

Engineering Education

Graduate Student Manual



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EED Graduate Student Handbook

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Section 1. Welcome

Welcome to the Department of Engineering Education (EED) in the College of Engineering at Utah State University (USU). We are sure that you will find a dynamic faculty, talented student colleagues, and supportive staff in the Department. The Engineering Education Ph.D. program will provide you with the knowledge and tools to compete in today's global environment while preparing you to be a leader in teaching tomorrow's engineers. Please familiarize yourself with information in this handbook so you will be informed about the program, policies, and procedures. We trust that you will find this handbook useful in assisting you with guidelines for success. In the new school year and beyond, our Ph.D. program will meet and exceed your expectations of a successful graduate experience. Always feel free to contact anyone in our program with questions.

Congratulations on becoming a productive and important part of our graduate program. The faculty, students, and staff wish you a warm welcome.

Section 2. Program Requirements (see Table 1)

Additional Requirements:

In addition to the program requirements outlined on Table 1, a full-time matriculated Ph.D. graduate student must fulfill one of the following:

- Register for 9 or more graduate credits; or
 - Register for 6 or more graduate credits if employed as a graduate assistant for 20 hours per week; or
 - Register for 3 graduate credits with all required coursework completed and only the research component of the degree remaining (the student's Program of Study must have been submitted to the School of Graduate Studies); or
 - Register for at least 3 graduate credits during the semester of the final thesis/dissertation defense.
- 1) Maintain a minimum cumulative GPA of 3.0 during your graduate study.
 - 2) Identify courses with pre-requisites (such as STAT 5200 and EDUC 6570) and discuss in advance with your Faculty Advisor and EED Senior Staff Assistant. They will help solve relevant issues.
 - 3) If you have finished all required coursework and research credits for the program but are not yet finished with your research, you must register for 3 credits of Continuing Graduate Advisement (CGA) each semester you are here including the semester you defend. You do not have to register in the summer, but must be registered during the fall and spring semesters. The maximum number of CGA credits available is 10; this equates to 3 semesters of 3 credits each to finish.
 - 4) If you are using CGA credits and are an international student, you must file a **Reduced Course Load Form** (on the USU OISS website: <https://globalengagement.usu.edu/iss/htm/current-students/international-student-forms/>) each semester you are only taking 3 credits. Complete this form and give to the EED Senior Staff Assistant, in order to remain visa compliant.
 - 5) If you are using CGA credits, you are still eligible for the subsidized graduate student insurance as long as they are still 0.5 FTE and receiving a graduate assistantship.

Table 1. EED Program Requirements

**College of Engineering
Department of Engineering Education
Doctor of Philosophy (PhD)
Engineering Education**

| <u>Engineering Education Core (15 Credits)</u> | | | <u>Engineering Elective – Area of Specialization (6 Credits minimum) Choose from the following:</u> | | |
|---|--|------|---|--|------|
| EED 6090 | Developing an Online Educational Curriculum | 3 cr | EED 6910 | Special Topics in Engineering | 3 cr |
| EED 6150 | Teaching, Pedagogy & Assessment in Eng. Ed. | 3 cr | EED 7500 | Education Internationalizing Institutions of Higher education | 3 cr |
| EED 7010 | Role of Cognition in Engineering Education | 3 cr | EED 7810* | Research Seminar | 1 cr |
| EED 7230 | Foundations of Engineering Education | 3 cr | EDUC/SPED 7700 | Subject Methods & Design | 3 cr |
| EED 7460 | Finance & Grant Writing | 3 cr | PSY 7030 | Instrument Development | 3 cr |
| <u>Research Theory Core (9 Credits)</u> | | | PSY 7070 | Adv Measurement Theories & Practice | 3 cr |
| PSY 6570 | Introduction to Educational & Psychological Research | 3 cr | PSY 7610 | Research, Design & Analysis II | 3 cr |
| STAT 5200 or EDUC/PSY 6600 | Design of Experiments Measure, Design & Anal. I | 3 cr | And STAT 5200 | Design of Experiments | |
| EDUC 7030 | Qualitative Methods in Engineering Education | 3 cr | PSY 7650 | Longitudinal Res Design & Analysis | 3 cr |
| | | | TEAL 6150 | Foundations of Curriculum | 3 cr |
| | | | TEAL 6410 | Educational Foundations | 3 cr |
| | | | TEAL 7300 | Historical, Social, & Cultural Foundations of Education (Prerequisite: TEAL 6410) | 3 cr |

Other appropriate courses may be approved by committee

Dissertation (12 Credits minimum)

PhD Dissertation: Students must take an appropriate number of research credit hours to complement their graduate program and be consistent with the Graduate School requirements.

Additional Degree Requirements

1. Qualifying Examination
2. Proposal Defense
3. Dissertation Defense/Examination
4. One peer-reviewed journal paper submission or a conference presentation with a peer-reviewed paper per 12 dissertation credits. Minimum 1 journal paper submission required.
5. EED 7810* - Research Seminar (1 credit) Attendance is required throughout the entire PhD program. Registration is required a minimum of one time.
6. Teaching experience including one or more of the following:
 - a. Two semesters of guided teaching experience
 - b. Experience as a K-12 teacher
 - c. Experience as university/college/community college faculty
 - d. Other equivalent experience approved by the department chair and the student's graduate committee

Section 3. Course Schedule (subject to change)

**Graduate Course Schedule
(Subject to Change)**

| Semester | EED | | PSY/STAT/TEAL | | EDUC | |
|-------------|--|--|--|------|--|------|
| | Courses | Time | Courses | Time | Courses | Time |
| Fall 2017 | EED 6910 EED 7230 EED 7460 | TBA T 1:30–4:20 pm M 3:30–6:20 pm | PSY 6330 PSY 6570 STAT 5200 TEAL 6150 TEAL 6410 TEAL 7300 | | EDUC 6570 EDUC 6770 | |
| Spring 2018 | EED 6910 EED 7030 EED 7010 EED 7810 | TBA W 1:30-4:20 pm M 1:30-4:20 pm T 12:00-1:15 pm | PSY 7070 STAT 5200 TEAL 6150 TEAL 6410 TEAL 7310 | | EDUC 6570 EDUC 6770 EDUC 7610 EDUC 7780 | |
| Summer 2018 | | | TEAL 6150 TEAL 6410 | | EDUC 6570 EDUC 6770 EDUC 7610 | |
| Fall 2018 | EED 6910 EED 6150 EED 7500 | TBA M 1:30-4:20 pm T 1:30-4:20 pm | PSY 6330 PSY 6570 STAT 5200 TEAL 6150 TEAL 6410 TEAL 7300 | | EDUC 6570 EDUC 6770 | |
| Spring 2019 | EED 6090 EED 6910 EED 7810 | W 1:30-4:20 pm TBA T 12:00-1:15 pm | PSY 7070 STAT 5200 TEAL 6150 TEAL 6410 TEAL 7310 | | EDUC 6570 EDUC 6770 EDUC 7610 EDUC 7780 | |
| Summer 2019 | | | TEAL 6150 TEAL 6410 | | EDUC 6570 EDUC 7610 | |

March 2017

Section 4. Milestones for Engineering Education Ph.D. Degree

| Typical Academic Activities | | | | | | | |
|--|--|--|---|---|---|--|--|
| First Year | | Second Year | | Third Year | | Fourth Year | |
| Semester 1 | Semester 2 | Semester 3 | Semester 4 | Semester 5 | Semester 6 | Semester 7 | Semester 8 |
| <ul style="list-style-type: none"> 9 credits coursework | <ul style="list-style-type: none"> 9 credits coursework Form Graduate Committee PoS¹ meeting | <ul style="list-style-type: none"> 9 credits coursework Qualifying exam IRB² (Institutional Review Board) training | <ul style="list-style-type: none"> 3 credits coursework 6 credits dissertation Proposal defense IRB² Application | <ul style="list-style-type: none"> 6 credits dissertation Data collection/ analyses /write up | <ul style="list-style-type: none"> 3 credits CGA³ Data collection/ analyses /write up Final defense Graduate | <ul style="list-style-type: none"> 3 credits CGA^{3, 4} Data collection/ analyses /write up⁴ Final defense⁴ Graduate⁴ | <ul style="list-style-type: none"> 3 credits CGA^{3, 4} Data collection/ analyses /write up⁴ Final defense⁴ Graduate⁴ |

¹PoS = **Program of Study** - The Program of Study (PoS) constitutes a contract between the student, the committee, and the School of Graduate Studies regarding what courses a student will take in completion of his or her program requirements. PoS should be completed within the second semester of coursework.

²IRB = **Institutional Review Board** - Reviews proposed research involving human participants in order to protect citizens against potential risks of research participation while promoting high-quality studies that can provide rewards to participants and/or society. IRB should be approved by graduate committee before applying.

³CGA = **Continuing Graduate Advisement**

⁴Only if necessary

Section 5. Checklist for Degree Completion

| √ | Activities | Date of Completion |
|---|---|--------------------|
| □ | <p>Program of study (PoS) meeting By the end of the second semester, students must form a supervisory committee that will work with them throughout the proposal and final defense phases of their dissertation research. For further information visit: http://rgs.usu.edu/graduateschool/forms/#requiredforms</p> | |
| □ | <p>Core courses (24 credits) completion The Engineering Education Department (EED) requires students to enroll in a minimum of 24 core course credits prescribed in EED Ph.D. curriculum and maintain a cumulative GPA of 3.0. For further information visit: http://eed.usu.edu/1_students/current_students/program_requirements</p> | |
| □ | <p>Elective courses (6 credits) completion The Engineering Education Department (EED) requires students to enroll in a minimum of 6 elective course credits prescribed in the EED Ph.D. curriculum and maintain a cumulative GPA of 3.0. For further information visit: http://eed.usu.edu/1_students/current_students/program_requirements</p> | |
| □ | <p>Qualifying exam (see Section 7)</p> | |
| □ | <p>Develop dissertation proposal Students need to develop a dissertation proposal of their research methodology and design. The Faculty Advisor will work closely with the graduate student in the development of this document.</p> | |
| □ | <p>Dissertation proposal defense Students need to discuss with their Committee Chair before scheduling for a proposal defense. The Faculty Advisor must read and approve the proposal document before circulating it to the committee members.</p> | |
| □ | <p>Application for candidacy The Application for Candidacy form must be submitted three months before students' dissertation defense and must accompany a signed copy of students' dissertation proposal cover sheet. The Application for Candidacy form, signed by all members of the committee and the department head, attests that students are ready to conduct independent dissertation research. For further information visit: http://rgs.usu.edu/graduateschool/forms/#requiredforms</p> | |
| □ | <p>IRB training and application via the Collaborative Institutional Training Initiative (CITI) Before Ph.D. candidates can collect any research data, they need to participate in IRB training for IRB certification (http://rgs.usu.edu/irb/htm/training) and submit an IRB application (http://rgs.usu.edu/irb/htm/getting-started).</p> | |
| □ | <p>Data collection.</p> | |

| √ | Activities | Date of Completion |
|---|--|---------------------------|
| □ | Data analysis and results Students need to discuss with their Faculty Advisor the data analysis and results of the data collection. | |
| □ | Dissertation final defense Students need to discuss with their Faculty Advisor before scheduling for a defense. The Faculty Advisor must read and approve the dissertation document before circulating it to the committee members. At least four weeks before the dissertation defense, the dissertation document needs to be provided to all committee members. At least two weeks before the defense, Ph.D. candidates need to have the Appointment for Examination form completed and submit a draft of the dissertation title page. For further information visit: http://rgs.usu.edu/graduateschool/forms/#requiredforms <u>Note:</u> Students must submit an <u>unsigned</u> (draft) title page of your dissertation research with the Appointment of Examination form before the defense. | |
| □ | Dissertation submission to Graduate School A dissertation report must be submitted to the School of Graduate Studies with appropriate signatures on the document. For further information visit: http://rgs.usu.edu/graduateschool/forms/#requiredforms | |
| □ | Submission of a copy of dissertation to EED One copy of the student's dissertation must be submitted to the EED through the Senior Staff Assistant. Additional bound copies of the dissertation for the Faculty Advisor and committee members should be discussed by the Faculty Advisor and candidate. | |
| □ | Commencement Utah State University holds a graduate ceremony once a year (typically in early May). | |

Section 6. Forming the Committee for the Program of Study and Guidelines

There are several considerations to take into account when putting together your Doctoral Dissertation Committee. Before you complete 18 credits of doctoral courses, select a Faculty Advisor. Typically, the Faculty Advisor is your initial advisor who offers you a research and/or teaching assistantship. He/she will provide you with the majority of your research and/or teaching feedback and will work closely with you throughout your program experience. Your primary advisor's area of research will have a strong influence in the direction of your research.

It is extremely important that you both share common scholarly interests. If another faculty member is a better match for guiding you through your program and dissertation efforts and is willing and able to work with you, you can request a change of Faculty Advisor. Be aware, however, that a change of initial Faculty Advisor will result in an automatic termination of your teaching and/or research assistantship with your initial Faculty Advisor.

You and your Faculty Advisor will work together to select two or three additional faculty members in EED who have the expertise in your area or areas related to your research. Make sure that the members you select can work well with you and your Faculty Advisor and whose styles are

complementary. All committee members must hold a doctorate and be approved by members of the EED graduate faculty. Note that faculty members may decline to serve. You are encouraged to have additional faculty members in mind in case this happens. Once you have selected your committee, complete the appropriate Supervisory Committee Approval form (<http://rgs.usu.edu/graduateschool/forms/#requiredforms>).

At the time you submit your Program of Study (see Section 4 - Milestones for Engineering Education Ph.D. Degree), you must have a five-person committee in place. One of the members on your committee should be a faculty member outside of your area of study who is a member of the graduate faculty in his/her department. This person's area of scholarly interest should not be closely related to the concept behind your dissertation. As such, any committee member outside of your department must be consulted and approved by your Faculty Advisor. In selecting an outside committee member, keep in mind that he/she should provide specialized assistance in your overall research design. For example, if your goal is to validate a survey, this committee member should be skilled in surveys. If your dissertation topic crosses research areas outside the expertise of you faculty advisor, you must discuss with your advisor the stipulations by which this research will be conducted and your advisor must approve the outside committee member.

Note that it is not unusual for your committee to change due to leaves of absence, sabbaticals, reassignments, change of research interests, or arrival of a new faculty member. If this is the case, be sure to complete a **Revised Committee Form** (<http://rgs.usu.edu/graduateschool/forms>) and submit the form to the Graduate School at least six weeks prior to the final defense of your dissertation.

Section 7. Guidelines for Qualifying Exam

The qualifying exam is offered two or three times a year (depending on academic year calendar) during the fall, spring and summer.

2017-18 Exam Dates:

- May 18, 2017 (Thursday) & May 19, 2017 (Friday)
- August 31, 2017 (Thursday) & September 1, 2017 (Friday)
- January 18, 2018 (Thursday) & January 19, 2018 (Friday)

The main purpose of the qualifying exam in the Department of Engineering Education (EED) is to assess the extent to which you have achieved mastery of knowledge gained from the core courses in the Engineering Education curriculum and to gauge your readiness for future doctoral study. Evidence of mastery as exemplified with a satisfactory result enables you and your dissertation committee to proceed with confidence to the dissertation phase of your program.

Prior to taking the qualifying exam, you must meet with your Faculty Advisor to determine preparation and date of the exam. The exam date must be agreed upon by you and the Faculty Advisor. To participate in the qualifying exam, you must complete, at the minimum, all but one course in your doctoral program.

The qualifying exam consists of two sections administered over two days. You are given four hours to complete each section. This is an in-class exam designed to assess your ability to synthesize and communicate in writing the theoretical, conceptual, empirical core knowledge of, and research methodology in engineering education.

Based on the current EED Ph.D. curriculum, the Exam on Day 1 covers knowledge gained from *EED 6090, 6150, 7010, and 7230*. The Exam on Day 2 covers knowledge gained from *EED 6570, 7460, EED 7030, and STAT 5200*. You will be provided with a non-Internet accessible computer and proctor for monitoring during the exam. No reading (paper or electronic) materials will be permitted in the exam room. Your exam must be saved in the designated folder on the hard drive of the computer before leaving the exam room. Your exam must follow American Psychology Association (APA) format.

The EED Faculty Advisor will assign three EED faculty, including the student's Faculty Advisor, to read and review your exam and determine if the quality of the exam is satisfactory (absolute or partially) or unsatisfactory. The final decision of the exam result will be based on the discussion and consensus made by the Review Committee and announced to you approximately 30 days from the exam. If the student manuscript is deemed to be partially satisfactory, then you are required to rework the part(s) of the exam suggested by the Committee. If you receive an unsatisfactory result, then you must retake the exam on the next available date. The exam can be retaken no more than two (2) times.

Section 8. Expectations

1) Overall Expectations

Ph.D. students are responsible for working towards completion of their degree programs in a timely manner. In addition to gaining expertise in Engineering Education, you are expected to expand the knowledge of the discipline by discovering and pursuing a unique topic of scholarly research, resulting in the Ph.D. dissertation. It is your responsibility to ensure continued progress of your academic program and research.

- **Expectations:** Students working on an **Assistantship (RA or TA)** are expected to work **20 hours per week** (12 months per year for RA and 9 months for TA). This includes the adherence to timelines for the successful completion of any duties, such as research projects, teaching assignments, and work related to the assistantship. Program coursework, class assignments, and working part-time on other jobs outside the campus are not part of the 20 hours per week.
- **Resources:** Students will receive appropriate resources, including office space, reasonable access to faculty, appropriate course offerings to meet the student's approved program of study, and facilities to allow completion of the program.
- **Guidance:** Students will receive advice and direction regarding the academic program as well as dissertation research.
- **Training:** Students will receive training on the current best practices in research and teaching, including appropriate techniques, tools, methods, and equipment needed to successfully carry out research or teaching duties.
- **Appropriateness:** Students will have projects and tasks that are assigned appropriately for the program of study and designed to help make continued progress towards completion of the degree.
- **Evaluation:** Students will receive timely and fair assessment of their work, including course work, program exams, research, and teaching.
- **Professional development:** Students will be provided, in appropriate cases, with opportunities to publish research, present the student's work; apply for patents and

copyrights for the student's work; and attend colloquia, seminars, and workshops to support professional development.

- **Fair treatment:** Students will be given appropriate credit for work and provided clear guidelines on authorship, data ownership, and research practices when engaged in joint research projects (see details in *Ethical Conduct and Intellectual Property* below)
- **Conflict of interest:** Students will receive appropriate instruction about avoiding conflicts of interest.
- **Feedback:** Students will be provided feedback on performance and given clear guidelines and agreements on the required areas of improvement when performance is deemed poor and the student is in jeopardy of being removed from the program.

2) Academic Progress Report

The academic progress report consists of two components and allows you to both report your progress towards graduation concerning what you have learned as well as your research progress on funded research areas.

Component One. The first component involves a written report that is to be submitted at the end of each spring semester to your Faculty Advisor and the Department Head. This report should not be longer than two pages and should be succinct. The report should indicate the milestones you have achieved in your directed research under your Faculty Advisor.

This reported research is not meant to reflect any research work done as part of any courses you have taken or are taking but rather should reflect work done towards research in directions that your Faculty Advisor and you have chosen and collaborated on. Examples may include a list of abstract submittals for conference publications, submitted journal articles, accepted and published journal articles, submittal of a grant you helped to develop, data collection, data analysis, and in general any work you have completed in regards to research and publication activities. This document should clearly illustrate that you are making progress towards a research agenda.

An appropriate allocation of time towards research should be 20 hours per week. Please note that a 20-hour per week time allocation is a targeted average and is not meant to include homework for courses, research engaged in for other courses, your own personal work, or service work you are completing for others.

Component Two. The second component consists of a presentation of your research developed and delivered in the Research Seminar class (EED 7810). You are required to attend this course each year of your graduate experience and register for the course once. During this course you will be expected to present your current research endeavors and progress to both faculty and fellow EED graduate students. This is an opportunity for you to gain experience making presentations and to receive feedback that will prove beneficial as you progress towards presenting at professional conferences.

3) Ethical Conduct and Intellectual Property

- High standards of integrity and ethical practice are important in your academic and professional career. You are encouraged to read carefully the Utah State University ethical conduct policy, which is available online at <https://studentconduct.usu.edu/>

- During your graduate study, some courses may require you to design and/or execute a course research project, which may potentially result in conference and/or journal publications. Your Faculty Advisor might not be aware of these course requirements. You should discuss in advance with your Faculty Advisor your course research project and determine if it is appropriate to use the research topic and/or the research method (such as data collection and data analysis) that are similar to, or the same as, your dissertation research or any other research project that is under supervision of your Faculty Advisor.
- You are encouraged to read carefully about what constitutes intellectual property (visit: <http://ipso.usu.edu/htm/about>). For example, you may receive wages, financial support, training, and/or research experience associated with a USU research project (either internally or externally funded) and/or employment under the direction of a Faculty Advisor. In the process of your research, you may come in contact with or generate certain proprietary and confidential information. This includes: data, formulae, computer software, specifications, processes, designs, inventions, creative works, patent applications, copyrights, trade secrets, know-how, and/or other technical or product information associated with your research; anything marked as or later designated as “confidential” or “proprietary”; and anything that you reasonably should understand to be confidential or proprietary (“Proprietary and Confidential Information”). You should understand that 1) Proprietary and Confidential Information is owned and controlled by USU, 2) you are not to publish or disclose any Proprietary and Confidential Information to third parties, except as otherwise authorized by USU in writing; and 3) you are not to make any use of Proprietary and Confidential Information, except in the course of your participation in the research or as otherwise authorized by USU in writing.
- To be listed as an author on a publication, criteria generally requires you make a significant, identifiable, original intellectual contribution to the project; contribute more than “serving as a pair of hands” (recording data, entering data, typing, analyzing data); understand the study reported in the paper as a whole, and participate in the writing of the technical paper.

Note: As a general guide, you should always discuss with your Faculty Advisor the order of authorship on publications generated from your course work and project and dissertation research.

Additional information on authorship

You are encouraged to review:

- APA’s publication: “A Graduate Student’s Guide to Determining Authorship Credit and Authorship Order”) <http://www.apa.org/science/leadership/students/authorship-paper.pdf>
- The responsible conduct of research, including responsible authorship and publication practices by Ruth Ellen Bulger <http://edepot.wur.nl/137683>
- A Guide To Responsible Conduct In Research Third Edition http://www.nap.edu/openbook.php?record_id=12192&page=R1

4) Department Check-In and Check-Out Procedures

Department Check-In

- If you are an international student, you will need to see the Immigration Advisor in the Office of International Students and Scholars as soon as you arrive at Utah State University.
- If you are receiving an assistantship through the Department, you will need to be put on payroll. I-9, W-4 and direct deposit forms will need to be completed. There is specific documentation that is required for each form. This information will be provided to you by the EED Senior Staff Assistant once you arrive.
- For office space in the graduate student cubicles, please see the Systems Administrator for the Engineering Education Department.
- Keys/prox cards will be ordered for you once you arrive. It is your responsibility to visit the Key Office once you are notified keys are ready.
- A computer is provided for your use in the Engineering Education student offices. It is your choice to use this computer or you may provide your own computer.

Department Check-Out

- Clean out your office space; return the space to its original condition.
 - Return key and or prox cards to the Key Office when you have completed the program. If keys are not returned, you will be billed \$25 for each key.
 - If you used a departmental computer, make sure all documents are removed from the hard drive and ask the Engineering Education IT personnel to verify the computer is clean of any viruses.
 - Turn in a bound copy of your dissertation to the department.
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Section 9. Other Useful Information Available on the Internet

- USU Graduate School: <http://rgs.usu.edu/graduateschool/>
 - USU Graduate Catalog:
http://catalog.usu.edu/preview_entity.php?catoid=12&ent_oid=998
 - USU Office of International Students and Scholars (OISS):
<http://globalengagement.usu.edu>
 - Purdue's Online Writing Lab: <https://owl.english.purdue.edu/owl/resource/560/01/>
 - Publication Manual of the American Psychological Association, Sixth Edition
<http://www.apastyle.org/manual/index.aspx>
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