Sustainable Development, MS

This interdisciplinary program equips students with higher-order learning skills as well as more practical, applied preparation for a variety of careers in sustainable development. The program's goal is to produce trainees with not only the fundamental and theoretical understanding expected from more traditional graduate degree recipients, but also the highly marketable, professional skills of someone graduating from an applied field of study.

Learning Outcomes

Graduates will be able to:

- analyze problems, conduct research, and make policy recommendations on topics related to the United Nations Sustainable Development Goals (UN SDGs), and anticipate the social, economic, political, technological, human health, and environmental impacts of their proposed interventions;
- communicate science effectively and responsively with diverse audiences, from technical peers to potential employers, policymakers, and the public, as well as communicate across modern forms of media intended for public engagement and dissemination of advances toward sustainable development goals; and
- demonstrate qualities essential to thrive across a range of careers, including interpersonal skills (e.g., collaboration, teamwork, and cultural competence), problem-solving abilities (e.g., inquiry, critical thinking, and creativity), and professional strengths (e.g., work ethic, responsible conduct, management, and leadership).

Requirements

The interdisciplinary Master of Science program in sustainable development requires a total of 30 s.h. of graduate credit to earn the degree without thesis. Students may choose to earn the degree with thesis. All students must maintain a UI cumulative grade-point average of at least 2.75.

With the approval of their faculty advisors, students develop a study plan that satisfies the requirements of their chosen curriculum. All students must successfully complete the core courses and take two analytical and methods courses plus elective coursework that focuses on one of the United Nations Sustainable Development Goals (UN SDGs).

The thesis option requires the completion of a project with a program partner (e.g., a community, nongovernmental organization, public agency, or private sector partner) and culminates in a required project portfolio. Students choosing the thesis option must register for SDG:6325 Thesis: Sustainable Development.

Some grants also require students to complete a responsible conduct of research or research ethics course (ENGR:7270 Engineering Ethics). Students should check with the program director to determine whether this requirement applies to them.

The MS in sustainable development requires the following coursework.

Core Courses

Course #	Title	Hours
All of these:		
SDG:4000/ SEES:4000	The United Nations Sustainable Development Goals: A Blueprint for a Sustainable Future	3
SDG:5100/ CEE:5151	Building Future Leaders in Sustainable Development	3
SDG:5225/ CEE:5225/ GRAD:5225	Communicating Data Through Stories	3
SDG:6000/ URP:6209	Sustainable Communities Lab I	3
SDG:6210/ URP:6210	Sustainable Communities Lab II	3

Analytical and Methods Courses

Students choose two courses (at least 6 s.h.) offered by supporting programs. The courses provide students with training in analytical competencies necessary for sustainable development, including spatial analysis, statistics, informatics, data management, and decision analysis.

Course #	Title	Hours
Two of these:		
CEE:5310/ IGPI:5311/URP:5310	Informatics for Sustainable Systems	3
CEE:5460	Water Quality and Flow	3
SEES:3050/ IGPI:3050	Geospatial Programming	3
SEES:3500/ IGPI:3500	Introduction to Environmental Remote Sensing	3
SEES:3520/ IGPI:3520	GIS for Environmental Applications	3
SEES:3540/ IGPI:3540	Geographic Visualization	3
SEES:4150/ GHS:4150/ IGPI:4150	Health and Environment: GIS Applications	3
SEES:4520/ IGPI:4520	GIS for Environmental Studies: Applications	3
SEES:4580/ IGPI:4581	Introduction to Geographic Databases	3
URP:6200/ PBAF:6200	Analytical Methods for Evidence-Based Policy	3
URP:6225/ PBAF:6225	Applied GIS for Planning and Policy Making	3
URP:6258/ PBAF:6258	Systems and Scenario Thinking	3

Electives

Students complete at least 9 s.h. in elective coursework structured around the 2030 Sustainable Development Goals (SDGs). Students are required to focus on one SDG and complete three courses in that specialization area to provide depth in one area.

Students completing a thesis are permitted to apply a maximum of 3 s.h. of SDG:6325 Thesis: Sustainable

Development toward elective requirements but are not required to do so.

Affordable and Clean Energy

Course #	Title	Hours
CBE:3405	Green Chemical and Energy Technologies	3
CEE:5410	Politics and Economics of the Food, Energy, Water Nexus	3
CHEM:4760	Radiochemistry: Energy, Medicine, and the Environment	3
SEES:3780/ GHS:3780/ HIST:3240/ POLI:3431	U.S. Energy Policy in Global Context	3

Clean Water and Sanitation

Course #	Title	Hours
CEE:4102	Groundwater	3
CEE:4119	Hydrology	3
CEE:4150/CBE:4420	Environmental Chemistry	3
CEE:4385	Water Scarcity in Rural India	3
CEE:5350	Watershed Hydrology and Ecosystem Processes	3
CEE:5440	Foundations of Environmental Chemistry and Microbiology	3
CEE:5460	Water Quality and Flow	3
OEH:4240	Global Environmental Health	3

Climate Action

Course #	Title	Hours
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3
CEE:4180	Fundamentals of Atmospheric Science	3
SEES:3331	Human Dimensions of Climate	3
SEES:4470	Ecological Climatology	3
SEES:5800/ PBAF:5800/ URP:5800	Environmental Policy: Theory and Practice	3

Industry, Innovation, and Infrastructure

Course #	Title	Hours
SEES:3420	Sustainable and Green Building Concepts	3
URP:6202	Land Use Planning: Law and Practice	3
URP:6266/ PBAF:6266	Transportation, Urban Form, and Sustainability	3

Responsible Consumption and Production

Course #	Title	Hours
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
GHS:3560	Global Garbage and Global Health	3
SEES:3090/ GHS:3070	Hungry Planet: Global Geographies of Food	3
SEES:4750/ URP:4750	Environmental Impact Analysis	3
SEES:4770/ AFAM:4770/ GHS:4770	Environmental Justice	3
URP:6256/ PBAF:6256	Environmental Policy	3

Sustainable Cities and Communities

Course #	Title	Hours
CEE:4107/CBE:4410	Sustainable Systems	3
SEES:3350	Urban Ecology	3
SEES:3400	Iowa Environmental Policy in Practice	3
SEES:3760/ GHS:3760	Hazards and Society	3
SEES:4210	Sustainability as a System Science	3
URP:6245/ PBAF:6245	Growth Management	3

The Biosphere (Life Below Water and Life on Land)

Course #	Title	Hours
CBE:3405	Green Chemical and Energy Technologies	3
CEE:5350	Watershed Hydrology and Ecosystem Processes	3
SEES:3020	Earth Surface Processes	3
SEES:3340	Ecosystem Services	3
SEES:4790	Applied Environmental Geology	3

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations and the Graduate College Admission Requirements on the Graduate College website and the sustainable development admission requirements.

Prospective students must hold a baccalaureate degree or the equivalent from an accredited institution with preparation appropriate for advanced study in the field of sustainability. Students with an undergraduate degree in natural and social sciences, technology, engineering, and/or mathematics will be well prepared to thrive in this interdisciplinary degree program. The program is intentionally designed to be inclusive for students coming from different and diverse academic backgrounds given the broad range of perspectives and expertise that are needed to move society closer to sustainable development goals.

Application materials must include:

- one- or two-page self-statement describing an applicant's interest in the sustainable development program, how formal and informal experiences make the applicant a good fit for the program, and how the applicant can uniquely contribute to the program; the statement should

briefly discuss the career path(s) the applicant intends to pursue upon completion of the degree;
- a résumé; and
- three letters of recommendation.

Career Advancement

Graduates can obtain employment across a variety of sectors that intersect with sustainability and sustainable development, including jobs in public service at the local, state, or federal level in all areas related to the environment (e.g., watershed management coordinators, state natural resource departments, and sustainability directors for cities across the United States, analysts and scientists at governmental agencies such as the U.S. Department of Agriculture or the U.S. Environmental Protection Agency. Graduates may find employment in the private sector as consultants for industries seeking to improve the sustainability of their operations and processes (e.g., sustainable supply chain, waste management, minimization, and sustainability reporting, metric development, and management).

Graduates are better qualified for positions in the private sector including chief sustainability officer, director of sustainability, and sustainability project manager or coordinator. Opportunities also exist for careers in global development, working internationally with nongovernmental organizations (NGOs), and other organizations that strive to advance sustainable development goals worldwide, particularly in resource-constrained areas of the developing world. In addition, degree recipients are well-positioned to pursue additional graduate studies toward a PhD, MBA, or JD degree.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Sustainable Development, MS

Course	Title	Hours
Academic Career		
Any Semester		
30 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. [a, b]		
Graduate College program GPA of at least 2.75 is required. [c]		
	Hours	**0**
First Year		
Fall		
SDG:4000	The United Nations Sustainable Development Goals: A Blueprint for a Sustainable Future	3
SDG:5100	Building Future Leaders in Sustainable Development	3
URP:6209	Sustainable Communities Lab I	3
	Hours	**9**
Spring		
SDG:5225	Communicating Data Through Stories	3
URP:6210	Sustainable Communities Lab II	3
Analytical and Methods course [d, e]		3
	Hours	**9**
Second Year		
Fall		
ENGR:7270	Engineering Ethics [f]	1
Analytical and Methods course [d, e]		3
Elective course [d, g]		3
Elective course [d, g]		3
	Hours	**10**
Spring		
Elective course [d, g]		3
Final Exam [h]		
	Hours	**3**
	Total Hours	**31**

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b Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.

c Graduate College program GPA is comprised of all courses that are approved degree requirements. If a student takes more than the minimum required number of semester hours to complete the degree, but all courses taken are eligible to count toward the degree, those courses will be included in the Graduate College program GPA.

d Work with faculty advisors to select appropriate coursework from an approved list; refer to the General Catalog for more information.

e Students choose two courses (at least 6 s.h.) offered by supporting programs.

f Some grant funded students are also required to complete a responsible conduct of research or research ethic course (ENGR:7270); students should check with the SDG Program Director to determine whether this requirement applies to them.

g Students complete at least 9 s.h. in elective course coursework structured around the 2030 Sustainable Development Goals (SDGs). Students are required to focus on one SDG and complete three courses in that specialization area to provide depth in one area.

h Completion of all coursework.