

# SUSTAINABILITY AND ENERGY

[trienens-institute.northwestern.edu](https://trienens-institute.northwestern.edu) (<https://trienens-institute.northwestern.edu>)

The Paula M. Trienens Institute for Sustainability and Energy (formerly ISEN (<https://trienens-institute.northwestern.edu/25-million-grant-to-northwestern-will-accelerate-global-sustainability-and-energy-innovation/>)) advances global energy and sustainability solutions through transformational research, interdisciplinary education, and public engagement. The Trienens Institute is the enterprise-wide sustainability and energy Institute supporting on-campus research at the undergraduate, graduate, and faculty levels across physical and social sciences, engineering, law, policy, business, and communications. It also sponsors a variety of stakeholder engagement programs, both on and off campus, in collaboration with student groups, academic and governmental partners, and private industry.

The Institute offers curriculum at the undergraduate and graduate levels, including an **undergraduate certificate** in sustainability and energy. The Certificate provides a means for any Northwestern undergraduate student to pursue interdisciplinary instruction in the increasingly important areas of climate, sustainability, and energy during their undergraduate coursework, while signaling broad topic proficiency to potential future employers. See more at [trienens-institute.northwestern.edu/sustainability-and-energy-certificate](https://trienens-institute.northwestern.edu/sustainability-and-energy-certificate).

The Trienens Institute also offers a **professional Master of Science** in Energy and Sustainability (MSES), in collaboration with the McCormick School of Engineering. The Master's program prepares graduate students for public and private sector leadership careers in energy and sustainability. The one-year degree combines a comprehensive, interdisciplinary core curriculum spanning technology, markets, and public policy with a student-selected elective specialization track, allowing content personalization while maintaining an overall cohort experience. MSES also provides critical professional training while limiting time out of the workforce, and facilitates student experience with industry partners and practitioners. Certain MSES curriculum (<https://www.northwestern.edu/mses/curriculum/course-listings.html>) may be available to advanced undergraduates, with permission of the instructor. At this time, there is no formal option for a combined BA/BS-MS; graduating students would need to apply directly to the program. See more at [northwestern.edu/mses](https://www.northwestern.edu/mses) (<https://www.northwestern.edu/mses/>).

Finally, in partnership with Northwestern's Study Abroad Office, Office of International Program Development, and Northwestern Engineering Office for Global Initiatives, the Trienens Institute offers for-credit and non-credit summer programs in China (energy technology and policy), Germany (sustainability and energy), Israel (water resource management), Chile (energy storage and critical minerals), and Taiwan (innovation and hi-tech). See more at [trienens-institute.northwestern.edu/study-abroad](https://trienens-institute.northwestern.edu/study-abroad).

## Certificate Requirements (7 units)

Course	Title
ISEN 210-0	Introduction to Sustainability: Challenges and Solutions
ISEN 220-0	Introduction to Energy Systems for the 21st Century

ISEN 230-0

Climate Change and Sustainability: Ethical Dimensions

- 4 electives
  - Chosen from pre-approved curricula—including study abroad options—in the natural and social sciences, engineering, and other disciplines. An eligible electives list (along with registration forms and FAQs) is at [trienens-institute.northwestern.edu/sustainability-and-energy-certificate/](https://trienens-institute.northwestern.edu/sustainability-and-energy-certificate/).
  - Can draw no more than 2 elective courses from a single department/program.
  - At least 3 must be 300 level or higher.
  - 3.0 GPA requirement.
- Up to 3 of the 7 total courses may be double-counted toward all other academic plans (major, minor, other certificates; including distribution requirements, unrestricted electives, etc).

### ISEN 210-0 Introduction to Sustainability: Challenges and Solutions (1 Unit)

Introduction to using lifecycle systems perspectives in forming evaluations and basic quantitative understandings of the challenges and potential solutions that exist for sustainable societies; framing these in the context of resource use, energy consumption and development, and environmental constraints. *Social Behavioral Sciences Distro Area*

### ISEN 220-0 Introduction to Energy Systems for the 21st Century (1 Unit)

Overview of energy issues in the context of global sustainability: energy demands for industrial, transportation, housing, and commercial uses, strategies for demand reduction, traditional versus renewable energy systems. *Natural Sciences Distro Area*

### ISEN 230-0 Climate Change and Sustainability: Ethical Dimensions

(1 Unit) Interdisciplinary analysis of economic and ethical issues concerning climate change; scientific evidence for anthropogenic global warming; economics and ethics of resource use, conservation practices, and sustainability. ISEN 230-0 taught with PHIL 270-0; students may not earn credit for both courses. *Ethical and Evaluative Thinking Foundational Disci Ethics Values Distro Area Global Perspectives on Power, Justice, and Equity*

**ISEN 350-SA Energy Technology & Policy in China (1 Unit)** Examines the energy landscape in China, including an overview of various energy technologies, national policies, practical applications, and future innovations, through lectures and field trips in the US and China. Restricted to students in Northwestern's China program.

**ISEN 390-0 Special Topics in Energy & Sustainability (1 Unit)** Focused exploration of specific topical themes, trends, and challenges in applied energy and sustainability. Content varies each year; previously offered topics include geographic information systems and the impact of energy systems on the geographic distribution, wellbeing, and social organization of societies. May be repeated for credit with change in topic.

**ISEN 390-SA Special Topics in Energy & Sustainability (1 Unit)** Focused exploration of specific topical themes, trends, and challenges in applied energy and sustainability. Content varies each year; previously offered topics include geographic information systems and the impact of energy systems on the geographic distribution, wellbeing, and social organization of societies. May be repeated for credit with change in topic.

**ISEN 399-0 Independent Study (1 Unit)** Independent study under direction of faculty member. Consent of department required.