University of Maryland School of Public Policy

New Graduate Certificate in Science, Technology, and Innovation Policy
with a focus on
Energy and the Environment

The University of Maryland School of Public Policy has created a new Graduate Certificate in Science, Technology and Innovation Policy available beginning Spring 2023. The certificate provides the knowledge and skills necessary to understand, analyze, and implement policies related to science, technology, and innovation, including regulatory aspects related to new technologies and approaches for creating and commercializing new technologies and innovations.

The Graduate Certificate in Science, Technology and Innovation Policy is a four-course (twelve credit) program of study designed for mid-career professionals from public agencies, multinational organizations and relevant private and civil society organizations. It is designed such that it can work in and across a range of science and technology domains and can be customized to those domains – in this case, energy and the environment – as well as customized to the needs of any sponsoring industries or organizations.

Courses
The Graduate Certificate in Science, Technology and Innovation Policy with a focus on Energy and the Environment contains the following three courses and choice of a fourth (descriptions at document end).

1. Influence of Science on Policy and Policy on Science
2. Concepts of Technology Change and Innovation
3. Modernizing the Energy System

   - choice of –

1. Sustainable Energy Conversion and the Environment
2. Renewable Energy Applications
3. Strategies for Managing Innovation
4. Integrated Modeling for Policy
5. Decision Analysis
6. Course Newly Developed for Client Organization

Learning Outcomes
The courses listed above are designed to provide a set of learning outcomes that benefit individuals working in the energy and environment realm and the organizations sponsoring them for study. This includes:

- Quantitative analytical skills for analyzing and assessing empirical data related to technology and technology change.
- Analytical skills for designing and evaluating STI policies and programs, including innovation support mechanisms, egulatory approaches aimed at addressing the social, and environmental and other spillovers of new technologies.
- Exposure to the main types of STI policy documents and processes, including Congressional hearings, statutes, federal budgets, court decisions, National Research Council reports, and studies from advocacy groups.

- Communication skills in writing policy memos, preparing Congressional testimony, and making presentations.

Students

The Certificate is designed for mid-career professionals from public agencies, multinational organizations and relevant private and civil society organizations. It is aimed both at students with STEM backgrounds who wish to acquire a deeper understanding and appreciation of the social and political processes that shape science and technology, and to students with a policy background who recognize that many issues are reliant on and shaped by science and technological advances. To participate in this program, all students must have a regionally accredited Bachelors degree with a 3.0 minimum GPA and must apply and be accepted to the University of Maryland Graduate School. Students must finish with a G.P.A. of 3.0 or higher to complete this certificate.

Program Format

The Certificate will commence with a course in Spring 2023 entitled **"**Influence of Science on Policy and Policy on Science" (description below) taught by Dr. Rosina Bierbaum (Research Professor and Roy F. Westin Chair in Natural Economics) and Dr. S. James Gates (Distinguished Professor; Regents Professor; and Clark Leadership Chair in Science). The course will be offered Tuesday evenings – online?. Subsequent courses will be offered in traditional semester-long courses also in the evenings. Courses will be taught on the College Park campus; students can also videoconference into classes by permission.

Customization

The Certificate *format* can also be customized. Should an organization (eg. with geographically distributed workforces) wish to sponsor a cohort of students, the Certificate can be offered in a traditional semester format via courses in the Spring and Fall terms and/or it may be offered in a non-traditional format, including condensed terms, and online or hybrid instruction.

The Certificate *content* can also be customized. The School can work with sponsoring agencies or companies to choose, or newly create, a fourth course that, for them, best complements the required three. In addition, the case studies, readings, student assignments, etc. of all courses can be tailored to the interests of students and sponsoring agencies.

Faculty and Other Resources

The program has been developed through an intensive consultative process involving University tenured and professional faculty, and course instruction will utilize the University's nationally renowned, resident practitioner scholars as well as adjunct practitioners who are preeminent in the field. Professor Anand Patwardhan (Professor at the School of Public Policy)and Dr. Charles Harry (Associate Research Professor and Director of the Center for Governance of Technology and Systems - GoTech) serve as co-Academic Directors of the Certificate and both will teach in the program.

Credentialing

The Graduate Certificate in Science, Technology and Innovation Policy offers a University credential that will be reflected in student transcripts.

Tuition

Tuition for the program is $3,500 per course ($14,000 total). Limited fellowship opportunities may be available and the School will work with the tuition reimbursement policies of sponsoring companies and payment programs of federal and state agencies.

Course Descriptions

PLCY 688J: Concepts of Technology Change and Innovation
The course provides a thorough understanding of technology and innovation and the characteristics, determinants and drivers of technological change. The course introduces key analytical constructs such as technology and product life cycles and learning curves, and the range of institutional, market and social factors that affect the diffusion and adoption of technologies, including the concepts of national innovation systems, and innovation support mechanisms.

PLCY 689L: Influence of Science on Policy and Policy on Science
This course explores how scientific and technical information gets used (or not used) in the formation of public policy, and how public policy influences science and technology development. Students will come away from this course with a fundamental understanding of the institutional landscape of S&T policy, the instruments of S&T policy implementation, and the processes of S&T policy decision-making. This institutional landscape encompasses government, business, academic institutions, and NGOs.

PLCY 699B: Modernizing the Energy System
This course will explore science, technology and innovation policy issues in the context of clean energy technologies and a decarbonized energy system. Key technologies such as renewable energy technologies, intelligent end-use systems and smart grids will be assessed and the course will build an understanding of the dynamics of their development and deployment. Aspects such as innovation support mechanisms, technology cooperation and collaboration and early stage technology finance will be explored.

Sustainable Energy Conversion and the Environment

Renewable Energy Applications

Integrated Modeling for Policy

Decision Analysis

Strategies for Managing Innovation