

Department of Chemical &  
Biomedical Engineering

# Graduate Student Handbook

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FAMU-FSU  
Engineering

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**Department of Chemical & Biomedical Engineering  
Graduate Student Handbook**

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## 1. Background

The Florida A&M University-Florida State University (FAMU-FSU) College of Engineering is a joint college that serves Florida A&M University, which is a historically black institution founded in 1887, and The Florida State University, which traces its history back to 1851. Established in 1982 and located in Tallahassee, Florida, the mission of the FAMU-FSU College of Engineering is as follows: to provide an innovative academic program of excellence at the undergraduate and graduate levels, as judged by the highest standards and recognized by national peers; to attract and produce greater numbers of women and minorities in professional engineering, engineering teaching, and engineering research; and to attain national and international recognition of the College through educational and research achievements and professional service of its faculty and students. The FAMU-FSU College of Engineering has an enrollment of more than 2,100 undergraduate students and approximately 300 graduate students.

The Department of Chemical & Biomedical Engineering is committed to providing a high quality and modern education in the fundamental principles and practices of chemical and biomedical engineering. The fundamental unifying theme of chemical engineering is the study of multicomponent multiphase systems at both the molecular and macroscopic scale with particular emphasis on processes with chemical transformation, *i.e.*, chemical reaction. The biomedical engineering emphasis in CBE builds upon the chemical engineering strength and is focused on cellular and biochemical transformations in natural and synthetic environments. An integral part of the education process involves faculty and students conducting groundbreaking and innovative research in areas of critical importance to society. CBE seeks to prepare students for academic and professional work through classroom and laboratory instruction and research with modern experimental, mathematical and computational tools.

The vision of the Department of Chemical & Biomedical Engineering is to serve the state and nation by providing a leading educational and research program in chemical and biomedical engineering. We aim to capitalize on the fundamental strengths of (a) chemical engineering in the study and application of multi-component, multiphase transport and reaction processes and (b) biomedical engineering in the study of materials, processes, instrumentation and signal analysis to make innovative and creative advances that address pressing societal problems in human health, environment and industry.

### 1.1 Degrees Offered

CBE maintains undergraduate and graduate programs that lead to the following degrees:

- Bachelor of Science (BS) in Biomedical Engineering with majors in Biomaterials & Biopolymers, Cell & Bioprocess, and Image & Signal Processing
- Bachelor of Science (BS) in Chemical Engineering with majors in Chemical & Materials Engineering
- Master of Science (MS) in Biomedical Engineering (course work and thesis)
- Master of Science (MS) in Chemical Engineering (course work and thesis)
- Doctor of Philosophy (PhD) in Biomedical Engineering
- Doctor of Philosophy (PhD) in Chemical Engineering



The CBE graduate program has research areas in biomaterials, cellular & tissue engineering, imaging, nanoscale science & engineering, plasma reaction engineering, polymers & complex fluids, and renewable & advanced power production.

## 1.2 Graduate Program Objectives and Outcomes

**Program Objectives:** To provide the highest quality advanced biomedical & chemical engineering educational and research opportunities for graduate students, and advance statewide, national and international reputations for excellence in engineering education and research.

**Educational Outcomes:** Upon graduation, biomedical & chemical engineering students will have acquired the following skillset:

1. *Written and Oral Communication Skills:* The successful student demonstrates oral and written communication skills in the technical aspects of biomedical/chemical engineering.
2. *Analysis of Literature:* The successful student can analyze pertinent literature critically and fully, and determine the state-of-the-art in a given topic.
3. *Critical Thinking Skills:* The successful student demonstrates critical thinking skills and theoretical abilities in the field of biomedical/chemical engineering.
4. *Solve Chemical/Biomedical Engineering Problems Using Computational & Experimental Skills:* The successful student can solve biomedical/chemical engineering problems using simulations, experimental techniques, molecular and continuum theories, etc.
5. *Solve Original Research Problems:* The successful student will be able to propose and pursue original research in the field of biomedical/chemical engineering.

## 2. Admissions Requirements

Individuals seeking admission to graduate study in CBE must meet the criteria set by both the university and department. The following sections detail the admission requirements as set by the Department. Applicants should note that the Graduate Offices at both FAMU and FSU have additional requirements including application fees. Information on FAMU admission requirements may be found at [www.applyweb.com/famug](http://www.applyweb.com/famug) and FSU admission requirements may be found at [www.admissions.fsu.edu](http://www.admissions.fsu.edu). Because the college is shared between FAMU and FSU, applicants can apply for the CBE graduate program through either University depending on individual circumstances or preferences.

For Fall semester admission, application deadlines set by the department are as follows:

Decision Type	Deadline
Early Admissions	31 December
Full Funding Consideration/Admissions	1 February
Regular International Student Admissions	1 March
Regular Domestic (USA) Student Admissions	1 May

CBE primarily admits new graduate students in the Fall semester. Under special and unique conditions, new graduates can be admitted during the Spring and Summer semesters, but only with prior communication with the department. The universities may accept applications after the deadlines listed above. CBE will try to accommodate late applications, but processing of such applications is not guaranteed. CBE advises that applications and all supporting documents be

submitted well in advance of these department deadlines, especially for applicants interested in financial support (stipends, tuition and other financial support). In addition to the admission requirements of each University, a candidate for post-baccalaureate study in CBE also must meet the following requirements based on the intended degree.

## 2.1 MS Program (Thesis or Course)

Under the disciplines of biomedical engineering or chemical engineering, the Master of Science (MS) degree has two degree options. The thesis MS degree has a research component and requires completion of a thesis. The course-based MS degree requires only the successful completion of coursework. CBE admission requirements for the MS degree program are as follows:

1. A baccalaureate degree in biomedical engineering, chemical engineering or an allied field from an accredited college or university;
2. Fulfillment of the requirements for the baccalaureate degree or its equivalent. Students may be required to satisfy deficiencies by taking undergraduate courses (see below) or can enroll in a transitional summer program (Section 2.6) if they do not have a degree from an accredited chemical engineering degree program;
3. An undergraduate or graduate GPA of 3.0 (on a 4.0 scale) or higher;
4. GRE requirement or waiver: For thesis MS applicants, a minimum GRE percentile of at least 48% on the verbal portion and 75% on the quantitative portion of the test. It is noted that the GRE percentiles of funded graduate students on assistantship are typically higher than these minima. For course MS applicants, a GRE score meeting the above minima is required unless the applicant meets the criteria for a GRE waiver, as indicated in Section 2.5.
5. Three letters of recommendation from persons familiar with the student's work and background;
6. A personal statement of professional goals; and
7. *International students*: For students whose native language is not English and who did not graduate from an accredited US institution with either a BS or MS degree, minimum scores on the TOEFL are 550 (paper-based), 213 (computer-based) or 80 (Internet-based).

**Students who do not possess a bachelor's degree in biomedical or chemical engineering** may be required to complete a department-designated sequence of undergraduate courses with a grade of "B" or higher in each course or may be eligible for an accelerated transitional program taken during the summer prior to full enrollment. Up to six (6) semester hours of 4000-level coursework approved by the Department may be counted as graduate electives. Transfer credit from another institution is limited to six (6) hours with departmental approval. Typical undergraduate course sequences (in preparation for graduate courses) include the following:

1. ECH 3023 - Mass and Energy Balances I (3)
2. ECH 3024 - Mass and Energy Balances II (3)
3. ECH 3101 - Chemical Engineering Thermodynamics or BME 3622 – Biothermodynamics (3)
4. ECH 3301 - Chemical Engineering Process Analysis (3)
5. ECH 3266 - Introductory Transport Phenomena or BME 3261 – Biotransport Phenomena (3)
6. ECH 3418 - Separations Processes or BME 3100 – Biomaterials (3)
7. ECH 3854 - Chemical Engineering Computations or BME 3702 – Biocomputations (3)
8. ECH 4267 - Advanced Transport Phenomena or BME 4211 – Biomechanics (3)
9. ECH 4504 - Kinetics and Reactor Design (3)
10. BME 4403/4C – Quantitative Anatomy & Systems Physiology I & II (3)

## 2.2 BS-MS Pathway

CBE has implemented a Bachelor of Science and Master of Science (BS-MS) pathway based on the existing bachelor and master of science degree programs that cover the areas of Chemical and Biomedical Engineering. The Department wants to allow academically talented students to obtain both a BS and MS degree in a shorter time span (five years), while still producing engineers that are qualified fully to enter professional practice in industry. This program is designed for students pursuing an undergraduate degree in Biomedical or Chemical Engineering who also wish to obtain a graduate degree in either Biomedical or Chemical Engineering. Well-qualified students who expect to have a GPA of 3.0 or better in engineering studies are invited to apply for the program during the spring semester of their third year in the College. Students who have graduated by this pathway have successfully been able to find jobs or have pursued advanced degrees in Chemical Engineering, Materials Engineering, Biomedical Engineering, Medicine, Business, Patent Law and other related fields.

## 2.3 BS-MS Pathway Application Procedure

Students initiate the process to enter the BS-MS pathway by meeting with their advisor to determine eligibility. If qualified, the student submits an online application for review by the CBE Graduate Committee. If accepted by the committee, the student must maintain a GPA of 3.0 and take the Graduate Record Examination (GRE) during the first semester of their senior year, meeting the minimum score to satisfy MS admission requirements, or apply for a GRE waiver (Section 2.5).

A senior or upper-division honors student may carry graduate courses for dual undergraduate-graduate credit provided the student:

- 1) has earned either a grade point average (GPA) of 3.0 ("B") or;
- 2) carries a course load of no more than fifteen (15) semester credit hours;
- 3) has the advance approval of the Dean, the CBE Chair/Graduate Director, and the instructor offering any graduate course, prior to registration. The student must have eligibility certified in the Office of the University Registrar before seeking approval of those listed in Item 3.

Upon admission to the graduate program, up to twelve (12) but no less than nine (9) semester hours may be counted toward the combined program's MS degree, provided the course has not been counted towards a previous degree, with the exception of the undergraduate degree that is part of the BS-MS pathway. Eligible applicants must have completed the following coursework before taking graduate coursework:

Biomedical Engineering Majors	Chemical Engineering Majors
BME 3100 – Biomaterials	ECH 3101 – Thermodynamics
BME 3261 – Biotransport Phenomena	ECH 3266 – Transport Phenomena I
BME 3622 – Biothermodynamics	ECH 3854 – Chemical Engineering Computations
BME 3702 – Biocomputations	ECH 3274L – Transport Phenomena Lab
BME 4211 – Biomechanics	ECH 3418 – Separations Process
BME 4403/4C – Quantitative Anatomy and Systems Physiology I & II	ECH 4267 – Transport Phenomena II
BME 4503/L – Bioinstrumentation	ECH 4937 – Chemical Engineering Statistics

## 2.4 PhD Degree

Under the disciplines of biomedical engineering or chemical engineering, CBE has two degree tracks in the PhD program. Applicants may enter either discipline with either a BS or MS degree, with the latter typically earning some transfer of credit towards the terminal degree (discussed later). Admissions requirements for the PhD program are as follows:

1. A baccalaureate degree in biomedical engineering, chemical engineering or an allied field from an accredited college or university;
2. Fulfillment of the requirements for the baccalaureate degree or its equivalent. Students may be required to satisfy deficiencies by taking undergraduate courses (see below) or can enroll in a transitional summer program (Section 2.6) if they do not have a degree from an accredited chemical engineering degree program;
3. An undergraduate or graduate GPA of 3.0 (on a 4.0 scale) or higher;
4. GRE requirement or waiver: For thesis MS applicants, a minimum GRE percentile of at least 48% on the verbal portion and 75% on the quantitative portion of the test. It is noted that the GRE percentiles of funded graduate students on assistantship are typically higher than these minima. For course MS applicants, a GRE score meeting the above minima is required unless the applicant meets the criteria for a GRE waiver, as indicated in Section 2.5.
5. Three letters of recommendation from persons familiar with the student's work and background;
6. A personal statement of professional goals;
7. Maintenance of a high scholastic graduate record at the previous college or university attended (if applicable); and
8. *International students*: For students whose native language is not English and who did not graduate from an accredited US institution with either a BS or MS degree, minimum scores on the TOEFL are 550 (paper-based), 213 (computer-based) or 80 (Internet-based).

Applicants who meet admission requirements are encouraged to apply directly for the PhD program. Students who maintain a 3.0 graduate GPA and demonstrate proficiency in conducting research in biomedical or chemical engineering by passing the CBE PhD qualifying examination (see PhD Qualifying Examination Requirements for more details) are admitted to PhD candidacy. Students who fulfill these requirements may, upon approval of the graduate committee and major supervisor, proceed directly toward the PhD without first obtaining a MS degree.

Students with a thesis MS degree in biomedical or chemical engineering from the FAMU-FSU College of Engineering may, with approval of the graduate committee and major professor, take nine (9) additional approved semester hours beyond the MS requirements to satisfy the 30-hour course requirement for the PhD. All other requirements must be fulfilled as stated below. Students with MS degrees from other institutions will be given a specific course plan by the departmental graduate committee.

## 2.5 GRE Waiver

All individuals applying to FAMU-FSU Engineering graduate degree programs must submit a valid GRE general exam result. However, course-based MS applicants may obtain a GRE waiver if one of the following criteria is met. To be considered for a GRE waiver, the online approval form



([www.eng.famu.fsu.edu/student/gre-waiver-form](http://www.eng.famu.fsu.edu/student/gre-waiver-form)) must be completed.

- A completed MS or PhD degree with a GPA of 3.0/4.0 or higher from a regionally accredited institution
- Three (3) years of professional experience working in an engineering or related field, and a 3.0/4.0 or higher engineering undergrad GPA
- FAMU or FSU undergraduate student with an upper-division engineering GPA of 3.2/4.0 or higher and an overall GPA of 3.4/4.0 or higher.

**Additional GRE Waiver Option for Internal COE Students.** This waiver option is specifically for FAMU-FSU Engineering students and alumni. Unlike the waiver option above, this GRE waiver option can be chosen for both MS and PhD applicants. An eligible candidate that meets **all** of the following criteria must complete an online form ([www.eng.famu.fsu.edu/student/gre-waiver-form](http://www.eng.famu.fsu.edu/student/gre-waiver-form)).

- FAMU-FSU Engineering student or alumnus
- Completed, or will complete prior to matriculation in the graduate program, a degree from the same department as the intended new graduate application
- Upper-Level undergraduate or graduate GPA of 3.2 or above
- Provide a favorable letter of recommendation from a FAMU-FSU Engineering faculty member during the application process

## 2.6 Transition Program for Majors outside of Biomedical or Chemical Engineering

CBE has instituted an accelerated transition program for prospective graduate students who have undergraduate degrees from outside of traditional Chemical or Biomedical Engineering majors. These applicants would follow the preparatory curriculum shown below in order to enter the FAMU-FSU CBE graduate program formally.

### **Targeted Applicants:**

- Applicants with non-CBE BS degrees in engineering.
- Applicants with Physics BS degrees.
- Applicants with Chemistry or Biology BS degrees having strong math skills (thru Ordinary Differential Equations [ODE]).

### **Eligibility Requirements:**

1. Students having to take any mathematics through differential equations would need to complete these prior to entrance. Students needing a course in ordinary differential equations should take ECH 3301.
2. Other graduate electives or thesis hours can be taken during the first two years if prerequisites are met.
3. Courses prior to the first Fall Semester would be at the student's expense or supported by CBE based on availability of funds.
4. The qualifying examination would follow immediately after the first Fall Semester unless petition is made to the graduate committee to delay. MS (course-based) would be awarded after the 2<sup>nd</sup> Spring semester. MS thesis would be awarded after defense of the thesis.

**Streamlined course requirements for non-Biomedical or Chemical Engineering majors:**

- ECH 5000 (Graduate Transition Course for Non-majors) – Combined summer course of Mass & Energy Balances, Transport I & II and Thermodynamics for accelerated preparation for entering students. One 3-hr 12-week course (Summer term A) must be taken during the summer semester before core BME/ECH coursework.
- ECH 4504 – Kinetics & Reactor Design (3) – required completion of this senior undergraduate course (either as an undergraduate course or graduate section) during either the Fall or Summer semesters after completion of ECH 5000.

**Proposed Plan of Study – Transition Program**

FIRST YEAR	
<b>Summer Semester</b>	<b>3</b>
ECH 5000 – Transition Course (Mass & Energy Balances, Thermodynamics & Transport) – 12-week course	3
<b>Fall Semester</b>	<b>12</b>
ECH 5052 - Research Methods in Chemical Engineering	3
ECH 5261 - Adv. Transport	3
ECH 5840 - Adv. ChE Math	3
ECH 4504 - Kinetics & Reactor Design (or subsequent summer semester)	3
<b>Spring Semester</b>	<b>9</b>
ECH 5126 - Adv. Thermo. or BME Cell	3
Elective	3
Elective	3

### 3. Program Requirements

#### 3.1 Biomedical Engineering MS Program – Thesis Option

The Master of Science (MS) in Biomedical Engineering with thesis provides students with education in advanced biomedical engineering topics as well as research experience culminating in a thesis.

**Curriculum.** The MS curriculum includes a total of 30 semester hours, consisting of coursework and thesis research (see below). To enroll in a course, students must satisfy the course prerequisites. Students entering the major without a biomedical or chemical engineering degree also must satisfy the transition program requirements or an alternate plan of study provided by the CBE graduate committee.

The thesis-type MS degree is awarded upon successful completion of the following requirements:

1. Twelve (12) semester hours of biomedical engineering graduate core courses (see below)
2. Nine (9) semester hours of approved electives
3. Nine (9) semester hours of BME 5971r, Thesis
4. Oral defense of the MS thesis - BME 8976, Thesis Defense (0) (P/F grade only)
5. Registration and attendance at all departmental seminars - BME 5935, BME Seminar (0)

No course with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements. The candidate also must complete and defend an original thesis (BME 8976, Thesis Defense).

Transfer credit from another institution is limited to six (6) semester hours towards the MS degree and only with departmental approval.

#### **Graduate Biomedical Engineering Core Courses (twelve [12] semester hours):**

ECH 5052 - Research Methods in Chemical Engineering (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

XXX XXXX - Approved Course in Physiology or Cell Biology (3)

An approved course in Physiology or Cell Biology is required for completion of the graduate BME degree. Approved courses include: PCB 5746 - Mammalian Physiology I; PCB 5747 - Mammalian Physiology II; PCB 5796 - Sensory Physiology; PCB 5835 - Neurophysiology; PCB 5137 - Advanced Cell Biology; PCB 5525 - Molecular Biology; PCB 5845 - Cell and Molecular Neuroscience; and BCH 5405 - Molecular Biology. Additional courses may satisfy the physiology/biology requirement but require petition to the Graduate committee for approval as a core substitute.

#### **Biomedical Engineering Electives (nine [9] semester hours):**

Students should consult major professor to determine the elective courses offered by the department. Additional elective courses may be found in the University Graduate Bulletin.

#### **Thesis Hours (nine [9] semester hours):**

BME 5971r - Thesis (1-9) (S/U grade only)

#### **Thesis Defense (zero [0] semester hours):**

BME 8976 - Thesis Defense (0) (P/F grade only) - In addition to the thirty (30) semester hours of

coursework and thesis, an oral examination in defense of the thesis is required for the Master of Science in biomedical engineering thesis option.

**NOTE: In the semester of the THESIS DEFENSE (BME 8976), degree candidates must take a minimum number of thesis hours simultaneously. Currently, the minimum number of thesis hours (BME 5971r) is two (2) during the semester of defense.**

### 3.2 Chemical Engineering MS Program – Thesis Option

The Master of Science (MS) in Chemical Engineering with thesis provides students with education in advanced chemical engineering topics as well as research experience culminating in a thesis.

**Curriculum.** The MS curriculum includes a total of 30 semester hours, consisting of coursework and thesis research (see below). To enroll in a course, students must satisfy the course prerequisites. Students entering the major without a chemical engineering degree also must satisfy the transition program requirements or an alternate plan of study provided by the CBE graduate committee.

The thesis-type MS degree is awarded upon successful completion of the following requirements:

1. Twelve (12) semester hours of chemical engineering graduate core courses (see below)
2. Nine (9) semester hours of approved electives
3. Nine (9) semester hours of ECH 5971r, Thesis
4. Oral defense of the MS thesis - ECH 8976, Thesis Defense (0) (P/F grade only)
5. Registration and attendance at all departmental seminars - ECH 5935, ChE Seminar (0)

No course with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements. The candidate also must complete and defend an original thesis (ECH 8976, Thesis Defense).

Transfer credit from another institution is limited to six (6) semester hours towards the MS degree and only with departmental approval.

#### **Graduate Chemical Engineering Core Courses (twelve [12] semester hours):**

ECH 5052 - Research Methods in Chemical Engineering (3)

ECH 5126 - Advanced Chemical Engineering Thermodynamics I (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

#### **Chemical Engineering Electives (nine [9] semester hours):**

Students should consult major professor to determine the elective courses offered by the department. Additional elective courses may be found in the University Graduate Bulletin.

#### **Thesis Hours (nine [9] semester hours):**

ECH 5971r - Thesis (1-9) (S/U grade only)

#### **Thesis Defense (zero [0] semester hours):**

ECH 8976 - Thesis Defense (0) (P/F grade only) - In addition to the thirty (30) semester hours of coursework and thesis, an oral examination in defense of the thesis is required for the Master of

Science in chemical engineering thesis option.

**NOTE: In the semester of the THESIS DEFENSE (ECH 8976), degree candidates must take a minimum number of thesis hours simultaneously. Currently, the minimum number of thesis hours (ECH 5971r) is two (2) during the semester of defense.**

### 3.3 Common MS Thesis Requirements

**3.3.1 Safety Training.** CBE places a priority on the conduct of research in a safe and responsible fashion. Therefore, all MS thesis students are required to take a minimum of safety training courses offered by the FSU Office of Environmental Health & Safety ([www.safety.fsu.edu](http://www.safety.fsu.edu)). For all new students, these in-person courses are arranged with FSU EH&S as part of the CBE Fall Orientation, and include: General Laboratory Safety/Hazard Communication/Right-to-Know and Fire Safety. For BME students, additional training is provided and required: Biomedical Waste/Bloodborne Pathogens/Biosafety Level 2 and Above Laboratory Training. In addition, new students are required to complete online safety training modules on: Electrical Safety Awareness, Compressed Gas Safety, Cryogen Safety and Laboratory Facility Engineering Controls. Additional training may be required by individual research laboratories as mandated by the parameters of research and the major professor. Finally, continuing graduate students are required to maintain safety training compliance by completing online refresher courses annually when requested by FSU EH&S and its automatic training notification system.

**3.3.2 Program for Instructional Excellence.** All MS graduate students are required to attend the FSU Program for Instructional Excellence (PIE) Workshop ([www.pie.fsu.edu](http://www.pie.fsu.edu)) if they are to be assigned to teaching assistant (TA) duties. This requirement is mandatory regardless of the student's classification as a teaching assistant or research assistant. This workshop is provided before the beginning of the fall semester, with a modified version at the start of the spring semester for out-of-cycle admissions.

**3.3.3 Major professor and supervisory committee.** The MS student must select a major professor and a supervisory committee by the beginning of the second semester in the program. The major professor must agree to serve as the student's academic advisor and thesis supervisor, and must be a full-time CBE faculty with Graduate Faculty/Directive status.

The MS student chooses the supervisory committee in consultation with the major professor. The supervisory committee consists of three (3) full-time faculty members, including the major professor as the chair; one member may be from outside of CBE. All committeemembers must have Graduate Faculty status. Additional members may be appointed to the committee if deemed appropriate by the major professor. The supervisory committee oversees and supervises the student's research effort, approves the written thesis, attends the oral defense of the thesis and recommends granting of the degree. The Thesis committee should be submitted to the CBE Graduate Coordinator such that membership of the supervisory committee can be recorded at the Department as well as the University Graduate School or Office as required.

**3.3.4 Plan of Study.** The MS student, in consultation with his/her major professor, establishes the Plan of Study and should discuss this plan with the Thesis committee. A typical Plan of Study (see



Section 8) includes a list of proposed courses, a time schedule for completion of these courses, and a summary of the proposed thesis topic. The Plan of Study is used by the student and major professor as a guideline throughout the student's MS study and should be updated if changes occur. This Plan of Study should be reflected in the Annual Evaluation submitted by the student and major professor.

**3.3.5 Annual Evaluation.** All MS students must report their annual educational and research progress to their supervisory committee at least once a year, typically in the form of an oral presentation. In addition, all students will use the Departmental Annual Evaluation form to provide an update on and changes to the Plan of Study, a self-evaluation of progress over the last year, and an evaluation by the major professor. After discussions with the student, the major professor should submit this Annual Evaluation (and any other annual evaluation forms required by the Department, College or University, e.g. the FAMU Annual Evaluation for graduate students, Form 2) by the end of the spring semester. The instructions and form for the Annual Evaluation can be found online ([www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)).

**3.3.6 Thesis.** The MS student selects the thesis topic and prepares the thesis with supervision by the major professor and supervisory committee. Before registering for thesis hours, the student must consult the major professor as to the proportion of time to be devoted to thesis work. It is the student's responsibility to comply with the required thesis format of the University and the deadlines and requirements for thesis submission (see FAMU: [www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies) or FSU: [www.gradstudies.fsu.edu](http://www.gradstudies.fsu.edu)).

When the complete thesis is ready for review by the supervisory committee, the major professor will authorize its distribution to committee members. The thesis manuscript should be complete in every respect, including data analysis, figures and tables. The supervisory committee can recommend editorial and/or substantive changes after review and the oral thesis defense. The thesis should be provided to the supervisory committee at least two (2) weeks before the date of the oral thesis defense.

**3.3.7 Journal manuscripts.** In partial fulfillment of the MS degree requirements, the MS student must prepare a minimum of one (1) complete manuscript that is ready for submittal to a peer-reviewed journal. It is expected that the major professor will submit the manuscript and complete the publication process.

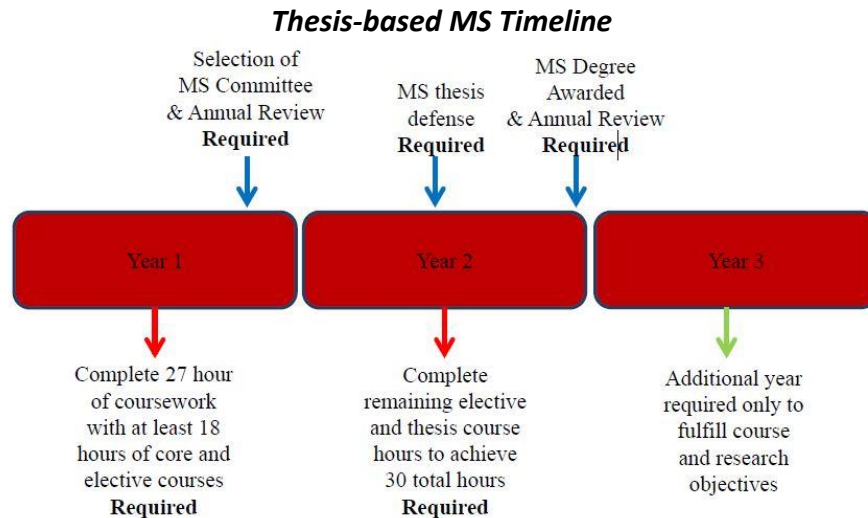
**3.3.8 Thesis defense.** A thesis defense with oral examination is a mandatory part of the degree requirements. The student must satisfactorily pass this oral examination, as determined by the supervisory committee, before submission of the final thesis to the University.

- The thesis defense will be scheduled only with approval of the major professor, supervisory committee and Department.
- The defense should be scheduled before the final thesis submission deadline with sufficient time to allow for revisions; see University deadlines.
- The thesis defense shall be announced according to College and University policies, and will open be to the public.
- The oral defense consists of two parts: 1) a defense presentation that includes appropriate

use of visual aids and has a duration of 30-40 minutes and 2) oral examination by the supervisory committee.

- The outcome of the thesis defense is determined by the supervisory committee and is reported by the major professor to the Department on the Thesis Defense Assessment form ([www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)).

**3.3.9 Suggested timeline and checklist.** A suggested timeline for completion of the MS degree requirements and a milestones checklist are provided below, respectively. Students may need to enroll in additional hours to maintain full-time status each semester.



**Thesis MS Milestone Checklist**

Milestone or Action	When
Select a Major Professor	By beginning of 2 <sup>nd</sup> semester
Define Plan of Study	By end of 2 <sup>nd</sup> semester
Request transfer credit (if applicable)	By end of 2 <sup>nd</sup> semester
Complete RCR training	By end of first year
Submit Annual Evaluations	By the end of each spring semester
Apply for graduation with University	Beginning of final semester
Prepare a manuscript for journal submission	Final semester
Schedule thesis defense	In final semester, at least two weeks prior to planned defense date
Defend thesis	
Submit Thesis Assessment form to Department	Check University for deadlines
Submit approved final MS thesis to University	
Complete Exit Survey	End of final semester

**3.4 Biomedical Engineering MS Program – Course Option**

The Master of Science (MS) in Biomedical Engineering by coursework provides students with additional educational background in advanced biomedical engineering topics.

**Curriculum.** The MS curriculum includes a total of 30 semester hours, consisting solely of coursework

(see below). To enroll in a course, students must satisfy the course prerequisites. Students entering the major without a biomedical or chemical engineering degree also must satisfy the transition program requirements or an alternate plan of study provided by the CBE graduate committee.

The course-based MS degree is awarded upon successful completion of the following requirements:

1. Nine (9) semester hours of biomedical engineering graduate core courses (see below)
2. Twenty-one (21) semester hours of approved electives
3. Registration and attendance at all departmental seminars - BME 5935, BME Seminar (0)

No course with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements.

Transfer credit from another institution is limited to six (6) semester hours towards the MS degree and only with departmental approval.

Note: Departmental support generally is not available for students pursuing a non-thesis MS degree.

***Graduate Biomedical Engineering Core Courses (nine [9] semester hours):***

ECH 5126 - Advanced Chemical Engineering Thermodynamics I (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

***Biomedical Engineering Electives (twenty-one [21] semester hours):***

Students should consult the CBE graduate coordinator or director to determine the elective courses offered by the Department. Additional elective courses may be found in the University Graduate Bulletin.

### ***3.5 Chemical Engineering MS Program – Course Option***

The Master of Science (MS) in Chemical Engineering by coursework provides students with additional educational background in advanced chemical engineering topics.

***Curriculum.*** The MS curriculum includes a total of 30 semester hours, consisting solely of coursework (see below). To enroll in a course, students must satisfy the course prerequisites. Students entering the major without a chemical engineering degree also must satisfy the transition program requirements or an alternate plan of study provided by the CBE graduate committee.

The course-based MS degree is awarded upon successful completion of the following requirements:

1. Nine (9) semester hours of chemical engineering graduate core courses (see below)
2. Twenty-one (21) semester hours of approved electives
3. Registration and attendance at all departmental seminars - ECH 5935, ChE Seminar (0)

No course with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements.

Transfer credit from another institution is limited to six (6) semester hours towards the MS degree

and only with departmental approval.

Note: Departmental support generally is not available for students pursuing a non-thesis MS degree.

**Graduate Chemical Engineering Core Courses (nine [9] semester hours):**

ECH 5126 - Advanced Chemical Engineering Thermodynamics I (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

**Chemical Engineering Electives (twenty-one [21] semester hours):**

Students should consult the CBE graduate coordinator or director to determine the elective courses offered by the Department. Additional elective courses may be found in the University Graduate Bulletin.

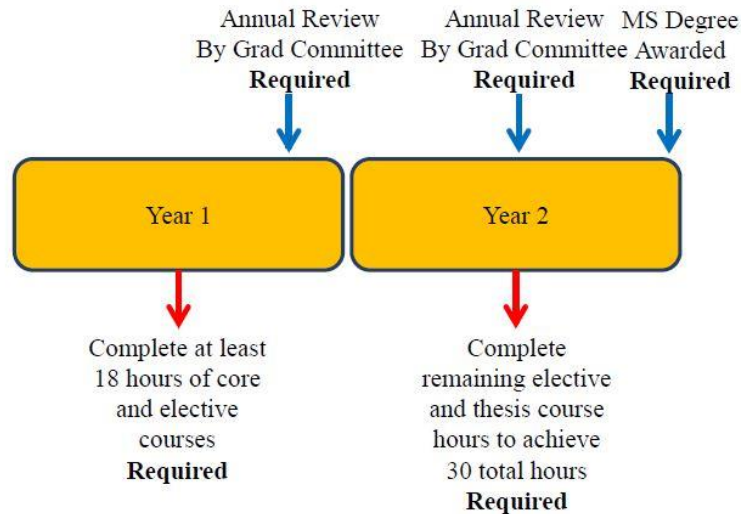
### **3.6 Common Course-based MS Requirements**

**3.6.1 Safety Training.** CBE places a priority on safety and training. Therefore, all course-based MS students are encouraged to take safety training courses offered by the FSU Office of Environmental Health & Safety ([www.safety.fsu.edu](http://www.safety.fsu.edu)). For all new students, these in-person courses are arranged with FSU EH&S as part of the CBE Fall Orientation, and include: General Laboratory Safety/Hazard Communication/Right-to-Know and Fire Safety. For BME students, additional training is available: Biomedical Waste/Bloodborne Pathogens/Biosafety Level 2 and Above Laboratory Training. In addition, new course-based MS students are encouraged to complete online safety training modules on: Electrical Safety Awareness, Compressed Gas Safety, Cryogen Safety and Laboratory Facility Engineering Controls. These safety course and additional training are required to perform any work in individual research laboratories as mandated by the parameters of research and the major professor. Finally, continuing graduate students can maintain safety training compliance by completing online refresher courses annually when requested by FSU EH&S and its automatic training notification system.

**3.6.2 Program for Instructional Excellence.** All MS graduate students are required to attend the FSU Program for Instructional Excellence (PIE) Workshop ([www.pie.fsu.edu](http://www.pie.fsu.edu)) if they are to be assigned to teaching assistant (TA) or grader duties. This workshop is provided before the beginning of the fall semester, with a modified version at the start of the spring semester for out-of-cycle admissions.

**3.6.3 Suggested timeline and checklist.** A suggested timeline for completion of the course-based MS degree requirements and a milestones checklist are provided below, respectively. Students may need to enroll in additional hours to maintain full-time status each semester.

#### **Course-based MS Timeline**



**Course-based MS Milestone Checklist**

<i><b>Milestone or Action</b></i>	<i><b>When</b></i>
Define Plan of Study	By end of 2 <sup>nd</sup> semester
Request transfer credit (if applicable)	By end of 2 <sup>nd</sup> semester
Annual evaluations (default advisor, CBE Graduate Director)	By the end of each spring semester
Apply for graduation with University	Beginning of final semester
Complete Exit Survey	End of final semester

**3.6.4 Annual Evaluation.** All course-based MS students will be evaluated in the Spring semester by the CBE Graduate Coordinator and Director based on their progression through required coursework.

**3.7 BS-MS Pathway**

This pathway provides academically talented undergraduate students an opportunity to complete both a BS and MS degree in five (5) years. Upon approval, this pathway allows at least nine (9) but up to twelve (12) graduate hours to be double-counted toward an undergraduate degree program. The successful BS-MS student will earn the Bachelor of Science (BS) degree upon completion of the undergraduate program and the course-based Master of Science (MS) degree upon completion of the graduate program.

The program requirements for the graduate portion of this pathway are identical to the course-based MS program requirements above for Biomedical Engineering (Section 3.3) or Chemical Engineering (Section 3.4), with the only difference being that BS-MS students take up to 12 hours of coursework as senior undergraduates to reduce their graduate year course load to 18-20 hours.

The FAMU-FSU College of Engineering offers a tuition supplement to cover the tuition differential for up to twelve (12) credit hours of graduate coursework taken by eligible undergraduate students in the program, meaning undergraduate BS-MS students will pay only undergraduate rates for double-counted graduate courses, as long as eligibility criteria are maintained. Once BS-MS students



completes the undergraduate degree and enroll in the graduate program, regular graduate tuition rates apply. The course-based MS degree is intended to be self-funded; assistantships and tuition waivers are not available, although departmental grading positions (hourly OPS) may be available to defer some of the costs of matriculation.

**Suggested timeline.** A suggested timeline for completion of the BS-MS pathway requirements is provided.

### Outline of the BS-MS Pathway: Program of Study

SENIOR YEAR (4 <sup>TH</sup> year)			
Fall Semester	13	Spring Semester	13
ECH 4404L - Unit Ops. Lab	3	ECH 4323 - Process Control	3
ECH 4604 - ChE Proc. Design I	4	ECH 4323L - Process Control Lab	1
5000-level Chemical/Biomedical Engr. Elective #1	3	ECH 4615 - ChE Proc. Design II	3
5000-level Chemical/Biomedical Engr. Elective #2	3	5000-level Chemical/Biomedical Engr. Elective #3	3
		5000-level Chemical/Biomedical Engr. Elective*	3
GRADUATE YEAR (1 <sup>ST</sup> year)			
Fall Semester	12	Spring Semester	9
ECH 5261 - Advanced Transport Phenom. I	3	ECH 5126 - Adv. Chem. Eng. Thermo. I (ChemE) or Core Grad Physiology/Cell Biology (BME)	3
ECH 5840 - Advanced ChE Math	3	5000-level Chemical/Biomedical Engr. Elective	3
5000-level Chemical/Biomedical Engr. Elective	3	5000-level Chemical/Biomedical Engr. Elective	3
5000-level Chemical/Biomedical Engr. Elective <sup>x</sup>	3	ECH/BME 5935, ChE/BME Seminar	0
ECH/BME 5935, ChE/BME Seminar	0		

\*Optional course during Undergraduate Senior Year

<sup>x</sup>Not required if four courses are taken in Undergraduate Senior Year

Green courses are double counted towards the BS and MS degrees; a minimum on nine (9) credit hours are counted in this fashion.

### 3.8 Biomedical Engineering PhD Program

The PhD degree in Biomedical Engineering is a research degree designed to produce a scholar; it is granted only to students who have demonstrated mastery in a specialty of biomedical engineering and capacity to conduct original and independent scholarly work.

**Curriculum.** Fifty-seven (57) semester hours are required for the PhD degree in BME as follows:

1. Twelve (12) semester hours of BME core courses
2. Eighteen (18) semester hours of approved electives
3. Twenty-seven (27) semester hours of BME 6980r, Dissertation
4. Successful completion of BME 8965r, Doctoral Qualifying Exam (0) (P/F grade only)
5. Successful defense of an oral and written dissertation - BME 8985, Dissertation Defense (0) (P/F grade only)
6. Registration and attendance at all departmental seminars - BME 5935, BME Seminar (0)

No courses with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements.

**Required Biomedical Engineering Core Graduate Courses (twelve [12] semester hours):**

ECH 5052 - Research Methods in Chemical Engineering (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

XXX XXXX - Approved Course in Physiology or Cell Biology (3)

An approved course in Physiology or Cell Biology is required for completion of the graduate BME degree. Approved courses include: PCB 5746 - Mammalian Physiology I; PCB 5747 - Mammalian Physiology II; PCB 5796 - Sensory Physiology; PCB 5835 - Neurophysiology; PCB 5137 - Advanced Cell Biology; PCB 5525 - Molecular Biology; PCB 5845 - Cell and Molecular Neuroscience; and BCH 5405 - Molecular Biology. Additional courses may satisfy the physiology/biology requirement but require petition to the Graduate committee for approval as a core substitute.

**BME PhD Doctoral Qualifying Examination (zero [0] semester hours):**

BME 8965r - Doctoral Qualifying Exam (0) (P/F grade only) – After the first semester of matriculation in the PhD program, students will take the PhD Qualifying Examination as the first step toward PhD candidacy. Currently, this course and its examination are held in the Spring semester, and students are expected to enroll and complete the examination at that time. Retakes of the examination occur in a subsequent semester, with current policy dictating a 2<sup>nd</sup> attempt in the following fall semester. Students are permitted only two attempts before dismissal from the PhD program. See Section 3.11.1 for details.

**NOTE: Following successful completion of the Qualifying Examination, students must take a minimum number (currently, two) of dissertation hours (BME 6980r) EVERY semester that they remain in the PhD program regardless of other class loads. As most tuition waivers provide a maximum of nine (9) credit hours per term, students must consider this requirement when registering for multiple courses, and should consult the major professor and CBE Graduate Director for guidance before enrolling for more than nine hours.**

**Dissertation Defense (zero [0] semester hours):**

BME 8985 - Defense (0) (P/F grade only) - In addition to the thirty (30) semester hours of coursework and dissertation, an oral examination in defense of the dissertation is required for the PhD in biomedical engineering.

**NOTE: In the semester of the DISSERTATION DEFENSE (BME 8985), degree candidates must take a minimum number of dissertation hours simultaneously. Currently, the minimum number of dissertation hours (BME 6980r) is two (2) during the semester of defense.**

**Biomedical Engineering Electives (eighteen [18] semester hours):**

Students should consult a major professor to determine the elective courses offered by the department. Additional elective courses may be found in the University Graduate Bulletin.

**Dissertation Hours (twenty-seven [27] semester hours):**

BME 6980r - Dissertation (1-9) (S/U grade only)

**Degree Requirements**

The following requirements for the PhD degree in biomedical engineering must be met:

1. Passage of the BME PhD Qualifying Examination (BME 8965) within two (2) consecutive exam attempts (see PhD Qualifying Examination below for more details); successful completion will result in formal admission to PhD candidacy;
2. Selection of a research topic and major professor;
3. Formation of a supervisory committee in consultation with the major professor(s);
4. Passage of the SPEAK requirement for international students to enable the performance of laboratory and teaching assistance duties. A minimum score of 45 must be obtained before the student is permitted to present a PhD prospectus;
5. Submission and defense of a PhD prospectus on the dissertation topic to the supervisory committee;
6. Completion of a minimum of thirty (30) semester hours of advanced coursework in biomedical engineering and related disciplines;
7. Completion of at least twenty-seven (27) semester hours of dissertation research;
8. Assistance in the teaching of at least one undergraduate laboratory course;
9. Submission or publication of scholarly articles based on original dissertation research in peer-reviewed journals;
10. Presentation of a research topic at a local, regional, national or international professional meeting;
11. Satisfaction of University Scholarly Engagement requirements; and
12. Presentation and defense of an original dissertation (BME 8985, Dissertation Defense).

All paperwork associated with the above requirements (see Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) must be submitted in a timely fashion to the Departmental with appropriate signatures for review by the CBE Graduate Committee and Director.

### 3.9 Chemical Engineering PhD Program

The PhD degree in Chemical Engineering is a research degree designed to produce a scholar; it is granted only to students who have demonstrated mastery in a specialty of chemical engineering and capacity to conduct original and independent scholarly work.

**Curriculum.** Fifty-seven (57) semester hours are required for the PhD degree in ECH as follows:

1. Twelve (12) semester hours of ECH core courses
2. Eighteen (18) semester hours of approved electives
3. Twenty-seven (27) semester hours of ECH 6980r, Dissertation
4. Successful completion of ECH 8965r, Doctoral Preliminary Exam (0) (P/F grade only)
5. Successful defense of an oral and written dissertation - ECH 8985, Dissertation Defense (0) (P/F grade only)
6. Registration and attendance at all departmental seminars - ECH 5935, ECH Seminar (0)

No courses with a grade below "C" will be counted toward fulfillment of degree requirements. No more than one course with a grade of "C" will be counted toward fulfillment of degree requirements.

**Required Chemical Engineering Core Graduate Courses (twelve [12] semester hours):**

ECH 5052 - Research Methods in Chemical Engineering (3)

ECH 5126 - Advanced Chemical Engineering Thermodynamics I (3)

ECH 5261 - Advanced Transport Phenomena I (3)

ECH 5840 - Advanced Chemical Engineering Mathematics I (3)

**ECH PhD Doctoral Qualifying Examination (zero [0] semester hours):**

ECH 8965r - Doctoral Preliminary Exam (0) (P/F grade only) – After the first semester of matriculation in the PhD program, students will take the PhD Qualifying Examination as the first step toward PhD candidacy. Currently, this course and its examination are held in the Spring semester, and students are expected to enroll and complete the examination at that time. Retakes of the examination occur in a subsequent semester, with current policy dictating a 2<sup>nd</sup> attempt in the following fall semester. Students are permitted only two (2) attempts before dismissal from the PhD program. See Section 3.11.1 for details.

**NOTE: Following successful completion of the Qualifying Examination, students must take a minimum number (currently, two) of dissertation hours (ECH 6980r) EVERY semester that they remain in the PhD program regardless of other class loads. As most tuition waivers provide a maximum of nine (9) credit hours per term, students must consider this requirement when registering for multiple courses, and should consult the major professor and CBE Graduate Director for guidance before enrolling for more than nine hours.**

**Dissertation Defense (zero [0] semester hours):**

ECH 8985 - Defense (0) (P/F grade only) - In addition to the thirty (30) semester hours of coursework and dissertation, an oral examination in defense of the dissertation is required for the PhD in biomedical engineering.

**NOTE: In the semester of the DISSERTATION DEFENSE (ECH 8985), degree candidates must take**

***a minimum number of dissertation hours simultaneously. Currently, the minimum number of dissertation hours (ECH 6980r) is two (2) during the semester of defense.***

***Chemical Engineering Electives (eighteen [18] semester hours):***

Students should consult a major professor to determine the elective courses offered by the department. Additional elective courses may be found in the University Graduate Bulletin.

***Dissertation Hours (twenty-seven [27] semester hours):***

ECH 6980r - Dissertation (1-9) (S/U grade only)

**Degree Requirements:**

The following requirements for the PhD degree in chemical engineering must be met:

1. Passage of the ECH PhD Preliminary Examination (ECH 8965r) within two (2) consecutive exam attempts (see PhD Qualifying Examination Requirements below for more details); successful completion will result in formal admission to PhD candidacy;
2. Selection of a research topic and major professor;
3. Formation of a supervisory committee in consultation with the major professor(s);
4. Passage of the SPEAK requirement for international students to enable the performance of laboratory and teaching assistance duties. A minimum score of 45 must be obtained before the student is permitted to present a PhD prospectus;
5. Submission and defense of a PhD prospectus on the dissertation topic to the supervisory committee;
6. Completion of a minimum of thirty (30) semester hours of advanced coursework in biomedical engineering and related disciplines;
7. Completion of at least twenty-seven (27) semester hours of dissertation research;
8. Assistance in the teaching of at least one undergraduate laboratory course;
9. Submission or publication of scholarly articles based on original dissertation research in peer-reviewed journals;
10. Presentation of a research topic at a local, regional, national or international professional meeting;
11. Presentation and defense of an original dissertation (ECH 8985, Dissertation Defense).

All paperwork associated with the above requirements (see forms, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) must be submitted in a timely fashion to the Department with appropriate signatures for review by the CBE Graduate Committee and its Chair.



### **3.10 Common PhD Program Requirements**

The following items are common requirements for all CBE PhD students regardless of discipline.

**3.10.1 Progression to PhD following MS Degree or Other Graduate Coursework.** Students with MS degrees in BME or ChE from the FAMU-FSU College of Engineering may, with approval of the graduate committee and major professor, take nine (9) additional approved semester hours beyond the thesis-type MS course requirements to satisfy the thirty (30) semester hour requirement for the PhD. All other requirements must be fulfilled as stated above.

Students with MS degrees in BME or ChE from other institutions will be given a specific course plan by the departmental graduate committee. A maximum of thirty (30) semester hours may be assigned to remedy any deficiencies in the student's background. Transfer credit from another institution is limited to a maximum of nine (9) semester hours towards the PhD degree and only with departmental approval. The petition for credit transfer must be submitted by the student during the first academic year in the program.

**3.10.2 Safety Training.** CBE places a priority on the conduct of research in a safe and responsible fashion. Therefore, all MS and PhD students are required to take a minimum of safety training courses offered by the FSU Office of Environmental Health & Safety ([www.safety.fsu.edu](http://www.safety.fsu.edu)). For all new students, these in-person courses are arranged with FSU EH&S as part of the CBE Fall Orientation, and include: General Laboratory Safety/Hazard Communication/Right-to-Know and Fire Safety. For BME students, additional training is provided and required: Biomedical Waste/Bloodborne Pathogens/Biosafety Level 2 and Above Laboratory Training. In addition, new students are required to complete online safety training modules on: Electrical Safety Awareness, Compressed Gas Safety, Cryogen Safety and Laboratory Facility Engineering Controls. Additional training may be required by individual research laboratories as mandated by the parameters of research and the major professor. Finally, continuing graduate students are required to maintain safety training compliance by completing online refresher courses annually when requested by FSU EH&S and its automatic training notification system.

**3.10.3 Program for Instructional Excellence.** All PhD graduate students are required to attend the FSU Program for Instructional Excellence (PIE) Workshop to prepare for teaching assistant (TA) duties. This requirement is mandatory regardless of the student's classification as a teaching assistant or research assistant. This workshop is provided before the beginning of the fall semester, with a modified version at the start of the spring semester for out-of-cycle admissions.

**3.10.4 Major professor and supervisory committee.** The PhD student selects a major professor and a supervisory committee by the beginning of the second semester. The major professor must agree to serve as the student's academic advisor and dissertation supervisor and must be a full-time CBE faculty with Graduate Faculty/Directive status.

The PhD student will choose the supervisory committee in consultation with the major professor. The supervisory committee consists of four (4) full-time faculty members, including the major professor as the chair; one member must be from outside of CBE and serves as the University Representative. The University Representative must be a tenured member of the faculty. All committee members

must have Graduate Faculty/Directive status. Additional members may be appointed to the committee, if deemed appropriate by the major professor. The supervisory committee oversees and supervises the student's research effort, administers the PhD Prospectus, recommends full doctoral candidacy, attends the oral defense of the dissertation, approves the written dissertation and recommends granting of the degree.

**3.10.5 Instructional Responsibilities.** Practice and experience in instruction is a component of the doctoral degree. Therefore, PhD students are required to assistance in the teaching of at least one undergraduate laboratory course during their tenure in the Department. During the semester of service as a laboratory TA, the PhD student will receive a stipend supplement to offset the additional training and instructional time involved in this duty. At present, the following undergraduate laboratory courses satisfy this requirement: BME 4323L – Biodynamics & Control; BME 4332L – Cell & Tissue Engineering; BME 4403C – QASP I; BME 4404C – QASP II; BME 4503L - Bioinstrumentation; ECH 3274L – Transport Phenomena; and ECH 4404L - Unit Operations. For international students, passage of the SPEAK (Speaking Proficiency English Assessment Kit) examination ([www.cies.fsu.edu/programs/english-academic-purposes/speak-exam-information](http://www.cies.fsu.edu/programs/english-academic-purposes/speak-exam-information)) for conversational English in a classroom setting to enable the performance of laboratory and teaching assistance duties is required. A minimum score of 45 must be obtained before the student is permitted to perform TA duties. In addition, this SPEAK score must be obtained before the student will be permitted to present a PhD prospectus.

**3.10.6 Plan of Study.** The PhD student, in consultation with the major professor, is required to develop an approved Plan of Study. The Plan of Study (see Section 8) should include a list of proposed courses, a timeschedule for completion of these courses, and a summary of the proposed dissertation topic. This Plan of Study should be contained within the Annual Evaluation submitted to the Graduate Committee each Spring, and should be updated regularly to track the student's progression and any significant alteration of the guiding plan throughout the progression to degree

**3.10.7 Annual evaluation.** All PhD students must report their annual educational and research progress to their supervisory committee at least once a year, typically in the form of an oral presentation. Additional meetings with Dissertation committee are encouraged as warranted by research objectives. In addition, all students will use the Departmental Annual Evaluation form to provide an update on and changes to the Plan of Study, a self-evaluation of progress over the last year, and an evaluation by the major professor. After discussions with the student, the major professor should submit this Annual Evaluation (and any other annual evaluation forms required by the Department, College or University, e.g. the FAMU Annual Evaluation for graduate students, Form 2) by the end of the spring semester. The instructions and form for the Annual Evaluation can be found online (Section 8 or [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)).

### 3.11 Steps to Full PhD Candidacy

Students are admitted to candidacy for the PhD degree only afterpassing the Qualifying Examination (see below), completing the PhD prospectus (see below) and being certified by the Department with the University Registrar. All forms (Qualifying Examination Assessment, Prospectus Assessment and University Candidacy forms) need to be submitted to the CBE graduate coordinator. A student becomes eligible to and must register for dissertation credits (BME or ECH 6980r) the semester after

successful completion of the Qualifying Examination and must maintain a minimum number of dissertation credits (usually two credit hours) each semester thereafter until defense of the PhD dissertation.

**3.11.1 PhD Qualifying Examination.** Successful PhD candidates will have a sound background in engineering, as well as the creativity and judgment necessary to conduct independent research. The purpose of the Qualifying Examination is to assess these qualities with an emphasis on evaluating the student's potential to conduct an original course of study and investigation. All prospective PhD candidates must enroll in the appropriate Doctoral Qualifying Exam course (either BME 8965r or ECH 8965r) for the semester that they intend to take the qualifying examination. Currently, the Qualifying Examination is administered in the 1<sup>st</sup> spring semester following initial matriculation in the CBE graduate program unless otherwise determined by the CBE Graduate Committee. Second attempts are administered in the following fall semester.

The Qualifying Examination tests the student's ability (1) to define, describe and examine critically relevant literature; (2) to think creatively and to apply basic chemical/biomedical engineering concepts; (3) to communicate in a scholarly and rigorous manner the progress and results of research; and (4) to conduct productive, rigorous and creative scientific investigations.

This exam will be based on the student's ability to evaluate a fundamental research article from the literature of chemical engineering. Specifically, the student will be asked to:

1. Identify the problems addressed in the paper;
2. Formulate a critical appraisal of the authors' contributions to the problem and the significance of the work;
3. Critically evaluate the technical soundness of the approach used and results obtained;
4. Summarize and critique advances in the field since the publication of the assigned article;
5. Propose in concrete terms research work that might be done to extend and (if necessary) improve upon the study discussed in the article; and
6. Comment on the incorporation of the article's findings into the potential course of dissertation work of the student.

The Graduate Qualifying Examination Committee, which will be comprised of at least three faculty members, will assign a fundamental article from the literature of chemical or biomedical engineering. Three weeks following the assignment of the chosen research article, the student will be required to submit a written report on the exam problem as well as any additional commentaries or simulations deemed critical by the student. This report will be distributed to all members of the Qualify Examination Committee for review. Committee members will submit comments and questions back to the prospective PhD candidate within five (5) business days. This review will identify (a) aspects of the written report that require additional attention or (b) critical research points that will need to be addressed in the oral presentation.

After the submission of the report and the return of the committee's review, the student will give an oral presentation to the Qualifying Examination Committee. The oral presentation will be approximately one hour in length. The student will give a 40-minute presentation open to the public,

followed by a 20-minute question and answer session. The oral presentation should address the exam criteria, as well as any issues raised by the committee's review of the submitted written report. Additionally, the student is permitted to submit any supplementary information to augment the written report. An edited written report should have been submitted by this time.

Following the oral presentation, the Qualifying Examination Committee will evaluate the student's performance in closed session. Three outcomes are possible: pass, provisional pass or fail. An affirmative majority vote from the faculty is required for the student to pass the examination. A unanimous vote for a provisional pass will require the student to satisfy additional requirements deemed necessary by the Qualification Examination Committee, such as (but not limited to) the successful completion of specific coursework or completion of a MS degree prior to granting full PhD candidacy. A pass or provision pass of the Qualifying Examination will permit the student to begin or continue research work contributing to the student's PhD dissertation.

If neither a pass nor provisional pass vote is reached, the student will have failed the Qualifying Examination. Per College policy, the Dean's office will be notified of the outcome of any examination attempt. The student will have one additional attempt to pass the examination, though the Qualifying Examination Committee will make a recommendation to the student and major advisor about the examination performance of the student and likelihood of future success. The re-examination will be scheduled at the discretion of the Graduate Committee. The second attempt at the examination will occur no sooner than six (6) full class weeks after the results of the first attempt are shared with the student. For the purpose of this policy, a "full class week" is defined as a week with five days during which classes are held. Students must be registered separately for their first and second attempt, if necessary within the same semester, and must receive either a "pass" or a "fail" grade for each attempt. Students can take the examination for admission to candidacy only twice. Failure of the Qualifying Examination on two occasions will eliminate the student from consideration for PhD candidacy, rendering the student ineligible to continue in the degree.

An exception request regarding timing of re-examination can be submitted for consideration to the Academic Dean's Office by either the student or CBE Graduate Committee. Students who allege that academic regulations and/or procedures were applied improperly for the re-examination of their examination may have their grievances addressed through the general academic appeals process.

Upon successful completion of the comprehensive exam, the student is admitted to PhD candidacy. For each attempt, the Qualifying Examination Committee chair will report the outcome on the PhD Qualifying Examination Assessment form (Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) by submission to the Graduate Director and Graduate Committee.

**3.11.2 PhD Prospectus.** Following completion of core coursework and the PhD Qualifying Examination, the student should prepare and defend a PhD prospectus that lays out the background, strategy and preliminary work conducted to support the proposed PhD dissertation research. The PhD prospectus must be completed by the end of the 6<sup>th</sup> semester in the program.

The PhD Prospectus evaluates whether the student has demonstrated the ability to conduct independent research, obtain sufficient relevant scientific knowledge in the area of research and

integrate that knowledge into a coherent Ph.D. dissertation. The prospectus has both written and oral components, and is administered by the PhD dissertation committee and complies with the requirements of the college and University.

The written component of the PhD Prospectus is a proposal describing the proposed research work for the student's dissertation. The proposal should represent the cumulation to date of educational and research activities focused on the proposed topic of study. The proposal should be in a format suitable for research proposals submitted to funding agencies. At a minimum, the proposal should include the following components: abstract, problem statement or hypothesis, research aims or objectives, critical literature review, research plan and tasks, intellectual merit and broader impact, expected outcomes, and timeline for completion. The oral component of the PhD prospectus will include a presentation by the student on the written proposal and dissertation research. The PhD dissertation committee will evaluate both the written and oral components as a whole as well as the academic preparation and research activities of the student, and that committee is charged with assessing the proficiency of the student as well as the feasibility of the proposed project. In doing so, the committee may ask any questions of the student about the proposal or any topics relevant to the proposed work or discipline.

The PhD dissertation committee will report the outcome of the PhD Prospectus according to the vote of its members. The committee chair will report the outcome on the PhD Prospectus Assessment form (Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) by submission to the Graduate Director and Graduate Committee.

The annual evaluation form (Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) also reports the date of successful completion of the PhD prospectus, but the overall recommendation must follow the above guideline. If any student requires re-examination, the outcome can only be reported as "passed" or "failed." If the student does not pass the PhD prospectus, that student will have one more attempt to pass the PhD prospectus, and normally, the re-examination will require revision to the written document with a repeat of the oral presentation, although individual committees may require only one of the above as deemed appropriate.

After completion of the PhD prospectus, the student is elevated to full PhD candidacy in the Department. In the semester after prospectus completion, the student will receive an increase in stipend and should complete all dissertation work within two academic years.

**3.11.3 Dissertation.** The most important element of the doctoral program is original and fundamental research resulting in a Doctoral Dissertation. Students will enroll in dissertation research hours (BME or ECH 6980) only after the successful completion of the Qualifying Examination and entrance to the doctoral candidacy. The student selects the dissertation topic in consultation with the major professor and supervisory dissertation committee. The supervisory committee approves the dissertation research topic based on the student's dissertation prospectus proposal. To be acceptable, the dissertation must be original research that is a significant contribution to the discipline, and it must reflect a substantial scholarly effort on the student's part.

It is the student's responsibility to comply with the required dissertation format of the University as

well as the deadlines and requirements for dissertation submission (see [www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies) or [www.gradstudies.fsu.edu](http://www.gradstudies.fsu.edu)).

At the completion of the dissertation research and when the complete dissertation is ready for review by the supervisory committee, the major professor will authorize its distribution to committee members. The dissertation should be complete in every respect, including data analysis, figures and tables. The supervisory committee can recommend editorial and/or substantive changes after review and the oral dissertation defense. The dissertation should be provided to the supervisory committee at least ten (10) working days before the date of the dissertation defense.

The PhD student is required to defend the dissertation publicly according to Department, College and University policies with regards to announcement and scheduling. Notification of the defense is to be posted on the calendars of the Department, College and Graduate school at least two weeks prior to the date of the defense.

**3.11.4 Scholarly Activities.** In partial fulfillment of the PhD degree requirements, the PhD student must prepare a minimum of one (1) manuscript for peer-reviewed journals, which should have the status of "Accepted." It is highly recommended and expected that the dissertation will yield a minimum of 3-5 manuscripts and publications. In addition, the PhD student must present a research topic at a local, regional, national or international professional meeting at least once during their tenure in the department.

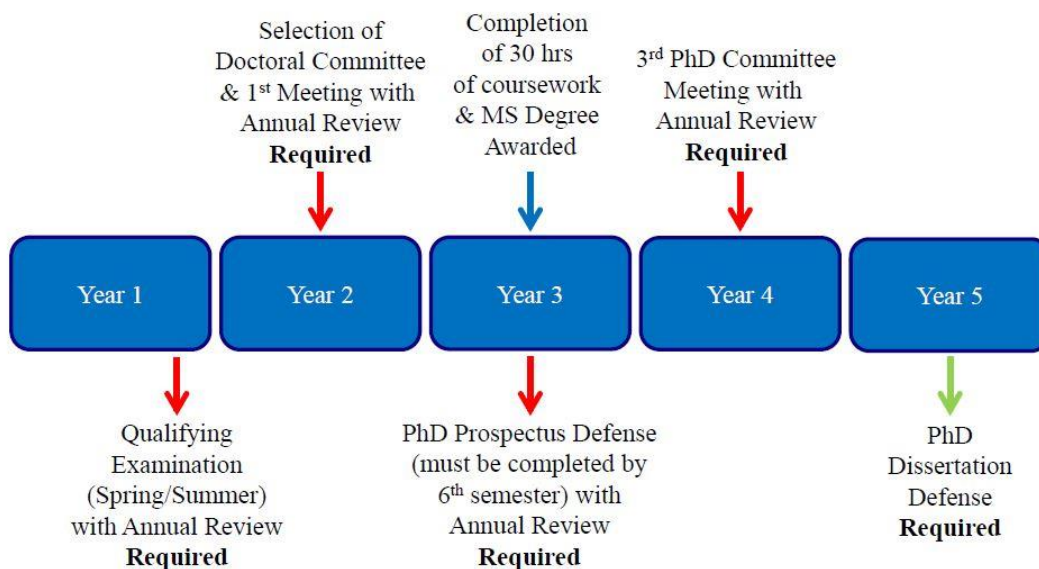
**3.11.5 Dissertation Defense.** A dissertation defense with oral examination is a mandatory part of the degree requirements. The student must satisfactorily pass this oral examination, as determined by the supervisory committee, before submission of the final dissertation to the university.

- The dissertation defense will be scheduled only with approval of the major professor, supervisory committee, and department. The student will be permitted to schedule the dissertation defense only if the student has 1) completed the research work, 2) written a complete dissertation, and 3) satisfied the scholarly activities requirement.
- The defense should be scheduled before the final dissertation submission deadline with sufficient time to allow for revisions; see university deadlines.
- The dissertation defense shall be announced and open to the public.
- The oral defense consists of two parts: 1) a defense presentation that includes appropriate use of visual aids and has a duration of 45-55 minutes and 2) oral examination by the supervisory committee.
- The outcome of the dissertation defense is determined by the supervisory committee and is reported by the major professor to the department. The committee chair will report the outcome on the PhD Defense Assessment form (Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)) by submission to the Graduate Director and Graduate Committee.

**3.11.6 Suggested timeline and checklist.** A suggested timeline for completion of the PhD degree requirements and a milestones checklist are provided below. Students may need to enroll in additional hours to maintain enrollment requirements (see Sections 5.1 and 5.3).



### Suggested PhD timeline



### PhD milestones checklist

<b>Milestone or Action</b>	<b>When</b>
PIE Training for TA duties	Before 1 <sup>st</sup> fall semester (orientation activity)
Departmental safety training	Before 1 <sup>st</sup> fall semester (orientation activity) and then annual refreshers thereafter
SPEAK Exam (for international students)	Before 1 <sup>st</sup> fall semester (orientation activity) with repeats as necessary to meet minimum score
Selection and assignment of major professor	By beginning of 2 <sup>nd</sup> semester
Undergraduate laboratory TA requirement	After the 1 <sup>st</sup> semester in program & completion of SPEAK minimum requirement (as needed)
PhD qualifying examination	2 <sup>nd</sup> semester (1 <sup>st</sup> spring semester)
Request transfer credit (if applicable)	By end of 1 <sup>st</sup> academic year
Annual Graduate Student Evaluation (self & mentor)	Each spring semester
Prepare Plan of Study	By beginning of 3 <sup>rd</sup> semester, or completion of 18 credit hours
Dissertation hours	Minimum enrollment in 2 h each semester after successful completion of the PhD Qualifying Exam
Complete RCR training	By end of 1 <sup>st</sup> academic year
Selection of PhD Dissertation Committee	By end of 2 <sup>nd</sup> fall semester
Annual meetings with PhD Committee	Annually, with meetings recorded in Annual Evaluation
PhD Prospectus (written and oral)	By end of semester 6 <sup>th</sup> academic semester
Scholarly activity: conference presentation & journal manuscript acceptance (1) for publication	Submitted by semester prior to graduation or earlier
Apply for graduation with University	Beginning of final semester
Dissertation defense	Final semester
Submit approved final PhD dissertation	Final semester; check University for manuscript clearance deadlines
Complete Exit Survey	Before end of final semester



## 4. Academic Policies

All students are required to adhere to the policies of the university, the FAMU-FSU College of Engineering, and CBE. It is the student's responsibility to be familiar with these policies and to refer to them throughout the conduct of studies. These policies include academic policies, graduation requirements, and thesis and dissertation guidelines.

Major university requirements and policies are briefly discussed in Section 5, but students are encouraged to review university bulletins and websites ([www.gradschool.fsu.edu](http://www.gradschool.fsu.edu) and [www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies), respectively) for additional information. Department academic policies are described in this section.

### 4.1 Academic Performance

Once enrolled in a CBE graduate program, the student must satisfy the following requirements for retention:

- Maintain a cumulative GPA of at least 3.0. If a student's GPA falls below 3.0, the student will be placed on academic probation.
- No grade below a "C" will be credited towards graduate degree requirements.
- Satisfy all University graduate student policies (see Section 5).

### 4.2 Coursework

A minimum of one-half the total required coursework must be taken at the FAMU-FSU College of Engineering.

**Prerequisites.** Students must satisfy prerequisites to enroll in a course. Students entering the major without a biomedical or chemical engineering degree also must satisfy the transition program.

**Undergraduate Courses.** For students enrolling in Fall 2019 and later, the University no longer accepts undergraduate courses toward the graduate degree. All courses must be 5000-level or 6000-level courses. Any 4000-level courses taken by a graduate student must be taken as preparatory courses or supplemental to their plan of study, which may affect the ability to apply tuition waivers for those courses.

**Directed Individual Study (DIS).** A maximum of six (6) credit hours from up to two (2) Directed Individual Study (DIS) courses may be applied towards degree requirements with prior approval from the CBE department. The content of the DIS may not directly overlap with thesis or dissertation research work, nor may it duplicate the content of an existing course.

**Letter Grade and S/U Grading.** The minimum number of hours of coursework taken on a letter-grade basis is as follows: thesis MS students, at least 18 hours; course MS students, at least 27 hours; and PhD students, at least 27 hours.

**Transfer Credit.** Transfer of courses not counted toward a previous degree from another accredited graduate school is limited to nine (9) semester hours. In addition, transfer of courses not counted toward a previous degree from the institution in which the student is enrolled (*i.e.*, FAMU or FSU) is limited to twelve (12) semester hours total. In all cases, transfer credits require approval of the department and shall be completed with grades of "B" or better.

### 4.3 RCR Training

MS (thesis) and PhD students are required to successfully complete responsible conduct of

research (RCR) training as part of the degree requirements.

- MS (thesis) and PhD students must complete RCR training within a year of their initial enrollment in a CBE graduate program. RCR training is optional for course-based MS students. PhD students who completed RCR training as MS students at the FAMU-FSU College of Engineering do not need to repeat this training.
- Two options are available for RCR training:
  - Option 1: FSU offers the Responsible Research one-hour graduate course each spring semester. The in-state tuition and textbook will be provided by FSU for each FSU student enrolled in the course (limited to 90 students). For details, see [www.gradschool.fsu.edu/academics-research/research-and-scholarly-integrity/fsu-rcr-course](http://www.gradschool.fsu.edu/academics-research/research-and-scholarly-integrity/fsu-rcr-course).
  - Option 2: FAMU and FSU offer online training that includes seven 1-hour modules with quizzes. Topics include: Research Misconduct, Data Acquisition and Management, Responsible Authorship and Publication, Responsible Peer Review, Responsible Mentoring, Conflicts of Interest, and Collaborative Science. For additional information, see [www.gradschool.fsu.edu/academics-research/research-and-scholarly-integrity/fsu-citi-courses](http://www.gradschool.fsu.edu/academics-research/research-and-scholarly-integrity/fsu-citi-courses).
- MS and PhD students need to confirm that they have completed RCR training in a timely manner and note this completion in their plan of study and annual evaluations.

#### **4.4 Academic Advising**

All graduate students must meet with their advisor (major professor, graduate coordinator or graduate director) each semester during the registration period. The meeting may be a face-to-face meeting, email, phone or online conferencing. First-semester students who have not selected an advisor can meet with the CBE Graduate Coordinator (course-based MS) or Graduate Director (thesis MS or PhD).

#### **4.5 Annual Assessment of Progress**

All PhD students must report on their research progress at least once each year to the supervisory committee. The annual review meeting takes the form of an oral presentation before the committee members, typically at the end of the spring semester. The preliminary examination and dissertation defense will serve as the annual evaluation for the years in which they occur. The student will receive this annual assessment in writing; feedback addresses the research plan, progress toward completion, and oral and written communication skills. The instructions and form for the annual evaluation can be found online (Section 8, [www.eng.famu.fsu.edu/cbe/department-resources](http://www.eng.famu.fsu.edu/cbe/department-resources)). Students with teaching assistantship (TA) or research assistantship (RA) also will receive written assessment on their performance of their duties by their supervisor.

### **5. University Requirements and Policies**

University requirements and policies are provided by the FAMU Office Graduate Studies and Research ([www.famu.edu/index.cfm?a=graduatestudies](http://www.famu.edu/index.cfm?a=graduatestudies)) and by FSU Graduate School (<http://www.gradstudies.fsu.edu>) (also see the FAMU or FSU Graduate Student Handbooks). Key requirements and policies are highlighted here.

### **5.1 Full-time and Part-time Status**

A full-time load is twelve (12) hours per semester. Nine (9) hours is considered a full-time load for students with teaching or research assistantship appointments of at least quarter time (10 h per week). For international students, at least nine (9) credit hours per semester is considered full-time.

After passage of the qualifying examination for PhD candidacy, a PhD student who has not made a final dissertation submission shall include in the required full-time load a minimum of two (2) credit hours of dissertation per semester until completion of the degree. Any student (MS or PhD) should take a minimum of two (2) credit hours of thesis or dissertation in the semester of the final defense. A student is typically required to register for at least nine (9) credit hours in a term for an assistantship is received. With an underload permission from the Dean's office, a student must register for at least two (2) credit hours of thesis or dissertation per semester.

### **5.2 Scholarly Engagement**

The purpose of the Scholarly Engagement requirement is to ensure that doctoral students are active participants in the scholarly community. To meet the Scholarly Engagement requirement, doctoral students should interact with faculty and peers in ways that may include enrolling in courses; attending seminars, symposia and conferences; engaging in collaborative study and research beyond the University campus; and utilizing the library, laboratories and other facilities provided by the University. The goal is to prepare students to be scholars who independently can acquire, evaluate and extend knowledge, as well as develop themselves as effective communicators and disseminators of knowledge.

### **5.3 Continuous Enrollment**

Students not continuously enrolled from semester to semester during the academic year (fall and spring) may need to reapply for admission through the University.

### **5.4 Time to Completion**

For MS students, all work towards the degree must be completed within five years (FAMU) or seven years (FSU) from the time the student originally registers for graduate studies. For doctoral students, all requirements for the PhD degree must be completed within seven years (FAMU) or five calendar years (FSU) from the time the student passes the PhD Qualifying Examination or the student must pass a new qualifying examination.

### **5.5 International Students**

International students must comply with the U.S. Department of Homeland Security rules and regulations. International students enrolled at FAMU are encouraged to consult with the FAMU Office of International Education and Development ([www.famu.edu/index.cfm?oied](http://www.famu.edu/index.cfm?oied)). International students enrolled at FSU are encouraged to consult with the FSU Center for Global Engagement ([www.cge.fsu.edu](http://www.cge.fsu.edu)).

### **5.6 University-Wide Standards for Teaching Assistants**

Students who assume any teaching assistant (TA) role (*e.g.*, grader, lab TA, course TA) must satisfy the minimum requirements for the specific teaching role(s). Requirements include graduate coursework or a MS degree in the discipline, participation in the Program in Instructional Excellence (PIE) teaching conference and TA training ([www.pie.fsu.edu](http://www.pie.fsu.edu)), certification of spoken English (SPEAK exam) for those

whose native language is not English, supervision by a faculty member & periodic evaluations.

For specific requirements, see the document “University-wide Standards for Graduate Teaching Assistants,” which may be found at ([www.pie.fsu.edu/ta-standards](http://www.pie.fsu.edu/ta-standards)).

## 6. Offered Courses

A list of courses offered by CBE is provided in the university general bulletins. Students are responsible for checking the graduate edition of the general bulletin for the university in which they are enrolled to confirm course information:

- FAMU: see [www.famu.edu/index.cfm?a=Registrar](http://www.famu.edu/index.cfm?a=Registrar)
- FSU: see [www.registrar.fsu.edu/bulletin/graduate/departments/chemical\\_engineering](http://www.registrar.fsu.edu/bulletin/graduate/departments/chemical_engineering)

Classes with insufficient enrollment are subject to cancellation. Students are encouraged to sign up for classes early in the registration period. Through the FAMU-FSU Cooperative Program, students at either university may take a class at the other parent university if that course is not offered at their home university in a given semester.

## 7. Checklist for New Students

### 7.1 FAMU Students

Refer to the FAMU School of Graduate Studies and Research for information on requirements at [www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies).

### 7.2 FSU Students

The Graduate School at FSU provides an information packet and checklist for new graduate students at [www.gradschool.fsu.edu/newcurrent-students](http://www.gradschool.fsu.edu/newcurrent-students). In addition, an orientation for new graduate students is held each August. International students enrolled through FSU are encouraged to consult with the Center for Global Engagement ([www.cge.fsu.edu](http://www.cge.fsu.edu)).

### 7.3 All Graduate Students

- College and department orientations are held each Fall semester before classes begin.
- Students must meet with a faculty advisor prior to registering for classes. First-semester students who have not selected an advisor can meet with any CBE faculty with Graduate Directive status, preferably in their specialty area (see Section 4.4).
- See the College Computing Services (CCS) in Room A332 to request an engineering account, which is required to access the public computers at the College of Engineering.

## 8. Forms

The following forms may be found at the CBE webpage ([www.eng.famu.fsu.edu/CBE](http://www.eng.famu.fsu.edu/CBE)). FAMU forms may be found at [www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies), and FSU forms may be found at [www.gradschool.fsu.edu/forms](http://www.gradschool.fsu.edu/forms). *Check with your University for additional required forms.*

Forms for all graduate students:

- Annual Graduate Student Evaluation
- Exit Survey
- Other forms (*e.g.*, transfer credit, DIS, etc.) may be found in the CBE main office (A131).
- Announcement of annual evaluation, qualifying examination, prospectus and defense is done by emailing the CBE Graduate Coordinator the title of the presentation, abstract and name of the advisor.

Additional forms for MS students:

- MS Plan of Study
- MS Thesis Assessment form (department form)
- FAMU Defense Outcome or FSU Manuscript Signature (online)

Additional forms for Ph.D. students:

- PhD Plan of Study
- PhD Qualifying Examination Assessment (department form)
- FSU Admission to Candidacy Form
- PhD Prospectus Assessment (department form)
- PhD Defense Assessment (department form)
- FAMU Defense Outcome
- FSU University Representative Doctoral Defense Report (online)
- FSU Manuscript Signature (online)

## 9. Funding Information

### 9.1 Teaching & Research Assistantships

A limited number of teaching assistantships (TA) and research assistantships (RA) are available through CBE to graduate students on a competitive basis each semester, with first preference to PhD students and candidates. The Department has limited amount of funding for TA positions, especially for the summer semester. For both TA and RA positions, the student must coordinate closely with the major professor. University matriculation (tuition) waivers also may be granted as supplementary awards to students with assistantship appointments of at least 10 h/week. Students with University Graduate Fellowships are expected to perform teaching and/or research related tasks equivalent to 20 h/week effort.

In addition to department sources of financial support, the universities and external organizations provide fellowships for graduate study.

- FAMU School of Graduate Studies and Research compiles information about fellowships provided by FAMU and external sources ([www.famu.edu/index.cfm?graduatestudies](http://www.famu.edu/index.cfm?graduatestudies)) (see the links to Financial Aid and Funding Opportunities)
- Fellowships provided by the FSU Graduate School ([www.gradschool.fsu.edu/Funding-Awards/Graduate-School-Fellowships-and-Grants](http://www.gradschool.fsu.edu/Funding-Awards/Graduate-School-Fellowships-and-Grants))
- FSU Office of Graduate Fellowships and Awards provides information about external fellowships ([www.ogfa.fsu.edu](http://www.ogfa.fsu.edu))

- College of Engineering provides information about scholarships and fellowships at ([www.eng.famu.fsu.edu/scholarships](http://www.eng.famu.fsu.edu/scholarships))  
MS and PhD students are strongly encouraged to apply for fellowships from federal funding agencies, such as:
- National Science Foundation ([www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=6201](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201))
- Department of Energy ([www.science.energy.gov/wdts/scgsr](http://www.science.energy.gov/wdts/scgsr))
- US Environmental Protection Agency ([www.epa.gov/ncer/fellow](http://www.epa.gov/ncer/fellow))

### **9.2 Travel Support for Graduate Students**

The Department will announce the CBE Graduate Research Award each spring semester as part of the CBE Departmental Research Day. Based on oral and/or poster presentation at this event, the award recognizes excellence in graduate student research. Each recipient will receive up to \$500, which can be used for presenting a paper in a conference. The award money can be used any time before the student leaves the graduate program. Generally, two students are awarded based separately on oral and poster presentation performance.

## **10. Contact Information**

For more information about graduate studies in the Department of Chemical & Biomedical Engineering at the FAMU-FSU College of Engineering, please contact:

Department of Chemical & Biomedical Engineering  
FAMU-FSU College of Engineering  
2525 Pottsdamer Street  
Tallahassee, Florida 32310  
Phone: 001.850.410.6151  
Email: [chemical@eng.famu.fsu.edu](mailto:chemical@eng.famu.fsu.edu)