

# ENVIRONMENTAL SCIENCE (M.S.)

The human impact on Earth's environment over past two centuries is unprecedented. An incredible 300% increase in human population growth in the 20<sup>th</sup> century has led to an increase in energy consumption by more than 1000% since 1950. Never in the history of the Earth has such a drastic increase in the atmospheric CO<sub>2</sub> occurred over such a short period of time. Education on the '*science of the changing environment*' is at the forefront of human endeavor, and a significant fraction of the global GDP is currently being spent on addressing this science (e.g. increasing spatial extent of harmful algal blooms, ocean acidification, ever increasing amount of micro-plastics in fresh and salt water systems, effects of global climate change including flooding/drought and other weather-related catastrophic events, etc.). The master's program addresses many of the anthropogenic environmental changes listed above. This inter-disciplinary program include courses from several branches of science including coastal and environmental geology, environmental biology, low-temperature aqueous geochemistry, environmental isotope geochemistry, biogeochemistry, remote sensing, big data analytics, climate science, toxicology, water quality, etc.

## Admission Requirements

Admission to this program is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). The minimum grade point average required for regular admission to the program is 2.75. Specific admissions requirements include: evidence of a completed baccalaureate degree from an accredited college or university; college-level coursework in geology, biology, mathematics, physics, and chemistry; two letters of recommendation; and a one-page statement of purpose.

## Program Requirements

The Master of Science in Environmental Science requires a minimum of 30 credits. This will include 8-credit of M.S. thesis (ESG 8999) and 1-credit of seminar (ESG 6100). This is Plan A option only. All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the College of Liberal Arts and Sciences (<http://bulletins.wayne.edu/graduate/college-liberal-arts-sciences/academic-regulations/>).

The M.S. degree typically includes courses chosen from the following list.

Code	Title	Credits
ESG 5000	Geological Site Assessment	4
ESG 5120	Environmental Geochemistry	4
ESG 5150	Soils and Soil Pollution	4
ESG 5210	Environmental and Applied Geophysics	4
ESG 5360	Hydrology and Water Resources	4
ESG 5420	Mathematical Methods in Earth Science	4
ESG 5510	Environmental Fate and Transport of Pollutants	4
ESG 5600	Special Topics in Environmental Science and Geology	4
ESG 5650	Applied Geologic Mapping	4
ESG 5700	Environmental Law and Policy	3
ESG 6100	Seminar: Environmental Science and Geology	1
ESG 6160	Applied Remote Sensing	3
ESG 6165	Biodiversity Changes in the Anthropocene	4

ESG 6170	Spatial Statistics and Analyses for Environmental Applications	3
ESG 6180	Environmental DNA for Ecosystem Monitoring and Conservation	4
ESG 6190	Environmental Microbiology	4
ESG 6250	Fluvial Geomorphology	3
ESG 6300	Emerging Organic Contaminants in Global Environment	4
ESG 6320	Coastal Geology and Processes in the Great Lakes	3
ESG 6400	Isotopes: Applications in Geological and Environmental Sciences	4
ESG 8999	Master's Thesis Research and Direction	8
BIO 5040/7045	Biometry	4
BIO 5100/7110	Aquatic Ecology	4
BIO 5440/7440	Terrestrial Ecology	4
BIO 5490/7490	Population and Community Ecology	3
BIO 5540/7540	Landscape Ecology	3
BIO 5740/7740	General Entomology	4
BIO 6190	Advanced Special Topics *	6
BIO 6420	Ecotoxicology and Risk Assessment	3
BIO 7310	Sustainability of Urban Environmental Systems	2
CE 5230	Water Supply and Wastewater Engineering	3
CE 5610	Advanced Highway Design	3
CE 7995	Special Topics in Civil Engineering II *	3
ECO 5230	Environmental Economics	4
ECO 6800	Advanced Urban and Regional Economics	4
UP 5430	Cities and Food	3
UP 6470	Environmental Planning	3
ANT 5140	Biology and Culture	3
ANT 5060	Urban Anthropology	3
FPH 7420	Principles of Environmental Health	3
PS 5560	Biopolitics	4

\* Topics to be chosen in consultation with an advisor.