Engineering Education

Graduate Student Manual

Last Updated: September 2018
Graduate Student Manual
Department of Engineering Education
Utah State University

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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 you will find a dynamic faculty, talented student colleagues, and a supportive staff in the Department. The Ph.D. in Engineering Education program will provide you the knowledge and tools that are necessary to compete in today’s competitive global environment, while preparing you to be a leader in teaching tomorrow’s engineers. Please familiarize yourself with information in this manual, so you will be informed about the program, its policies, and its procedures. We trust you will find this manual useful in assisting you with guidelines to ensure your success. In the new school year and beyond, our program will meet and exceed your expectations of a successful graduate experience. Always feel free to contact anyone in the program with questions.

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

Section 2. Teaching and Research Assistantships

Teaching Assistantships (TAs) and Research Assistantships (RAs) are different types of graduate assistantships offered to students as a means to receive the financial support necessary to commit to their academic programs. Students must be enrolled in a minimum of 9 semester hours and must be in good academic standing each semester they are appointed. TA and RA appointments are meant to provide students with invaluable experiences in teaching, research, and other scholarly activities, as well as to allow students to engage in an optimal full-time graduate school experience. In EED, some students who assist with both teaching and research qualify as both a TA and RA.

2.1 Teaching Assistants

Graduate Student TAs are employed a maximum of 20 hours per week to help meet the instructional needs of the university. The Graduate TA, under the direction of an assigned faculty member, will aid in the teaching of one or more courses. TAs are paid from Departmental funds; appointments and reappointments are subject to several factors and are on a semester-by-semester basis.

2.2 Research Assistants

Graduate Student RAs are employed a maximum of 20 hours per week and are focused on assisting the research efforts of their faculty mentor in a way that relates to the student’s educational objectives. Graduate Student RAs are typically paid from individual research awards or from externally funded contracts and grants. The Principal Investigator of the award will direct and supervise the RA’s research activities. Appointments and reappointments are evaluated on a yearly basis.

As new TAs and RAs, graduate students take on multiple roles in the university. First, as employees, they are responsible for issues such as compliance, rules of conduct, regulation, and appropriate human resource procedures. Second, as new graduate students, they learn about available resources to assist them with the inherent challenges found in juggling the work
of teaching and/or research with the demands of graduate school. Finally, in their new professional roles of teachers and researchers, graduate students learn and implement tactics for interacting with undergraduates, structuring learning experiences, engaging with cultural issues in a multi-cultured university, and fulfilling faculty expectations of TAs and RAs.

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Section 3. Program Requirements

3.1 Core EED Program Requirements

The core EED program requirements can be found in the table on page 7.

3.2 Additional EED Program Requirements

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.

** International students are allowed to take 6 credits only in their first semester.

In addition, a full-time matriculated Ph.D. graduate student:

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 each semester you take only 3 credits. You can find the form at the USU School of Graduate Studies website: https://rgs.usu.edu/graduateschool/reduced-course-load. Complete this form and give to the EED Graduate Program Coordinator 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 you are still 0.5 FTE and receiving a graduate assistantship.

### 3.3 Institutional Requirements

1. **Research Scholars Orientation**: Typically occurs a week before the beginning of classes in the fall semester and immediately following the [New Graduate Student Orientation](#). There will be a sign-in sheet for attendance credit. It is possible to watch a video through Canvas and take a quiz if you are not able to attend in person.

2. **Fall Research Scholars Forum**: Typically occurs during the fall semester. You have the option to watch a video through Canvas and take a quiz if you are not able to attend in person.

3. **Spring Research Scholars Forum**: Typically occurs in the spring semester. You have the option to watch a video through Canvas and take a quiz if you are not able to attend in person.

4. **Complete the Online Responsible Conduct of Research Module** provided by the [Collaborative Institutional Training Initiative (CITI)](#).

5. **FERPA Training**: If you will be participating as a teaching assistant in a course and will be handling grades, you must complete FERPA training. You have the option to take this training online.

6. **USU 6900 – Research Integrity**: The Research Integrity course provides an introduction to key topics of Responsible Conduct of Research, which helps students and researchers understand their responsibilities related to proper research conduct and the regulations that ensure research is scientifically sound, ethical, and safe. This understanding is critical for any career in scholarly research, whether in academics, government, or industry.

   The individuals are required to complete the Research Scholars Certification program:

   - All doctoral students entering fall semester of 2013 or later
   - Students (undergraduate and graduate) and postdoctoral fellows who are supported through National Science Foundation funding
   - Trainees supported by some categories of grants from NIH, including training grants, development grants, and dissertation grants
   - Trainees supported through NIFA grants administered by the USDA beginning in August 2013

   USU 6900 is used to record completion of the Responsible Conduct of Research requirements. Students working toward completion of the certificate must register for USU 6900 during one semester. The course provides an underpinning of ethical conduct for students entering the research enterprise at USU. The course is designed for graduate students, upper-level undergraduate students, and postdoctoral fellows based on regulatory requirements from federal funding agencies.

   All doctoral students should include USU 6900 in their Program of Study; the course will appear on the transcript of any student who completes the training. We strongly
encourage completion of the Research Integrity course near the beginning of a student’s research activities. The certification is an indication to the institution and the scientific community that the recipient is dedicated to the responsible conduct of research. For information concerning this program, contact Jodi Roberts, Compliance Manager, at jodi.roberts@usu.edu or (435) 797-8305.

7. **Tuition Residency Requirements:** The Utah law states: If a student who has not previously acquired domicile in Utah enrolls at a Utah system of higher education school, the student must reside in Utah for 12 continuous months and meet the other criteria or qualify for an exception in order to gain residency for tuition purposes. If you are not a resident, see deadlines and instructions on how to apply. [https://www.usu.edu/admissions/residency/](https://www.usu.edu/admissions/residency/)

8. **Sexual Assault Prevention and Alcohol Edu:** As part of our comprehensive health and safety program, USU expects all incoming students – including first-year students, transfer students, and graduate students – to complete health and safety online courses before they can register for spring semester courses. These courses will empower students to make informed decisions about issues that affect college students and our USU community. [http://studentaffairs.usu.edu/haven-alcoholedu/](http://studentaffairs.usu.edu/haven-alcoholedu/)

9. **Mandatory Driver Training:** To be able to borrow vehicles from the USU Motor Pool or drive any USU vehicle, please complete all of the following steps:

1) Review the tutorial (video) on how to use the Utah Learning Portal.
2) Create a new user account in the Utah Learning Portal and be sure to save your username and password for later use.
3) From the Utah Learning Portal, select the Public & Higher Ed portal link, log in to your account, and select the Defensive Driver Training course.
4) When you have completed the Defensive Driver Training, be sure to save a copy of your completion certificate from the Utah Learning Portal.

Once all of these steps are complete, fill out the USU Driver Training Certification form. Please note you cannot drive or rent a University vehicle without completing the training and filling out the required form.

10. **Title IX / Affirmative Action:** Students are encouraged to report an incident involving an alleged violation of the USU Sexual Misconduct Policy, which includes: sexual harassment, sexual assault, gender-based harassment, intimate partner violence, domestic violence, and stalking. You can file a report on your own behalf or on behalf of anyone who may have experienced sexual harassment, misconduct or violence [https://aaeo.usu.edu/](https://aaeo.usu.edu/).

11. **Laboratory Safety:** The Office of Environmental Health and Safety (OSHA) requires training for anyone working in a chemical laboratory including principle investigators, lab employees, research technicians, teaching assistants, and graduate students. Chemical hygiene principles, spill prevention, hazardous waste management, and fire safety are discussed. Check with your Faculty Advisor for more information and to schedule training [http://rgs.usu.edu/ehs](http://rgs.usu.edu/ehs).
# Core EED Program Requirements

## Doctor of Philosophy (PhD) in Engineering Education

Department of Engineering Education

<table>
<thead>
<tr>
<th>Engineering Education Core (15 Credits)</th>
<th>Engineering Elective – Area of Specialization (6 Credits minimum)</th>
<th>Choose from the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EED 6090 Developing an Online Educational Curriculum</td>
<td>EED 6910 Special Topics in Engineering Education</td>
<td>3 cr</td>
</tr>
<tr>
<td>EED 6150 Teaching, Learning &amp; Assessment in Engineering Edu.</td>
<td>EED 7500 Internationalizing Institutions of Higher education</td>
<td>3 cr</td>
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<tr>
<td>EED 7010 Role of Cognition in Engineering Education</td>
<td>EED 7810* Research Seminar</td>
<td>1 cr</td>
</tr>
<tr>
<td>EED 7230 Foundations of Engineering Education</td>
<td>EDUC/SPED 7700 Subject Methods &amp; Design</td>
<td>3 cr</td>
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<tr>
<td>EED 7460 Finance &amp; Grant Writing</td>
<td>PSY 7030 Instrument Development</td>
<td>3 cr</td>
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<tr>
<td><strong>Research Theory Core (9 Credits)</strong></td>
<td>PSY 7070 Adv. Measurement Theories &amp; Practice</td>
<td>3 cr</td>
</tr>
<tr>
<td>EDUC/PSY 6570 Introduction to Educational &amp; Psychological Research</td>
<td>PSY 7610 Research, Design &amp; Analysis II</td>
<td>3 cr</td>
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<tr>
<td>STAT 5200 or EDUC/PSY 6600</td>
<td>PSY 7650 Longitudinal Res. Design &amp; Analysis</td>
<td>3 cr</td>
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<tr>
<td>Measure, Design &amp; Anal. I</td>
<td>TEAL 6150 Foundations of Curriculum</td>
<td>3 cr</td>
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<tr>
<td><strong>EED 7040 Qualitative Methods in Engineering Education</strong></td>
<td>TEAL 6410 Educational Foundations</td>
<td>3 cr</td>
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<td></td>
<td>TEAL 7300 Historical, Social, &amp; Cultural Foundations of Education (Prerequisite: TEAL 6410)</td>
<td>3 cr</td>
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</table>

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 Head and the student’s graduate committee
## Section 4. Course Schedule

**Graduate Course Schedule**  
Two-year cycle, subject to change

<table>
<thead>
<tr>
<th>Semester</th>
<th>EED Courses</th>
<th>Time</th>
<th>PSY/STAT/TEAL Courses</th>
<th>Time</th>
<th>EDUC Courses</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2018</td>
<td>EED 6150</td>
<td>M 1:30-4:20 pm TBA</td>
<td>PSY 6330</td>
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<td>EDUC 6570</td>
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<td></td>
<td>EED 6910 *</td>
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<td>PSY 6570</td>
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<td>EDUC 6770</td>
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<td></td>
<td>EED 7210</td>
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<td>STAT 5200</td>
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<td>EED 7300</td>
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<td>TEAL 6150</td>
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<td>EED 7410</td>
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<td>TEAL 6410</td>
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<td>EED 7300</td>
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<td>TEAL 7300</td>
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<td>Spring 2019</td>
<td>EED 6090</td>
<td>W 1:30-4:20 pm TBA</td>
<td>PSY 7070</td>
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<td>EED 6910 *</td>
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<td>EED 7410</td>
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<td>Summer 2019</td>
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<td>Spring 2020</td>
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</table>

* If you need to take EED 6910 Special Topics course or an EED 7900 Independent Study course, consult with your Faculty Advisor in advance to determine potential topics for study.
## Section 5. Milestones for Ph.D. in Engineering Education Degree

### Typical Academic Activities

<table>
<thead>
<tr>
<th>First Year</th>
<th>Second Year</th>
<th>Third Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semester 1</strong></td>
<td><strong>Semester 2</strong></td>
<td><strong>Semester 3</strong></td>
<td><strong>Semester 4</strong></td>
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<tr>
<td>● 9 credits coursework</td>
<td>● 9 credits coursework</td>
<td>● 9 credits coursework</td>
<td>● 3 credits coursework</td>
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<tr>
<td>Form Graduate Committee</td>
<td>IRB (Institutional Review Board) training</td>
<td>IRB2 Application</td>
<td>Qualifying exam</td>
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<tr>
<td>PoS1 meeting</td>
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</table>

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. The PoS should be completed within the second semester of coursework.

2IRB = Institutional Review Board (IRB) - The IRB 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 applications should be reviewed by your Faculty Advisor before submission.

3CGA = Continuing Graduate Advisement

4Only if necessary

### Section 6. Checklist for Degree Completion and EED requirements

Any pertinent institutional requirement must be completed in addition to the following checklist.

<table>
<thead>
<tr>
<th>✓</th>
<th>Activities</th>
<th>Date of Completion</th>
</tr>
</thead>
</table>
| □ | **Program of Study (PoS) Meeting (see Section 7)**  
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](http://rgs.usu.edu/graduateschool/forms/#requiredforms) | |
| □ | **Core Courses (24 credits) Completion**  
The Engineering Education Department (EED) requires students to enroll in a minimum of 24 core 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](http://eed.usu.edu) | |

9 | P a g e
<table>
<thead>
<tr>
<th>Activities</th>
<th>Date of Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective Courses (6 credits) Completion</td>
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<tr>
<td>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: <a href="http://eed.usu.edu">http://eed.usu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Qualifying Exam (see Section 8)</td>
<td></td>
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<tr>
<td>Dissertation Research Proposal (see Section 9)</td>
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<tr>
<td>Students need to develop a dissertation research proposal of their research methodology and design. The Faculty Advisor will work closely with the graduate student in the development of this document.</td>
<td></td>
</tr>
<tr>
<td>Dissertation Proposal Defense</td>
<td></td>
</tr>
<tr>
<td>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.</td>
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<tr>
<td>Application for Candidacy</td>
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<tr>
<td>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: <a href="http://rgs.usu.edu/graduateschool/forms/#requiredforms">http://rgs.usu.edu/graduateschool/forms/#requiredforms</a></td>
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<tr>
<td>IRB Training and Application via the Collaborative Institutional Training Initiative (CITI)</td>
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<tr>
<td>Data Analysis and Results</td>
<td></td>
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<tr>
<td>Students need to discuss with their Faculty Advisor the data analysis and results of the data collection.</td>
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</tr>
<tr>
<td>Dissertation Final Defense</td>
<td></td>
</tr>
<tr>
<td>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 4 weeks before the dissertation defense, the dissertation document needs to be provided to all committee members. At least 2 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: <a href="http://rgs.usu.edu/graduateschool/forms/#requiredforms">http://rgs.usu.edu/graduateschool/forms/#requiredforms</a></td>
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<td>Activities</td>
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<td>Students must submit an unsigned (draft) title page of their dissertation</td>
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<td>research with the Appointment of Examination form before the defense.</td>
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<td>Dissertation Submission to Graduate School</td>
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<td>A dissertation report must be submitted to the School of Graduate Studies</td>
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<td>with appropriate signatures on the document. For further information visit:</td>
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<td></td>
<td><a href="http://rgs.usu.edu/graduateschool/forms/#requiredforms">http://rgs.usu.edu/graduateschool/forms/#requiredforms</a></td>
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<tr>
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<td>Submission of a Hardcopy of Dissertation to EED</td>
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<td>One hardcopy of the student’s dissertation must be submitted to the EED</td>
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<td>through the Senior Staff Assistant. The question of whether to order</td>
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<tr>
<td></td>
<td>additional bound copies of the dissertation for the Faculty Advisor and/or</td>
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<tr>
<td></td>
<td>committee members should be discussed by the Faculty Advisor and candidate.</td>
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<td></td>
<td>Commencement</td>
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<td></td>
<td>Utah State University holds a graduate ceremony once a year (typically in</td>
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<td></td>
<td>early May).</td>
</tr>
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</table>

Section 7. Forming the Committee for the Program of Study and Guidelines

You are encouraged to consider the following information when selecting 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 you both share common scholarly interests. If you believe another faculty member is a better match for guiding you through your program and dissertation efforts, it is recommended you first attempt to discuss this with your Faculty Advisor to finalize any projects or work on transition deliverables/details. If the latter is not a feasible option, you can request a change of Faculty Advisor by the Department Head. Be aware, however, a change of initial Faculty Advisor will result in an automatic termination of your teaching and/or research assistantship with your initial Faculty Advisor.

Your Faculty Advisor and you should 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 the members you select can work well with you and your Faculty Advisor and whose styles are complementary. All committee members must have been approved by the USU Graduate School. 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 in the Graduate School (http://rgs.usu.edu/graduateschool/forms/#requiredforms).
At the time you submit your Program of Study (see Section 5 Milestones for Ph.D. in Engineering Education Degree), you must have a five-person committee in place. At least 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 be closely related to the concept behind your dissertation. As such, any committee member outside of EED must be consulted and approved by your Faculty Advisor.

In selecting an outside committee member, keep in mind they should provide specialized assistance in your overall research design but not have a primary role in chairing or co-chairing your committees. 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 your 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: 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 6 weeks prior to the final defense of your dissertation.

Section 8. Guidelines for Qualifying Exam

8.1 Exam Dates

The qualifying exam is offered two times a year:

- Thursday and Friday of the fourth week of January
- Thursday and Friday of the fourth week of August

8.2 The Purpose of the Qualifying Exam

The main purpose of the qualifying exam in the Engineering Education Department (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 in engineering education. Evidence of mastery is exemplified with your attainment of a satisfactory decision by the Department as it will allow you to proceed to the next phase of your research program.

8.3 Eligibility

To participate in the qualifying exam, you must complete, at the minimum, all but one course in your doctoral program. Proof of completing this course requirement should be shared with your Faculty Advisor (Major Professor) before setting up an official examination request.

8.4 Coverage of the Exam

The qualifying exam consists of two sections administered over two days. You are given 4 hours to complete each section. You will have a short 15-minute proctored-supervised break in
each day of the exam. The qualifying exam is designed to assess your ability to synthesize and communicate in writing the theoretical, conceptual, and 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 EDUC/PSY 6570, EED 7460, EED 7040, and STAT 5200 (or EDUC/PSY 6600).

8.5 Facility During the Two-Day Exam

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. At least three days prior to the exam, you can email a prepared list of references that may be relevant to your responses to the EED Graduate Program Coordinator. Your prepared list of references will then be stored on the above-mentioned computer for you to use (copy and paste) during the exam. This will save you time in typing the references when you are taking the exam.

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.

8.6 Exam Evaluation

An EED Exam Review Committee, including your Faculty Advisor (Major Professor) and other EED faculty members, will read and review your exam to 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 Exam Review Committee and announced to you approximately 30 days from the exam. If your manuscript is deemed to be partially satisfactory, you are then 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.

Responses to your exam will be evaluated by the Review Committee using the following general criteria, among others:

- Did you respond to all the issues and problems presented in the question?
- Are your responses accurate, concise, clear, well-organized, and conceptualized?
- Do your responses reflect an in-depth understanding of the issues and problems that were presented in the questions?
- Are your responses based on well-established research and theory and did you reference accordingly?

9.1 Why Dissertation Research Proposal

As part of the requirements for completing the Ph.D. degree in Engineering Education, students must independently write and defend a dissertation research proposal. The dissertation proposal is not the final dissertation. The dissertation research proposal is a proposal for conducting the dissertation research. The dissertation research proposal has two main objectives. First, the proposal articulates the student’s dissertation research plan. Second, the proposal provides an opportunity for the student to gain experience in research proposal writing, which is a necessary component to writing the dissertation.

The process to write and defend a dissertation research proposal includes a series of meetings with the Faculty Advisor and, possibly, the doctoral dissertation committee. Students must submit the proposal electronically to their entire committee 2 weeks before the defense of the proposal. The dissertation research proposal must be approved by the doctoral dissertation committee before the dissertation research can begin.

9.2 Guidelines for Dissertation Research Proposal

This section provides guidance for Ph.D. students to prepare a dissertation research proposal. The items described in the Dissertation Research Proposal Content and Components section shown below consists of the minimum requirements stipulated by the Department. The recommended page length for the proposal is 30-50 pages, not including references and appendix. You should work with your Faculty Advisor to determine the most appropriate length of the proposal. The proposal should follow APA guidelines, use 1-inch margins on all sides, be double spaced, and use 12 point Times New Roman font.

The dissertation research proposal consists of Chapters 1-3 of your final dissertation, along with the description of a pilot study, if needed. If you are including a pilot study chapter, the text in this chapter should not be an exact copy of a previously submitted or published manuscript. Doing so would constitute copyright infringement. Instead, the pilot study chapter should include a synthesis or summary of other related work to this dissertation and reference a publication already published. If elements of a published or submitted article must be included in the pilot study, this work then needs to be presented in an original manner.

The dissertation proposal (Chapters 1-3 of your dissertation) should contain the following:

- **Title Page:** Should include the title of the research study that the graduate student will conduct, student’s name, major professor (research advisor), and department name.
- **Chapter 1, Introduction** (3-10 pages): Should include a well described rationale for the study as well as the research questions/hypothesis pertinent to this work.
- **Chapter 2, Review of Literature** (10-25 pages): Should include selected literature on the state of art of the research in the field as well as a discussion of how the graduate student’s work will help fill a gap in the engineering education field.
- **Pilot Study Results** (optional): Should include preliminary findings from current research, a recent conference proceeding, or poster that is relevant and will help support the justification for the work as introduced in the Introduction and Review of Literature sections.
- **Chapter 3, Research Methodology/Design** (10-20 pages): Should include an overview of the intended methodology or research design along with citations to justify the research.
study selection. In addition, a discussion of the methods and overview of the intended data analysis procedures should be discussed.

9.3 Guidelines for Dissertation

The following paragraphs describe specific dissertation components. These components for Chapters 1-3 and the pilot study (if included) also apply to the dissertation research proposal. To fulfill the responsibilities of the first three chapters in the dissertation research proposal, IRB approval will be needed before you conduct the proposed dissertation research. At the conclusion of your final dissertation document (e.g. Chapters 1-6 or higher) you must include the copy of the IRB approval certificate as an appendix in your final dissertation.

Writing the final dissertation will require you to refine the work presented in the dissertation research proposal in coordination with your faculty advisor. The following are minimum requirements stipulated by the EED.

Chapter 1 Introduction

1. Frame the problem, i.e., background or need for the study.
   1) Why is this research important?
   2) Cite literature as needed using APA style
2. Summarize your purposes/goals and objectives.
3. Summarize research questions and/or hypotheses, which should align 100% with objectives.
4. Briefly describe your research approach, i.e., qualitative, quantitative, or mixed-methods.
5. Briefly describe the theoretical framework guiding the study, if used, and positionality as a researcher.
6. Briefly discuss the research methodology and/or research design.
7. Summarize the assumptions.
8. Summarize the significance of the study and implications of the study.
9. Summarize the limitations of the study.
10. List the definitions of key terms used in your dissertation.

Chapter 2 Review of Literature

1. Introduction: “This literature review will....”
2. Use subsections that indicate the topics of your theoretical framework.\(^1\)
3. Show in your theoretical framework there is a gap in existing research and how your study will help fill this void.\(^1\)
4. Include a summary of the Review of Literature as it relates to your theoretical framework and main objectives of the research.

\(^1\) There is often confusion whether material should be duplicated in Chapter 2 and Chapter 3. The best answer is that you may often need to include discussions in both chapters but with different objectives. For example, you may decide to use a case study qualitative research method in your research. You should then include a literature review of whether any existing case study research has been done in this area (showing the uniqueness of your work) as well as any literature that shows the method is viable for the work you are proposing (similar work done with a case study method). In Chapter 3, you would also want to reference methods publications showing you are following an accepted research methodology and arguing the selection of this method is appropriate.
Pilot Study (optional)

This pilot study section is optional and required only if pilot work was done to help argue the research. If used, the study becomes Chapter 3 and other chapters increment accordingly.

1. Purpose and overview.
2. Appropriate subsections to define and describe the components of the pilot work, i.e., methods, results, discussions, conclusions, implications, etc.
3. As indicated above, this pilot should not be copyrighted from previously submitted, reviewed, or published work; this chapter should be original in approach and in writing.

Chapter 3 Research Methodology/Design

1. Describe the research approach (i.e. mixed methods, qualitative, quantitative) and justify your selection (e.g., an explanatory sequential mixed method design was selected because …).¹
2. Restate the research questions for qualitative and mixed-methods research AND/OR hypotheses for quantitative and mixed-methods research.
3. Describe the research methodology/design and its appropriateness based on your theoretical framework (if used) and positionality as a researcher.¹
4. Discuss IRB approval for your dissertation research. Proof of IRB must be included in an appendix in your final dissertation.
5. Describe the population from which the participants were recruited.
6. Describe participant recruitment or sampling procedures (e.g. purposeful sampling considerations, sample size estimations, and randomization).¹
7. Describe the participants.
8. Describe the data collection methods and discuss how they align with the research methodology.
9. Describe the data analysis techniques (e.g., types of coding techniques, types of statistical analysis techniques, and data mixing procedures).

Chapter 4 Results ²

1. List and describe your results. Be careful not to discuss or interpret your results to any substantial extent in this section.
2. Clearly describe how your results map to or “answer” your research questions and/or hypotheses.

Chapter 5 Discussions ²

1. Interpret your results in the context of the previous work discussed in your literature review and theoretical framework (if used) sections. Be sure to draw connections between your results and those of other researchers.
2. Consider the limitations of your study when making interpretations and, if needed, discuss how the study limitations moderate your interpretations.
3. Discuss how the study met its goals/objectives.

² A common, standard organization of Chapters 4-6 is provided here. Be aware there is creative flexibility that exists when developing and organizing the results, discussion, and conclusions of your research. Other organizational schemes may be more appropriate for your particular study. You should discuss how to structure Chapters 4, 5, and 6 with your Faculty Advisor before beginning to write your results.
Chapter 6 Conclusions/Significance/Implications

1. Summarize the major, most important outcomes from the study.
2. Provide recommendations for future researchers in the same field. These recommendations can include:
   1) Recommendations for future research topics.
   2) Pertinent research questions that need to be answered within the field.
   3) Implications of the research for teaching and/or professional engineering practice.

Section 10. Expectations

10.1 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 an average of 20 hours per week (12 months per year for RAs and 9 months for TAs). This includes 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 jobs outside the campus are not part of the 20 hours per week. Also, this time needs to be reported to your Faculty Advisor. Be sure you discuss the best strategy to report hours worked.

  Presidential Doctoral Research Fellowship (PDRF) recipients are also expected to commit to an average of 20 hours of work per week (12 months per year). Funding provided through their fellowship by the Office of Research and Graduate Studies and the Department is under the direction of their Faculty Advisor, and research should align with what has been agreed upon by the Faculty Advisor and the student. Students should also review the additional requirements and expectations needed as a recipient of this fellowship.

- **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 per discretion of each Faculty Advisor.

- **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 *Ethnical 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.

### 10.2 Academic Progress Report

The academic progress report consists of two components and allows you to 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 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.

10.3 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 what constitutes intellectual property (visit: https://www.usu.edu/policies/587/). 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 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 require 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.

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.

For additional information on authorship, you are encouraged to review:
• 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/read/12192/chapter/1

10.4 Department Check-In Procedures

☐ If you are an international student, you will need to see the Immigration Advisor in the Office of Global Engagement (https://globalengagement.usu.edu) 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 required for each form. This information will be provided to you by the EED Graduate Program Coordinator once you arrive.

☐ For office space in the graduate student cubicles, please see the Graduator Program Coordinator of the Engineering Education Department.

☐ Keys and/or 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.

10.5 Department Check-Out Procedures

☐ Clean out your office space; return the space to its original condition (EED office staff must check the office space).

☐ 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 IT personnel to verify the computer is clean of any viruses.

☐ Turn in a bound copy of your dissertation to the Department.

☐ Provide employment information: institution where you will work, job title, and permanent email address.
Section 11. Other Useful Information

- Engineering Writing Center:
  https://engineering.usu.edu/students/ewc/

The Engineering Writing Center (EWC) assists engineering students (both undergraduate and graduate) in developing their technical writing skills. Through one-on-one consultations, students refine document structure, apply technical writing standards, and use correct grammar and format. The EWC is located in SER 130, and appointments can be made at ewc.usu.edu. Hours of operation are Monday through Friday from 1:30-4:30 (for scheduled appointments) and Monday through Thursday from 4:30-6:30 (for walk-ins).

The EWC does not provide assistance for theses and dissertations due to the specialized nature of these documents. Graduate students are encouraged to see their Faculty Advisors for assistance with these documents.

- 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 Global Engagement:
  http://globalengagement.usu.edu

- Purdue’s Online Writing Lab:
  https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html

- Publication Manual of the American Psychological Association, Sixth Edition