Welcome to SEAS!
Admitted Student Visit Day

Specialization Coordinator
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Specialization Overview
program mission, goals, dual degrees

Our Challenges
climate crisis, decarbonizing, food systems, water

Our Approach
systems thinking, program elements, and themes

Solutions and Impact
Work by alumni and students, career outcomes,

Resources
Opportunities,

Questions
At the University of Michigan School for Environment and Sustainability (SEAS), we are at the forefront of building a more sustainable and just world for all by transforming the impact of higher education and reimagining the future. We are advancing action through innovation, research, education and engagement in society, and developing leaders who are empowered to halt the climate crisis and create an environmentally sound future for generations to come.

**Why Enroll?**

- Skills, knowledge, tools, methods to solve complex sustainability challenges
- Interdisciplinary training
- Excellence of programs in SEAS and across UM
- SEAS community
- Alumni network
- Success of our students and alumni
Sustainable Systems Mission

• Sustainable Systems graduates are equipped to become leaders through an interdisciplinary curriculum that focuses on systems thinking, as well as a sound understanding of ecological principles, the capabilities of technology, and the mechanisms that reshape economic and social progress.

• To guide and accelerate the development and transformation of technologies, enterprise, and systems for meeting basic human needs in a sustainable manner.

• This curriculum is designed to provide interdisciplinary education and professional development for students in SEAS and those in dual degree programs.
Themes

• Examples of Research Areas
• Autonomous and electrified vehicles
• Carbon neutrality modeling and strategy
• Circular economy
• Corporate environmental strategy
• Energy efficient technologies
• Energy insecurity and justice
• Environmental impacts of international trade
• Environmental information disclosure and greenwashing
• Food, water, energy nexus and sustainable diets
• Net-zero buildings
• Renewable energy siting and grid integration
• Resource management in developing countries
• Sustainable supply chains
• Transportation climate policy
• Urban agriculture and sustainable food systems
• Urban infrastructure systems
SEAS is Different

- Our customizable learning experience
- Our interdisciplinary emphasis
- We turn knowledge into impact
- Solutions to complex environmental problems
- The first environmental school to offer master’s projects
- With X alumni (update stat), SEAS has the largest alumni network of any environmental degree program.
- Our global engagement equips graduates to change the world
Pillars of Sus Sys

Sample Courses
- Industrial Ecology
- Electric Propulsion
- Sustainable Cities
- Climate Physics
- Traffic Engineering
- Urban Agriculture
- Wetland Ecology

Master’s Project or Thesis
- 16-month group project
- Real client
- Real problem
- Professional learning
- Giveback to society

Core
- SEAS + SusSys Core
- Electives, Analytics
- Project, practicum, extra courses
- Sustainable Design & Technology
- Sustainable Enterprise

Dual Degrees
- Other U-M schools
  - Law
  - Public Policy
  - Business
  - Engineering
  - Economics
  - Urban Planning
- Over 30% pursue a dual degree
Dual Degree: Erb Institute

Overview
• 2.5 or 3 year degree (MBA and MS)
• Curriculum includes client-based field projects with companies, government, and nonprofits.
• Two summer internships
• Resources include specialized projects, access to rich network of sustainability leaders, career support and additional funding

Impact Projects
• Short term, hands-on, field experiences
• Over 100 student projects to date
• About 1/3 have been international
• Locations include: Ecuador, Galapagos Islands, Costa Rica, Nicaragua, Cuba, China, Gabon, Switzerland, Spain, and more!

Partnership Projects
• Through Partnership Projects, Erb students work collaboratively with companies, associations and nonprofits to tackle pressing business challenges and broader strategy questions. These are paid opportunities separate from internships and curricular coursework

Internships
• Students take on 2 internships
• Opportunities for out-of-the-box experiences
• Funding support for students pursuing internships with nonprofits

Practitioner Engagement
• U-M workshops, career chats, and guest lectures with sustainability leaders, access to multiple boards
• 500 alumni
Dual Degree: Erb Institute

Alumni Employers by Industry

- Investment Banking: 21%
- Education: 17.1%
- Real Estate: 15.1%
- Consumer Goods: 11.2%
- Manufacturing: 4.9%
- Transportation: 5.4%
- Healthcare/Pharmaceuticals: 6.8%
- Financial Services: 12%
- Retail: 5.1%
- Technology/Telecom Services: 4%
- Energy/Raw Materials: 3.2%
- Other: 1%
- Consulting: 3.5%

Alumni Primary Functional Area

- Consulting: 40%
- Sustainability/Environment: 30%
- General Management: 20%
- Other: 10%
- Strategic Planning: 9%
- Finance: 8%
- Operations/Supply Chain: 7%
- Marketing: 6%
- Policy/Government Affairs: 5%
- Sales: 4%
- Human Resources: 3%
- Information Technology: 2%
Dual Degree: Engineering

MS/MSE Program
- MS/MSE Dual Degree Program
- 2-2.5 years to complete
- First in the nation
- Launched Fall 2007

Engineering Sustainable Systems 54 Credit

- Mechanical
- Chemical
- Environmental
- Civil
- Sustainable design and manufacturing
- Sustainable energy systems
- Sustainable water resources
- Sustainable systems
- Aquatic sciences

SEAS
More Dual Degrees

Environment & Sustainability MS

Master of urban and regional planning (MURP)
Master of science in public policy (MPP)
Juris doctor (JD)
Self-initiated dual degrees
Our Challenges
Our Challenge:

Climate Crisis

<table>
<thead>
<tr>
<th>Per capita (tonnes CO₂)</th>
<th>Cumulative emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>7</td>
</tr>
<tr>
<td>United States</td>
<td>6.7</td>
</tr>
<tr>
<td>EU28</td>
<td>2</td>
</tr>
<tr>
<td>India</td>
<td>11.6</td>
</tr>
<tr>
<td>Japan</td>
<td>9.1</td>
</tr>
<tr>
<td>Russia</td>
<td>8.7</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>12.4</td>
</tr>
<tr>
<td>South Korea</td>
<td>18.1</td>
</tr>
<tr>
<td>Canada</td>
<td>15.3</td>
</tr>
<tr>
<td>World average</td>
<td>4.8</td>
</tr>
</tbody>
</table>

United States 25%
China 13%
Russia 7%
Japan 4%
Rest of the world 26%

IPCC goals for 1.5°C, global CO2 emissions: ~45% reduction from 2010 levels by 2030, net zero around 2050

Global average greenhouse emissions
1.5°C target in 2030: 2.8 t CO2e/capita
Our Challenge:
Decarbonizing Energy Systems

Total = 100.1 Quads

- Petroleum: 37%
- Natural Gas: 32%
- Coal: 11%
- Renewables: 11%
- Nuclear: 8%
- Wind: 23.8%
- Hydroelectric: 21.7%
- Geothermal: 1.8%
- Biomass: 43.5%
- Solar: 9.1%

Total = 4.12 trillion kilowatthours

- Natural Gas: 38%
- Coal: 23%
- Nuclear: 18%
- Renewables: 18%
- Petroleum: 1%
- Wind: 7.3%
- Hydro: 6.6%
- Solar: 4.9%
- Biomass: 1.4%
- Geothermal: 0.4%

2019 fuel shares in world total energy supply

- Natural Gas: 23.1%
- Oil: 16.5%
- Coal: 26.9%
- Renewables: 15.5%
- Hydro: 2.5%
- Other*: 0.3%

2019 fuel shares of world electricity production

- Natural Gas: 23.1%
- Coal: 38.2%
- Renewables: 22.6%
- Biomass and waste: 2.1%
- Solar: 15.2%
- Hydro: 15.8%
- Other*: 0.4%

* Other includes non-renewable wastes and other sources not included elsewhere such as fuel cells and thermal heat, etc.
** Includes pumped storage generation.
Note: Totals in graphics might not add up due to rounding.
Source: EIA/OECD World Energy Balances.
Our Challenge:

Decarbonizing Mobility and Accessibility

**Reduce travel**
- Live closer to work, bundle trips, telework, teleconference

**Shift modes**
- Public transit, bike, walk

**Vehicle electrification**
- Inform design, vehicle adoption decisions
- Charging infrastructure, equity, access
- Deploy with renewable energy sources
- Develop circular economy for EV batteries

**Other technologies**
- Vehicle lightweighting, powertrain efficiency, automation

**Policy**
- Incentives for EV deployment
- More stringent vehicle GHG standards
- Tax to address externalities of climate change
Our Challenge:

Food Systems

Source: Sustainability Factsheets
Our Challenge:

Water Scarcity and Sanitation
Our Approach
Our Approach:

Systems Approach
Our Approach:
Program Elements

**Systems Analysis**
- Evaluate sustainability performance

**Sustainable Design and Technology**
- Guide design of sustainable products and technology

**Sustainable Enterprise**
- Lead public and private sector organizations in the innovation and implementation of sustainable systems
Example 1: ESM student focusing on Mobility + Built Environment

Example 2: EPP student focusing on both Conservation + Restoration and Climate + Energy

Example 3: SusDev student focusing on Water
Tailoring your Degree Beyond your Specialization

Certificates

- Environmental Justice
- Industrial Ecology
- Spatial Analysis
- Sustainability
- Climate Change Solutions
Core Faculty

Michael Craig
Assistant Professor

Benjamin Goldstein
Assistant Professor

Greg Keoleian
Professor, CSS Director

Thomas Lyon
Professor

Shelie Miller
Professor

Joshua Newell
Professor

Sara Soderstrom
Associate Professor

Parth Vaishnav
Assistant Professor

Charlene Zietsma
Professor
Solutions and Impact
students and alumni
Master’s Projects
first environmental school to offer master’s projects
Scope 3 Emissions Assessment and Circular Economy Protocol Development at Ford Motor Company

Laura Aguilar Esteva
Akshat Kasliwal
Michael Kinzler
Thesis: The Intersection of Energy and Justice

Dominic Bednar

- SS track ’16
- Exploring Spatial, Racial and Socioeconomic Patterns of Residential Heating Affordability, Consumption & Efficiency in Wayne County, Michigan
Life Cycle
Comparison of Manual and Machine Dishwashing

Gabriela Porras

• SS track ‘19
• Exploring Spatial, Racial and Socioeconomic Patterns of Residential Heating Affordability, Consumption & Efficiency in Wayne County, Michigan

LETTER • OPEN ACCESS
A guide to household manual and machine dishwashing through a life cycle perspective

Gabriela Y Porras1, Gregory A Keoleian1 ID, Geoffrey M Lewis1 ID and Nagapooja Seeba2
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Alumni Impact

All Sectors

- Michelle Farhatt, ‘11, Arc Engineer, PJM Interconnection
- Elizabeth Terry, ‘03, Program Manager, National Grid
- Devon Douglas, ‘09, Director of Sustainability, Etsy
- Shoshanna Lenski, ‘11, Director of Strategy & Planning at DTE Energy
- Patti Liao, ‘11, Senior Manager, Recurrent Energy
- Adithya Dahagama, ‘16, Program Manager, Energy & Infrastructure Strategy
- Rob Frederick, ‘00, VP and Director, Corporate Responsibility
- Amanda Farthing, ‘21, Research Engineer II, National Renewable Energy Laboratory
- Michael London, ‘20, Product Manager, 3D Printing - Metals at HP
Career Outcomes

95% Satisfied with post-grad position
96% Job seekers found full-time jobs
90% Found position within 6 months
# 2022 Salaries

## By Sector

<table>
<thead>
<tr>
<th>Specialization</th>
<th>% of reported</th>
<th>Count</th>
<th>Average</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Degree*</td>
<td>35.5%</td>
<td>27</td>
<td>$131,016</td>
<td>$125,000</td>
<td>$75,000 - $175,000</td>
</tr>
<tr>
<td>Behavior, Education &amp; Communication</td>
<td>24.0%</td>
<td>18</td>
<td>$98,333</td>
<td>$83,500</td>
<td>$40,000 - $175,000</td>
</tr>
<tr>
<td>Environmental Policy &amp; Planning</td>
<td>21.3%</td>
<td>16</td>
<td>$111,195</td>
<td>$90,000</td>
<td>$57,000 - $175,000</td>
</tr>
<tr>
<td>Ecosystem Science &amp; Management</td>
<td>21.3%</td>
<td>16</td>
<td>$65,187</td>
<td>$58,500</td>
<td>$35,000 - $135,000</td>
</tr>
<tr>
<td>Environmental Justice</td>
<td>17.3%</td>
<td>14</td>
<td>$62,715</td>
<td>$54,000</td>
<td>$40,000 - $94,000</td>
</tr>
<tr>
<td><strong>Sustainable Systems</strong></td>
<td><strong>17.3%</strong></td>
<td><strong>13</strong></td>
<td><strong>$114,502</strong></td>
<td><strong>$120,000</strong></td>
<td><strong>$70,000 - $175,000</strong></td>
</tr>
<tr>
<td>Geospatial Data Sciences</td>
<td>9.3%</td>
<td>7</td>
<td>$54,229</td>
<td>$55,000</td>
<td>$32,000 - $82,601</td>
</tr>
<tr>
<td>Landscape Architecture</td>
<td>8.0%</td>
<td>6</td>
<td>$63,900</td>
<td>$62,200</td>
<td>$55,000 - $72,000</td>
</tr>
<tr>
<td>PhD</td>
<td>5.3%</td>
<td>4</td>
<td>$61,250</td>
<td>$57,500</td>
<td>$50,000 - $80,000</td>
</tr>
<tr>
<td>Sustainability and Development</td>
<td>4.0%</td>
<td>3</td>
<td>$64,000</td>
<td>$65,000</td>
<td>$49,000 - $78,000</td>
</tr>
</tbody>
</table>

*Dual degree students pursued degrees in multiple schools
Opportunities

Center for Sustainable Systems (CSS)

• Nearly all of the research conducted involves the participation of students
• Research Assistantships, hourly employment (including work-study) and volunteer positions
• Opportunity to publish research results

Forums and Lectures

• Lectures are being announced weekly, but several are recurring
• Annual Wege Lecture
• Monthly Lectures
  ◦ CSS Research Forums
  ◦ SS Forums
  ◦ Erb Colloquium Brown Bag

Clubs

• SEAS Student Government
• Consortium on Agriculture, Food, and the Environment
• BLUElab
• Ross Net Impact
• Energy Club @ Ross
• Student Sustainability Initiative (SSI)
• Michigan Backpacking Club

Conferences

• COP Conferences yearly
• Group of students attended and presented on observations from the Global Climate Conference in Paris.
CSS Sustainability Factsheets

- Get the facts!
- 28 Factsheets
- 1763 facts and 838 citations and 135 graphics
- Updated annually
Supportive Community

Largest living alumni body of any university

12,600+

Total alumni, the largest graduate population of any environmental degree program

33%

Of SEAS alumni have received a dual degree from another one of U-M's nationally ranked top 10 programs

Alumni

Are represented in all 50 states and 80+ countries
Our Culture
Funding

- **Financial Aid website** to gain knowledge about internal and external resources to inform you as you develop your plan to finance your graduate degree. These resources include, but are not limited to:

- **Federal and university financial aid**: This aid takes into account financial need, and the funding sources include grants, loans, and student employment. A completed FAFSA is required.

- **SEAS funding**: These competitive merit scholarships are awarded by the school, generally at the time of admission.

- **Graduate Student Appointments student employment**: These limited and competitive positions—Graduate Student Instructor (GSI), Graduate Student Research Assistant (GSRA), and Graduate Student Staff Assistant (GRSA)—often include a full-tuition waiver, health and dental benefits, and a monthly stipend.

- **External funding**: Fastweb, Pivot, and SPIN are three popular clearinghouses for student-centered grants offered by independent organizations.

- **Rackham funding (scholarships, fellowships, travel)**: Similar to SEAS funding, these selective grants are offered by the Rackham Graduate School.

- **Student Hourly Employment**: This includes 1) hourly part-time work; 2) work study, which is partially funded by the federal government. To qualify, students must have a work study allocation as part of their funding package. International students are not eligible. Check with SEAS faculty regarding hourly employment.

- **SEAS Funding Database**: Better understand the specific funding opportunities that are available.
Come join us!

Enrollment deadline April 15
Questions?

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