

# Doctor of Philosophy in Energy Engineering

\* After the inclusion of the required core courses and dissertation, students should then use a combination of 15 - 33 credits of remaining coursework and 30-48 credits of research, to acquire the combined total of 90 credit hours.

## Admission Requirements

The applicant must meet the School of Graduate Studies' current minimum general admission requirements as published in the graduate catalog. Additional requirements include:

1. B.S. degree in an engineering discipline from an ABET accredited program with a GPA of at least 3.0 or a M.S. degree in an engineering discipline with a GPA of at least 3.0. Students holding a B.S. degree in a science or other engineering-related field may be admitted to Qualified Status with an obligation to acquire background undergraduate engineering knowledge. The exact requirements will be determined on a case-by-case basis.
2. Graduate Record Examination General Test for those with undergraduate degrees from non-ABET accredited programs.
3. Satisfy the School of Graduate Studies' English Language Proficiency requirements as published in the graduate catalog.

## Degree Requirements

Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School. The following requirements are in addition to the UND graduate school general requirements for the Ph.D.; A minimum of 90 semester credits, including acceptable master's degree work and credits granted for the dissertation and the research leading to the dissertation. **Students who transfer graduate coursework may be able to apply those credits towards the program based on the maximum allowed by the School of Graduate Studies.** These 90 credits should include:

1. Required Core Courses (15 credits):

Code	Title	Credits
ENE 501	Managing Energy Resources and Policy	3
ENE 510	Energy Systems Engineering I	3
ENE 511	Energy Systems Engineering II	3
ENGR 554	Applied Project Management	3
ENGR 556	System Dynamics I	3
<b>Total Credits</b>		<b>15</b>

2. Remaining Coursework Electives (15 - 33 credits)\*:

Code	Title	Credits
ENE 512	Energy Systems Optimization	3
ENE 522	Energy Storage Systems I	3
ENE 523	Energy Storage Systems II	3
ENE 530	Applied Engineering Business Analysis	3
ENE 533	Project Dynamics Strategy Modeling	3
ENGR 558	System Dynamics II	3

Additional options should be selected in coordination with student's advisor and graduate program director

3. Required Research (30 - 48 credits)\*:

Code	Title	Credits
ENE 591	Research in Energy Engineering	30-48

4. Required Dissertation (12 credits):

Code	Title	Credits
ENE 999	Dissertation in Energy Engineering	12

## Additional Requirements

1. Successful completion of an oral comprehensive exam when at least 45 post baccalaureate credits have been completed. This exam will be based on core courses taken for this degree and their application to the student's research. The exam will be administered by at least three graduate faculty members from the Institute for Energy Studies and its Faculty Affiliates. Candidates who fail the exam will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial exam attempt.
2. Students must present to their advisory committee an annual oral progress report describing research progress.
3. Preparation and defense of a dissertation documenting original and independent research on a topic related to energy engineering.
4. At least two peer-reviewed conference, journal, or patent application submitted with the consent of the student's advisor
5. Scholarly Tools: Engineering and mathematics courses required to fulfill the requirements for those students admitted under Qualified Status. Scholarly tools courses taken for graduate credit after a student has enrolled in a graduate program at UND may be counted to fulfill requirements listed in Item 1.
6. There is no residency requirement for this program.