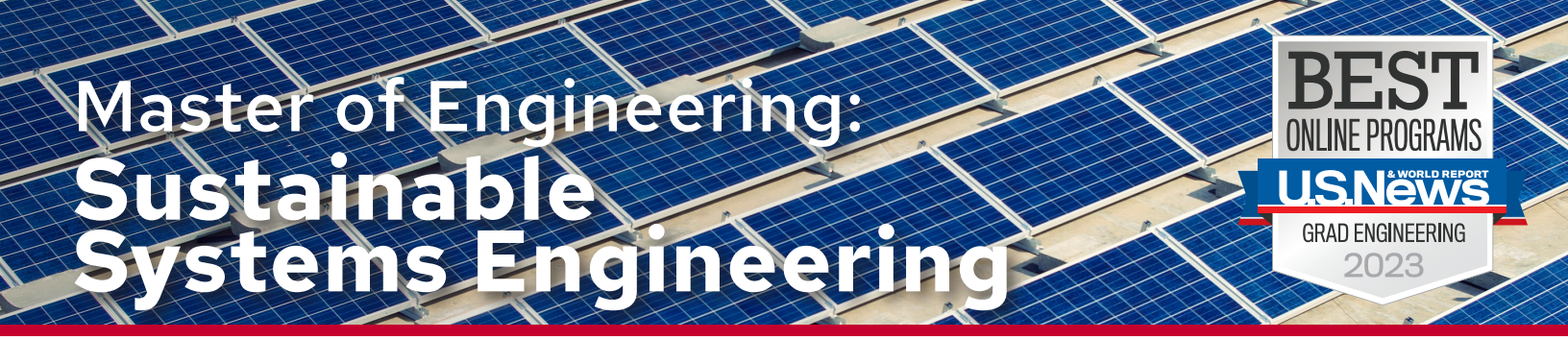


Master of Engineering: Sustainable Systems Engineering

BEST ONLINE PROGRAMS
U.S.News & WORLD REPORT
GRAD ENGINEERING
2023

The University of Wisconsin–Madison's online Master of Engineering: Sustainable Systems Engineering program focuses on preparing you to understand and apply the policy, science, engineering, and economics of sustainable energy systems and environmental resource management.

What You 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 & How You Learn

Where Fully online; spring and fall admission

How 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 the common curriculum.

Most classes meet online once a week at a defined day/time with additional learning activities that supplement the course delivery; each class is recorded, so you can participate regardless of your travel schedule or location.

> **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

Tuition: Resident and non-resident: $1,300 per credit

Typical Curriculum

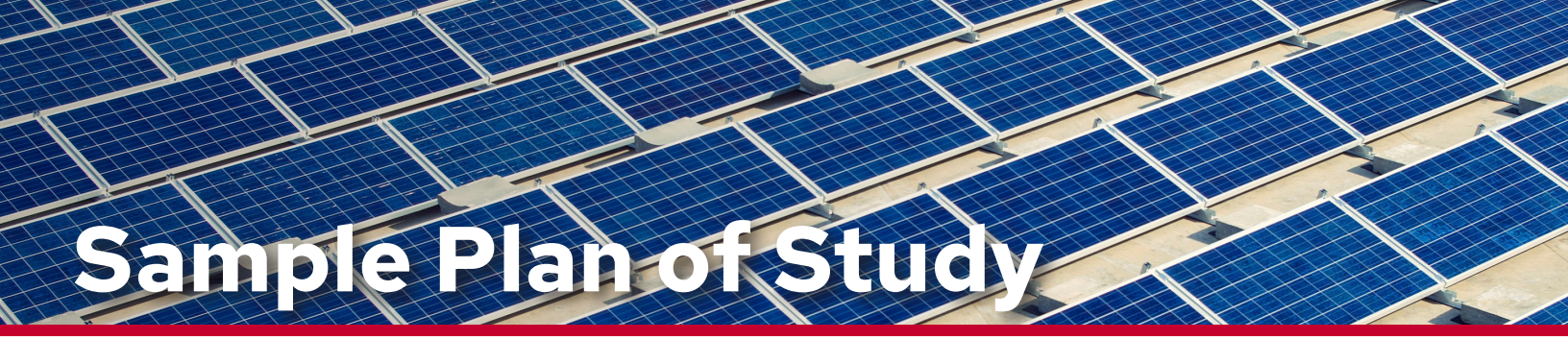
- Core Competencies of Sustainability
- Environmental Sustainability Tools
- Energy Resources
- Sustainable Energy Challenges and Solutions
- Distributed Renewable Energy System Design
- Energy Efficiency in Buildings
- Sustainable Facilities
- Wind Energy Development and Design
- Sustainable Systems Engineering Capstone

Questions?

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

Graduate Programs Coordinator
608-263-4483
gradadmissions@interpro.wisc.edu

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON



Sample Plan of Study

Year 1		Course Number	Course Title	Credits
Fall 1		EPD660	**Core Competencies of Sustainability**	3
		EPD702	**Professional Presentations**	1
Spring 1		BSE367	**Renewable Energy Systems**	3
		EP418	**Sustainable Energy Challenges**	1
Summer 1		CIVENGR729	**Environmental Sustainability Tools**	3
		EPD785	**Effective Negotiations**	1
Year 2				
Fall 2		EPD731	**Energy Efficiency in Buildings**	3
Spring 2	OR	GLE535	**Wind Energy 3D (Develop, Design, Deliver)**	3
	OR	EPD690	**Distributed Renewable Energy System Design**	3
Summer 2		GEOSCI411	**Energy Resources**	3
		EPD784	**Project Management**	1
Year 3				
Fall 3		EPD730	**Sustainable Facilities**	3
		EPD704	**Organizational Communication**	1
Spring 3		EPD669	**SSE Capstone Design**	3
		EPD783	**Leading Teams**	1

Course schedule subject to change.

The schedule shown above is one example. Each individual course plan will vary based on starting semester and electives chosen. More electives are available, such as:

- EPD639 Plastics Recycling and Sustainability
- EPD704: Organizational Communication and Problem Solving
- EPD706: Change Management
- EPD708: Creating Breakthrough Innovations

Science and Sustainability Curriculum (minimum 9 credits)

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 project-based 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.

Flexible Curriculum • In-Depth • Broad-Ranging, Technical Knowledge • Start Fall or Spring

Learn more at **go.wisc.edu/SSE**

Core Engineering and Design Curriculum (minimum 12 credits)

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.

Distributed Renewable Energy System Design
Design renewable/sustainable energy (solar, wind, geothermal exchange) for "behind the meter" systems (i.e., distributed energy) for residential, commercial, industrial, and institutional buildings and campuses. Each course segment will include the energy principles at building- and campus-scale. Site evaluation and economics; current technologies; analysis of sizing and installation. Trends in residential and commercial building-integrated systems, market dynamics, policies, and drivers.

Wind Energy Development and Design
Science and mechanics component includes turbine basics, wind resource assessment, energy production, and economic return. Balance-of-plant 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.

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