



College of Engineering and Computing

Applied Computer Science, B.S.

2023-2024

Concentration in Technology Policy

About the Applied CS Program

The Bachelor of Science in Applied Computer Science (BS ACS) is for students who want the knowledge and expertise of Computer Science to work in one of the many disciplines that require advanced computing techniques. These fields do not merely use computing but create new and interesting problems for the computer scientist. One such field is the area of Technology Policy.

About the Technology Policy Concentration

Social media executives are called to testify before Congress to explain how they combat misinformation and the spread of extremism. The CEO of OpenAI begs Congress for regulatory guardrails for their new technology. Recent headlines point to the critical need for computer scientists who understand how government works. Legislators need tech-savvy advisors who can help craft common sense legislation that encourages innovation while protecting citizens' rights.

The Technology Policy concentration is designed to give students the knowledge and skills of a policy degree along with training in computer science. The program explores the possibilities and challenges inherent in new technologies and the ways in which public institutions can seek to regulate these technologies to maximize their benefits. Students of this program learn both core Computer Science topics such as programming, computing theory, software engineering, and systems, while also exploring the role of policy and markets in innovation, and the legal and ethical dilemmas that surround the use of technology.

The curriculum was designed in consultation with business and government leaders. Graduates of the program will be well equipped for a wide variety of business and industry positions, drawing on their knowledge of computing and policy to inform organizations and act upon best practices.

The Schar School of Policy and Government treats Technology Policy Concentration students as co-majors and will connect them to career planning resources and professional development opportunities in the policy field.

Employers and Employment

Computer scientists have a vast range of well-paid opportunities after college. Software and technology are everywhere; to solve the problems of the future, we need expert programmers with a solid grasp of both theoretical and applied computational competency to develop, maintain, and enhance these solutions. As computing has become ubiquitous, there are also many specialized cross-disciplinary opportunities to work on new and exciting ventures. As one of the nation's top technology hubs, the DC region hosts countless technology companies, governmental contractors, and non-governmental organizations, pursuing virtually any cause that resonates with you. Students at GMU have ample opportunities to work with elite companies, prepare for security clearances, and gain valuable work experiences in tandem with this strong educational program in computing.

Sample Schedule

FIRST SEMESTER (14 CREDITS)

CS 110 Essentials of Computer Science	3
CS 112 Introduction to Programming	4
MATH 113 Analytical Geometry & Calculus	4
GOVT 150 Introduction to Technology Policy	3

SECOND SEMESTER (16 CREDITS)

CS 211 Object-Oriented Programming	3
MATH 114 Analytical Geometry & Calculus II	4
ENGH 100/101 [MC]	3
GOVT 101/103 [MC]	3
COMM 100/101	3

THIRD SEMESTER (16 CREDITS)

CS 262 Low-Level Programming	3
MATH 125 Discrete Mathematics	3
GOVT 300 Research Methods and Analysis	4
GOVT 134 Grand Challenges to Human Security [MC]	3
GOVT 352 Responsible Innovation [MC]	3

FOURTH SEMESTER (15 CREDITS)

CS 310 Data Structures	3
CS 330 Formal Methods & Models	3
GOVT 363 Sci/Technology Institutions/Policy	3
GOVT 366/367/368 Econ/Public Policy coursework Literature [MC]	3

FIFTH SEMESTER (16 CREDITS)

CS 321 Software Engineering	3
CS 367 Computer Systems and Programming	4
MATH 203 Linear Algebra	3
GOVT 426 Political Theory of Autonomous Algorithms	3
ENGH 302 Advanced Composition	3

SIXTH SEMESTER (13 CREDITS)

CS 471 Operating Systems	3
Natural Science with Lab [MC]	4
GOVT 460 Surveillance/Privacy in Contemp. Society	3
TCHP Related Elective	3

SEVENTH SEMESTER (15 CREDITS)

CS 483 Analysis of Algorithms	3
TCHP Related Elective	3
TCHP Related Elective	3
Natural Science [MC]	3
Arts [MC]	3

EIGHTH SEMESTER (15 CREDITS)

GOVT 492/CS 405, Mason Apex requirement [MC]	3
ACS Senior Elective	3
TCHP Related Elective	3
Global History [MC]	3
General Electives	3

A Closer Look at TCHP Courses

The following courses have been created specifically for this program.

GOVT150 *Introduction to Technology Policy*

Introduces the roles of government and industry in the rapid developments in information and communication technology. Presents major issues in technology development and regulation in the U.S. and around the world. Considers the legal, economic, political, sociological, public health and moral perspectives in examining the worlds of data, networks and computation.

GOVT363 *Science and Technology Institutions & Policymaking*

Explores the relationship between scientific achievement and geopolitical power. Examines the development of science and technology institutions and policy. Introduces the history of modern United States sci-tech development and places it in global comparative perspective. Students develop critical thinking and effective writing skills by critiquing current technology policies and suggesting improvements.

GOVT354 *Responsible Innovation*

Policy professionals today need to understand the power of technologies to create politics, and of specific processes by which technologies might be consciously shaped. Such understanding underpins the ability – and responsibility – to manage technologies and their effects. As interactions among technologies, organizations and cultures intensify, and conflicts among them and in the wider society intensify as well. This course is designed not only to help minimize such failures, but to maximize success in administrative, policy and political contexts.

GOVT369 *Cybersecurity Policy*

This course examines the rapidly expanding cyber world which provides new challenges for existing governance systems worldwide. Will cover existing laws, practices and social norms around cyberspace, and explore options for countering security threats and forming policies. Topics covered may include nonstate actors and international security, misinformation and weaponized information, ransomware, cryptocurrencies, and public regulation of private companies.

GOVT462 *Public Interest Technology*

This course cuts across the traditional boundaries of public policy, legal considerations, public administration, data analytics, and the supporting role of digital technologies. Practical values such as digital ethics and equity, understanding public values and navigating “fake news” are explored with current readings and case studies. The course will also delve into privacy in the digital age as well as how technology can be used better to serve and engage the public.

- see <http://catalog.gmu.edu/mason-core> Mason Core Categories for full listings of accepted courses.
Phone: 703-993-1530; Email: csug@gmu.edu, Website: <https://cs.gmu.edu>