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Objectives of the Doctor of Engineering in Engineering

Penn State, long respected and consistently recognized for having one of the top engineering programs in the country, is proud to offer a high-quality online Doctor of Engineering in Engineering (D.Eng.) program through the Penn State World Campus. Taught by respected Penn State faculty with strong academic credentials and real-world experience, the online D.Eng. program can position you for advancement to the highest-level leadership positions in research and engineering in both the private and public sectors. As a D.Eng. student, you can learn to:

- research and develop new products or processes that can benefit industrial, governmental, or military entities;
- analyze and synthesize critical information within your discipline, and, where appropriate, across multiple disciplines;
- communicate the major issues of your discipline and effectively disseminate research findings through technical reports, presentations, and peer-reviewed papers; and
- lead high-performing research and development teams, divisions, and corporations.

The online Doctor of Engineering in Engineering program incorporates the rigor of a Ph.D. with a focus of career progression from academic research to leadership in a commercial setting.
General Information

Penn State’s College of Engineering offers a Doctor of Engineering (D.Eng.) program aimed at the working professionals who desire to advance their career by demonstrating the ability to conduct and lead applied research within an industrial, military, organizational, or governmental setting. Throughout this Handbook, when “industry” is used we are also referring to military, government, and other organizational settings. To accommodate the working professional, the program is offered online through the highly regarded Penn State World Campus.

The program consists of 45 credits, of which 9 credits are focused on developing leadership and innovation management skills of value to the student’s career growth, 6 credits are focused on developing research skills, and 15 credits are focused on developing the needed technical skills through graduate-level technical courses relevant for addressing an appropriate applied research topic. An additional 15 research credits are required to complete the student’s praxis research project. Program milestones include the qualifying exam, comprehensive exam (praxis proposal), and final defense.

It is expected that the student will enter the doctoral program with an identified applied research topic that will result in a praxis. The praxis research topic will be finalized in consultation with a program administrator, the student, and the praxis committee, which will include the faculty advisor and other graduate faculty. The praxis research project is analogous to the dissertation research project that is a requirement of a Ph.D. program and the written praxis is the final written documentation of the culminating project in the D.Eng. program.

Program Office

The physical location of the Program Office for the Doctor of Engineering (D.Eng.) in Engineering Program is 213 Hammond Bldg. on Penn State’s University Park campus. The D.Eng. Program is administered by:

- **Director:** Prof. Sven Bilén
- **Associate Director:** Prof. Joanna DeFranco
- **Administrative Support Assistant:** Ms. Mariah Germello

The office is open during normal business hours on Mondays through Fridays; any changes in hours and hybrid/remote operations will be posted on the office door. Students can call the
office at 814-865-1345 or email us at DEngGradOffice@psu.edu and we will respond as quickly as possible.

General functions of the D.Eng. Program Office include:

1) Assist students with administrative questions, document submission, milestone scheduling, and submitting their final praxis;
2) Prepare material for consideration and action by the D.Eng. Directors, D.Eng. governing committees, and/or the D.Eng. graduate faculty;
3) Recruit the highest quality D.Eng. students;
4) Review applications for admission into the D.Eng. Program; and
5) Schedule and administer the D.Eng. qualifying examination.

The D.Eng. Programs Office is guided and assisted in these duties by several faculty committees comprised of D.Eng. graduate faculty. Committee members are appointed by the School of Engineering Design and Innovation (SEDI) Head in consultation with the D.Eng. Directors.

Penn State Email
Every Penn State graduate student receives a Penn State access account and email address. The D.Eng. program uses email to notify students of various announcements, events, program requirements, etc. All D.Eng. students are expected to use their Penn State email account for all correspondence regarding academics. If you choose to use an account other than the one provided by the University, you are responsible for all information contained in your Penn State account. The Information Technology (IT) website has more information on Penn State’s IT infrastructure and policies.

University Policies
This Handbook includes a few of the general University policies that have special relevance to D.Eng. program. It does not include all of the policies that can affect your time as a student at Penn State. Some of these may be found at The Graduate School’s website and other appropriate policies are provided at relevant locations online. This Handbook does not supersede any general policy of the University.

If you have specific questions regarding a specific policy, please contact the D.Eng. Program Office.
General Information

Safety and Compliance
As D.Eng. students will be performing the majority of their praxis research using facilities and resources available to them within their home organizations, they should follow any and all safety and compliance protocols established by their home organization.

In addition to safety issues, there are federally mandated compliance issues. Filing applications and obtaining approvals for the proposed work must precede any activities involving human subjects, vertebrate subjects, bio-hazardous material, and radioactive materials. Details are available at the Penn State Research website.

Expectation that the D.Eng. Student is a Remote Student
The D.Eng. is an online program for professional students and, as such, the expectation is that the student is pursuing their degree remotely. In addition, no physical office space will be provided to the student, and other support services that a resident student could expect are generally not provided (e.g., parking, computers). The World Campus provides access to a many of the services at Penn State, and maintains a listing of those services.

Scholarship and Research Integrity
Students are expected to commit themselves to the highest level of ethical conduct in their academic and research activities. All D.Eng. students must complete the Scholarship and Research Integrity Requirement (SARI) during their time within the D.Eng. program at Penn State. To satisfy the SARI requirement, the required ENGR 820 course contains the necessary content; hence, successful completion of ENGR 820 will satisfy the SARI requirement.

World Campus Student Advisory Board
The World Campus Student Advisory Board is an extension of Student Affairs whose members provide advocacy on behalf of students through collaborative partnerships with administrators and faculty. The Advisory Board works to enrich and improve the World Campus experience and to provide relevant services to World Campus students.
Admission, Advising, Courses, Milestones, and Requirements

This section provides information on the D.Eng. admission, advising, courses, program milestones, and other program requirements.

Admission to the D.Eng. Program

Applicants are required to complete the University’s on-line application, which includes information specific to applying for the D.Eng. in Engineering. Applicants must provide formal transcripts, letters of reference, a resume/CV, and a personal statement. International students whose first language is not English must submit TOEFL scores. Application dates and descriptions of the required application components may be found at the D.Eng. program’s World Campus website.

Guidance for Writing the Personal Statement

This statement should be concise and well-written, and reflect your academic interests, research/praxis plan, and motivation, as well as how these further your career objectives. Please include the following sections in your statement:

Academic Interests (approx. 1/2 page): Discuss your academic interest in the D.Eng. program. In addition, propose a course work plan (i.e., review the program’s electives and discuss which courses would be most effective to help reach your praxis research and professional goals).

Praxis Research Interests and Rational (approx. 1 page): The praxis research should apply what you come to the program with and will learn in this program (methods/technology/theory) to research and solve a significant/complex problem from your work. The goal of this section is to describe to the admissions committee a problem you have identified and the research plan, goals, and deliverables, and how these will be supported. In other words, this section should reflect your ability to effectively communicate the maturity of your research aspirations.

Career Objectives (approx. 1/2 page): This section should communicate a synergy between the education and praxis research accomplished in this program with your career/professional goals.
Advising

Academic advising typically is provided by the faculty member who supervises the student's praxis research. Other members of the student's praxis committee may also serve as advisers. A newly admitted student will be assigned a temporary adviser who will provide initial advising at the beginning of their first semester. The program will work to identify a permanent praxis adviser by end of the student's first semester. The directors of the D.Eng. program are available to consult and assist with difficult decisions.

Coursework

To graduate from the D.Eng. in Engineering Program, you must maintain a grade-point average of 3.0 or better in all course work, which includes:

- at least 9 credits of required core courses
  - Choose three of ENGR 804, ENGR 501, ENGR 405, and ENGR 802
- at least 6 credits of research and statistics methods
  - ENGR 820
  - Choose one: STAT 500, 501, 505, or 510
- at least 15 credits of technical electives
  - Check course list
  - Please Note: Approval is required for any classes that start with A-I, DAAN, ENGMT, SYSEN, SWENG or INSC. To request approval, please send the following information to mld5449@psu.edu: your name, PSU ID, course name, course number, course section, and semester.
- at least 15 credits of praxis research
  - ENGR 810

Registration for ENGR 810 is permitted throughout the D.Eng. program, but should only be taken when the praxis is adequately defined and progress is occurring with the praxis research. A student should register for the section of ENGR 810 that is specific to their adviser. To schedule ENGR 810 or any controlled technical electives, please contact the D.Eng. Program Office for assistance.
Transferring Courses

Any student with a conferred master’s degree from Penn State or an external institution is not allowed to transfer any credits from a conferred master’s degree to the D.Eng. program per Graduate School policy GCAC 309 Transfer Credits. If you have “unused” credits, up to 10 credits of high-quality graduate work done may be considered for transfer into the D.Eng. program. Please note, it is the discretion of the D.Eng. program to review your graduate transcript and identify eligible credits to transfer.

Obtaining Graduate Certificates

TBD. Students may consider obtaining a graduate certificate as part of their D.Eng. program. To obtain these, students must apply to the certificate program and be accepted, and this must be completed before they have taken all the certificate’s required courses, i.e., the certificates cannot be applied retroactively.

Qualifying Exam, Comprehensive Exam, and Final Praxis

This section discusses the three major milestones of the D.Eng. Program: Qualifying Examination, Comprehensive Examination (i.e., praxis proposal), and Final Written Praxis and Final Oral Defense.

Admission to the D.Eng. Program does not imply admission to D.Eng. candidacy, which is granted only by the D.Eng. Graduate Committee after the student completes all the D.Eng. qualification procedures. The decision for or against completion of these requirements is reported to The Graduate School. Positive recommendations are entered on the transcript, but failures are not recorded.

Qualifying Exam

The D.Eng. Qualifying Examination is prepared and administered by the Qualifying Examination Committee comprised of members of the D.Eng. Graduate Faculty, working closely with the D.Eng. Programs Office. It is structured around an assessment of the student’s proficiency with applied engineering research methods (ENGR 820), statistics, and the review and critical assessment of literature that is related to the student’s proposed praxis research. The exam will consist of an online written exam taken with oversight of online proctoring.

The primary purpose of the Qualifying Examination is to provide an early assessment of whether the student is developing the knowledge, skills, and attributes the D.Eng. program has
defined in its Objectives, including evidence of critical thinking skills necessary for successful applied research at the doctoral level. The Qualifying Examination is conducted early in a student’s program to ensure that the considerable investment of time, resources, and effort required by the student has a high likelihood of leading to completion of the D.Eng. degree.

The exam is administered twice each academic year: once each during the fall and spring semesters. Exam dates will be announced by the D.Eng. Program Director by email to all D.Eng. students. The Qualifying Examination will occur on a Saturday, on which day there will be a 10-hour window during which the student will take two exam parts: part 1 (2 hours) and part 2 (4 hours). The student may take a break between exams as long as both parts are completed within the 10 hours. Details for scheduling the Qualifying Examination will be included in the exam announcement. Should the student fail their first attempt at the Qualifying Examination, the D.Eng. Qualifying Exam Committee will determine the conditions to be met before a second (and final) examination attempt is to be administered. Passing the Qualifying Examination requires an 80% or higher on both exam parts.

**Eligibility:** To be eligible to take the Qualifying Examination the student must have:

- Earned **at least 12 credits** in courses eligible to be counted toward the D.Eng. degree (ENGR 820, STAT 5XX, and two courses of technical electives) or the equivalent as determined and documented by the program;
- A **grade-point average of 3.20** or higher for courses taken at Penn State while a D.Eng. graduate student; and
- No incompletes, deferred grades, or transferred credits apply.

The first attempt at the D.Eng. Qualifying Examination must be taken within 25 months of matriculation into the D.Eng. program.

**Exam Scheduling and Preparation Period:** Two months prior to the scheduled examination, students will meet with their praxis adviser to select three exemplar peer-reviewed journal articles that are related to their praxis research area. These articles will be sent to the D.Eng. Qualification Examination Committee to identify one additional exemplar article that will be used during Part 2 of the exam. To prepare for Part 2 of the exam a question pool will be provided to assist in preparing for the exam.

**Exam Format:** The Qualifying Examination will consist of two parts of equal weight:
Part 1: This part of the exam assesses the student’s mastery of the material drawn from ENGR 820 (with support from the statistics course).

Part 2: Each student will be given one paper (not one of the three) related to their field of study. During this exam part, the student will have access to the Penn State Libraries to access scholarly literature as needed but should be aware that plagiarism in any form will not be tolerated and will result in University-level sanctions that may include expulsion from the University.

In the written exam, students will be instructed to complete a series of written prompts (a subset of the question pool) to demonstrate understanding of the articles, applied research methodology, technical proficiency, and mastery of written English. The depth, quality, and accuracy of the answers to the questions will be used to assess technical mastery, and the quality of writing will be used to assess written communication skills.

When completing the written prompts, students should explain relevant theoretical underpinnings of the work, novel methodologies or techniques introduced, and significant findings leveraging visual evidence (graphics from the work, external sources, or original) to explain their perspectives of the work to an audience of faculty members.

Students are expected to explicitly cover the following topics:

- **Theoretical Background**: Succinctly demonstrate an understanding of the underlying theories that support and motivate the work.

- **Research Objectives/Methodology**: Articulate a clear understanding of the overarching objectives of the work. Describe if/how the methods proposed are appropriate given the research objectives.

- **Findings**: Clearly summarize the key findings of the work.

- **Impact**: Contextualize the impact of the work in the field leveraging literature to support your arguments and note any next steps that may/may not be associated with your proposed praxis research.

**Student Resources**: Students are advised to study foundational D.Eng. material and to master relevant coursework before taking the D.Eng. Qualifying Examination. They should also work with their faculty advisers and ENGR 820 instructor to practice accessing and citing literature
(in general), synthesizing literature, discussing technical papers, and critically reviewing technical papers.

The Qualifying Examination normally will be scheduled for the end of the second week of classes during the Fall and Spring semesters.

Students who do not pass the Qualifying Examination must take it again the next time it is offered. Students who are unsuccessful in their second attempt will be disqualified from the D.Eng. program.

Appeals
If the Qualifying Examination is failed on the second attempt, the D.Eng. Graduate Committee will consider student petitions giving special attention to inputs from the student’s area faculty and praxis adviser. The primary criteria that the committee will consider will be based on evidence of quality of accomplished research and potential for future research. This evidence should include statements by at least one and preferably two professors commenting on past and expected research, as well as a list of papers published or accepted for publication in refereed journals or conferences. The primary evidence can be strengthened by a statement of willingness of a faculty member to provide continued supervision of the student’s praxis research. The committee will also consider GPA, core course and technical course grades, written and/or oral qualifying exam scores, and improvement in performance from the previous exam. Proximity to the pass threshold is not by itself sufficient grounds for reversing a decision. The decision of the committee is final.

Praxis Committee Appointment
A student’s D.Eng. praxis committee must be appointed no later than the end of the semester following successful completion of the D.Eng. Qualification Examination. The chair of the committee (generally the praxis adviser) must be on graduate faculty within the D.Eng. in Engineering Program (this list of graduate faculty is maintained by the Graduate School). Two other committee members are selected by the adviser. With approval from D.Eng. Director and The Graduate School, a fourth committee member may be added from outside Penn State, if appropriate and contingent that they satisfy the requirements for special committee member as outlined by The Graduate School.
Comprehensive Examination

The D.Eng. Comprehensive Examination consists of a written praxis proposal and an oral examination with presentation of the proposed praxis. Though the nature of the praxis proposal is under the jurisdiction of the doctoral committee, it is recommended that the main body of the proposal be limited to the equivalent of fifteen (15) single-spaced pages of text. This proposal should contain, as a minimum, the background and motivation for the praxis research being undertaken, the specific problem(s) to be tackled, and the approach as well as methods to be adopted for attempting the solution together with a summary of any preliminary results. Any additional material that does not belong to the core of the proposal, but provides either justification of the proposed scheme or documentation of preliminary efforts, could be included in an appendix.

The Comprehensive Examination may be scheduled once the student has completed 12 of the required 15 credits of technical electives.

The Comprehensive Examination may be taken in person or virtually. The results of the exam will be provided to the student along with any recommendations, which may include recommendations for additional coursework, topics for review, etc.

Final Written Praxis and Final Oral Exam

The written praxis must be provided to the members of the student’s D.Eng. praxis committee at least 2 weeks prior and the final oral exam must be scheduled with The Graduate School through the D.Eng. Program Staff Assistant at least 3 weeks prior to the exam date.

The final oral exam must be completed within 8 years of entrance into the D.Eng. program. A minimum of three months must have elapsed since the Comprehensive Examination. At least 3 weeks before the Final Oral exam, the student must see the D.Eng. Program Staff Assistant for the forms necessary to officially schedule the final oral exam. One of the forms the student will receive will be verification by the adviser’s signature that the praxis is ready to be distributed to the other committee members and ready to be defended. At least 2 weeks before the exam date, the student will distribute copies of the written praxis to the committee members. The exam may be canceled if documents are not delivered to committee members at least 2 weeks prior to the exam date. The graduate staff coordinator will verify that all requirements have been met and will obtain the D.Eng. Director’s signature and send the request on to the Graduate School.
The Graduate School sends the Final Oral Exam Report form to the D.Eng. Program Staff Assistant indicating that the exam has been officially scheduled. This examination, open to the public, relates in large measure to the praxis but may cover the entire field of study. The exam may take place in person, virtually, or in hybrid format. The praxis committee determines the exact examination procedure. All members of the doctoral praxis must participate in the final oral exam. All committee members’ marked evaluation of the defense will be recorded electronically and submitted to The Graduate School. A favorable vote of at least two-thirds of the members of the committee is required for passing. If the student fails, it is the responsibility of the praxis committee to determine whether or not another examination may be taken. The approval of the praxis rests entirely with the doctoral committee and the D.Eng. program director.

Final oral exams and written praxis submissions must meet The Graduate School’s published deadlines for completion and be submitted by the published dates for graduation in a given semester.

Other Requirements

Communication and Language Competence

D.Eng. students shall demonstrate competence in the use of the English language for purposes of both written and oral communication. They should be able to communicate technical material in a clear, concise, and well-organized manner. The praxis adviser or the doctoral committee may require that the student take formal courses in technical writing, speech, etc., if it is determined that the communication skills are inadequate. There will be various communication experiences throughout the program.

Writing Requirements

Before the D.Eng. student’s Comprehensive Examination is scheduled, the praxis adviser must formally attest to the English competence of the student.

Students are expected to gain writing experience by preparing research reports, conference papers, and refereed journal articles as they report on their original findings. The doctoral committee is expected to review and critically evaluate any of the student's written work, including the praxis proposal, interim reports, and manuscripts.

The written praxis is to meet the standards set forth by The Graduate School and is to be evaluated by the doctoral committee for the quality of the writing as well as technical content.
At the beginning of the research, each student should access the Thesis and Dissertation Guide to ensure that the written or graphical materials generated from time to time can be in the format acceptable to The Graduate School.

It is strongly recommended that D.Eng. students use the LaTeX style or Word template provided via the link above to ensure compliance with formatting guidelines.

**Oral and Presentation Requirements**

Presentation skills of all D.Eng. students will be evaluated after formal completion of all procedures required for admission to D.Eng. candidacy. Each student will make a 15-to-20-minute presentation on a technical topic to a group of students and/or faculty including their praxis adviser. This presentation will be coordinated by the praxis adviser and should take place no later than the first semester after passing the Qualifying Examination. Students found to have deficiencies in presentation skills will be required to take a course to develop these skills.

The student will make an oral presentation of approximately 30 minutes in length to the doctoral committee on the praxis problem and the approach to its solution. This praxis proposal presentation is a part of the Comprehensive Examination.

The student is encouraged to attend conferences to make oral presentations of their praxis research work and the write papers for submission to journals. These opportunities are discussed in consultation with the praxis adviser.

In addition, an oral presentation on the results of the praxis research is required. This presentation will be a part of the final praxis defense.

**Other Constraints**

To be eligible for the Comprehensive and Final Oral Exams, a student must have a minimum grade point average of 3.0, must be registered, must have no missing or deferred grades, and must have satisfied any provisional requirements for admission.

After passing the qualifying exam, a student must maintain continuous registration for each fall and spring semester until they defend their praxis. Students who fail to register will be assessed tuition for any semesters in which they did not register before being permitted to continue their D.Eng. studies.
D.Eng. Residency Requirement and Time Limit

Five days of residency during the length of their program is required of all D.Eng. students and can be satisfied at any Penn State campus or combination of campuses (except World Campus). The full residency requirement can be met by attending a single five-day campus residency or multiple shorter on-campus residencies that combine to a minimum of five days. The D.Eng. program office will track days and certify this requirement has or will be met (i.e., if the student intends to defend in person) by the date of the Final Praxis Defense.

Immediately prior to each fall semester, the D.Eng. Program will hold an optional two-day orientation on the Penn State University Park campus that can count toward part of the residency requirement. Residency days can also be obtained through visits to campus for research meetings with praxis faculty, students, and researchers; attendance in lab group meetings; on-campus workshops; and organized D.Eng. Program–specific professional development activities that will be offered from time to time for those in the program and to the broader community. Some of these days may also be spent in fulfillment of major program milestones including your qualifying exam, comprehensive exam, and praxis defense.

A doctoral student must complete the program and submit an accepted praxis within 8 years of matriculation into the D.Eng. Program.

Intellectual Property

[Note: this section is subject to change and is being assessed] In general, as D.Eng. students are not employees of The Pennsylvania State University and are not using Penn State facilities for their research, then the Intellectual Property (IP) policies in force are those of their home entities. Penn State policies the govern student IP are found in IPG01 Faculty Guidance on Student Intellectual Property Rights and IPG02 Special Student Intellectual Property Agreement Forms.

Taking a Semester Off

Should it become necessary for a D.Eng. student to take a semester off, the student should continue to be engaged with their praxis adviser and working on their praxis research during their semester off from courses, to ensure that momentum is maintained and to minimize the impact on the praxis adviser and the larger research group in which they participate.
When a student is not enrolled in any spring or fall semester, their LionPATH account automatically becomes "discontinued" by the second week of the semester. Students would need to apply to Resume Study to reactivate their LionPATH account when they are ready to start taking classes again. There are no fees or documentation required to resume study, and it generally takes two business days for a LionPATH account to be reactivated. The summer is considered a vacation period for all students unless the graduate program or ISSA requires otherwise. For example, if a student was enrolled for spring, and doesn’t register for summer, they are still considered an enrolled student. To continue making adequate progress in the DEng program, it is advised that the student continue to take courses during the summer semester.

**Annual Orientation and Program Meeting**

Prior to the Fall semester, the DEng program will offer a 2-day program meeting for enrolled DEng Students. This meeting is optional and will be held at the University Park campus. Travel arrangements/costs are the responsibility of the student. If attending both days in person, attendance will count towards D.Eng. residency requirement.

If not attending in person, students may participate in some of the meeting sessions that will be delivered in hybrid format.