

Environmental Metrology & Policy

NIST



EPA

GEORGETOWN UNIVERSITY

For program details/submit application, visit emap.georgetown.edu

Master of Science in Environmental Metrology & Policy (MS-EMAP) at Georgetown University

Program Features

- Unique GU/NIST/EPA collaboration
- First in the Nation
- Interdisciplinary program
- Funded summer research internships at NIST & EPA or other agencies
- State-of-the-art metrology instruments in partnership with Agilent Technologies
- Integrated professional training combining science & policy-making
- Real-life learning & working experience with leading experts
- Location in the Nation's capital supports rich career opportunities

Application Deadlines for Fall 2017

- July 15 for U. S. applicants
- April 15 for foreign applicants

Curriculum

- 2-year 40-credits
- Integrated metrology & policy-making core courses
- Electives in economics, government, ethics & environmental science
- Summative capstone with thesis
- Seminar/discussion forum series

Admission Criteria

- BS/BA in STEM/min. 3.0/4 GPA
- 1-year General Chemistry/lab
- 1 sem. Organic Chemistry/lab
- 1 sem. Biochemistry/lab
- 1 sem. Quantitative Analysis/lab
- GRE and TOEFL (for non-native English speakers)
- CV/resume, personal statement, 3 recommendation letters

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Making sound environmental decisions to address today's and tomorrow's pollution challenges requires a sophisticated understanding of how to measure pollution in multiple media (metrology) and how to use these data to help assess environmental risks to humans and ecosystems. This information, combined with an appreciation of environmental law and other policy considerations, is essential to formulating environmental decisions that are predicated on the use of the best available science and the rule of law. The Master of Science in Environmental Metrology and Policy (MS-EMAP) at Georgetown University (GU) is unique in providing this broad expertise and marketable skill to tomorrow's scientists and engineers interested in leading environmental research and policymaking at all levels of government, industry, and other organizations.

By combining instructors from the National Institute of Standards and Technology (NIST), the Environmental Protection Agency (EPA), and GU, the MS-EMAP program is an interdisciplinary program that includes:

- courses in environmental chemistry, metrology, risk assessment, law, and policymaking;
- lessons learned from environmental case studies; and
- hands-on laboratory experience with state-of-the-art metrology instruments.

A special and attractive feature of the program is funded summer research internships at NIST, EPA, and other agencies.

Students completing this rigorous curriculum will learn how to use state-of-the-art instruments to identify and quantify pollutants in both physical (air, water, and land) and biological (blood, urine, and tissue) media. They will also learn the levels of accuracy and precision associated with the measurements, and how the data collected can be reliably analyzed statistically and combined judiciously to quantify potentially hazardous exposures to both humans and ecosystems. Students will also become familiar with the science of risk assessment and how it combines epidemiologic, occupational, clinical, animal, *in vivo*, *in vitro*, and recently *in silico* data to estimate human and ecological responses to pollutant exposures. In addition, students will learn the laws that govern environmental protection in the United States and other countries; when and how, and more importantly why, these laws were enacted. Lastly, students will gain an appreciation of both the process by which environmental decisions are made and the efficacy of past decisions through an evaluation of real world case studies.

In summary, the Master of Science in Environmental Metrology and Policy at Georgetown University will provide students with uniquely integrated real-life learning and working experience with today's leading environmental metrology and policy experts, so that the program's graduates are ably prepared to fulfill this role in the future.

The MS-EMAP 2-Year Curriculum Sequence

Year-1 Fall Semester

- EMAP-501 Chemistry of Environmental Exposures (core, 3 credits)
- EMAP-502 Statistical Methods in Metrology (core, 3 credits)
- EMAP-503 Introduction to Environmental Policy Science (core, 2 credits)
- EMAP-504 Introduction to US and International Environmental Laws and Policies (core, 2 credits)
- EMAP-500 Bi-weekly Seminar/Discussion Forum Series (0-credit)

Year-1 Spring Semester

- EMAP-511 Introduction to Chemical & Biochemical Metrology (core, 3 credits)
- EMAP-512 Chem & Biochem Metrology Lab I: Instrumental Principles and Measurements (core, 3 credits)
- EMAP-514 Introduction to Environmental Risk Assessment and Management (core, 2 credits)
- EMAP-515 Advanced Environmental Policy Making Science I: A Study of Practical Cases (core, 2 credits)
- EMAP-500 Bi-weekly Seminar/Discussion Forum Series (0-credit)

In-between Summer

- Program-funded 10-week program-funded research internship at NIST/EPA or other government agencies, profit/non-profit organizations (prelude of capstone project)

Year-2 Fall Semester

- EMAP-517/HSCI-501 Occupational Toxicology (core, 3 credits)
- EMAP-513 Chem. & Biochem. Metrology Lab II: Student-Selected Metrology Labs/ Capstone Preparation (core, 2 credits)
- EMAP-516 Advanced Environmental Policy Making Science II: A Study of Practical Cases (core, 2 credits)
- One Elective in Government (3 credits)
- EMAP-500 Bi-weekly Seminar/Discussion Forum Series (0-credit)

Year-2 Spring Semester

- EMAP-518 Summative Capstone Project with thesis (core, 3 credits)
- One Elective in Economics (3 credits)
- One Elective in Environmental (Social) Science (2 credits)
- One Elective in Ethics (2 credits)
- EMAP-500 Bi-weekly Seminar/Discussion Forum Series (0-credit)