# Table of Contents

Purpose of the Graduate Handbook ................................................................. 2  
Admissions Criteria ......................................................................................... 2  
The Ohio State University Graduate School Application Minimum Requirements .................................................. 2  
Department of Engineering Education Application Requirements ................................................................. 3  
Department of Engineering Education Degree Requirements ................................................................. 3  
  Core Courses ............................................................................................. 3  
Elective Courses ......................................................................................... 3  
Disciplinary Requirements ........................................................................ 4  
Department of Engineering Education Milestones ............................................. 5  
Advisor Selection ......................................................................................... 5  
Plan of Study ............................................................................................... 6  
Transfer Credit ........................................................................................... 6  
Funding ...................................................................................................... 12  
Fellowships & Scholarships ........................................................................ 12  
Graduate Teaching Associate (GTA) Positions ............................................... 13  
Graduate Research Associate (GRA) Positions ............................................... 13  
External Funding ....................................................................................... 13  
Important Dates & Academic Calendar ........................................................... 13  
The Graduate School Event and Graduation Calendar ...................................... 13  
The Ohio State University Academic Calendar ................................................ 14  
Points of Contact ....................................................................................... 14  
Graduate Studies Committee ....................................................................... 14  
Graduate Studies Chair ............................................................................. 14  
Graduate Program Coordinator .................................................................. 14  
Goals for Graduate Student Learning & Development .................................... 14  
Appendices: Contents ............................................................................... 16  
Appendix A: Graduate Student Forms ......................................................... 17  
Appendix B: PhD Program Goals and Outcomes ........................................... 24  
Appendix C: EED Organizational Charts .......................................................
Purpose of the Graduate Handbook

The Graduate Handbook provides a detailed description of the requirements for the PhD in Engineering Education as well as descriptions of the procedures to be followed in completing the requirements of the program. Additional information concerning Graduate School policies can be found at the Ohio State [Graduate School website](#).

This handbook includes the requirements, policies, and procedures adopted by the Department of Engineering Education (EED) at Ohio State for successful completion of the PhD program. The Ohio State Graduate School has established further and separate requirements and EED graduate students must meet the requirements of both the Graduate School and the EED for successful degree completion. While Graduate School requirements may be mentioned occasionally in this document, students should consult the [Graduate School’s Graduate Handbook](#) for overarching policies and procedures that apply to graduate students across the university.

If there is any doubt regarding the interpretation of any regulation or requirement in this handbook, or if there are questions about the graduate program involving matters not covered in this handbook, please consult with the EED’s Graduate Program Coordinator.

This document is a living document that may change each academic year. Students will follow the Handbook of the year their studies initiated, or they may request the Graduate Studies and Research Infrastructure (GSRI) Committee to consider them under a more recent Handbook if changes made are favorable to the student. Any changes to the Graduate Handbook will be communicated to the graduate students by the beginning of the academic year. This document will reside in the box folder, “EED Graduate Student Resources” as well as on the EED website.

Admissions Criteria

The Ohio State University Graduate School Application Minimum Requirements

For a complete application to Ohio State, please submit documentation that demonstrates fulfillment of the following:

- A **baccalaureate or professional degree** (or equivalent foreign credential) from an accredited college or university, earned by the expected date of entry into your graduate program.
- A **minimum of a 3.0 cumulative GPA** (on a 4.0 scale) in all prior undergraduate and graduate work. ([How to calculate your GPA](#)).
- **Prerequisite training that will enable you to pursue your program.** Evidence usually comes in the form of transcripts or other credentials documenting that you have completed prerequisite academic work.
- **Proof of English language proficiency**, for international applicants and those who have held the status of U.S. permanent resident for less than one year from the first day of the first term of enrollment. Minimum required scores:
  - TOEFL: 79 on the Internet-based, 550 on the paper-based
  - MELAB: 82
  - IELTS: 7.0
Department of Engineering Education Application Requirements

- Three letters of recommendation
- Resume or CV
- Institutional transcript(s), undergraduate and graduate degrees
- Short essay responses
- TOEFL (or other) Test Score, if needed

Department of Engineering Education Degree Requirements

Core Courses

There are 16 credits of required core engineering education coursework:

- ENGREDU 6100: Foundations and the Field of Engineering Education (three credits)
- ENGREDU 6200: Learning Theory, Pedagogy, and Assessment (three credits)
- ENGREDU 7189.01: Teaching Practicum I (two credits, must be taken in the same term as the start of a significant two-semester teaching experience)
- ENGREDU 7189.02: Teaching Practicum II (one credit, must be taken in the same term as the second semester of a significant two-semester teaching experience)
- ENGREDU 7780: Research Design in Engineering Education (three credits)
- ENGREDU 7881: Seminar in Engineering Education (one credit each semester with a requirement of two total to count toward the degree with expectation that students will participate each semester of enrollment unless there are schedule conflicts)
- ENGREDU 7900: Career Exploration and Professional Development in Engineering Education (three credits)

Elective Courses

There are two categories of elective coursework required for the program. Research methods serve to support student’s research, whereas the specialization coursework supports the student’s research focus and future career goals.

There are 9 credits of required Research Methods coursework:

- Three credits of quantitative research methods that includes an emphasis on statistics, including but not limited to the following existing Ohio State courses:
  - STAT 5510: Statistical Foundations of Survey Research
  - STAT 6410: Design and Analysis of Experiments
  - ESQREM 6641: Introduction to Educational Statistics
  - ESQREM 6661: Introduction to Educational Measurement
- Three credits of qualitative research methods, including but not limited to the following existing Ohio State courses:
  - ESHESA 7256: Qualitative Research in Higher Educational Settings
  - EDUTL 8001: Discourse Analysis and Educational Research I
  - EDUTL 8002: Discourse Analysis and Educational Research II
  - ESQRE 8280: Qualitative Research in Education: Paradigms, Theories, and Exemplars
- Three credits of advanced research methods, including but not limited to the following existing Ohio State courses:
  - ESQREM 7635: Advanced Research Methods
  - EDUTL 7749 Concept Inventories in STEM Education
  - ESQRE 8290: Qualitative Research in Education: Methods and Analysis
EDUTL 8751: Survey and Critical Analysis of Research in STEM Education

There are 12 credits of required Specialization coursework:

- Three credits minimum within the Department of Engineering Education
- Three credits minimum outside the Department of Engineering Education
- A coherent course of study in the student's chosen area of specialization. Each faculty advisor will work with their students to together define the specialization focus for each student's coursework, based on student needs and faculty interests. Further categorization will be developed among the emergent individual specializations. It is not intended that any specializations will appear on the student transcript unless the student specifically chooses to draw upon existing OSU programs that are already noted on transcripts. Some examples (many of which are transcriptable) include:
  - Adult education / Business human resource development
  - African American and African studies (transcriptable OSU graduate minor)
  - Applied developmental science in education (transcriptable Ohio State interdisciplinary specialization)
  - College and university teaching (transcriptable OSU interdisciplinary specialization)
  - Disability studies (transcriptable OSU interdisciplinary specialization)
  - Engineering technical communications
  - Humanitarian engineering
  - Inter-professional studies (transcriptable OSU interdisciplinary specialization)
  - Latino/a studies (transcriptable OSU interdisciplinary specialization)
  - Neuroscience (transcriptable OSU graduate minor)
  - Nonprofit studies (transcriptable OSU graduate minor)
  - Public policy and management (transcriptable OSU graduate minor)
  - Sexuality studies (transcriptable OSU interdisciplinary specialization)
  - Statistics and statistical data analysis (transcriptable OSU graduate minor)
  - Survey research (transcriptable OSU interdisciplinary specialization)
  - Women's, gender, and sexuality studies (transcriptable OSU graduate minor)

If there are interests in other specializations, please contact the Graduate Program Coordinator.

At least 30 hours of research toward the dissertation is required for each PhD student, as well. This course is ENGREDU 8999 and you must contact the Graduate Program Coordinator to enroll you in the number of hours you and your advisor have determined are necessary each semester. No instructor permission is needed if the student is enrolling in Dissertation Research hours with their permanent faculty advisor.

**Disciplinary Requirements**

In addition to the core and elective coursework, 12 credits in traditional engineering coursework are required. Traditional engineering coursework must be a 5000 level course or higher.*

*Ph.D. candidates with an undergraduate degree in non-engineering STEM fields (e.g., math, physics or chemistry) are generally required to take two to five undergraduate courses in a selected traditional engineering discipline, including a significant engineering design experience, to adequately prepare them for graduate level courses at the 5000 or higher level. Students must receive approval for these courses from a potential faculty advisor. Not all of this course work can count toward the PhD degree, and this constraint will be made transparent to students who are in this situation.

Alternatively, students may demonstrate their engineering proficiency, and thus their eligibility to enroll in graduate-level engineering coursework, through successful completion of the Fundamentals of Engineering (FE) examination (NCEES, 2017) and demonstrated completion of a significant engineering
design experience. In the United States, engineers are licensed at the state level by professional licensing boards. Professional Engineering (P.E.) licensure candidates must meet a combination of requirements in education, experience, and exams. The first of the two major national exams, usually taken within six months of graduation from an accredited undergraduate program, is the Fundamentals of Engineering (FE) examination (NCEES, 2017). A few states will allow candidates with undergraduate degrees in non-engineering STEM fields to sit for these exams, if they can demonstrate appropriate on-the-job engineering experience.

Department of Engineering Education Milestones
(Also located on the EED website)

EED milestones and the timing of each milestone is listed in Table 1. Details about each milestone are listed below.

<table>
<thead>
<tr>
<th><strong>Milestone</strong></th>
<th><strong>Timeline</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisor Selection</td>
<td>End of student’s first year</td>
</tr>
<tr>
<td>Plan of Study</td>
<td>End of student’s first year</td>
</tr>
<tr>
<td>Transfer Credits Approved</td>
<td>End of student’s first year</td>
</tr>
<tr>
<td>Annual Review</td>
<td>Every year</td>
</tr>
<tr>
<td>Qualifier Exam</td>
<td>End of student’s first year, or when the student completes the three EED core courses</td>
</tr>
<tr>
<td>Candidacy Exam</td>
<td>After completion of coursework</td>
</tr>
<tr>
<td>Dissertation Defense (Final Oral Exam)</td>
<td>End of program</td>
</tr>
</tbody>
</table>

Table 1- Milestone Overview

Advisor Selection
Academic advisors must be selected by the end of the student’s first year in the Ph.D. program. For example, if a student begins the program in August, an advisor must be selected by the end of Spring semester. The advisor must be a member of the EED Graduate Faculty (tenure-track or tenured) and should have particular expertise in the area of research the student intends to pursue. Advisor selection involves conversations with faculty surrounding, but not limited to, the following:

- Both the student’s and advisor’s work styles
- Faculty advising style and expectations
- Student timeline for graduation
- Student and faculty research interests
- Student career interests
- Faculty funding availability

To allow EED PhD students sufficient time to develop their research interests, the department encourages prospective and new students to meet with as many of the EED faculty as possible before selecting an advisor. The student will then fill out the Advisor Request Form and submit it to the Graduate Program Coordinator. In the event that a student wishes to switch advisors, the student must complete the Change of Advisor Form and submit it to the Graduate Program Coordinator. In all cases, the faculty member must give his/her consent to serve in the capacity of graduate advisor. A student may also select two faculty as co-advisors. At least one of the co-advisors must have Category P status at the university; the other may hold M status. For more information on Category P and M faculty, please see the Graduate School’s Graduate Handbook, section 12.4, page 80.
Interim Advisors
Before a formal faculty advisor is selected, an interim advisor with “P” status (a tenure-track, tenured, or research professor) is assigned randomly to each student upon admission. Interim advisors help students make connections within and outside of the department, assist with fellowship or other applications, and discusses research and career interests. Advisors will remain interim advisors until an official advisor is selected and an Advisor Request Form is completed.

Plan of Study
A plan of study outlines the general curriculum, transfer courses, and semester timelines for course completion. Students must submit their plans of study by the end of their first year in the Ph.D. program. For example, if a student begins the program in August, the plan of study must be complete, submitted, and approved by the end of Spring semester. The Plan of Study Form outlines the student’s semester-by-semester plan for completing program and university requirements and lists the courses taken and those the student is planning to take. It also includes courses previously taken at other institutions that the student has transferred in, or wishes to transfer in, for EED credit. The student and faculty advisor will work together to prepare the plan of study for approval by the Graduate Studies and Research Infrastructure (GSRI) Committee. The GSRI will review and discuss the plan of study, make suggestions for changes if needed, and vote to approve the plan. If changes are recommended, the student will submit the changes to their faculty advisor for approval, and no further GSRI action is needed.

Transfer Credit
Students may transfer up to 30 credits beyond the bachelor’s degree of course work at the 5000 level or higher (graduate credit) earned at another accredited university. The following conditions must be satisfied in order to transfer graduate credit:

- that the graduate credit was earned as a graduate student at an accredited university
- that the student earned at least a grade of “B” for which credit is to be transferred (grades of satisfactory (“S”) or pass (“P”) may be evaluated but not accepted as transfer credits)
- that the GSRI Committee approves the transfer

Additionally, the Graduate School lists other considerations:

- Doctoral students can only transfer in one Master’s degree
- If doctoral students have additional credit hours beyond 30 to transfer, those credit hours must be at the doctoral level and the student must demonstrate that they attended a Ph. D. program at that institution.
- Ph.D. students must complete (at least) 24 credit hours at Ohio State.

Credits should be transferred within the student’s first year. Transfer credits count in the student’s total earned hours but do not count in the student’s graduate cumulative point-hour ratio. The credit hours and the mark “K” appear on the student’s official permanent record.

Transfer requests will be reviewed by the GSRI Committee after being approved by the student’s advisor or interim advisor. Students should prepare a packet for review by the GSRI Committee that includes the following:

- A Course Transfer Request Form for each course
- Syllabi for all courses (courses taken at other institutions as well as the Ohio State course the student is requesting it count toward)
- Justification statements (one paragraph each) explaining why the course should transfer
• Table or Excel spreadsheet summarizing the requests (see Appendix).

On receipt and evaluation of a transcript listing courses completed, the student initiates the request for transfer of graduate credit via GRADFORMS. Once approved by the program, the request will be reviewed by the Graduate School for the final decision and if approved, the Graduate School will notify the student.

Annual Review
The annual review serves as a formal checkpoint between the faculty advisor and the student and is to be completed once per year beginning at the end of the student’s first year. The review is not punitive in nature; rather, the advisor discusses strengths, successes, and areas for growth and improvement with the student. The annual review form that the advisor and student complete together can be found in the “EED Graduate Student Resources” Box folder.

Exams

Qualifier Exam
The EED Qualifier Exam is a written and oral demonstration of a student’s comprehension of EED core coursework (i.e., ENGREDU 6100: Foundations and the Field of Engineering Education, ENGREDU 6200 Learning Theory, Pedagogy, and Assessment, and ENGREDU 7780: Research Design in Engineering Education). The qualifier is designed to test knowledge of core course material and will ask students to apply methods learned in courses and other activities in their first year as graduate students. Students should take the Qualifier Exam at the end of their first year in the Ph.D. program, or when they have completed the three core EED courses.

The Qualifier will only be offered once a year in early August, before classes start. For students who do not pass all or part of the exam, a makeup exam will be offered every January, also before classes start. No new Qualifiers will be administered in January, only in August. Those who did not pass or withdrew their attempt in August are eligible for a retake in January or the following August. Oral exams will only be given in August. If a student does not pass the oral exam in August, they must wait until the following August to make it up.

Three questions will be emailed to students on the day that the exam is scheduled to start, and students will have 2 weeks to write their answers. Please note that students are NOT expected to only work on the Qualifier during this time. They should still participate in their classes, attend meetings, and continue to work on their other responsibilities.

The day after answers are submitted, students will receive example National Science Foundation (NSF) proposals which they are to read and critique in preparation for the team Oral Panel, which will take place approximately 10-14 days after the answers are submitted. Specific dates will be provided to students each time the Qualifier is offered. No written materials will be collected for the Oral Panel. The Oral Panel will take place approximately one week after written responses are submitted. The Graduate Program Coordinator will email participating students for their availability for ~2 hours on the day of the Oral Panel. The Oral Panel will be a discussion among participating students concerning proposals prepared for the NSF solicitation, overseen by three faculty members. Each student will receive one proposal to review and is expected to serve as an ambassador for that proposal during the oral exam discussion. Students will work in a team to decide which is the strongest proposal. Though the Oral Panel is a team-based exercise, each student will be scored individually.

Students may use notes, books, or other resources with the exception of peer collaboration. Any instances of peer collaboration will be considered Academic Dishonesty and will result in university action through COAM.

Revised 8/19/19 8
**Guidelines for Asking Questions:** If students have questions during the Written Exam, they should email them to the Graduate Program Coordinator. The questions will be answered by the faculty, and the Graduate Program Coordinator will send out the response to all students taking the Qualifier.

**Guidelines for Submission:** Answers will be typed in 11 point Calibri font, single-spaced, and submitted to the Graduate Program Coordinator in three separate PDFs (one PDF per question) by the exam’s due date. Each PDF should be de-identified (no names or ID numbers) but should include a cover page with the question and the student’s information. The Graduate Program Coordinator will remove the cover page before uploading each question to a box folder where faculty will access the exams for evaluation. APA Citation style is expected throughout the written portion of the exam. Though there is no minimum or maximum required page length for the written portion of the exam, most good answers are around 10 pages with 1.5 spacing.

**Grading:** Answers will be graded using a double-blind process. De-identified answers will be graded by two faculty members using the following mastery scale:

- **Beginning** - does not demonstrate graduate-level proficiency
- **Developing** - demonstrates limited graduate-level proficiency
- **Accomplished** - demonstrates acceptable graduate-level proficiency
- **Exemplary** - demonstrates above average graduate-level proficiency

The above holistic scale will be applied twice to each question a student submits: once in the category of Content and once in the category of Mechanics, Style, and Organization. *Scores of Accomplished or Exemplary indicate that a student has satisfactorily answered the question and passed, while scores of Beginning and Developing indicate a failed attempt. A student must “pass” in both categories to pass the question. If the 2 faculty graders disagree on a “passing” or “non-pass” score, a third faculty member will serve as a tiebreaker. A rubric will be provided to students before the exam begins.

Approximately one week after the Oral Panel, students will receive their scores via email for all questions, along with comments (but not revisions) for both portions of the Qualifier. If a student fails to answer one or more questions satisfactorily, the question may be rewritten during a future Qualifier. Each question may be attempted twice; if the student does not pass the Qualifier on the second try, the student will be dismissed from the Ph.D. program.

**Withdrawal Policy:** Students who have begun the Qualifier Exam may withdraw their attempt up until the submission deadline. The withdrawal does not count against the student as one of their attempts at the Qualifier, but a student may only employ the withdrawal option once.

**Retake policy:**

- The first non- or partial pass on the Qualifier Exam counts only internally to EED. The second non- or partial pass counts internally and prompts communication with the Graduate School. This means the Graduate Program Coordinator must notify the Graduate School that a student is not progressing as expected; the Graduate School will send a warning letter to the student regarding the student’s potential dismissal from the Graduate School. Dismissal is not formalized until the Graduate School issues two warnings.
- Students who wish to continue in the PhD program after their second non- or partial pass on the Qualifier Exam are responsible for completing the Individualized Developmental Exam (IDE). If the student chooses not to complete the IDE by the end of the following semester, the Graduate School will issue the second formal letter and the student will be dismissed from the program. The IDE consists of a meeting between the student and the advisor documenting the challenges and developing a plan to ensure growth; revision of answers that includes how the student addressed issues; and a follow-up meeting with the faculty advisor and two other department faculty members.
Any testing accommodations should be brought to the Graduate Program Coordinator’s attention as soon as you decide to take the exam. We will accommodate any student registered with Ohio State Student Life Disability Services appropriately.

Preparation: Students are expected to prepare for the Qualifier Exam for a period of time deemed appropriate by the student’s faculty advisor. Preparation involves more work than simply having completed required coursework, and what qualifies as adequate preparation will be determined by the student and their faculty advisor.

**Candidacy Exam**

The candidacy examination is a requirement of Ohio State’s Graduate School and requires a “…single examination consisting of two portions, written and oral, administered under the auspices of the Graduate Studies Committee in conjunction with the student’s candidacy examination committee and the Graduate School” (Graduate School Graduate Handbook, Section 7.3). The purpose of the candidacy examination is to test a student’s knowledge and comprehension of engineering education, capacity to undertake independent research, and ability to think and express ideas clearly. It is usually taken once the student completes all required and elective coursework so that the student can focus on the dissertation following successful completion of the Candidacy Exam.

The candidacy examination consists of a written and oral portion, the structure of which is at the discretion of the department. Doctoral students achieve candidacy once both portions are successfully completed.

Candidacy should be reached after doctoral students have taken enough course work to become proficient in the field of study, which is generally two years after starting the doctoral program or one year after qualifying or preliminary exams.

Doctoral students who have achieved candidacy are deemed to have:

1. acquired the necessary advanced knowledge of the subject (normally by meeting all of the course requirements for the particular PhD program)
2. developed the needed technical skills (e.g., language, laboratory, computational, etc.) for work in the subject
3. demonstrated the ability to do the research or scholarship necessary to begin work on a dissertation’

EED goals for the students taking the Candidacy Exam are:

- To familiarize themselves with the literature in the field
- To practice formulating a research problem
- To practice synthesizing information in clear, cohesive arguments
- To develop a research question and corresponding plan
Members of the Candidacy Exam Committee
Committee members are chosen by the student and the advisor. The committee should be composed of
the student’s advisor and at least three other relevant graduate faculty members chosen by the student and
the advisor together. Only tenure-track, tenured, research, and clinical faculty can serve on candidacy
exam committees. The Candidacy Exam Committee can be formed at any time deemed appropriate by the
student and the faculty advisor.

The Candidacy Exam consists of both a written and oral portion. The process for scheduling and taking
the Candidacy Exam is as follows:

1) Student forms a candidacy exam committee made up of four faculty members, providing ample
time for faculty to respond to the request and discuss the student’s research interests with them.
2) Student schedules the candidacy timeframe, wherein the research proposal will be developed,
submitted, and defended (example: August – November 2020). In addition, at this time, the
student should schedule their candidacy exam oral defense with the Graduate School. The
Graduate School specifies:

“The oral portion of the candidacy examination lasts approximately two hours and is held
after completion of the written portion. To schedule the oral exam, the student must submit an
Application for Candidacy on GRADFORMS and have this approved by their program and
advisor at least two weeks before the oral's proposed date. The oral examination must take
place during announced university business hours, Monday through Friday”

3) Student develops a 15-page NSF-style research proposal in consultation with their advisor and
submits it to their committee
   a. The committee may approve a different yet equivalent style based on the student’s career
      interest; however, the focus must still be a research proposal.
4) The committee has 2 weeks to read the proposal and develop questions. Each committee
   members will write one question based on the proposal that aids the student in the development of
   their dissertation research.
   a. If the committee finds the proposal to be inadequate, the committee may decide to restart
      the process.
5) After the two-week proposal review period, the student will be given the four questions and will
   have four weeks to write a response to each question.
   a. At this time, the student should also schedule their candidacy exam oral defense with the
      graduate school.
6) After the four-week response period, all of the questions and student’s responses will be emailed
to the entire committee. The committee has 2 weeks to read all the materials and prepare for the
candidacy exam oral defense.
7) After the two-week response review period, the committee and the student will meet for a two-
   hour candidacy exam oral defense that has been previously approved by the Graduate School.
The only people in attendance at the oral defense are the student and the Candidacy Exam
Committee members.
   a. During this meeting the student may clarify any of their written items, answer additional
      questions for the committee, and provide additional insights about their proposal
dissertation research.
   b. This time will also be used to negotiate any ill-defined requirements of the dissertation
      research so the student and committee are all in agreement about the scope of work
      needed to complete the research.
8) Following the candidacy exam oral defense, if the exam is deemed satisfactory, the committee
members will submit the required paperwork to the Graduate School for processing.

Revised 8/19/19 11
Candidacy Expiration

Students should complete all doctoral program requirements within five years of taking the candidacy exam or the exam will expire, resulting in cancellation of the student’s candidacy. The student can petition the Graduate Studies and Research Infrastructure Committee to take a supplemental candidacy exam, which will differ from the original exam given. If the student passes this supplemental candidacy examination, the student is readmitted to candidacy and must then complete a dissertation document within two years. Note that EED students are not guaranteed a supplemental exam.

For more Graduate School policies regarding the Candidacy Exam, please visit:
https://gradsch.osu.edu/handbook/7-8-doctoral-candidacy

Dissertation Defense (Final Oral Examination)

Dissertation Committee
The student must form a dissertation committee made up of at least three authorized Graduate Faculty members. The Chair of the dissertation committee is the student’s advisor who must be a Category “P” status Graduate Faculty member in EED. The dissertation committee is established at a time thought appropriate by the student and the advisor. It is the student’s responsibility to make certain that committee members are on duty in the semester of the defense.

Final Oral Examination
Regarding the dissertation defense, the Ohio State Graduate School Handbook states:

“The final oral examination committee is composed of the student’s dissertation committee, plus the Graduate Faculty Representative. Other Graduate Faculty members may be added to the committee, subject to the rules of the Graduate Studies Committee. The advisor serves as chair of the final oral examination committee. The advisor of a doctoral student must be a Category P member of the student’s graduate program. Responsibility for conducting and evaluating the final oral examination rests with the student’s final oral examination committee.

Draft Approval. Before a defense can be held, the student must submit a complete, word-processed dissertation draft to the dissertation committee for review and approval or disapproval. All dissertations submitted for format review and approval must be of a caliber similar to that expected of an article submitted to a journal for review. Draft documents that are missing tables, graphs, citations, chapters or sections, etc., are incomplete. Incomplete drafts cannot be submitted for draft approval or defended.

Scheduling. A dissertation committee member’s approval of the dissertation draft means that the committee member judges it to be of sufficient merit to warrant holding the final oral examination. To schedule the final exam, the student must submit an Application for Final Examination on GRADFORMS and have this approved by each dissertation committee member at least two weeks before the proposed defense date. After the final oral examination committee has been approved by the Dean of the Graduate School and the Graduate Faculty Representative has been assigned, the Report on Final Examination and Report on Final Document are made available to the examination committee. The final oral examination must take place during announced university business hours, Monday through Friday.

Graduate Faculty Representative. Once the final oral examination is scheduled, the Graduate School appoints the Graduate Faculty Representative (GFR). The GFR is a Category P graduate faculty member who is neither a graduate faculty member in the doctoral candidate’s graduate program nor a member of the dissertation committee. No less than one week before the final oral
examination, a complete dissertation or DMA document draft must be presented to the GFR for reference. The presence of the GFR is required at the oral examination for its entire duration. The GFR is a full voting member of the final oral examination committee and is invited by the advisor to ask questions. The GFR has the right to ask at least one question and renders an opinion by observation of the student’s answers to all questions. The purpose of the GFR on the final oral examination committee is to assess:

- the rigor of the examination process
- the fairness, professionalism and integrity of the examination process
- conformity to rules of the Graduate School (e.g., duration of the exam, adequate time for questions by the committee members) The GFR reports a judgment of the above to the Graduate School once the final oral examination is completed through an evaluation form on GRADFORMS, preferably within 48 hours after the examination.

**Attendance and Format.** Except when video conferencing is approved by the Graduate School, all members of the final oral examination committee must be present during the entire examination. All committee members are expected to participate fully in questioning during the course of the examination and in the discussion of and decision on the result. Other faculty members and graduate students may attend the examination, subject to the rules of the Graduate Studies Committee. The final oral examination lasts approximately two hours. A presentation of the dissertation research by the student is allowable. At least one hour of the two-hour examination period, however, must be allotted to discussion of the research and to questions of and answers by the student. Local programs may develop additional local protocols and procedures.”

In EED, the student and advisor will set expectations for what constitutes a successful defense. The final exam will include a two hour, private oral defense following a one hour public presentation of the dissertation research. The Graduate Program Coordinator will help students advertise their public presentations to the department and external parties.
Funding

Funding for graduate students is never guaranteed, unless expressly stated in a contract or admission letter. Students with a one-year contract for funding should not expect that the contract will automatically be renewed. Funding decisions are made at the discretion of the advisor and are based on a variety of factors, including budget constraints, graduate positions available, student standing, progress in the department, and more. Different types of funding opportunities are explained in detail below.

Fellowships & Scholarships

Fellowships are prestigious awards that enhance a student’s CV and guarantee one or more years of funding for their graduate work. Students are expected to apply for fellowships for which they are eligible. With the exception of University Fellowships and College of Engineering Fellowships, the onus falls upon the student to complete the application requirements for any fellowship. Examples of fellowships are described below.

University Fellowships are awarded by the Graduate School on an annual basis. To be considered for University Fellowships, students must submit application materials to the EED by December 1 for admission the following Autumn semester. The Graduate Program Coordinator and the Graduate Studies Chair will nominate eligible applicants for University Fellowships. Benefits and requirements for all Graduate School Fellows can be found here.

College of Engineering Fellowships are awarded by the College on an annual basis. The Graduate Program Coordinator and the Graduate Studies Chair will nominate eligible applicants for College Fellowships upon receipt of application materials.

GRE scores are not required for any fellowship nominations.

Graduate Research Fellowship Program

NSF awards fellowships annually to eligible graduate students as part of their Graduate Research Fellowship Program (GRFP). All eligible EED graduate students are highly encouraged to apply for the GRFP. Eligibility requirements and more information about the GRFP can be found here. Every Autumn semester, the Graduate Program Coordinator, along with some faculty, will host a roundtable information session about the GRFP. Students are expected to attend the roundtable session and bring drafts of their GRFP applications. Students will work with faculty advisors or, in the event that an advisor has not yet been selected, a faculty member willing to serve as interim advisor, on their applications.

Graduate Teaching Associate (GTA) Positions

One of the requirements of the PhD Program in Engineering Education is to engage in a “significant teaching experience,” per the PhD Program Proposal document and this Handbook. While a significant teaching experience may occur any number of ways, many PhD students will serve the Department of Engineering Education as Graduate Teaching Associates (GTAs). GTAs in Engineering Education who are assigned a 50% appointment are expected to work 20 hours per week toward the duties outlined in the GTA Handbook. GTAs who are assigned a 25% appointment are expected to work 10 hours per week. These appointment numbers are the same across all departments and Colleges at Ohio State.
Graduate Research Associate (GRA) Positions

Students should also pursue a Graduate Research Associate (GRA) position for funding. If there is a faculty member doing research in a field of interest, you may reach out to them to inquire if they are looking for GRAs. The funding acquired from these positions comes directly from the faculty and may vary depending on the project. Similar to the GTA role, GRAs who are assigned a 50% appointment are expected to work 20 hours per week towards the duties that are assigned to them by the researchers of the project. GRAs may also be assigned 25% appointments and are expected to work 10 hours per week. These appointment numbers are the same across all departments and Colleges at Ohio State.

External Funding

Other funding opportunities exist around the university. Graduate students are encouraged to reach out to departments and centers of interest if no other funding opportunities are evident. Examples of funding opportunities include Graduate Associate positions at the Center for the Study and Teaching of Writing, the University Institute for Teaching and Learning, the Office of Diversity and Inclusion, and the Multicultural Center. For more information on external funding opportunities, see the Graduate Program Coordinator or contact faculty directly about available research opportunities. For more information about policies that apply to Graduate Associates, visit the Graduate School’s website on Graduate Associates.

The specific degree requirements for successfully completing a PhD in Engineering Education are outlined in this section. A minimum of 80 graduate credit hours beyond the baccalaureate degree, including coursework and a dissertation, are required to obtain a doctoral degree in Engineering Education. If a student has obtained a Master’s degree at Ohio State or elsewhere, a minimum of 50 graduate credit hours beyond the Master’s is required.

Important Dates & Academic Calendar

The Graduate School Event and Graduation Calendar

Find dissertation defenses, special events, and graduate school events here: https://gradsch.osu.edu/calendar

Find the graduate calendar here: https://gradsch.osu.edu/calendar/graduation

Revised 8/19/19 14
The Ohio State University Academic Calendar
Find important dates including University holidays and finals week here:
https://registrar.osu.edu/staff/bigcal.asp

Points of Contact

Graduate Studies Committee
The Graduate Studies and Research Infrastructure (GSRI) Committee leads recruitment and monitors EED graduate students, oversees graduate-level curriculum matters related to the graduate courses offered by the department, and implements Graduate School policies in the EED. The director of the Graduate Program is the chair of the GSRI Committee. The Graduate Program is led by faculty in the department with graduate faculty status in conjunction with the Graduate Program Coordinator.

Graduate Studies Committee Chair
The Graduate Studies Committee Chair oversees the GSRI Committee in its operations and decision-making. The Chair also serves as a liaison between graduate faculty and the Graduate School, nominates faculty for P and M status, and approves processes.

Graduate Program Coordinator
The EED’s Graduate Program Coordinator assists with the daily administrative responsibilities of the Graduate Program. Other roles include the following:

- Recruitment of graduate students
- Provides information about the graduate program to prospective students, faculty at Ohio State and other institutions, industry partners, and others
- Advises on required and elective coursework, specialization area, program and university policies and procedures
- Develops professional development for graduate students
- Serves as a voting member of the EED Graduate Studies and Research Infrastructure Committee
- Advocates on behalf of graduate students and their interests
- Processes applications and admissions into the department
- Liaises between the graduate students and the following offices and groups:
  - The Graduate School
  - Graduate & Professional Admissions
  - Graduate faculty in the EED

Goals for Graduate Student Learning & Development
The PhD program in Engineering Education has been very consciously and rigorously designed using the Backward Design method discussed in Wiggins and McTighe (1998) and elsewhere. Guided by the experts in curriculum design at Ohio State’s University Institute for Teaching and Learning, the Graduate Studies and Research Infrastructure (GSRI) Committee proposed several learning goals for graduate students who complete the PhD in this department. These goals include:

1. Identify, discuss, and address critical issues facing engineering education in alignment with stakeholder needs.
2. Design, conduct, and critique research in engineering education
3. Demonstrate, value, and apply engineering expertise
4. Create, teach, and assess courses and curricula
5. Identify, demonstrate, and value appropriate personal and professional skills, mindsets, and traits

In addition, the GSRI Committee wrote program outcomes and levels of proficiency graduate students should attain by their graduation from the program. These can be accessed in the Appendix of this document.
Appendices: Contents

Appendix A: Graduate Student Forms
Appendix A.1: Transfer Petition
Appendix A.2: Petition for Course Substitution
Appendix A.3: Advisor Request
Appendix A.4: Change of Advisor
Appendix A.5: Request to Change Plan of Study
Appendix A.6: Candidacy Exam Committee Request
Appendix A.7: Dissertation Committee Request
Plan of Study Spreadsheet: https://app.box.com/file/317444636883

Appendix B: PhD Program Goals and Outcomes

Appendix C: EED Organizational Charts
EED Petition for Transfer Course Credit

Date: ____________________________________________________________

Student Name: ___________________________ OSU Email Address: ___________________________

OSU ID #: ____________________________

University where credit was attained: ______________________________________________________

Course department: ___________________________ Course number: ___________________________

Course title: ____________________________

Official course description from course syllabus: ___________________________________________

________________________________________________________________________

OSU equivalent course (Department & Number): ____________________________

__________________________ Student Signature

For action by the EED Graduate Studies Committee

Approved [ ] Disapproved [ ]

Comments: ____________________________________________________________________________

_____________________________________________________________________________________

____________________ Graduate Studies Chair Signature

*Please attach the syllabi for both courses in question to this document along with a justification (one paragraph) for why this course should qualify for transfer credit
Petition for Course Substitution

Date: ______________________________________________________

Student Name: __________________________ OSU Email Address: __________________________

OSU ID #: ____________________________________________________________________________

Course department: __________________________ Course number: ________ Credit Hours: ________

Course title: __________________________________________________________________________

Official course description from course syllabus: ____________________________________________

____________________________________________________________________________________

Which Ohio State course should this course replace?

Course title: __________________________ Course Number: __________ Credit Hours: _________

_________________________________________ Student Signature

For action by the EED Graduate Studies Committee

Approved [ ] Disapproved [ ]

Comments: __________________________________________________________________________

____________________________________________________________________________________

_________________________ Graduate Studies Chair Signature

*Please attach the syllabi for both courses in question to this document along with a justification (one paragraph) for why this course should qualify for a course substitution*
Advisor Request Form

Student Name and # ______________________ Date: __________________

Semester Enrolled: ________________________________________________

Research Interests/Areas: __________________________________________

Faculty member you are requesting to advise your doctoral work:

Professor: _________________________________________________________

This advisor assignment is:  ☐ Temporary  ☐ Permanent

_________________________  ____________________________
Signature of Graduate Student  Signature of Requested Advisor
Change of Advisor Form

Date: __________________________________________

This is to certify that the advisor of: __________________________________________

OSU ID #: __________________________ Email Address: __________________________

Semester Enrolled: __________________________

Research Interests: __________________________________________

Has been changed from:

Professor: __________________________________________

To:

Professor: __________________________________________

This advisor assignment is: □ Temporary

□ Permanent

____________________________________________ Signature of Graduate Student

____________________________________________ Signature of Current Advisor

____________________________________________ Signature of New Advisor
Request to Change Plan of Study

Date: ____________

Student Name: ___________________________ OSU Email Address: ___________________________

OSU ID #: ________________________________

Change requested:

____________________________________________________________________________________

Reason for change request:

____________________________________________________________________________________

Advisor Signature ___________________________ Student Signature ___________________________

For action by the EED Graduate Studies Committee

Approved ☐   Disapproved ☐

Comments: __________________________________________________________________________

____________________________________________________________________________________

Graduate Studies Chair Signature ___________________________

*Please attach the original plan of study to this document*
EED Request for Approval of Candidacy Examination Committee

Student Name: ___________________________ Date: ___________________________

OSU ID #: ___________________________ Email Address: ___________________________

- As faculty advisor, I am requesting approval for the Candidacy Examination Committee and acceptance of dissertation research for the above named student.
- I have reviewed this student’s EED PhD plan of study and confirmed that it is up-to-date and the student is scheduled to complete the course requirements for the EED PhD degree.

____________________________________ Signature of Faculty Advisor

<table>
<thead>
<tr>
<th>Faculty Examiners</th>
<th>Signature</th>
<th>Research Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Examiner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Examiner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th Examiner</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

____________________________________ Signature of EED Graduate Studies Chair
EED Request for Approval of
Doctoral Dissertation Committee

Student Name: ____________________________ Date: ____________________________

OSU ID #: ____________________________ Email Address: __________________________

❖ As faculty advisor, I am requesting approval for the Doctoral Dissertation Committee.

_________________________________________________________________________
Signature of Faculty Advisor

Faculty Examiners Signature Research Area

__________________________________________
Faculty Advisor

__________________________________________
Dissertation Committee Member 2

__________________________________________
Dissertation Committee Member 3

__________________________________________
If applicable: Dissertation Committee Member 4

_________________________________________________________________________
Signature of EED Graduate Studies Chair
## Program Goals, Learning Outcomes, and Levels of Proficiency (Revised 2019)

Goal #1 with Program Outcomes and Levels of Proficiency

<table>
<thead>
<tr>
<th>Program Goals</th>
<th>Program Outcomes</th>
<th>Levels of Proficiency (*indicates optional and specialized proficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify, discuss, and address critical issues facing engineering education in alignment with stakeholder needs</td>
<td>1.A. Engage critical issues in the field with attention to inclusion of multiple perspectives and demographics</td>
<td>1.A.(i) Identify several contemporary educational issues with attention to inclusion of multiple perspectives and demographics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.A.(ii) Discuss the main perspectives of contemporary educational issues and describe impact on stakeholders with attention to inclusion of multiple perspectives and demographics.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.A.(iii) Develop and execute a plan to address educational issues with attention to inclusion of multiple perspectives and demographics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.A.(iv) Execute a plan to address educational issues with attention to inclusion of multiple perspectives and demographics</td>
</tr>
<tr>
<td></td>
<td>1.B. Analyze the history and foundations of the education of engineers and the discipline of engineering education in US and international contexts</td>
<td>1.B.(i) Identify broad historical and foundational aspects of engineering education in US and international contexts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.B.(ii) Discuss key historical and foundational aspects of engineering education related to contemporary issues in US and international contexts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.B.(iii) Synthesize relevant educational history and foundations of critical contemporary issues in US and international contexts.</td>
</tr>
<tr>
<td></td>
<td>1.C. Consider the perspectives of stakeholders in a given initiative within engineering education</td>
<td>1.C.(i) Characterize primary stakeholders (e.g., students, faculty, and employers in the sectors of industry, government, non-profits, and academia) in a given initiative within engineering education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.C.(ii) Interpret the needs of primary stakeholders in a given initiative within engineering education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.C.*( ) Engage with stakeholders to transform engineering education and meet stakeholder needs</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Program Outcomes</td>
<td>Levels of Proficiency (*indicates optional and specialized proficiency)</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2. Design, conduct, and critique research in engineering education | 2.A. Research with attention to inclusion of multiple perspectives and demographics so that research outcomes are more universally relevant | 2.A.(i) Identify ways that diverse populations may be impacted negatively and positively by research.  
2.A.(ii) Reflect critically on research across various fields that targets diverse audiences.  
2.A.(iii) Expand the body of knowledge in engineering education with attention to inclusion of multiple perspectives and demographics. |
| | 2.B. Propose research project | 2.B.(i) Generate researchable questions that advance the field  
2.B.(ii) Construct argument to address a research question citing scholarly references  
2.B.(iii) Describe qualitative, quantitative, mixed, and systematic review methods available  
2.B.(iv) Propose a research project in which the research question, argument, and method are well-aligned  
2.B.(*) Propose a research agenda informed from a synthesis of existing literature and research across multiple fields |
| | 2.C. Collect, analyze, and interpret data using appropriate techniques | 2.C.(i) Collect, analyze, and interpret data within a given set of research parameters  
2.C.(ii) Collect, analyze, and interpret data within a research project  
2.C.(iii) Defends the collection, analysis, and interpretation of data from a research project |
| | 2.D. Disseminate results of research efforts in traditional and non-traditional forms | 2.D.(i) Differentiate among and select types of dissemination venues for research  
2.D.(ii) Assess when research is appropriate for submission to identified venues  
2.D.(iii) Submit a manuscript for publication with preference for archival journals |
<table>
<thead>
<tr>
<th>Program Goals</th>
<th>Program Outcomes</th>
<th>Levels of Proficiency (*indicates optional and specialized proficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. E. Design, conduct, and critique research in engineering education <em>Continued</em></td>
<td>2.E. Critique the quality of engineering education research</td>
<td>2.E.(i) Identify quality indicators of research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.E.(ii) Evaluate the quality of research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.E.(*) Review research in a professional capacity</td>
</tr>
</tbody>
</table>
# Goal #3 with Program Outcomes and Levels of Proficiency

<table>
<thead>
<tr>
<th>Program Goals</th>
<th>Program Outcomes</th>
<th>Levels of Proficiency (*indicates optional and specialized proficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Create, teach, and assess courses and curricula</td>
<td>3.A. Educate with attention to inclusion of multiple perspectives and demographics so that every student has the opportunity to learn</td>
<td>3.A. (i) Discuss expert and novice learner similarities and differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.A. (ii) Diversify one's set of teaching techniques to engage multiple perspectives and demographics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.A. (iii) Implement a set of teaching techniques designed to engage all students in a given educational experience</td>
</tr>
<tr>
<td></td>
<td>3.B. Assess and improve teaching through informed, inquiry-based practice</td>
<td>3.B. (i) Reflect on one's teaching experiences highlighting strengths and areas for improvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.B. (ii) Critique different examples of teaching, highlighting the various techniques used and their appropriateness to the context</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.B. (iii) Gather and apply teaching feedback</td>
</tr>
<tr>
<td></td>
<td>3.C. Design a learning plan, including outcomes and strategies, through which a learner (self or other), develops mastery</td>
<td>3.C. (i) Create appropriate learning outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.C. (ii) Apply evidence-based learning strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.C. (iii) Design a learning plan</td>
</tr>
<tr>
<td></td>
<td>3.D. Design and deliver a course or other significant educational experience using evidence-based principles</td>
<td>3.D. (i) Design an assessment plan aligned with learning outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.D. (ii) Develop an instructional plan aligned with assessment plan and learning outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.D. (iii) Develop a course syllabus and discuss the choices made founded in learning theory explicitly addressing stakeholder needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.D. (iv) Deliver an instructional plan</td>
</tr>
</tbody>
</table>
Goal #4 with Program Outcomes and Levels of Proficiency

<table>
<thead>
<tr>
<th>Program Goals</th>
<th>Program Outcomes</th>
<th>Levels of Proficiency (*indicates optional and specialized proficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Identify, demonstrate, and value appropriate personal and professional skills, mindsets, and traits</td>
<td>4.A. Engage with matters of diversity, inclusion, and multiculturalism</td>
<td>4.A (i) Reflect on personal identity and its implications (e.g., relationships, privileges, and positionality)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.A.(ii) Analyze examples of social injustice at both the individual and systemic levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.A. (iii) Describe how to advocate for diversity, inclusion, and multiculturalism</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.A. (*) Disrupt social injustices and promote equity</td>
</tr>
<tr>
<td>4.B. Demonstrate a mindset that values curiosity and questioning across fields and perspectives, finds and leverages connections across a wide range of ideas, and crafts well-supported arguments that create value</td>
<td>4.B.(i) Demonstrate curiosity about varied perspectives from more than one field of study, in the context of a diverse and rapidly changing world</td>
<td>4.B.(ii) Connect appropriately cited examples, facts, or theories from more than one field of study or perspective to create value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.B.(iii) Craft a well-supported argument including claims, reasons, and evidence by citing scholarly references from more than one field of study, appropriate to the intended audience</td>
</tr>
<tr>
<td>4.C. Function effectively on diverse, multidisciplinary teams</td>
<td>4.C.(i) Discuss the elements of effective teamwork and importance of diverse, multidisciplinary teams</td>
<td>4.C.(ii) Participate effectively on a diverse, multidisciplinary team</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.C.(*) Manage a diverse, multidisciplinary team.</td>
</tr>
<tr>
<td>4.D. Communicate effectively with a range of audiences using multiple modes and media</td>
<td>4.D.(i) Give constructive feedback</td>
<td>4.D.(ii) Improve professional communications based on feedback from multiple sources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.D.(iii) Prepare professional communications (e.g., written documents, oral presentations, proposals, lesson plans, portfolios, job application materials) appropriate to a variety of audiences</td>
</tr>
<tr>
<td>4.E. Recognize and analyze the ethical implications of engineering education research and practice</td>
<td>4.E.(i) Maintain personal compliance with regulatory requirements for engineering education research and practice (e.g., RCR, FERPA)</td>
<td>4.E.(ii) Articulate broad ethical implications of engineering education research and practice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.E.(*) Make decisions that reflect shared ethical principles in the profession of engineering education</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Program Outcomes</td>
<td>Levels of Proficiency (*indicates optional and specialized proficiency)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4. Identify, demonstrate, and value appropriate personal and professional</td>
<td>4.F. Apply principles of project management to manage research and teaching projects.</td>
<td>4.F.(i) Critique a project management plan</td>
</tr>
<tr>
<td>skills, mindsets, and traits, continued</td>
<td></td>
<td>4.F.(ii) Develop a project management plan including primary constraints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(e.g., scope, schedule, budget, and quality)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.F.(iii) Implement the project management process for a comprehensive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>research or teaching project</td>
</tr>
<tr>
<td>4.G. Pursue relevant opportunities, funding sources, and other resources</td>
<td></td>
<td>4.G.(i) Identify relevant opportunities, funding sources, and other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.G.(ii) Select most appropriate opportunities, funding sources, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>other resources that align with one's interests and expertise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.G.(iii) Submit an application for a relevant opportunity, funding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>source or other resource</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.G.(*) Secure relevant opportunity, funding source, or other resource</td>
</tr>
<tr>
<td></td>
<td></td>
<td>that aligns with one's interests and expertise</td>
</tr>
<tr>
<td>4.H. Value and demonstrate commitment to continuing education and lifelong</td>
<td></td>
<td>4.H.(i) Describe the value of a variety of continuing education learning</td>
</tr>
<tr>
<td>learning</td>
<td></td>
<td>experiences in extending a personal learning plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.H.(ii) Develop and pursue plans for lifelong learning to support career</td>
</tr>
<tr>
<td></td>
<td></td>
<td>goals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.H.(*) Promote and contribute to knowledge and experiences of peers which</td>
</tr>
<tr>
<td></td>
<td></td>
<td>provide foundation for expanded knowledge, growth, and maturity over time</td>
</tr>
</tbody>
</table>