The Doctor of Philosophy in Engineering program provides a student with specialized training customized to meet his or her specific interests and goals. Faculty advisors work with each student to structure a graduate program consisting of traditional engineering study, complementary multidisciplinary studies, strong interaction between fellow engineering students, and high quality research. The program is based upon the research strengths of faculty, and includes studies in the major engineering disciplines. Students receive a Ph.D. of Engineering with a specified track of: Chemical Engineering, Civil Engineering, Electrical Engineering, Energy Engineering, Environmental Engineering, Geological Engineering, or Mechanical Engineering.

The program includes a significant research component characterized by substantial interaction between the student and their adviser. Research topics are determined based upon the mutual interest of the student and research adviser. Students develop a strong research methodology and apply this research method to a specific engineering problem as directed by their adviser. Student’s attendance is required at a weekly seminar. This seminar is used to enhance the research methodology, by allowing students to present their research during various stages of development. The seminar also serves the important role of providing exposure of all students to a diverse range of multidisciplinary work.

The program recognizes that effective researchers should have extensive expertise in a specialization (track) coupled with a familiarity and awareness of related research needs and the context for applying that expertise. Students enrolled in the Engineering Ph.D. program will develop a broad and inclusive background in the chosen track while also working with faculty from related disciplines to create the interdisciplinary and integrative research paradigms necessary for comprehensive research. A principal goal of the program is to produce Ph.D. research engineers for careers that focus on the invention and development of new technologies and advances for the 21st Century and beyond. Activities to develop professional and personal skills are intended through a multidisciplinary emphasis to enable participants to:

1. understand the ethical, political, and economic impacts of their research developments and policies; and
2. improve their ability to communicate about complex technical subjects in both professional and general settings.

**Goal 1:** Graduates will have a depth of knowledge in their chosen engineering emphasis area accompanied by a breadth of knowledge in related areas to achieve their specific goals and objectives.  
**Goal 2:** Graduates will be proficient researchers, i.e. they will have the skills required to formulate, assess and document a hypothesis.  
**Goal 3:** Graduates will be well prepared for advanced professional practice, for teaching, and for careers in research and creative activity in engineering or a related field.

Admission Requirements

1. A baccalaureate degree in an engineering discipline with a GPA of 3.3 or higher or a Master of Science degree in an engineering discipline with a GPA of 3.0.
2. Satisfy the Graduate School’s English Language Proficiency requirements as published in the Graduate Catalog.
3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers GRE test scores (students with a B.S. engineering degree from an ABET accredited program are not required to submit GRE scores), transcripts of previous college work, relevant research and work experience, letters of recommendation, research interests, and English language skills. Students must specify a track on their admission form to facilitate this evaluation.
4. A student holding a non-engineering degree or who does not meet the minimum requirements in items 1-2 above may apply to one of the Master of Science degree programs in the School of Engineering and Mines. Students successfully completing a UND M.S. engineering degree will be considered to satisfy the requirements of items 1-2 above; however, these students shall still be subject to the holistic evaluation process described in item 3 with the exception that new GRE test scores will not be required.

Students admitted to an engineering M.S. program but meeting the minimum requirements in items 1-2 above, may after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the master’s degree and work directly toward the Ph.D. degree. The recommendation of the advisory committee shall be brought to a vote by the program graduate committee relevant to the degree track requested by the student. A minimum of one week before such a meeting, the program graduate committee shall be notified and provided with the student's updated file which shall consist of the materials used for application into the M.S. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered. If the recommendation is approved by the relevant graduate committee, the student will be given the qualifying exam for the specific track the student wishes to enter. Passing this exam will advance the student to Approved Status in the Doctoral Program in Engineering.

*Please refer to the academic catalog for information pertaining to financial assistance and residence requirements*

**Apply online:** [http://graduateschool.und.edu](http://graduateschool.und.edu)  
**Deadlines apply. See our website for more details.**
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 as well as particular requirements set forth by the Engineering Doctoral Program.

The following requirements are in addition to the UND School of Graduate Studies general requirements for the Ph.D.:

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. Scholarly Tools: Proficiency in mathematics demonstrated by completing nine approved credits of mathematics intensive coursework (equivalent to UND 400-level or higher courses) with a grade of B or better which must include at least one course in numerical analysis. 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 5 below.
4. A maximum of 30 credit hours can be transferred from a master’s program.
5. A minimum of 30 credit hours must be doctoral research and dissertation.
6. Exactly 3 credit hours must be ENGR 562 Seminar in Engineering.
7. A minimum of 39 credit hours of coursework are required (up to 21 credit hours of coursework may be transferred from a master’s program in fulfilling this requirement subject to the credit transfer limits described in the general section of this graduate catalog). The coursework shall include the following:
   a. A minimum of 27 credit hours of track specific coursework selected from the approved list of courses. Equivalent graduate level coursework may be transferred from a master’s program.
   b. Multidisciplinary emphasis: A minimum of 12 credit hours of 300, 400, or 500 level coursework taken for graduate credit from any department within the University, subject to the approval of the student’s adviser. The student is encouraged to structure these courses as a minor. Equivalent course work may be transferred from a master’s program.
8. Successful completion of a qualifying examination, taken no earlier than the end of their first year in residence and no later than the end of their second year of residence. This examination will cover four general areas of their selected engineering track. Selection of the four general areas for this examination shall require the approval of the candidate’s faculty adviser and the track-specific Ph.D. Graduate Director. Three results for each of the four sections of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” for any section of the exam will be required to remediate the topical area in which the provisional pass was received in accordance to stipulations specified by the examiner, with approval of the track-specific Graduate Director. Candidates who fail one or more sections of the exam will be allowed one opportunity to repeat that section of the exam. The reexamination must take place no later than 13 months after the initial examination attempt. A direct admit student who fails an exam a second time may request to be reclassified as a master’s student and complete a track-appropriate Master of Science degree and then reapply to the Doctoral program.
9. An oral comprehensive examination is completed when at least 30 credits of post baccalaureate coursework has been completed. This examination will be based significantly on the core of the individual’s program of study including work in the minor field of study, but may also include questions related to other track-specific Engineering fundamentals. The examination will be administered by three faculty members from the program of the student’s track. Three results of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. 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 examination attempt.
10. Students must present to their advisory committee an annual oral progress report describing research progress. One of these presentations will include a detailed presentation of the dissertation research plan. This presentation must be completed at least one year prior to the expected completion of the Ph.D. requirements. These presentations may be made as a partial fulfillment of the students Seminar in Engineering (ENGR 562) requirements with approval of the student’s advisory committee.
11. A candidate for the degree must complete an original basic research investigation. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a dissertation covering the research. The project must represent an original and independent investigation by the student. It is normally expected that the results of the research will be submitted for publication in refereed research journals. The candidate will present and successfully defend the dissertation at the final examination (see School of Graduate Studies requirements).

Faculty and Areas of Expertise

Applicants are encouraged to browse the College of Engineering & Mines web site for listings of faculty and their areas of expertise.

Contact Information

Dr. Hossein Salehfar, Engineering Ph.D. Program Director
Department of Electrical Engineering
University of North Dakota
Upson II Room 160
243 Centennial Drive, Stop 7165, Grand Forks, ND 58202-7165

P: 701-777-4331
F: 701-777-5253
E: hossein.salehfar@engr.und.edu
http://www.engineering.und.edu/

Apply online: http://graduateschool.und.edu
Deadlines apply. See our website for more details.

Last Updated: 7/2/2014
Email: questions@gradschool.und.edu