### REQUIREMENTS FOR THE ISEN CERTIFICATE: *REVISED JANUARY 2015* *(added)*

- **isen 200-level sequence (3)**
  - ISEN 210 – Introduction to Sustainability
  - ISEN 220 – Introduction to Energy Systems for the 21st Century
  - ISEN 230 - Climate Change and Sustainability: Political, Economic and Ethical Dimension  
    *(Note: these courses are non-sequential and can be taken in whatever order best fits the student’s schedule)*

- **Electives (4)**
  - At least 3 at the 300 level.
  - At most 2 from any department or program.
  - Only 1 approved study abroad course can be counted
  - Relevant “Special Topics” courses may be counted more than once, with a change in topic.

- **GPA requirements**
  - 3.0-average or better within the ISEN 200-level sequence
  - 3.0-average or better across all seven requisite courses

### Natural Science

#### Biological Sciences
- BIOL SCI 313/PBC 435 – Quantitative Methods for Ecology and Conservation
- BIOL SCI 334 – Soils and the Environment
- BIOL SCI 335 – Critical Topics in Ecology and Conservation
- BIOL SCI 346 – Field Ecology
- BIOL SCI 347 – Conservation Biology

#### Chemistry
- CHEM 306 – Environmental Chemistry
- CHEM 393 – Green Chemistry
- CHEM 445 – Advanced Physical & Analytical Chemistry: Chemistry of Alternative Energy

### Earth and Planetary Science
- EARTH 310 – Introductory (Aqueous) Geochemistry
- EARTH 312 – Stable Isotope Geochemistry
- EARTH 314/CIV_ENV 314 – Organic Geochemistry
- EARTH 316 – Earth’s Changing Climate
- EARTH 342/ISEN 410 – Topics Contemporary Energy & Climate Chng
- EARTH 390 – Special Topics (when relevant, e.g., GIS Applications for Earth and Environmental Science)

### Environmental Sciences
- ENVR_SCi 201/CIV_ENV 201 – Earth: A Habitable Planet
- ENVR SCI 202/CIV_ENV 202 – The Health of the Biosphere
- ENVR SCI 203/CIV_ENV 203 – Energy and the Environment
- ENVR SCI 390 – Special Topics (when relevant, e.g., GIS Applications for Earth and Environmental Science, Soils & The Environment, etc.)
- ENVR SCI 398-1 – Environmental Research Seminar

### Other natural sciences
- PHYSICS 238 – Energy and Nuclear Power
- PBC 435/BIOl SCI 313 - Quantitative Methods for Ecology and Conservation

### Engineering, continued

#### Project Management
- PROJ_MGMT 441 - Sustainability in Construction
- PROJ_MGMT 443 - Sustainability Strategies in Organizations
- PROJ_MGMT 445 - Sustainability Policy and Regulatory Context
- PROJ_MGMT 446 – System Thinking for Sustainable Design

#### Other Engineering courses
- CHEM_ENG 307 – Kinetics and Reactor Engineering
- CHEM_ENG 365 – Sustainability, Technology and Society
- CHEM_ENG 367 (formerly 395) – Quantitative Methods in LCA
- ENTREP 430/ISEN 430 – Nuvention: Energy
- MAT SCI 381-1 – Materials for Energy-Efficient Technology
- MAT SCI 395 – Special Topics: Fuel Cells
- MECH_ENG 367 (formerly 395) – Quantitative Methods in LCA
- MECH_ENG 395 – Special Topics (when relevant, e.g., Combustion/Energy Systems; Fundamentals of Nuclear Reactor Physics; Energy and Society)

### Social Science

#### Anthropology
- ANTHRO 302 – Agriculture: Origins, Environ Impacts, & Social Transformations
- ANTHRO 383 – Environmental Anthropology

#### Economics
- ECON 370 - Environmental & Natural Resource Economics

#### Environmental Policy and Culture
- ENVR_POL 390 – Special Topics in EPC *(always relevant, e.g., Conservation in a Changing World: Humans & Animal Behavior)*
- ENVR_POL 394 – Professional Linkage Seminar *(always relevant, e.g., International Environmental Organizations)*
- ENVR_POL 395 – Special Topics Seminar *(always relevant, e.g.,Climate Change and Public Health)*

#### History
- HIST 300 - New Lectures in History *(when relevant, e.g., American Environmental History)*
- HIST 376 – Global Environments and World History
- HIST 392 – Topics in History *(when relevant, e.g., History of the Environment: Science, Technology and Culture, Environment and Energy in the Middle East, Energy in American History, etc.)*

#### ISEN (non-core) courses
- ISEN 390 – Special Topics in Energy and Sustainability *(always relevant)*
- ISEN 410 – Topics in Contemporary Energy & Climate Change
- ISEN 430/ENTREP 430 – Nuvention: Energy
- ISEN 495 - Special Topics in Energy and Sustainability *(always relevant)*

#### Philosophy
- PHIL 268 – Ethics and the Environment
- PHIL 270 - *Note – this is a cross-list of ISEN 230, and therefore is NOT eligible for elective credit*

#### Political Science
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<td>CIV_ENV 216</td>
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<td>CIV_ENV 303/ENVR_POL 390-22</td>
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<td>CIV_ENV 304</td>
<td>Civil &amp; Environmental Engineering Systems Analysis</td>
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<td>CIV_ENV 314/EARTH 314</td>
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<td>CIV_ENV 367</td>
<td>Aquatic Chemistry</td>
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<td>CIV_ENV 368</td>
<td>Sustainability: Issues and Actions Near and Far</td>
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<td>CIV_ENV 371</td>
<td>Introduction to Transportation Planning and Analysis</td>
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<td>CIV_ENV 376</td>
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<td>CIV_ENV 385-1,2,3</td>
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<tr>
<td>CIV_ENV 395</td>
<td>Special Topics (when relevant, e.g., Environmental Justice: Environmental Protection and Social Equity)</td>
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<td>POLI_SCI 349</td>
<td>International Environmental Politics</td>
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<td>SOCIOL 312</td>
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<td>MENA 390-4/HIST 392</td>
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<td>PSYCH 332</td>
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<td>Study Abroad Options</td>
<td>Bonn Summer Program: “Renewable Energy: Policy and Development”</td>
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<td>Wanxiang Summer Program (ISEN 390-SA)</td>
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