		Second-Year	
Fall	Spring	Fall	Spring
21-120 Differential and Integral Calculus	21-256 Multivariate Analysis	73-230 Intermediate Microeconomics	73-240 Intermediate Macroeconomics
36-200 Reasoning with Data	73-103 Principles of Macroeconomics	73-265 Economics and Data Science	73-274 Econometrics I
73-102 Principles of Microeconomics	84-275 Comparative Politics	84-226 International Relations	Communication Course (84-250 or 73-270)
84-104 Decision Processes in American Political Institutions	First-Year Writing	84-266 Research Design for Political Science	General Education
Grand Challenge Seminar	Disciplinary Perspectives: Humanities	84-310 International Political Economy	General Education
99-101 Computing @ Carnegie Mellon			

Third-Year		Fourth-Year	
Fall	Spring	Fall	Spring
General Education	CMU/WSP or Study Abroad	73-497 Senior Project	84-450 Policy Seminar
General Education	Explore	General Education	General Education
General Education	Explore	Economics & Politics Elective	Explore
General Education	Explore	Economics & Politics Elective	Explore
Economics & Politics Elective	Explore	Explore	Explore

Minor in Cybersecurity and International Conflict

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The minor in cybersecurity and international conflict analyzes the past, present, and future role of cyber conflict and cybersecurity in international politics. Cyber attacks by nation-states and their proxies have an important impact upon conflict. The complexity and policy challenges of cyber-engagements is immense. This minor addresses the role of deterrence, dissuasion, and attribution in cyber conflict, while also studying the nuances of key components of modern warfare—from the security dilemma to escalation management.

Courses in this minor focus on the existing gaps in our understanding of cybersecurity and international conflict, such as whether cyberspace is offense or defense dominant (or over time fluid between the two), and which factors are important in determining the answer to this. Other relevant questions include how nation-states, their primary adversaries, and a bevy of nonstate actors engage online and in the virtual and information environments. Accordingly, the minor exposes students to basic technology concepts, methods of attack and defense, potential strategy and goals for cyber-engagement, and response and forensics for cyber-engagements.

Alongside conventional methods of warfare, cybersecurity has rapidly developed into a centerpiece of a state's ability to project power. As the United States and other emerging cyber powers craft and implement doctrine in this domain, there is likely to be a rapid increase in activity, from efforts to disrupt the online activities of global terrorist networks, to cybersecurity offense and defense in the Russia-Ukraine war, to near daily raids on foreign networks designed to cripple states' cyberweapons before they can be deployed. In addition, the impact of cyberattacks on critical infrastructure, theft of intellectual property, pervasive identity theft, and hacking of sensitive databases have accumulated, gradually wearing down civilian networks and achieving strategic effects over time.

In the shifting landscape of cyber capabilities, how will laws, authorities, and policies keep pace? What are the implications and consequences of actions that may be considered "short of war" by some countries but "above the threshold" of conflict by others? Will a more aggressive defensive posture with respect to cybersecurity inadvertently increase the risk of conflict with states that sponsor malicious hacking groups? What is the proper balance between offense and defense in cybersecurity and how are cyber operations best integrated into a country's overall military strategy?

Unlike other kinds of conflicts, attribution of attacks presents significant challenges. Indeed, in many cases, it can be difficult to determine whether the attacker is a nation-state, a nonstate actor, a criminal gang, or a lone hacktivist. Investigators must combine technical and traditional methods to identify potentially responsible parties and to understand their intent. If the aggressor's identity cannot be confirmed, how can a counterattack be launched? Some attackers may seek to mount "false flag" attacks and deception, for example, that misdirect defenders to counter-attack in the wrong direction.

Additionally, what are appropriate responses to attacks made on civil infrastructure and private business operations, such as in the areas of financial services, transportation, energy, entertainment, and health care? In other words, what are the appropriate rules of engagement for national systems, infrastructural systems, businesses, and individuals? When, for example, is a counterattack or a "kinetic" response permissible?

These questions have major implications for the study of war and peace. Those who seek to start a war may be harder to find and their motives

more difficult to discern. The cybersecurity and international conflict minor tackles the social-scientific dimensions of cybersecurity with a focus on the implications of the cyber age for modern statecraft, warfare, elections (local, state, and national), and domestic and international politics.

CURRICULUM

60 units

Foundational Course

Students must take one of the following foundational courses (9 units):

84-104	Decision Processes in American Political Institutions	9
84-226	International Relations	9
84-275	Comparative Politics	9

Core Courses

Students must take all of the following core courses (24 units):

84-387	Remote Systems and the Cyber Domain in Conflict	9
84-388	Concepts of War and Cyber War	6
84-405	The Future of Warfare	9

Elective Courses

Students must take three courses from the following list of elective courses (27 units). At least one course (9 units) must be taken from the Carnegie Mellon Institute for Security and Technology and have an 84-number.

84-200	Security War Game Simulation	6
84-312	Terrorism in Sub-Saharan Africa	6
84-317	Defense Resourcing: From Strategy to Execution	6
84-319	Civil-Military Relations	9
84-323	War and Peace in the Contemporary Middle East	9
84-325	Contemporary American Foreign Policy	9
84-327	Repression and Control in Dictatorships	9
84-328	Military Strategy and Doctrine	9
84-329	Asian Strategies	6
84-365	The Politics of Fake News and Misinformation	9
84-370	Nuclear Security & Arms Control	9
84-372	Space and National Security	9
84-373	Emerging Technologies and International Law	9
84-374	Technology, Weapons, and International Conflict	9
84-380	US Grand Strategy	9
84-383	Cyber Policy as National Policy	6
84-386	The Privatization of Force	9
84-389	Terrorism and Insurgency	9
84-390	Social Media, Technology, and Conflict	9
16-735	Ethics and Robotics	12
17-200	Ethics and Policy Issues in Computing	9
17-303	Cryptocurrencies, Blockchains and Applications	Var.
17-331	Information Security, Privacy, and Policy	12
17-333	Privacy Policy, Law, and Technology	9
17-334	Usable Privacy and Security	9
17-702	Current Topics in Privacy Seminar	3
79-301	History of Surveillance: From the Plantation to Data Capitalism	6
79-302	Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems	9
80-249	AI, Society, and Humanity	9
95-444	Cybersecurity Policy and Governance	12

Students are permitted to double count a maximum of two courses between the minor in Cybersecurity and International Conflict and another major or minor.

Minor in International Relations and Political Science

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www.cmu.edu/cmist

The International Relations and Political Science (IRPS) minor examines international relations, comparative politics, and domestic politics from the discipline of political science. It analyzes the role of politics at the national, regional, international, and transnational levels; examines political and institutional arrangements within and among these levels; and investigates current issues relevant to the field of international relations.

The IRPS minor studies the ways in which leaders construct foreign and national security policy; the impact of domestic and international forces on states' security and economic policies; and the significance of alliances, coalitions, and international institutions for world politics. The minor emphasizes the importance of political institutions, decision making by leaders in shaping policy, and contemporary challenges to the international system.

A maximum of two courses may double count between the minor in International Relations and Political Science and another major or minor.

Curriculum

63 units

Core Courses

Students must take all of the following core courses (36 units):

84-104	Decision Processes in American Political Institutions	9
84-226	International Relations	9
84-275	Comparative Politics	9
84-110	Foundations of Political Economy	9
or 73-102	Principles of Microeconomics	
or 73-103	Principles of Macroeconomics	
or 73-104	Principles of Microeconomics Accelerated	

Electives

Students select three courses (27 units) from the elective lists below. Two courses (18 units) must be taken from the Carnegie Mellon Institute for Security and Technology (CMIST) and have an 84-number.

CMIST Electives

84-200	Security War Game Simulation	6
84-252	Briefing in the Policy World	6
84-303	International Human Rights	6
84-304	In the News: Analysis of Current National Security Priorities	6
84-306	Latin American Politics	9
84-307	Economic and Political History of Contemporary China	9
84-310	International Political Economy	9
84-312	Terrorism in Sub-Saharan Africa	6
84-315	Political Economy of International Migration	9
84-316	Political Economy of Transatlantic Partnership	9
84-317	Defense Resourcing: From Strategy to Execution	6
84-318	Politics of Developing Nations	9
84-319	Civil-Military Relations	9
84-322	Nonviolent Conflict and Revolution	9
84-323	War and Peace in the Contemporary Middle East	9
84-324	The Future of Democracy	9
84-325	Contemporary American Foreign Policy	9
84-327	Repression and Control in Dictatorships	9
84-328	Military Strategy and Doctrine	9
84-329	Asian Strategies	6
84-352	Representation and Voting Rights	9
84-354	The American Experiment: Unravelling the US Electoral System	6
84-362	Diplomacy and Statecraft	9
84-365	The Politics of Fake News and Misinformation	9
84-369	Decision Science for International Relations	9
84-370	Nuclear Security & Arms Control	9
84-372	Space and National Security	9
84-373	Emerging Technologies and International Law	9
84-374	Technology, Weapons, and International Conflict	9
84-380	US Grand Strategy	9
84-383	Cyber Policy as National Policy	6
84-386	The Privatization of Force	9

84-387	Remote Systems and the Cyber Domain in Conflict	9
84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-390	Social Media, Technology, and Conflict	9
84-393	Legislative Decision Making: US Congress	9
84-402	Judicial Politics and Behavior	9
84-405	The Future of Warfare	9
84-421	Advanced Topics in American Politics	9
84-440	Collaborative Research in Political Science	Var.

Additional Electives

19-452	EPP Projects II	12
70-342	Managing Across Cultures	9
70-365	International Trade and International Law	9
70-430	International Management	9
73-332	Political Economy	9
76-318	Communicating in the Global Marketplace	9
79-203	The Other Europe: The Habsburgs, Communism, & Central/Eastern Europe, 1740-1990	9
79-205	20th Century Europe	9
80-136	Social Structure, Public Policy & Ethics	9
79-223	Mexico: From the Aztec Empire to the Drug War	9
79-227	Modern Africa: The Slave Trade to the End of Apartheid	9
79-229	The Origins of the Palestinian-Israeli Conflict, 1880-1948	9
79-230	The Arab-Israeli Conflict and Peace Process since 1948	9
79-257	Germany and the Second World War	9
79-262	Modern China: From the Birth of Mao ... to Now	9
79-264	Tibet and China: History and Propaganda	9
79-265	Russian History: Game of Thrones	9
79-266	Russian History and Revolutionary Socialism	9
79-267	The Soviet Union in World War II: Military, Political, and Social History	9
79-275	Introduction to Global Studies	9
79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
79-301	History of Surveillance: From the Plantation to Data Capitalism	6
79-302	Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems	9
79-313	"Unwanted": Refugees, Asylum Seekers, and Patterns of Global Migration	6
79-314	How Do We Remember? The Politics and Cultures of Memory	9
79-318	Sustainable Social Change: History and Practice	9
79-320	Women, Politics, and Protest	9
79-343	Education, Democracy, and Civil Rights	9
79-377	Food, Culture, and Power: A History of Eating	9
79-385	Out of Africa: The Making of the African Diaspora	9
80-135	Introduction to Political Philosophy	9
80-136	Social Structure, Public Policy & Ethics	9
80-249	AI, Society, and Humanity	9
80-321	Causation, Law, and Social Policy	9
80-335	Social and Political Philosophy	9
80-348	Health, Human Rights, and International Development	9
80-447	Global Justice	9
82-3xx	82-3xx or 4xx Advanced Level Modern Language Class	
88-281	Topics in Law: 1st Amendment	9
88-284	Topics of Law: The Bill of Rights	9
88-411	Rise of the Asian Economies	9

Minor in Military Strategy and International Relations

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www.cmu.edu/cmist (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/www.cmu.edu/cmist/>)

The minor in Military Strategy and International Relations offers Carnegie Mellon undergraduates a course of study focusing on military strategy and the current national security landscape, including how cybersecurity and artificial intelligence influence national security decision making, and the full range of strategic challenges facing future leaders.

While the minor is open to all CMU undergraduates, it is particularly appropriate for CMU students embarking on the Reserve Officer Training Corps (ROTC) program as well as those interested in pursuing defense-related careers. CMU typically has several dozen ROTC students annually, spread throughout the university, along with many others who are interested in defense and strategy issues. Many students major in STEM fields, where they learn valuable technical skills but are exposed to little of the wider strategic context facing military leaders and decision-makers or to the political and institutional frameworks in which they operate. This minor is designed to complement that study and fill that gap.

In short, the Military Strategy and International Relations minor offers future military and defense leaders insight into the national and international strategic challenges they will navigate in the future.

The Military Strategy and International Relations minor will teach future leaders how of diplomacy, development, and defense intersect. It will engage students in the whys and hows of national strategy, military planning, and the future of warfare. In addition, the minor emphasizes the political, legal, and institutional systems that shape military affairs, with core courses on the topics of civil-military relations, military strategy, governance, diplomacy, and policy decision making. Finally, the minor stresses the use of cutting-edge analytical and social science methods to prepare students for advanced training, study, and government or military service in national and international security.

Curriculum

60 units

Core Courses

Students must take the following core courses (33 units):

Military Strategy		
84-328	Military Strategy and Doctrine	9
Governance		
84-319	Civil-Military Relations	9
Diplomacy (select one)		
84-325	Contemporary American Foreign Policy	9
84-362	Diplomacy and Statecraft	9
Policy		
84-450	Policy Seminar	6

Electives

Students must complete a total of 27 units (typically three courses) from the following list of courses. At least 9 units must be taken from the Carnegie Mellon Institute for Security and Technology (CMIST) and have an 84-number.

Electives		
84-104	Decision Processes in American Political Institutions	9
84-200	Security War Game Simulation	6
84-226	International Relations	9
84-275	Comparative Politics	9
84-312	Terrorism in Sub-Saharan Africa	6
84-313	International Organizations and Law	6
84-317	Defense Resourcing: From Strategy to Execution	6
84-318	Politics of Developing Nations	9
84-322	Nonviolent Conflict and Revolution	9
84-324	The Future of Democracy	9
84-325	Contemporary American Foreign Policy <small>If not used as a core course, course may count as an elective.</small>	9
84-327	Repression and Control in Dictatorships	9
84-329	Asian Strategies	6
84-362	Diplomacy and Statecraft <small>If not used as a core course, course may count as an elective.</small>	9

84-365	The Politics of Fake News and Misinformation	9
84-370	Nuclear Security & Arms Control	9
84-372	Space and National Security	9
84-373	Emerging Technologies and International Law	9
84-374	Technology, Weapons, and International Conflict	9
84-380	US Grand Strategy	9
84-383	Cyber Policy as National Policy	6
84-386	The Privatization of Force	9
84-387	Remote Systems and the Cyber Domain in Conflict	9
84-388	Concepts of War and Cyber War	6
84-389	Terrorism and Insurgency	9
84-390	Social Media, Technology, and Conflict	9
84-393	Legislative Decision Making: US Congress	9
84-405	The Future of Warfare	9
17-200	Ethics and Policy Issues in Computing	9
32-201	Leadership & Management	9
32-310	Evolution Of Warfare	9
32-402	Leadership and Ethics	9
79-257	Germany and the Second World War	9
79-268	World War I: The Twentieth Century's First Catastrophe	9
79-302	Killer Robots: The Ethics, Law, and Politics of Lethal Autonomous Weapons Systems	9
80-136	Social Structure, Public Policy & Ethics	9

Students may double count a maximum of two courses (18 units) with another major or minor. Unlimited double counting is permitted with general education requirements.

Minor in Politics and Public Policy

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www.cmu.edu/cmist (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/www.cmu.edu/cmist/>)

Rooted in the discipline of political science, the minor in Politics and Public Policy investigates US public policy issues and other matters of domestic politics while providing students hands-on and practical learning experiences. Students pursuing the Politics and Public Policy minor must participate in the Carnegie Mellon University Washington Semester Program (CMU/WSP) (<https://www.cmu.edu/ips/washington-dc-semester-program/>) for one semester during their undergraduate years.

The CMU/WSP, sponsored by the Carnegie Mellon Institute for Security and Technology (CMIST), is a semester-long program in which students live, intern, and take CMU classes in Washington, DC. Undergraduates from any course of study at the university may participate in the program. Students earn 48 units for the Carnegie Mellon University Washington Semester Program, interning about twenty-four hours per week in any sector or field of interest within Washington, DC, while taking classes taught by Carnegie Mellon faculty.

From embassies to nongovernmental organizations, think tanks to advocacy organizations, government agencies to congressional offices, and consulting firms to media outlets, Washington, DC, is the center of US political, international, and public policy activities. Students in the program come into direct contact with policymakers, Congressmen, think tank leaders, and business leaders, and through hands-on experience learn about the most pressing policy issues of the day.

Through this experiential learning program, CMU/WSP participants develop professional and networking skills, explore how coursework connects to the real world, learn to give and receive constructive feedback in the workplace and classroom, and intentionally reflect on their learning and growth. Every CMU/WSP student is paired with a Washington, DC- based alumni mentor to share career advice and tips about life in DC. CMIST also sponsors events and policy-oriented opportunities in Washington for students participating in the program to further enrich their experience and enhance their understanding of how Washington functions as a hub of international and domestic policy decision making.

Curriculum 66 units

Core Seminars

Students must take the following courses while participating in the CMU/WSP (24 units):

84-360	CMU/WSP: Internship Seminar	12
84-450	Policy Seminar	6
84-451	Policy Seminar II	6

Elective Seminars

Students must take 24 units from the below list of elective seminars offered in the CMU/WSP. Offerings vary by semester. (24 units):

84-330	The Shading of Democracy: The Influence of Race on American Politics	6
84-331	Money, Media, and the Power of Data in Decisionmaking	6
84-333	Power and Levers for Change in Washington, DC	12
84-334	The History and Practice of Economic Statecraft	6
84-335	US China Relations	6
84-336	Implementing Public Policy: From Good Idea To Reality	12
84-337	Biomedical Science Research, Policy, and Governance	6
84-339	Seminar in Public Policy Research	12
84-340	Making Change: How Organized Interests Work in Washington	12
84-348	Advocacy, Policy and Practice	6

Foundational Course

Students select one course from the following list of courses offered at Carnegie Mellon University's Pittsburgh or Qatar campus. Students may take this course before or after participating in the CMU/WSP. (9 units):

84-104	Decision Processes in American Political Institutions	9
84-226	International Relations	9
84-275	Comparative Politics	9

Economics Requirement

Students must complete one of the following courses. Students may take this course before or after participating in the CMU/WSP. Unlimited double counting in this category is permitted.

84-110	Foundations of Political Economy	9
73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
73-104	Principles of Microeconomics Accelerated	9

A maximum of two courses may double count between the minor in Politics and Public Policy and another major or minor.

Carnegie Mellon University Washington Semester Program

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www.cmu.edu/cmist (<http://coursecatalog.web.cmu.edu/schools-colleges/dietrichcollegeofhumanitiesandsocialsciences/instituteforpoliticsandstrategy/www.cmu.edu/cmist/>)

The Carnegie Mellon University Washington Semester Program (CMU/WSP), sponsored by the Carnegie Mellon Institute for Security and Technology (CMIST), is a semester-long program in which students live, intern, and take CMU classes in Washington, DC. Full-time undergraduates from any course of study at the university may participate in the program. Students earn forty-eight units for the Carnegie Mellon University Washington Semester Program, interning about twenty-four hours per week in any sector or field of interest within Washington, DC, while taking classes taught by Carnegie Mellon faculty.

From embassies to nongovernmental organizations, think tanks to advocacy organizations, government agencies to congressional offices, and consulting firms to media outlets, Washington, DC, is the center for many political, international relations, and public policy activities. Students in the program come into direct contact with political, business, and community leaders and learn about the most pressing policy issues of the day.

Through this experiential learning program, CMU/WSP participants develop professional and networking skills, explore how coursework connects to the real world, learn to give and receive constructive feedback in the workplace and classroom, and intentionally reflect on their learning and growth. Every CMU/WSP student is paired with a Washington, DC-based alumni mentor to share career advice and tips about life in DC. CMIST also sponsors events and policy-oriented opportunities in Washington for students participating in the program to further enrich their experience and enhance their understanding of how Washington functions as a hub of international and policy decision making.

Students should contact the Washington Program Manager to discuss the specifics of the program and the deputy director to discuss how the CMU/WSP may fit into their curriculum. Students who participate in the CMU/WSP may qualify for a minor in Politics and Public Policy (<https://www.cmu.edu/ips/undergraduate%20degrees/minors/minor-in-politics-and-public-policy.html>).

Applications (<https://www.cmu.edu/ips/washington-dc-semester-program/application.html>) are accepted on a rolling admission basis with a final deadline of October 1, for spring semester participation, and March 1, for fall semester participation.

Curriculum

Students who are admitted to the CMU/WSP will be enrolled in the 3 unit (pass/no pass) course 84-215 Tomorrow's Professionals in the mini semester directly preceding their time in DC.

During the semester in Washington, all students enroll in the following core seminars (24 units).

Core Seminars

84-360	CMU/WSP: Internship Seminar	12
84-450	Policy Seminar	6
84-451	Policy Seminar II	6

Students must enroll in 24 units from the below list of elective seminars. Offerings vary by semester.

Elective Seminars

84-313	International Organizations and Law	6
84-330	The Shading of Democracy: The Influence of Race on American Politics	6
84-331	Money, Media, and the Power of Data in Decisionmaking	6
84-334	The History and Practice of Economic Statecraft	6
84-335	US China Relations	6
84-336	Implementing Public Policy: From Good Idea To Reality	12

84-337	Biomedical Science Research, Policy, and Governance	6
84-339	Seminar in Public Policy Research	12
84-340	Making Change: How Organized Interests Work in Washington	12
84-348	Advocacy, Policy and Practice	6

Faculty

AUDREY KURTH CRONIN, Trustees Professor of Security and Technology; Director – DPhil, University of Oxford; Carnegie Mellon, 2023-

IGNACIO ARANA ARAYA, Assistant Professor – PhD, University of Pittsburgh; Carnegie Mellon, 2016-

HALEIGH BARTOS, Associate Professor of the Practice – MSW, University of Pittsburgh; Carnegie Mellon, 2021-

JUSTIN CANFIL, Assistant Professor – PhD, Columbia University; Carnegie Mellon, 2023-

JOHN J. CHIN, Assistant Teaching Professor – PhD, Princeton University; Carnegie Mellon, 2016-

BARUCH FISCHHOFF, Howard Heinz University Professor in the Carnegie Mellon Institute for Security and Technology and Department of Engineering and Public Policy – PhD, The Hebrew University of Jerusalem; Carnegie Mellon, 1987-

MARK S. KAMLET, University Professor of Economics and Public Policy; Provost Emeritus – PhD, University of California, Berkeley; Carnegie Mellon, 1978-

JOSHUA SCHWARTZ, Assistant Professor – PhD, University of Pennsylvania; Carnegie Mellon, 2023-

DANIEL M. SILVERMAN, Assistant Professor – PhD, The Ohio State University; Carnegie Mellon, 2017-

Post-Doctoral Fellows

JONATHAN CERVAS, Postdoctoral Fellow – PhD, University of California, Irvine; Carnegie Mellon, 2020-

NICOLE KLIEWER, Postdoctoral Fellow – PhD, Princeton University; Carnegie Mellon, 2023-

Scholar in Residence

PATRICK CRONIN, Scholar in Residence – DPhil, University of Oxford; Carnegie Mellon, 2023-

Visiting Faculty

HANZHANG LIU, Visiting Fellow – PhD, Columbia University; Carnegie Mellon, 2023-

Lecturers

RASHALL BRACKNEY, Lecturer – PhD, Robert Morris University; Carnegie Mellon, 2018-

MATTHEW BUTKOVIC, Lecturer – Master of Professional Studies, Pennsylvania State University; Carnegie Mellon, 2015-

FRED CRAWFORD, Lecturer – JD, Georgetown University; Carnegie Mellon, 2017-

DALE CROWELL, Lecturer – MA, Catholic University of America; Carnegie Mellon, 2018-

MARCIELA DEGRACE, Lecturer – PhD, Harvard University; Carnegie Mellon, 2018-

MOLLY DUNIGAN, Senior Lecturer – PhD, Cornell University; Carnegie Mellon, 2014-

MICHELLE GRISÉ, Lecturer – PhD, Yale University, JD, University of Michigan; Carnegie Mellon, 2019-

DANIEL HANSEN, Lecturer – PhD, Michigan State University; Carnegie Mellon, 2018-

THOMAS KARAKO, Lecturer – PhD, Claremont Graduate University; Carnegie Mellon, 2015-

MATTHEW LANE, Lecturer – PhD, The Pennsylvania State University; Carnegie Mellon, 2021-

SOPHIE LE BLANC, Lecturer – PhD, University of Delaware; Carnegie Mellon, 2017-

WILLIAM M. MARCELLINO, Lecturer – PhD, Carnegie Mellon University; Carnegie Mellon, 2021-

GEOFFREY MCGOVERN, Senior Lecturer – PhD, Binghamton University, JD, Harvard University; Carnegie Mellon, 2013-

FORREST E. MORGAN, Senior Lecturer – PhD, University of Maryland; Carnegie Mellon, 2017-

BRYAN ROONEY, Lecturer – PhD, Vanderbilt University; Carnegie Mellon, 2023-

KIMBERLY SMACZNIAK, Lecturer – JD, Harvard University; Carnegie Mellon, 2017-

ANDREW J. STRAVERS, Lecturer – PhD, University of Texas, Austin; Carnegie Mellon, 2021-

MARK A. TOUKAN, Lecturer – PhD, University of Wisconsin, Madison; Carnegie Mellon, 2021-

BEVERLEY WHEELER, Lecturer – DEd, Harvard University; Carnegie Mellon, 2012-

SEAN ZEIGLER, Lecturer – PhD, Duke University; Carnegie Mellon, 2019-