

PhD in Sustainable Energy

Students in the PhD program in Sustainable Energy conduct cross-disciplinary research that integrates energy science with societal and policy insights. Drawing upon emerging knowledge and deep historical insights, and utilizing information and methods from both technical and social sciences, students will explore and contribute to sustainability solutions that address urgent energy challenges.

Course Requirements

Students may be admitted to the program with either a bachelor's or a master's degree. If admitted with a bachelor's degree, students must complete a minimum of 84 credits (and have the opportunity to earn a master's in passing). If admitted with a master's degree, they must complete a minimum of 54 credits.

	Credits Required	
	Admitted with an approved master's	Admitted with a bachelor's
Core Courses	18	18
Electives	12*	42
Research	12	12
Dissertation	12	12
Total Credits Required	54	84

*Assuming relevant coursework at master's level.

Core Courses

The core courses are designed to provide students from diverse backgrounds with knowledge, methods and theories for the transdisciplinary study of complex energy systems. They explore the nexus of science and policy and develop the integrative methods needed to work across disciplines. Students coming from a science or engineering perspectives will be exposed to social science and policy issues, and vice versa. The core courses also provide students with a strong foundation in the main themes of sustainability.

Required Core Courses

- **SOS 571: Sustainable Energy I: Technologies and Systems** provides a technical primer on energy systems. It has three core modules: scientific, economic and environmental metrics for energy; power systems and electricity generation technologies; and transportation systems and fuel/vehicle technologies.
- **SOS 572: Sustainable Energy II: Transitions** addresses the technological, economic, social, and political contexts of energy transitions throughout history, how energy use has influenced urbanization, and how considerations of access to and control of energy sources shapes geopolitical strategies.
- **SOS 573: Sustainable Energy III: Futures Analysis, Negotiation and Governance** addresses policy and governance for sustainable energy systems. This includes understanding the influence of politics, social participation and technical forecasting in policy decision-making.
- **SOS 574: Sustainable Energy Analytics in Context** is an applied energy economics course. It addresses the primary metrics, data sources and methodologies used to measure sustainable energy, including how they are used to track progress toward sustainability goals and shape public policies.

- **SOS 575: Sustainable Energy Research Seminar** (taken each semester) helps students develop research skills for transdisciplinary energy research. Each fall, the course explores emerging topics, methods and theories in interdisciplinary energy research; each spring, it mentors students in the development of their own research ideas.
- **SOS 598: Community of Scholars** provides opportunities to develop new professional skills, build cohorts, interact with other students and faculty in the School of Sustainability, and network with alumni.

Elective Courses

Electives should be chosen in consultation with the students' committees. Electives can be taken outside of the School of Sustainability.

Popular electives include:

- GCU 598: Solar Energy & Public Policy
- SOS 532: Sustainable Urban Dynamics
- SOS 540: Statistical Modeling for Sustainability
- SOS 546: Life Cycle Assessment
- SOS 598: Carbon Management
- LAW 619: Energy Law & Policy

Research and Dissertation Hours

At least 12 credit hours of the approved PhD program must be **SOS 792 Research**, and at least 12 credit hours must be **SOS 799 Dissertation**. Students must achieve candidacy before enrolling in SOS 799 Dissertation.

Supervisory Committee

Students in the School of Sustainability choose at least three faculty members to advise their research and dissertation writing. This committee may be drawn from a large list of accomplished sustainability scholars within the School and across Arizona State University, as well as external committee members. Sustainable Energy PhD students have chosen faculty advisors from the School of Sustainability, Ira A. Fulton Schools of Engineering, School for the Future of Innovation in Society, and School of Geographical Sciences and Urban Planning. The committee must include members from at least two disciplines to reflect the transdisciplinary nature of the degree.

Benchmarks and Exams

Sustainable Energy PhD students achieve candidacy status after passing comprehensive exams and defending a dissertation prospectus. The SE PhD comprehensive exam may be taken when a student has completed or is close to completing their coursework. It includes a written portion and an oral portion administered by the student's supervisory committee. Students typically defend their dissertation prospectus in the semester after passing their comprehensive exams.

The final requirements for the PhD are a dissertation and oral defense of the dissertation. The dissertation must reflect the transdisciplinary nature of the degree by integrating research from multiple disciplines.

Additional Information and Questions

For additional information, please visit <https://sos.asu.edu/graduate-degrees-programs> or email SOSGradSunDevil@asu.edu.

