



UNIVERSITY OF CENTRAL FLORIDA

Biomedical Engineering PhD Graduate Program Handbook

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Biomedical Engineering PhD

Together, the [Graduate Student Handbook](#) and your graduate program handbook should serve as your main guide throughout your graduate career. The Graduate Student Handbook includes university information, policies, requirements and guidance for all graduate students. Your program handbook describes the details about graduate study and requirements in your specific program. While both of these handbooks are wonderful resources, know that you are always welcome to talk with faculty and staff in your program and in the Graduate College.

The central activities and missions of a university rest upon the fundamental assumption that all members of the university community conduct themselves in accordance with a strict adherence to academic and scholarly integrity. As a graduate student and member of the university community, you are expected to display the highest standards of academic and personal integrity.

Here are some resources to help you better understand your responsibilities:

- [Academic Honesty](#)
- [Academic Integrity Training](#) - Open to all graduate students at no cost
- [Plagiarism](#)

Introduction

Welcome to UCF's Biomedical Engineering PhD Program! Promoting student success is a primary goal of the program. This serves the best interests of the students, the faculty, the program and the university. This graduate handbook is created to serve as a guide for all Biomedical Engineering doctoral students (as well as faculty and staff) within the Biomedical Engineering program. In this handbook we have consolidated and explained many of the details of the graduate student policies and procedures at UCF, as well as specific rules within the Mechanical and Aerospace Engineering (MAE) Department. The objective of the doctoral handbook is to provide effective direction and guidance to graduate students that will lead to their success at UCF. Since the Graduate Catalog serves as the primary source for general policies, this handbook serves as a supplement, providing a more detailed and specific policy manual for students in the program.

The doctoral program in Biomedical Engineering (PHDBME) at UCF is distinguished by offering an outstanding selection of courses taught and by providing students with state-of-the-art research opportunities working with faculty mentors who are active in a wide range of sponsored research. The result is education through research. Students in the graduate BME doctoral program may be financially supported by graduate teaching assistants (GTA) or graduate research assistantships (GRA). The requirements of these positions include research tasks with clear objectives and scientific foundation. In the course of their research students develop significant interactions with scientists and engineers from outside UCF and have opportunities for presentations/publications at local and international conferences. In addition to the challenging coursework, the "education through research" approach provides graduates with both scientific competency and a polished professionalism.

The objective of this Handbook is to help students understand the process of completing a graduate education at UCF, provide information on resources that will help them develop academically and professionally, and to clearly define the responsibilities of the student to complete the degree program. The Handbook will also serve as a reference tool to guide graduate students through their graduate program and help students stay on track for degree completion. It will also help faculty and staff to better guide those students.

Advising/Mentoring

Advising and mentoring are two of the greatest elements that bring success to a doctoral student's career. The faculty advisor is a very important person in the life of a graduate student. The faculty advisor will, mostly likely, end up being the student's thesis or dissertation committee chair. The Graduate Coordinator, however, will provide initial guidance new students on overall academic requirements and the program and university policies and procedures, while the faculty advisor serves as the primary mentor providing direction on research, advice on plan of study, and guidance on other areas of academic and personal life.

Roles and Responsibilities:

- **Faculty Advisor**
 - The advisor helps the student select which courses to take.
 - The advisor (in consultation with the student) develops the student's plan of study
 - The advisor directs the student's research
 - The advisor reviews and approves the student's thesis or dissertation
 - The advisor often provides financial support for the student (based upon a research contract)
- **Student**
 - The student takes coursework as required, maintaining a minimum 3.0 GPA
 - The student maintains a full course load and works diligently to complete all requirements in a timely manner
 - The student (in consultation with the faculty advisor) develops a plan of study prior to completing the first 9 hours of coursework
 - It is the student's responsibility to keep informed of all rules, regulations, and procedures required for graduate studies. Graduate program regulations will not be waived or exceptions granted because students plead ignorance of the regulations or claim failure of the adviser to keep them informed.

The process in which a student should obtain a faculty advisor is by contacting the various Mechanical faculty and seeing where there is a common research interest. It is entirely the responsibility of the student to find an advisor. The student should do so within the first few weeks of their studies here at UCF. When there is no formal advisor, the Graduate Coordinator can serve as the default academic advisor.

The student-advisor relationship is a very important one for both parties and it is in their best interests to maintain this relationship and communicate openly. In those rare cases when either party desires a change, it is recommended that the need for a change be discussed with the program Graduate Coordinator.

Plan of Study

The plan of study serves as an agreement between the student and the program, listing all courses necessary for completing degree requirements. Students, with their advisor, decide on a course of study for meeting the degree requirements and complete the plan of study form. The plan of study will then serve as a guide for the student to follow and also serve as a reference tool for the PHDBME program to track the academic progress of the student. The plan of study form is located on the [MAE website](#). This form should be prepared and signed by the adviser and student, then given to the graduate program assistant for review, PHDBME Program Coordinator's approval (**Dr. Alain Kassab**), College approval and filing in the student's permanent file. It must comply with the student's relevant catalog.

Plans of study for students seeking a doctoral degree should be on file by completion of the initial 9 hours of graduate coursework. The student and his/her advisory committee may make changes in the plan of study at any

time with approval of the graduate program director. However, once established, the plan study cannot be altered solely due to poor academic performance of the student.

All doctoral students must maintain a minimum of 3.0 GPA for their graduate studies at UCF and on their plan of study coursework. If a student, with the agreement of their faculty advisor, wishes to make changes on their plan of study, they must follow the same process as submitting an initial plan of study. All signatures must be obtained again and the updated plan of study on file with the College.

Incomplete Grades

A grade of “I” (incomplete) may be assigned by the instructor when a student is unable to complete a course due to extenuating circumstances, and when all requirements can clearly be completed in a short period of time following the close of regular classes. In all circumstances where an “I” grade is received, the student and faculty member must complete an agreement form that specifies how and when the incomplete grade will be made up. This agreement form is submitted with the instructor’s grade rolls at the end of the semester, and a copy of this agreement is given to the college for further follow-up. For those students on financial assistance such as loans, the incomplete (I) must be made up by the agreement date. Failure to complete the agreed upon course requirements by the agreement date may result in the assignment of an “F” grade, or a “U” grade for thesis, dissertation, or research report hours. It is the student’s responsibility to arrange with the instructor for the change of the “I” grade when the course requirements have been met.

All grades of “I” must be resolved within one calendar year or prior to graduation, whichever comes first. Incompletes in regular course work left unresolved will be changed to “F” if not changed in the allowed time period, and this time period may be sooner for those receiving financial assistance. The exception to this is enrollment in dissertation (BME 7980) hours where the incomplete grade will be allowed to continue until graduation. UCF fellowship students cannot receive fellowship funds while holding incomplete grades and have thirty days from the issuance of the Incomplete to remedy it in order to continue to receive fellowship funds.

Graduation

Graduation is the culmination of a challenging and arduous journey in the pursuit of a higher degree. To get to this pinnacle, it takes dedication, sacrifice, and hard work (and meeting all the bureaucratic processes and deadlines of UCF). In order to eliminate or reduce the potential for any unnecessary delays or complications with graduation, each student must be aware of and comply with all degree requirements and deadlines, and must submit all necessary forms on time.

Forms and Deadlines

The following three documents are needed when applying to graduate: Intent to Graduate Form, Graduate Exit Survey, Final Plan of Study. They are to be submitted to the PHDBME admissions specialist by the end of the semester PRIOR to the semester of graduation. For example, if a student is planning on graduating in Spring of a given year then those forms are due by the end of the preceding Fall semester. The forms can be found online or from the Academic Affairs office for the College of Engineering in ENG 1- Room 107. The final plan of study should be a typed, final document indicating every class that has been taken to satisfy the doctoral requirements.

Overview of Important General Graduate Policies

Student Responsibility to Keep Informed

It is the student's responsibility to keep informed of all rules, regulations, and procedures required for graduate studies. Graduate program regulations will not be waived or exceptions granted because students plead ignorance of the regulations or claim failure of the adviser to keep them informed.

Definition of Formal Course Work

Formal courses – Existing UCF courses that involve standard class instruction of a defined body of disciplinary knowledge. These courses involve interactions between a formal course instructor and the students that make up the class, and can be traditional, face-to-face courses, web courses, and media-enhanced courses. Such classes include both core/required courses as well as elective courses, seminar courses and independent study courses (EML 6908), but are distinguished from the various categories of individualized research and scholarly courses.

Independent Study (EML 6908) – A course of study created outside of the standard-format formal courses offered by the university. Independent Study must have a formally defined core of knowledge to be learned by the student(s). The core of knowledge to be learned by the student(s) must be specified in written form and approved by the student(s), the instructor, and the program coordinator prior to enrollment in Independent Study.

Definition of Research and Scholarly Work

Directed Research (EML 6918) – Graduate-level research/scholarly work. Research hours taken at the graduate level. These can include laboratory rotations in addition to standard research and scholarly endeavors directed toward completion of a project.

Doctoral Research (BME 7919) – Doctoral-level research/scholarly work. Research hours at the doctoral level taken prior to passing candidacy. These can include laboratory rotations, preparation for candidacy exams, or standard research and scholarly endeavors directed toward completion of a project or a dissertation.

Doctoral Dissertation (BME 7980) – Research or scholarly hours taken after advancement to candidacy and directed toward completion of a dissertation.

It is the recommendation of the PHDBME program that students register for Directed Research (EML 6918) prior to passing the Qualifying Exam, and should then register for Doctoral Research (BME 7919) once the Qualifying Exam has been passed. No more than 12 hours of combined directed research, doctoral research and independent study (including MS transfer hours) will be allowed in a doctoral POS.

Full-time Enrollment Requirements

A full-time, degree-seeking, graduate student must take at least 9 credit hours in the fall and spring semesters. A half-time load is defined as enrolled in at least 4.5 credit hours in fall and spring terms. During the summer term, full-time is 6 credit hours and half-time is 3 credit hours. Graduate students receiving assistantships, tuition support, and fellowships must be enrolled full-time as degree-seeking students and maintain good academic progress.

For doctoral students who have passed the candidacy exam and are registered for doctoral dissertation (BME 7980) hours only, full-time is 3 hours per semester until graduation. Such students must continue to enroll in at least three dissertation hours each semester (including summers, without skipping a semester) until they successfully complete the dissertation and graduate. Students who wish to enroll in part-time hours should consult their adviser.

Review of Academic Performance

The primary responsibility for monitoring academic performance standards rests with the degree program. However, the academic college and the UCF College of Graduate Studies will monitor a student's progress and may dismiss any student if performance standards or academic progress as specified by the program, college or university are not maintained. Satisfactory academic performance in a program includes maintaining at least a 3.0 graduate status GPA (defined below) in all graduate work taken since admission into the program. Satisfactory performance also involves maintaining the standards of academic progress and professional integrity expected in a particular discipline or program. Failure to maintain these standards may result in dismissal of the student from the program. For more details on the process of academic probation and dismissal governed by the College of Graduate Studies, check out these [Academic Performance Policies](#).

Continuous Attendance

Failure to enroll in three consecutive semesters (spring, summer, and fall) is considered non-continuous enrollment.

Students are expected to maintain enrollment and to complete their graduate study expeditiously. A Special Leave of Absence should be requested when students anticipate they will not be enrolled for three consecutive semesters or more. If students are not enrolled in the university for a period of three consecutive semesters (spring, summer, fall) and do not obtain Special Leave of Absence approval for such interruptions in their plans of study, they will be discontinued and must reapply for admission. Readmission is not guaranteed.

All (domestic and international) students taking thesis or dissertation hours are required to be continuously enrolled (including summer) until the thesis or dissertation is completed.

Because of U.S. government regulations, international students must be enrolled every fall and spring semester. For students in this category, Special Leave of Absence is only available for documented medical reasons.

A student without an approved Leave of Absence who breaks continuous enrollment will lose the option of fulfilling the degree requirements originally listed in his/her official plan of study already on file, and will instead fulfill the degree requirements listed in the graduate catalog in effect at the time the student resumes his/her attendance

Reminder to International Students Regarding Employment

According to U.S. Citizenship and Immigration Services (USCIS) regulations, graduate students who are on an F-1 or J-1 visa may accept employment on campus without prior USCIS approval as long as students are enrolled full-time and employment does not interfere with their studies.

Graduate students who desire to engage in off-campus employment must be approved by the International Services Center (ISC) for Curricular Practical Training (CPT) prior to beginning the employment. CPT is defined as employment that is an integral part of the established curriculum and can be in the form of an internship or cooperative educational experience. In order to qualify for CPT, there are several requirements that must be met. Please speak with an adviser at the ISC for more information on these requirements and prior to engaging in off-campus employment.

During the fall and spring semesters, on-campus employment is limited to no more than 20 hours per week while school is in session. During the summer enrollment periods, on-campus employment is limited to no more than 30 hours per week for students who are enrolled full-time as graduate assistants. Such employment may be up to 40 hours per week during the summer if students are not enrolled full-time as graduate assistants. (Please note that all graduate assistants during the summer must enroll in a full-time course load.) Employment may also be up to 40 hours per week during vacation or other break periods. Please speak with an adviser at the ISC for clarification of these policies.

On-campus employment is not permitted after completion of the plan of study, unless the student is issued a Form I-20A-B to begin a new program and intends to enroll in the next regular academic term or session.

Students who received a bachelor's degree at one school and will start a master's degree or PhD at UCF are eligible to work during the summer at UCF as long as a Form I-20A-B was issued for the new master's or PhD program.

International students on an F-1 visa are eligible to apply for one year of optional practical training (OPT) after completion of their program.

For more information about the employment of international students, contact the International Services Center at 407-823-2337 or visit the office to speak with an adviser.

Biomedical Engineering Program Policies

The primary objective of doctoral study is to educate students to a point of excellence in conducting, disseminating, and applying scholarly research, with the explicit goal of making original, substantive contributions to their degree discipline. The advanced nature of doctoral education requires student participation, debate, evaluation, and discussion of diverse ideas and approaches. Careful analysis, independent research, and greater understanding and application of ideas are also expected.

The doctoral degree program requirements will consist of core and elective courses, seminars, directed and doctoral research, independent study, and dissertation research.

- Each doctoral plan of study will include a minimum of 72 semester hours of graduate credit beyond the baccalaureate degree or a minimum of 42 semester hours of graduate credit beyond the master's degree; these graduate credits must be taken as part of an approved graduate plan of study.
- 57 hours comprised of a combination of 5000- and 6000-level classes (with a minimum of 27 hours of formal coursework exclusive of Independent Study, Doctoral Research, and Doctoral Dissertation), and 15 hours of Doctoral Dissertation.
- All graduate credit in a doctoral program must be at 5000 level or higher.
- At least one-half of the credit hours used to meet program requirements must be in 6000-level or 7000-level courses, including the allowed number of research and dissertation hours.
- Only graduate-level credit with a grade of "C-" or higher may be used to satisfy degree requirements.

Course Levels

6000- and 7000-Level Courses—Minimum of 36 credit hours (including courses taken in a master's program) must be in 6000-level and 7000-level courses, which are designed, respectively, for graduate students and doctoral students only. For students with waived hours from an earned master's, this amount is at least one-half of the program hours remaining after the waived hours are applied.

Time Limitation and Continuous Enrollment

The student has seven years from the date of admission to the doctoral program to complete the dissertation and complete the doctoral degree. No courses used in a plan of study can be older than seven years at the time of graduation. There is no time limitation for waived or transferred hours from a completed master's degree used toward a doctoral degree.

Students who anticipate being out for an extended period of three consecutive semesters or longer should apply for a Special Leave of Absence. Students who do not maintain continuous enrollment without a Special Leave of Absence (see Continuous Attendance and Special Leave of Absence in the [General Graduate Policies](#)) must file

for readmission to the university, although seven years is measured from when the student was first admitted to the program.

Transfer Credits

Graduate transfer credits consist of hours completed at a regionally accredited institution (including UCF) or recognized international institution. Hours are eligible for transfer only if they meet the following criteria:

- Only graduate-level or higher courses may be accepted as transfer credits.
- Only courses with a grade of "B-" or higher may be transferred into a plan of study.
- Only hours that are no more than seven years old may be transferred, unless part of an earned graduate degree.
- Only formal course work hours, not thesis or research hours, may be accepted as transfer credits.

The acceptance of transfer credits must be approved by the PHDBME Program Coordinator. It is the policy of the PHDBME program that prior to a student taking their candidacy exam, they must make an appointment and have a joint meeting with the PHDBME Program Coordinator and their advisor to discuss the courses that are eligible for transfer credit. Students are encouraged to have this meeting earlier, when they prepare their first plan of study form. Students should be aware that transfers are not allowed in the semester that the student wishes to graduate.

Students with international transfer credit from recognized international institutions may be required to obtain a WES or Joseph Silny evaluation. Graduate degree programs are permitted to accept up to nine hours (more may apply for some accelerated programs) of graduate-level course work taken by a student while in undergraduate status at UCF.

Students admitted with an earned master's degree from a regionally accredited institution or recognized foreign institution may incorporate credits from that earned degree into their plan of study as follows. If the master's degree was earned in the same or a closely related area of study, up to 30 hours of their doctoral program requirements may be waived. Alternatively, programs may transfer up to 30 credit hours from any earned master's degree, provided they conduct a course-by-course review. Transfer credits are constrained by the criteria outlined in the above section of the [Transfer Credit policy](#) in the UCF Graduate Catalog. The number of credit hours waived or the courses transferred will be limited to those meeting UCF's criteria for formal coursework and must be courses that would be normally be approved as part of student's PHDBME plan of study if taken at UCF.

In no case may the sum of all transfer and waived credits exceed 50% of the total degree requirements of any doctoral degree.

All transfer credits toward a doctoral degree must be finalized prior to the student passing their candidacy exam.

Curriculum

Please visit the [Graduate Catalog](#) to see the current curriculum for our program.

The PhD in BEM curriculum includes a core requirement of seven (7) classes, and it is provided below:

Core required courses

- [BME5216C](#) - Mechanics of Biostructures I (3, Fall)
- [BME5217C](#) - Mechanics of Biostructures II (3, Spring)
- [BME6500C](#) - Bioinstrumentation (3, Fall)

- [BME6935](#) - Topics in Biomedical Engineering (3, Fall)
- [BME6231](#) - Continuum Biomechanics (3, Spring)
- BME 5742C: Modeling Techniques and Methodologies in Bioengineering (3 hours)
- ESI 5219: Engineering Statistics (3 hours) or STA 5206: Statistical Analysis (3 hours)

Elective Courses

Students may select elective courses from the list below. If the students have specific interests in certain topic, they should discuss with the graduate advisor or thesis chair to find other courses that are not listed here.

Biomedical Engineering

- [BME5742C](#) - Modeling Techniques and Methodologies in Bioengineering (3, Fall)
- [BME6525](#) - Methods in Neural-Machine Interfaces (3, Odd Spring)
- [BME5267](#) - Biofluid Mechanics (3, Fall)
- [BME6268C](#) - Applied and Computational Biofluids (3, Spring)
- [BME6215](#) - Advanced Biomechanics (3, Spring)
- [BME5572](#) - Biomedical Nanotechnology (3)
- [EEL5272](#) - Biomedical Sensors (3)
- [EEE5265](#) - Biomedical Effects and Applications of Electromagnetic Energy (3)
- [EEL5690](#) - Medical Robotics (3, Occasional)

Mechanical Engineering

- [EML6725](#) - Computational Fluid Dynamics and Heat Transfer I (3)
- [EML6726](#) - Computational Fluid Dynamics and Heat Transfer II (3)
- [EML6712](#) - Mechanics of Viscous Flow (3)
- [EAS6185](#) - Turbulent Flow (3)
- [EML5290](#) - Introduction to MEMS and Micromachining (3)
- [EML6067](#) - Finite Elements in Mechanical, Materials, and Aerospace Engineering I (3)
- [EML6068](#) - Finite Elements in Mechanical, Materials, and Aerospace Engineering II (3)

Material sciences

- [EMA5060](#) - Polymer Science and Engineering (3)
- [EMA5584](#) - Biomaterials (3)
- [EMA5588](#) - Biocompatibility of Materials (3)
- [EML5237](#) - Intermediate Mechanics of Materials (3)
- [EML5291](#) - MEMS Materials (3)
- [EML6299](#) - Advanced Topics on Miniaturization (3)

Industrial Engineering

- [ESI6247](#) - Experimental Design and Taguchi Methods (3)
- [ESI6609](#) - Industrial Engineering Analytics for Healthcare (3)

College of Medicine

- [IDS5127](#) - Foundation of Bio-Imaging Science (3)

- [IDS6253](#) - Bioanalytical Technology (3)
- [BSC5418](#) - Tissue Engineering (3)

Computer Science

- [CAP5516](#) - Medical Image Computing (3)
- [CAP5510](#) - Bioinformatics (3)

Optics and Photonics

- [OSE6111](#) - Optical Wave Propagation (3)

Mathematics and statistics

- [STA5176](#) - Introduction to Biostatistics
- [STA5206](#) - Statistical Analysis (3)
- [GMS6860](#) - Statistics for Biomedical Scientists (3)
- [ESI5219](#) - Engineering Statistics (3)
- [EML5060](#) - Mathematical Methods in Mechanical and Aerospace Engineering (3)

Doctoral Dissertation (15 hours)

- BME 7980 Doctoral Dissertation (variable hours)

In addition to completing coursework with a 3.0/4.0 of better GPA, the PhD in BME program requires:

- successful completion of the PhD in BME Qualifying Examination
- successful completion of the PhD Candidacy Examination and Dissertation Proposal Defense.
- successful defense of a PhD dissertation.
- completion of four (4) zero-credit hour MAE Seminars.

Timeline for Completion

Timeline for Students with Masters of Science Degree

(Or closely related MS degree) and transferring 30 hours from the MS – electives should be coordinated with your PhD thesis advisor and/or with the graduate program coordinator.

1st Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • BME5216C • BME6500C • BME6935 	<ul style="list-style-type: none"> • BME5217C • BME6231 • Track/elective course (optional) 	<ul style="list-style-type: none"> • Directed Research, optional
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 6 credit hours

2nd Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • BME 5742C • Electives (6 hours) • Qualifying Exam 	<ul style="list-style-type: none"> • Electives/Doctoral research (9 hours) • Candidacy Exam 	<ul style="list-style-type: none"> • BME 7980 Dissertation
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 3 credit hours

3rd Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • BME 7980 Dissertation 	<ul style="list-style-type: none"> • BME 7980 Dissertation 	<ul style="list-style-type: none"> • BME 7980 Dissertation
Semester Total: 3 credit hours	Semester Total: 3 credit hours	Semester Total: 3 credit hours

4th Year of Graduate Training

Fall	Spring
<ul style="list-style-type: none"> • BME 7980 Dissertation 	<ul style="list-style-type: none"> • BME 7980 Dissertation • Dissertation Defense
Semester Total: 3 credit hours	Semester Total: 3 credit hours

Optional Timeline for Students without a Master's Degree

1st Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • BME5216C • BME6500C • BME6935 	<ul style="list-style-type: none"> • BME5217C • BME6231 • Track/elective course (optional) 	<ul style="list-style-type: none"> • Doctoral Research, optional
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 6 credit hours

2nd Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • BME 5742C • Electives (6 hours) 	<ul style="list-style-type: none"> • Electives (9 hours) • Qualifying Exam 	<ul style="list-style-type: none"> • Doctoral Research, optional
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 6 credit hours

3rd Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none"> • Electives (9 hours) 	<ul style="list-style-type: none"> • Electives (9 hours) • Candidacy Exam 	<ul style="list-style-type: none"> • BME 7980 Dissertation
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 3 credit hours

4th Year of Graduate Training

Fall	Spring	Summer
<ul style="list-style-type: none">BME 7980 Dissertation Semester Total: 3 credit hours	<ul style="list-style-type: none">BME 7980 Dissertation Semester Total: 3 credit hours	<ul style="list-style-type: none">BME 7980 Dissertation Semester Total: 3 credit hours

5th Year of Graduate Training

Fall
<ul style="list-style-type: none">BME 7980 DissertationDissertation Defense Semester Total: 3 credit hours

Examination Requirements

Qualifying Exam

The PhD in BME Qualifying examination is a proposal-based examination and the procedures have been determined by the BME faculty, approved by the MAE Graduate Program Committee, and by the MAE Faculty. The PhD in BME Qualifying examination was instituted in Fall 2019 and is administered each Fall and Spring semester as an option for ME PhD students engaged in BME research and who were seeking BME training under our current curriculum and structure.

The Biomedical Engineering (BME) PhD Qualifying Examination (QE) is structured as a proposal-based examination. This option was selected due to the wide variety of research areas within BME program that places severe challenges to traditional curriculum-based qualifying exams. This format requires students to demonstrate their research skills, particularly surveying the literature and planning experiments with different techniques or modeling. The format offers as well to the faculty on the QE exam committee the opportunity to interrogate the student in his/her understanding of fundamental subject matter required for the successful completion of the student's PhD program. Proposal-based QEs provide students with exposure to grant writing and practice preparing such documents that are useful skills to have later in their careers.

Purpose of the BME PhD Qualifying Examination: the intent of BME qualifying examination is to evaluate the topical and technical skills of the student required to conduct the proposed research. There is no requirement of preliminary results and the intent of the draft proposal submitted by the student is at the level of a seed proposal to obtain data whether experimental or numerical or both. This proposal is to be a reflection of the student's work and understanding. This is not a pre-candidacy exam and this exam replaces the question-based traditional PhD qualifying examination and has the same aims. The qualifying examination topic should be distinct enough that it would not be included in the future candidacy exam about the actual PhD research to be undertaken by the student.

The BME qualifying exam is as rigorous as the traditional written question-based exams. The student applying to the BME PhD Qualifying Examination should devote the same amount of time and effort to study and prepare properly.

Format: The BME Qualifying Exam consists of a proposal prepared and defended by the student. The student will submit a written document on an approved subject and will give an oral presentation of the proposal followed by a

question-and-answer session. The proposal will be evaluated by at least 3 faculty members (which does not include the PhD advisor), who will deliberate and vote on a pass or fail recommendation for the student. Each student will have an independent QE committee and two chances to pass the QE.

The proposal prepared by the student will focus on a topic that is topically broadly related to their research area but not their PhD research. The student will submit their topic as an abstract (1 page in length) to the committee of three members responsible for their Qualify Exam to confirm the suitability of the topic. The committee may provide feedback at this point to guide the student and may require modification of the abstract and/or topic.

This examination is taken within the first two years into the PhD in BME program and must be successfully completed prior to the Candidacy Examination and Dissertation Proposal Defense.

Candidacy Exam

PhD in BME Candidacy Examination and Dissertation Proposal Defense are exams taken place prior to admission to Candidacy Status. It is normally taken near the end of completion of coursework and must be passed before being allowed to enroll in doctoral dissertation (BME 7980) hours. The student shall identify a dissertation committee consisting of the dissertation advisor, two additional members of the MAE faculty, and an external member all of whom must be on the UCF graduate faculty (<https://graduate.ucf.edu/graduate-guide/graduate-faculty-and-graduate-faculty-scholars>). The student shall provide a written document of the dissertation proposal which will constitute the written portion of the examination and will be permanently filed in the student's permanent records. The student shall make an oral presentation to the dissertation committee and successfully defend the proposed dissertation topic. All committee members will evaluate and vote as to whether the student has successfully completed the examinations and will formally inform the Graduate Program Coordinator who will update the student's status upon successful completion of the exams. All materials including the approved proposal and other agreements will be kept in the student's file in the program. Students must have passed candidacy and have the candidacy and dissertation advisory committee documentation received and processed by the College of Graduate Studies prior to the first day of classes for the term in order to enroll in dissertation hours for that term.

Dissertation Defense is an oral defense of the dissertation presented to the dissertation committee. This defense is made after consultation with the dissertation advisor and reports the outcomes of the doctoral research undertaken by the candidate as outlined in the dissertation proposal. The dissertation draft is to be provided to the committee at least two weeks in advance of the defense and the announcement of the defense (abstract, location, date and time) is to be posted at the CECS website two weeks prior to the defense. The student shall file an intent to graduate form and comply with the Graduate College regulations regarding the formatting and final submission of the dissertation for archival purposes (<https://graduate.ucf.edu/thesis-and-dissertation/>).

Dissertation Requirements

Admission to Candidacy

A student must demonstrate his or her readiness for the PhD program by successfully completing the candidacy examination before admission to full doctoral status and enrollment into dissertation hours. The candidacy examination should be taken when the student is nearing the end of course work. The exam is administered by the members of the student's dissertation advisory committee. External committee members of the dissertation advisory committee are not appointed until after the student has passed the Candidacy exam. Admission to candidacy will be approved by the Program Coordinator and College then forwarded to the UCF College of Graduate Studies for status change. Only after admission to candidacy may a student register for doctoral dissertation hours (EML 7980).

Doctoral students admitted to candidacy are expected to enroll in dissertation hours and to devote full-time effort to conducting their dissertation research and writing the required dissertation document. Students in doctoral candidacy must continuously enroll in at least three hours of dissertation course work (EML 7980) each semester (including summer) until the dissertation is completed. Students wishing to enroll in part-time hours should consult with their adviser.

Dissertation Advisory Committee Membership

Doctoral students must have a Dissertation Advisory Committee prior to the Candidacy Examination. The Committee must consist of a minimum of five members: four must be faculty members of the graduate program faculty approved to direct dissertations, one of whom is qualified to serve as Chair, and one must be at large from outside the degree program. The committee Chair must be a member of the graduate faculty approved to direct dissertations. Adjunct faculty and off-campus experts may serve as the outside-the-college person in the committee. Program areas may further specify additional committee membership. The College of Graduate Studies reserves the right to review appointments to advisory committees, place a representative on any advisory committee, or appoint a co-adviser. Graduate Faculty members must form the majority of any given committee. Additional information regarding the criteria for serving as a member, co-chair, or chair of a Dissertation Advisory Committee is provided in the updated [Graduate Faculty policy](#).

Committee membership must be approved by the Program Coordinator and submitted to the College of Graduate Studies. All members must have expertise in fields related to the dissertation topic. The UCF College of Graduate Studies reserves the right to review appointments to a dissertation advisory committee, place a representative on any dissertation advisory committee, or appoint a co-chair. A student may request a change in membership of the dissertation advisory committee with the approval of the program director and re-submission to the College of Graduate Studies.

In unusual cases, with approval from the department Chair, a professor may serve as a co-chair of a committee. Joint faculty members may serve as committee chairs, but off-campus experts and adjunct faculty may not serve as committee chairs.

All members vote on acceptance or rejection of the dissertation proposal and the final dissertation. The dissertation proposal and final dissertation must be approved by a majority of the advisory committee.

Responsibilities of Members of Doctoral Advisory Committees

(See [Graduate Faculty policy](#) for the source of this text.)

Responsibilities of all members of doctoral advisory committees

- To meet at regular intervals at least once per year to: (i) discuss and approve the proposed dissertation research and the plans for carrying out research; and (ii) to assess progress toward the dissertation and give the student a yearly letter of evaluation in addition to S/U grades awarded for 7980 courses.
- To review results from the Review for Originality through iThenticate.com.
- To participate in the candidacy and/or dissertation prospectus examination. The entire committee shall be present for the oral part of the examination and it shall be conducted on campus, unless there is an accepted arrangement that has been approved by the graduate program committee.
- To participate in the dissertation defense to assure: (i) that the dissertation is acceptable as original research and a contribution to the discipline; and (ii) that it meets the standards of the university. No fewer than four faculty members, including all members of the advisory committee, shall be present with the student during the examination. Only members of the advisory committee may sign the dissertation, and a majority must approve of the dissertation. The dissertation defense must be

conducted on campus, unless there is an accepted joint degree program with another university that specifies a different arrangement that has been approved by the university.

Responsibilities of the chair (and co-chair) of doctoral advisory committees

- In cooperation with the program director, to review the plan of study, the research, and all other degree requirements by meeting with the student early in the program and immediately after appointment as chair/co-chair.
- To suggest to the student possible committee members who could serve on the advisory committee. To establish timelines for the research, set expectations, and evaluate the student progress based upon these.
- To meet at regular intervals with the student to discuss the proposed dissertation research and the plans for carrying out research.
- To review in a timely manner all written materials submitted by students and offer suggested revisions.
- To meet once per year with the student and the dissertation advisory committee to assess progress towards the dissertation and give the student a yearly letter of evaluation in addition to S/U grades awarded for 7980 courses. The chair shall write this letter and send it to the program director and the College of Graduate Studies after consultation with the advisory committee.
- To coordinate the ongoing efforts of the committee as its chair, and to participate fully in the responsibilities of the committee members as a member of the advisory committee.
- To chair the candidacy and/or dissertation prospectus examinations. The entire committee shall be present for the oral portion of the examination and it shall be conducted on campus, unless there is an accepted arrangement that has been approved by the graduate program committee.
- To chair the dissertation defense, ensure its proper conduct as described above, and submit to the program director for the student's records all necessary grades, forms and other materials.

Responsibilities of the external committee member of a dissertation advisory committee

- External committee membership will entail the full responsibilities of other committee membership
- External committee members should bring specific disciplinary knowledge or research expertise to the committee.
- External committee members may be appointed from outside of the university or outside of the college (if the committee is for a college-wide program). The external committee member may not be affiliated in any way with the department of the committee, such as through joint or secondary joint appointments.
- Graduate faculty scholars are external members.

It is the responsibility of the student, with agreement from their committee members, to schedule the date, time and location of their candidacy exam. There are room reservation programs available online, which can be used to schedule a classroom and/or conference room on campus. The student can seek the assistance of the ME program assistant if they need assistance with scheduling the room facilities.

Converting Doctoral Research to Dissertation

In the semester that a student successfully passes their candidacy exam, they are allowed to register for Doctoral Research credit hours and have those hours converted to dissertation hours once they formally pass their candidacy. The candidacy exam must be passed before the withdrawal deadline for that semester (this signifies the halfway point of the semester). The process for converting the hours is that the faculty advisor for that student submits a memo or informal email to the program assistant approving that their student has passed the candidacy exam. That memo/email is then used as the necessary backup for converting the student's hours from doctoral

research to dissertation with the College. It is at this stage in the process when the student formally decides their committee members for their dissertation. The member names are to be listed on the candidacy memo/exam.

Dissertation

A doctoral student's dissertation may be among their biggest academic efforts that they ever make. It is highly recommended for a student to discuss format and content with their advisor, and to peruse other theses or dissertations before getting started.

The following is from the [UCF Graduate Catalog Dissertation Requirements](#) section:

"Dissertations are required in all UCF PhD and EdD programs. The dissertation consists of an original and substantial research study designed, conducted, and reported by the student with the guidance of the dissertation committee. The written dissertation must include a common theme with an introduction and literature review, details of the study, and results and conclusions prepared in accordance with program and university requirements. The dissertation is expected to represent a significant contribution to the discipline. Since this work must be original, it is very important that care is taken in properly citing ideas and quotations of others. Failure to do so is academic dishonesty and subject to termination from the program without receiving the degree. An oral defense of the dissertation is required."

University Dissertation Requirements

The College of Graduate Studies [Thesis and Dissertation page](#) contains information on the university's requirements for dissertation formatting, format review, defenses, final submission, and more. A step-by-step completion guide is also available on [Thesis and Dissertation Services](#) Site.

All university deadlines are listed in the [Academic Calendar](#). Your program or college may have other earlier deadlines; please check with your program and college staff for additional deadlines.

The following requirements must be met by dissertation students in their final term:

- Submit a properly formatted file for initial format review by the format review deadline
- Submit the Thesis and Dissertation Release Option form well before the defense
- Defend by the defense deadline
- Receive format approval (if not granted upon initial review)
- Submit signed approval form by final submission deadline
- Submit final dissertation document by final submission deadline

Students must format their dissertation according to the standards outlined in [Thesis and Dissertation Webcourse](#). Formatting questions or issues can be submitted to the Format Help page in the [Thesis and Dissertation Services](#) site. Format reviews and final submission must be completed in the [Thesis and Dissertation Services](#) site. The Dissertation Approval Form is also available in the Thesis and Dissertation Services site.

The College of Graduate Studies offers several thesis and dissertation [Workshops](#) each term. Students are highly encouraged to attend these workshops early in the dissertation process to fully understand the above policies and procedures.

The College of Graduate Studies thesis and dissertation office is best reached by email at editor@ucf.edu.

Enrollment in Dissertation Hours

The university requires all doctoral students to take a minimum of 15 credit hours of doctoral dissertation hours; however, specific programs may require more than this minimum. Dissertation research is considered to be a full-time effort, and post-candidacy enrollment in at least three doctoral dissertation (EML 7980) credit hours constitutes full-time graduate status. Doctoral students who have passed candidacy and have begun taking doctoral dissertation hours (EML 7980) must enroll in at least three dissertation hours each semester (including summers, without skipping a semester) and continue doing so until they complete the dissertation and graduate. Students wishing to enroll in part-time hours should consult with their adviser.

ETD Thesis and Dissertation Web page: graduate.ucf.edu/thesis-and-dissertation/.

Dissertation Defense

Usually scheduled after completing and writing the dissertation. This exam determines whether the student has done satisfactory work and fully understands the work that he or she has done. The oral defense of the dissertation is administered by the dissertation committee which makes a critical inquiry into the work reported in the dissertation and into the areas of knowledge that are immediately relevant to the research. All members vote on acceptance or rejection of the dissertation. The dissertation must be approved by a majority of the Committee. The committee has the final say on whether the student passes or fails.

Scheduling a Room

It is the student's responsibility to schedule a room for their doctoral defense. They must make sure that it can seat all who may be in attendance and is equipped with all the necessary media capabilities that would be required for their defense presentation. Students may speak with the program assistant if needing guidance regarding choosing a room for their defense. Students must make sure to reserve the room well in advance of their defense date to ensure a quality location.

Defense Announcement

All students, upon agreement and approval from the dissertation chair/faculty advisor, must supply a defense announcement TWO WEEKS prior to their defense date, as it will be posted on the College of Engineering website. The defense announcement should include the following information: date, time, location, committee member names, dissertation title, abstract and that the defense is open to the public. Post announcements on the following website: cecs.ucf.edu/.

Committee Members Present

To participate in the candidacy and/or dissertation prospectus examination, the entire committee shall be present for the oral part of the examination. It shall be conducted on campus, unless there is an accepted joint degree program with another university that specifies a different arrangement that has been approved by the university.

Paperwork/Forms Completed During Defense

Prior to every defense, the program assistant will organize all necessary paperwork that needs to be completed by committee chair and all other committee members during the student's doctoral defense. It is the responsibility of the student to pick up these forms, have them filled out by the appropriate members, and submitted back to the program assistant for filing.

Annual Review

Information projected to be entered in 2019-2020.

Graduate Research

Research is a vital part of graduate education, particularly for doctoral students. The development of research skills and the practice of good research ethics begin with graduate study. Faculty does serve a crucial role and are the primary source for teaching research skills and modeling research ethics.

- In the Biomedical Engineering program, much of our research is carried out as a part of contracted sponsored research. Faculty obtains sponsored research from many different government agencies, and/or industry, and thus commit the university to doing certain research tasks. Students are typically hired to help the faculty conduct the research, and as such are contractually obligated to give their “best efforts” to accomplishing the research tasks. In most cases, students who are supported on contracts may use the results of their work as the basis for their thesis or dissertation.
- It is important to be honest and ethical in conducting research as well as in taking classes. Report all data factually and completely. Please see the Graduate Catalog for policies pertaining to [Academic Behavior Standards](#).
- Patents and inventions may arise from the faculty and graduate student research. UCF has clear guidelines and a [Patent Invention Policy](#) detailed in the UCF Graduate Catalog.
- There are specific Laboratory Safety Procedures that must be followed by each student working in a lab. It is the program policy that each student is responsible for knowing and following the Safety Procedures. Please see the laboratories manager and/or your faculty advisor to get a copy of the Safety Procedures for the appropriate lab.

Faculty in the department are very active researchers, 10 of the top 20 researchers in the College are MMAE faculty.

Financial Support

Financial support is a major concern for graduate students, especially since many rely on financial support from the University to pursue graduate study. In combination, the College, the University, and the Department provide financial assistance to graduate students in several ways: (1) fellowships and scholarships are available to academically outstanding students, (2) Graduate Teaching Assistantships – GTAs (for grading or for lab teaching) are available in limited numbers, (3) Graduate Research Assistantships – GRAs (for assisting faculty with research) are more widely available in the ME program and depend on the research funding available to individual faculty.

Assistantships

All students are expected to maintain a 3.0 GPA in their Plan of Study. They must not make any more than two ‘C’ grades, and those must be balanced with two ‘A’ grades. Students on contract are expected to work 10 to 20 hours per week on their assigned tasks (whether it be grading, lab teaching, or research), while they are maintaining satisfactory progress in completing their academic courses.

Students must meet their obligations to continue to receive their financial support. If the students are on time cards, the cards must be filled out properly and filed on time. If they are on contract, they must maintain satisfactory work as defined by their supervisor. Also, being on contract requires that the students register for the proper number of hours of classes in time to process tuition waivers and to meet other academic requirements.

The duration of financial support may vary from one academic year at a time to up to a 4-year renewable fellowship.

International students are expected to be here as full-time students, and may not work off campus except under very strict conditions. For more information regarding [International student employment](#), please see the Graduate Catalog.

Tuition Support and Health Insurance

Tuition support and student health insurance correspond with a student's assistantship. If a student is working full-time (20 hours/week) as a Graduate Research Assistant (GRA) or a Graduate Teaching Assistant (GTA), they automatically qualify for health insurance and for re-classification as "in-state" for tuition purposes and the academic portion of their in-state tuition will either be waived (if GTA) or paid on their behalf by their research advisor (if GRA). [Tuition remission information](#) along with frequently asked questions concerning tuition waivers can be found on the College of Graduate Studies [Funding](#) website. Information regarding paid [health insurance coverage](#) for qualifying graduate assistantship and university fellowship students can also be located on the College of Graduate Studies website.

Important Contacts

International Services Center, global.ucf.edu/

Financial Aid, finaid.ucf.edu/

UCF Graduate Catalog, catalog.ucf.edu/index.php?catoid=4

Graduate Student Associations

The Graduate Student Association (GSA) is UCF's graduate organization committed to enrich graduate students' personal, educational and professional experience. To learn more or get involved, please visit facebook.com/groups/UCFgsa/.

[American Society of Materials International \(ASM\)](#) disseminates technical information related to materials science and engineering, and enhances the professional preparation of members through information-sharing and interaction among members in forums and meetings, routine chapter activities and publications.

[American Society of Mechanical Engineers \(ASME\)](#) promotes and enhances the technical competency and professional well-being of our members, through quality programs and activities in mechanical engineering.

[American Institute of Aeronautics and Astronautics \(AIAA\)](#) broadens the horizons of students interested in Aerospace Engineering and aid their futures in Aerospace engineering by bridging the gap between students and the industry.

[Students for the Exploration and Development of Space \(SEDS\)](#) promotes space exploration and the drive to become a space fairing civilization by providing members with experience on real life projects.

[The Florida Engineering Society](#) prepares engineering students of all disciplines for the high level of performance and responsibility that is required to succeed in today's job market, while providing the opportunity to develop professional relationships with professional engineers, educators and peers.

[National Society of Black Engineers \(NSBE\)](#) strives to increase the number of culturally responsible black engineers who excel academically, succeed professionally, and positively impact the community.

[Society of Hispanic Professional Engineers \(SHPE\)](#) promotes the development of Hispanics in engineering, science and other technical professions.

[Society of Women Engineers \(SWE\)](#) is a useful resource for women in technical fields including engineering.

[Student Panel for Engineering and Computer Science](#) promotes student interests and achievements within the College and to the technical community at-large, serving as an advisory board to the Dean of the College of Engineering and Computer Science and as a coordinating body for college-wide events.

[Theta Tau Professional Engineering Fraternity](#) develops and maintains a high standard of professional interest among its members.

For the most current listing of student organizations for the discipline, visit the [Student Organizations webpage](#).

Professional Development

In this section, we identify university resources available to students for professional development. A graduate student's professional development goes beyond completing course work, passing exams, conducting research for a thesis or dissertation, and meeting degree requirements. Professional development also involves developing the academic and non-academic skills needed to become successful in the field of choice. UCF has an active professional development program for graduate students, including the following programs:

- Preparing Tomorrow's Faculty Program, sponsored by Faculty Center for Teaching and Learning
- Career Services and Experiential Learning
- Pathways to Success Workshops
- Graduate Research forum, sponsored by the College of Graduate Studies
- Facilitate summer internships for graduate students and inform students of such opportunities.
- The following are Graduate Awards of Excellence programs:
 - Award for Excellence by a Graduate Teaching Assistant
 - Award for Excellence in Graduate Student Teaching
 - Award for the Outstanding Dissertation

Students have many opportunities to further their careers while pursuing graduate work here at the university. While working with faculty advisors, they are able to present papers and posters at various conferences, develop their grant writing skills while assisting with proposals and gain notoriety through their publications.

Job Search

UCF's Career Services department offers a wide range of programs and services designed to assist graduate students. These services include evaluation and exploration of career goals, preparation for the job search and job search resources. To learn more, visit their website at career.ucf.edu/.

For specific services or resources provided by the academic program, please visit the [Career webpage](#) on the Department of Mechanical, Materials and Aerospace Engineering [website](#).

Forms

- [College of Engineering and Computer Science Forms](#)
A listing of forms for students in the College of Engineering.
- [College of Graduate Studies Forms and References](#)
A complete listing of general forms and references for graduate students, with direct links, may be found here.
- [Graduate Petition Form](#)
When unusual situations arise, petitions for exceptions to policy may be requested by the student. Depending on the type of appeal, the student should contact his/her program adviser to begin the petition process.
- [Special Registration Access Form](#)
Also located in the Academic Affairs office for CECS, ENG 1 – Room 107
- [Traveling Scholar Form](#)
If a student would like to take advantage of special resources available on another campus but not

available on the home campus; for example, special course offerings, research opportunities, unique laboratories and library collections, this form must be completed and approved.

Useful Links

- [Mechanical and Aerospace Engineering](#)
- [College of Engineering and Computer Science](#)
- [College of Graduate Studies](#)
- [Academic Calendar](#)
- [Bookstore](#)
- [Campus Map](#)
- [Counseling Center](#)
- [Financial Assistance](#)
- [Golden Rule Student Handbook](#)
- [Graduate Catalog](#)
- [Graduate Student Association](#)
- [Graduate Student Center](#)
- [Housing and Residence Life](#)
- [Housing, off campus](#)
- [Knights Email](#)
- [Library](#)
- [NID Help](#)
- [Office of Student Involvement](#)
- [Pathways to Success](#)
- [Recreation and Wellness Center](#)
- [Shuttles Parking Services](#)
- [Student Health Services](#)
- [Thesis and Dissertation \(ETD\)](#)
- [UCF Global](#)
- [UCF IT Technology Services](#)
- [University Writing Center](#)

Grad Faculty

Asterisk = has previous committee experience, which qualifies the person to serve as vice chair

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