Master of Engineering: Sustainable Systems Engineering

Empower yourself to shape the future of clean energy systems and foster sustainability.

What You'll Learn

- Apply sustainability principles to engineering practices and renewable/sustainable energy system design
- Gain expertise in the environmental, social and economic aspects of sustainability challenges
- Position yourself to lead sustainability and renewable/sustainable energy project initiatives through your organization and for your clients
- Apply objective, reliable, and cost-effective solutions to sustainability problems through appropriate engineering, valid science, and responsible management

Where and How You'll Learn

Where Remote interactive online learning

How Classes meet online once a week, with additional learning activities that supplement the course delivery; each class is recorded, so you can participate regardless of your work schedule, travel schedule, or location.

Complete 9 credits of science and sustainability coursework, 12 credits within the engineering curriculum, and 9 credits of electives. You'll collaborate with fellow professionals as you progress together through a common curriculum.

> **The University of Wisconsin-Madison has the right perspective, resources, and people to lead with such a cutting-edge program. Sustainability continues to evolve at a rapid pace and there is incredible value in helping each other learn how it is changing in our respective areas of practice as working professionals.**
>
> *Matt Metzger, Civil Engineer, Barr Engineering Company*

Apply Now!

Visit **go.wisc.edu/SSE**

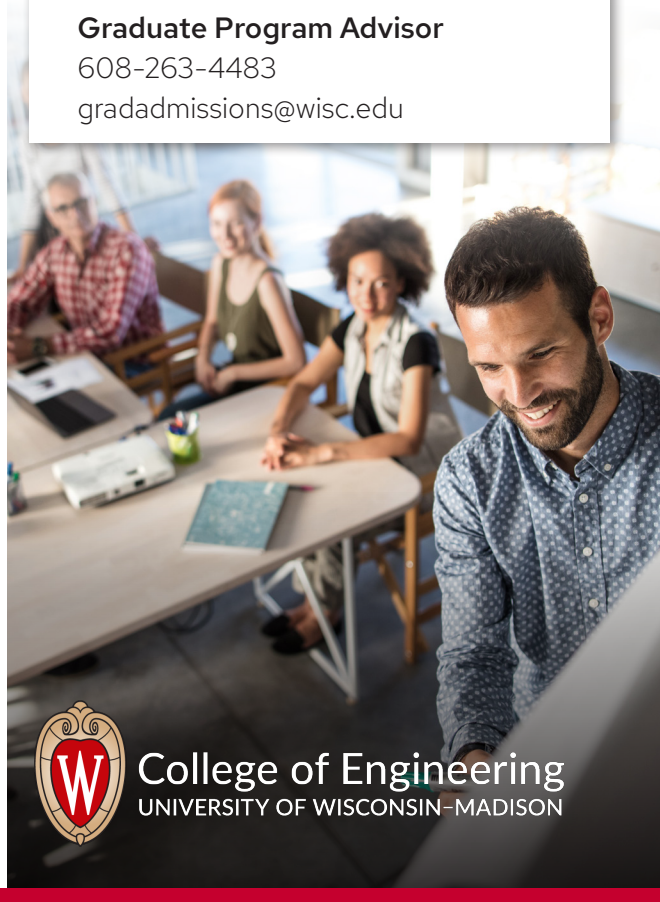
At a Glance

Delivery: Online
Credits: 30 graduate credits
Time Frame: 2 – 3 years; spring and fall admission
Tuition: $1,300 per credit
(Resident and non-resident)

Questions?

For more information on admission requirements, how to apply, tuition and financial aid or other questions, contact:

Graduate Program Advisor
608-263-4483
gradadmissions@wisc.edu



Sample Plan of Study

	Class Number	Class Name	Credits
1st Fall	EPD 660	Core Competencies of Sustainability	3
	EP 418	Sustainable Energy Challenges	1
1st Spring	BSE 367	Renewable Energy Systems	3
	EPD 702	Professional Presentations	1
1st Summer	CIVENGR 729	Environmental Sustainability Tools	3
	EPD 785	Effective Negotiations	1
2nd Fall	EPD 731	Energy Efficiency in Buildings	3
2nd Spring	GLE 535	Wind Energy 3D (Develop, Design, Deliver)	3
2nd Summer	GEOSCI 411	Energy Resources	3
	EPD 708	Creating Breakthrough Innovations	1
3rd Fall	EPD 730	Sustainable Facilities	3
	EPD 704	Organizational Communication	1
3rd Spring	EPD 669	SSE Capstone Design	3
	EPD 783	Leading Teams	1

For illustrative purposes only. Listed courses and schedule are subject to change

Science and Sustainability Course Examples

Core Competencies of Sustainability

Gain an introduction to real-world pragmatic skills and applications in sustainability competencies. Content in this course reaches across engineering expertise, from chemical engineering to building design to product design and energy. Course modules cover ecological footprinting, lifecycle assessment, resource use and integrated engineering practice.

Environmental Sustainability Tools

Environmental impact must be quantified systematically and rigorously in order to inform decision making, process improvement, and policy. Life cycle assessment will be utilized in a projectbased framework to evaluate the environmental impacts of products and process across multiple environmental impact categories.

Renewable Energy Systems

Learn about state-of-the-art renewable energy applications, including biomass for heat, electric power and liquid fuels, as well as geo-energy sources such as wind, solar, and hydropower. Perform engineering calculations of power and energy availability of renewable energy sources and learn about requirements for integrating renewable energy sources into production, distribution and end-use systems.

Energy Resources

Develop the ability to explain how resource quality impacts the implementation of renewable and nonrenewable energy systems, and assess the sustainability of natural resources that currently support both systems. You will also evaluate alternative pathways to mitigate the negative consequences of energy uses.

Engineering and Design Course Examples

Energy Efficiency in Buildings

Core principles of energy use in the building sector (residential, commercial, institutional buildings.) Factors that influence energy demand (equipment, controls, usage patterns, operation, maintenance). Concepts of heating and cooling loads, lighting, building envelope performance, IAQ, heat transfer, climate, orientation. Applications to existing building operation and improvement, new building design and planning. Trends toward zero energy buildings.

Sustainable Facilities

Explore the environmental impacts of commercial and residential buildings, including energy, water, materials, transportation, waste, human health, and land use impacts. Learn about improvement opportunities in each phase of a building's life cycle, case studies, benchmarking tools, related public policies and their effectiveness, emerging concepts, and the role of human behavior and innovation in building performance.

Wind Energy Development and Design

Science and mechanics component includes turbine basics, wind resource assessment, energy production, and economic return. Balance-ofplant design aspects include site layout and micro-siting, foundation systems, collector systems and interconnection, site civil and electrical infrastructure, and structural tower analysis. Development includes environmental due diligence and permitting, stakeholder engagement, and levelized cost of energy (LCOE).

Sustainable Systems Engineering Capstone (required)

Demonstrate your ability to think globally, sustainably, and creatively. Apply theory, tools, and research to conceptualize, analyze, and design a solution to a problem within a social, engineering, and environmental context. Integrate the tools, science, technical communication and engagement, and design principles acquired during the Sustainable Systems Engineering program.

Example Electives (maximum 9 credits)

Sustainable Energy Challenges

This 1-credit seminar provides you with a diverse array of subject areas from the nano scale to the global scale to give you a flavor of some of the cutting-edge research that is taking place in energy today.

Plastics Recycling and Sustainability

Sustainability and recycling aspects in the life cycles of plastics and polymeric materials. Chemistries that can be used to make polymers from sustainable or renewable sources and biodegradable polymers. Current recycling practices and their limitations including polymer-based materials such as composites and layered packaging. Textile recycling and plastic pollution including microplastics are covered.

Apply now: **go.wisc.edu/SSE**

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