

Scientific Solutions for Society (SS4S)

Graduate and Professional Certification: Public Policy

Overview of Specialization: This specialization prepares students and professionals to identify, analyze, and propose solutions to complex issues at the intersection of science, technology, ethics, and policy. Students will be equipped to 1) understand the ethical and societal implications of advances in research, medicine, and technology; 2) communicate to diverse audiences, including the public, policymakers, and the media; 3) examine existing policy frameworks and challenge normative assumptions and expectations; and 4) engage policymaking processes to balance innovation with responsible progress. With a complex and highly competitive job market, this certificate can serve as a valuable qualification in several job sectors including academia, private, and public.

Core competencies

Students will have acquired experience in the following competencies after completion of this specialization:

- Understand the principles of ethics, including respect for persons, beneficence, social justice, and democratic deliberation
- Recognize how recent cultural, political-economic, and environmental trends shape science both locally and globally
- Characterize local, regional and global problems where innovation and technology can play a role in solving
- Demonstrate the capacity to value and promote equity, diversity, human rights, and social and environmental justice
- Develop methodologies for bioethics analysis (foundational principlism, casuistic, communitarianism), political systems and analysis, deliberative decision-making, and data analysis

Elective Courses

Science Policy and Advocacy Fundamentals

A course to prepare students in learning basic skills and concepts in science policy and advocacy, as well as identify concrete ways to transition into careers in these areas. Among the goals of the course is to showcase the value of science communication for STEM scientists in promoting effective policy change. Modules include research and education policy, policy writing and elevator pitching sessions, effective engagement

with legislators through power mapping exercises, federal and state policy fellowships, leveraging policy for industry careers, and opportunities for local policy engagement.

Policy Research and Writing

A course to introduce students to the issues and methods of analyzing public policies and regulations. This course will provide students with a “tool kit” of practical methods for analyzing public policy issues by developing policy research and modeling skills that considers complex, real-world issues involving multiple actors with diverse interests, information uncertainty, institutional complexity, and ethical controversy.

Science and Diplomacy

A course to introduce students to the role of scientists, science, technology, and innovation in international diplomatic affairs. Students will hear from science diplomacy experts to gain a framework of science diplomacy, its various sectors, participating agencies, challenges, its future and potential for action. Students will gain an understanding of the analytical and ethical skills necessary to apply science in a diplomatic/international framework. The course will utilize case-studies of science as a tool for diplomacy, as well as case-studies for diplomacy advancing science. Students will engage in a debate style assignment for science as public good vs. private good, as well as write policy briefs, memos, and op-eds.

Policy Analysis Fundamentals

A course to teach students basic principles of policy research, writing, and analysis. Students will learn about different types of policy writing, the basics of developing a policy analysis, the structure of a policy analysis write-up, and necessary steps to write a policy analysis from start to finish. Course activities include policy research and peer to peer discussions. Resulting products could be writing pieces, infographics, a slide deck, or others.

Biology and Society

A course focused on students developing an appreciation for the ways in which institutions, practices, and ways of thinking associated with contemporary biology are specific to a particular place and time, and have changed over time. Students will learn to identify and state the significance of key people and events in the recent history of biology, while also understanding key theoretical frameworks for describing interactions between biology and society and apply these frameworks to new empirical cases. Students will learn to identify and evaluate the strength of the arguments and evidence used in an academic paper and how to extrapolate complex arguments to new contexts and how new information might change the argument. This course will utilize

case-based studies, and students will keep a portfolio of understanding which includes reflections, inquiries, and evidence sections.

Other Electives

Ethics in Science

News Literacy

Assessments:

- Student enrolled in the public policy specialization will be assessed by portfolio and quarterly surveys during their initial entry into certificate
- After completion of certificate, students will be followed up by annual survey and student centered database
- Other assessments will include faculty presentation/seminars on prospective ideas