This Guide contains information that supplements the University’s Graduate Catalog which is the primary document governing all academic programs. Although every effort has been made to maintain accuracy, the Department of Biomedical Engineering reserves the right to correct errors when found, without further notice to students. The presence of errors will not affect the application of the rules and requirements applicable to all students.
GRADUATE GUIDELINES
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Gainesville, Florida 32611

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OBJECTIVES AND OVERVIEW OF THE DEPARTMENT

The mission of the Department of Biomedical Engineering (BME) is to educate students with strong engineering and science backgrounds for Master’s and/or PhD degrees in Biomedical Engineering so that they can productively apply their training to the solution of engineering problems in the fields of medicine, biology and related fields.

Biomedical Engineering Objectives

1. Provide students with a broad knowledge base of biomedical engineering and specialized knowledge and experience in at least one of the core areas: Biomechanics, Tissue Engineering, Biomedical Imaging and Signal Processing, Cardiac Engineering, Neural Engineering, BioMicro-Electromechanical Systems.

2. Provide students with the ability to apply fundamental engineering principles from several traditional engineering disciplines to identify, analyze, and solve clinical problems and improve health care.

3. Provide students with the ability to design and conduct scientific and engineering experiments, and to analyze and interpret the resulting data.

4. Provide students with experience and understanding of design requirements and constraints in the clinical and biological science environment, including technology transfer.

5. Provide students with the skills needed to communicate effectively, work collaboratively, and understand their professional and ethical responsibilities and the impact of clinically significant engineering solutions in a societal and economic context.

The Department of BME is interdisciplinary and collaborative, with designated departments in the College of Engineering (COE) and College of Medicine (COM) acting as partners in the education of Biomedical Engineers. COE participating departments include: Mechanics & Engineering Science (AeMES), Chemical Engineering (CHE), Computer & Information Science & Engineering (CISE), Electrical & Computer Engineering (ECE), Materials Science & Engineering (MSE), Mechanical & Aerospace Engineering (MAE), and Nuclear & Radiological Engineering (NRE). The participating department within the COM includes Surgery, Anesthesiology, Radiology, and Cardiology.

Biomedical Engineering students are admitted to the Graduate School through the Department of BME. The BME Academic Committee reviews and makes all decisions regarding admission to the Department of BME. Each student’s research advisor must hold a Faculty appointment in the Department of BME. Supervisory committees for BME students normally include at least one member of the Faculty from the College of Engineering and one member of the Faculty from the College of Medicine.
GRADUATE FACULTY


ADMISSION TO THE DEPARTMENT OF BME

Introduction
The Department of Biomedical Engineering (BME) at the University of Florida offers the Master of Engineering (ME) the (MS) and the Doctorate of Philosophy (PhD) degrees in Biomedical Engineering. The Graduate Guidelines detail the policies and regulations governing these programs and should be used in conjunction with the University of Florida Graduate Catalog. It is the responsibility of the student to be familiar with both publications and to adhere to the stated rules.

Admission Procedures
Admission forms and procedures can be obtained from the Graduate Student Office GSO or directly from the web at http://www.bme.ufl.edu/academics/apply/index.php. Prospective students are urged to apply for admission as early as possible. Completed applications are reviewed by the BME Academic Committee for admission.

Admission Checklist

- Obtain all application materials from http://www.bme.ufl.edu/academics/apply/applicationprocess.php
- Electronic/On Line: send transcripts (graduate and undergraduate) area of study form, three letters of recommendation, and statement of purpose to:
  Department of Biomedical Engineering
  University of Florida
  PO Box 116131
  Gainesville, FL 32611-6131

- Take the Graduate Record Examination (GRE). The results are to be sent to the University of Florida Office of the Registrar via ETS. Where applicable, also have TOEFL scores forwarded to the Office of the Registrar via ETS.
- If you apply online, but don't pay the application fee online, be sure to mail the $30 check or money order and include the Fee Payment Cover Memo. Make check payable to the University of Florida. No application will be processed without payment of the application fee.
REQUIREMENTS FOR DEGREES

Unless otherwise specified, for any master’s degree, the student must earn a minimum of 30 credits as a graduate student at the University of Florida. No more than 9 of the 30 credits (earned with a grade of A, B+, or B) may be transferred from institutions approved for thesis purpose by the Dean of the Graduate School. At least half of the required credits, exclusive of 6971, must be in the field of study designated the major (pg. 33 - Graduate Catalog). The course requirements for doctoral degrees vary from field to field and from student to student. A minimum of 90 credits beyond the bachelor’s degree is required for the Ph.D. degree in all fields. All master’s degrees counted in the minimum must have been earned in the last seven years. (pg 34 - Graduate Catalog).

All coursework outside the College of Engineering (COE) is considered outside the major area of study. Therefore 3000 – 4000 level courses (up to 6 credits) from the College of Medicine (COM) can be used to meet the overall number of credits for the BME Graduate Degree electives. All COE courses will count as major credit. Please note that this means that any graduate level, University of Florida, COE course completed BEFORE the student entered the BME program will be calculated in with major credit and GPA.

A summary of the pertinent degree requirements is shown in the table. The BME specialty areas are: Biomechanics, Cell & Tissue Engineering, Biomedical Imaging and Processing, Cardiac Engineering, Neural Engineering, and BioMicro-Electromechanical Systems.

<table>
<thead>
<tr>
<th>SCH Requirements (minimum number)</th>
<th>Master (Thesis)</th>
<th>Master (Non-thesis)</th>
<th>Doctor of Philosophy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total SCH</td>
<td>30 a</td>
<td>30 a</td>
<td>90 a,b</td>
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<td>BME Core Requirements</td>
<td>14</td>
<td>14</td>
<td>18</td>
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<tr>
<td>Engineering Specialty Elective</td>
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<td>3</td>
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<tr>
<td>BME Engineering Elective</td>
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<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Research/Special Project</td>
<td>(var)</td>
<td>(var)</td>
<td>(var)</td>
</tr>
</tbody>
</table>

| Supervisory committee members (minimum number) | 3 | 1 c | 4 |
| Qualifying Exam | None | None | yes d |
| Final Exam | Oral e | Written f | Oral g |
| Time limit for completing degree | 7 years | 7 years | 5 years h |

a. Beyond BS  
b. May include 30 hours from Master’s program  
c. Recommend at least 2  
d. Two-part exam. Written part within four semesters after entry, not counting the summer semester  
e. On Thesis and course work  
f. Exam content determined by the student’s supervisory committee  
g. On Dissertation and course work  
h. 5 years from admission to candidacy.
Graduate Assistantships and Fellowships

Graduate Assistantships are available through individual academic units. Stipend rates paid are determined by the employing academic unit. Interested students should ask their academic-unit offices about the availability of assistantships and the procedure for making application. Prospective students should write directly to their major academic units.

Fellows and graduate assistants must pay appropriate in-state and out-of-state tuition. Fellows receiving semester stipends of $3150.00 or greater and trainees are expected to devote full time to their studies. Graduate assistants who have part-time teaching or research duties register for reduced study loads according to the schedule required for their appointment. Students on appointment will be financially liable for excess credits over the required registration or dropped courses. (pg. 25 - Graduate Catalog)

Registration Requirements

Graduate Students on Appointments – Required registration for fellows and trainees with stipends of $3,150 or greater per semester is 12 credits. Fellows whose stipends are less than $3,150 must register for at least 3 credits during fall and spring semesters and 2 credits for summer. Any additional credits are at the expense of the student. Full-Time Registration - Students may be considered full-time with a registration of 9-12 credits. However, most fellows and assistants on 0.01 - 0.024 FTE must be registered for 12 credits in fall/spring and 8 credits in summer. Students not on appointment may want to enroll full time to finish their degrees in the minimum timeframe or may be required to enroll full time by external funding agencies or their academic units.

Each semester the GSO distributes a Program of Study Worksheet (PSW - Form III-V) for each student to both the student and Chair of the Supervisory Committee. The PSW aids the student in both the planning and completion of degree requirements. The Department of BME places advisement holds on all students until the PSW has been signed by the advisor and returned to the Department of BME. To register, both the student and Chair of the Supervisory Committee must approve the PSW each semester prior to graduation. The approved form must be submitted to the Graduate Student Office to release advisement holds.

Registration for graduate courses varies with the individual courses. Students are required to obtain approval from their Research Advisor separately using the Research Registration Form (Forms VI - XI) if the Research Advisor is not the Chair of the Supervisory Committee. Otherwise, research credits are included on and approved by submission of the completed PSW to the GSO. Research credits are normally graded as S/U. All BME graduate students are required to register for at least one credit of BME 6905 Individual Work in Biomedical Engineering their first semester unless approved by the Graduate Coordinator.

Students who complete all graduate degree requirements during a given semester, but after the deadlines specified by the Graduate School, may receive their degree in the following semester without registering (clearing prior). However, students whose degree requirements are not completed before the first day of classes of the following semester must
register for a minimum of three credit hours during that semester. The Graduate School will not accept petitions to this policy. The 3-hour registration is only applicable if the student is not on an assistantship.

Final Term Registration

During the term in which the final examination is given and during the term the degree is received, a student must be registered for **at least three credits** in fall or spring and **two credits** in the summer that count toward his/her graduate degree. Students on a fellowship, traineeship, or assistantship must be registered appropriately for their appointment. Thesis students must be registered in 6971 and doctoral students in 7980 for at least the minimum required registration. (pg 30 - Graduate Catalog).

**Cleared Prior**

Students exempt from final term registration must meet all of the following conditions before the start of the first day of classes:

1. Correctly registered in the preceding term.
2. Completed all degree requirements, including final submission of the dissertation, thesis, or project and the final examination report.
3. Submitted the final examination form for the nonthesis degrees.
4. Cleared all incompletes or other unresolved grades.
5. Filed degree application with the Office of the University Registrar

**Add/Drop**

Courses may be dropped or added during the drop/add period without penalty. This period lasts four UF calendar days, or three days for summer sessions, beginning with the first day of the semester. Classes that meet for the first time after the drop/add period may be dropped without academic penalty or fee liability by the end of the next business day after the first meeting. This does not apply to laboratory sections. After this period, a course may be dropped and a W will appear on the transcript. Any course added or dropped after the deadline will result in a registration fee liability, even for students with fee waivers.

**Retaking Courses** – Graduate students may repeat courses in which they earn failing grades. The grade points from the first and subsequent attempts are included in the computation of the grade point average, but the student receives credit for the satisfactory attempt only. (pg. 30 - Graduate Catalog).

**Courses and Credits**

Undergraduate courses (1000-2999) may not be used as any part of the graduate degree requirements. All 1000-2000 level courses may be taken on a satisfactory/unsatisfactory basis (S/U). Courses numbered 5000 and above are limited to graduate students. Courses numbered 7000 and above are designed primarily for advanced graduate students.

No more than five credits each of 6910 (Supervised Research) and 6940 (Supervised Teaching) may be taken by a graduate student at the University of Florida. Generally graduate courses may not be repeated for credit. However, there is no limit on courses
number 6971, 6972, 6979, 7979, and 7980. Other courses that may be repeated for credit are designated by max: immediately following the semester credit designation.

**Professional Work** – Graduate students may receive credit toward their degrees for courses in professional programs (e.g., J.D., D.V.M., or M.D.) when their advisors and graduate coordinators certify that the course work is appropriate for their programs and when the students receive permission from the academic units and colleges offering the courses. A list of such courses for each student must be filed with the Graduate School Records Office and is limited to a maximum of 9 credits toward the master’s degree and 30 credits toward the doctorate. (pg. 31 - Graduate Catalog).

If a student needs to have any courses that are not considered Graduate Level, i.e., below 4000 level the Graduate Coordinator should make approvals before the student registers for the course. It is crucial that BME students have an overall comprehensive understanding of the curriculum and be able to master it well. If a student lacks in a particular area the Graduate Coordinator should suggest courses to enhance this student(s) education to the benefit of that student and his/her matriculation and experience through the Graduate Program in BME.

**Grades**

The only passing grades for graduate students are A, B+, B, C+, C, and S. C+ and C grades count towards a graduate degree if an equal number of credits in courses numbered 5000 or higher have been earned with grades of B+ and A, respectively. Grade points are not designated for S and U grades; these grades are not used in calculating the grade point average. All letter graded courses taken as a graduate student, except 1000 and 2000 level courses, are used in calculating the cumulative grade point average. (pg. 31 - Graduate Catalog).

**Preparation for Final Semester**

It is the student’s responsibility to ascertain that all requirements have been met and that every deadline is observed. Deadline dates are set forth in the University Calendar and by the college or academic unit. These dates are included in the front of the Graduate Catalog and in the Graduate Student Handbook.

When the dissertation or thesis is ready to be put in final form, the student should obtain the Guide for Preparing Thesis and Dissertations from the Graduate School Editorial Office (available on the web at [http://gradschool.rgp.ufl.edu/editorial/introduction.html](http://gradschool.rgp.ufl.edu/editorial/introduction.html), click Thesis and Dissertation Guide).

Students must also file a degree application with the Office of the University Registrar (222 Criser Hall) at the beginning of the final term and must meet minimum registration requirements. See Cleared Prior in the Graduate Catalog on page 30. (pg. 32 - Graduate Catalog). The GSO also requires a copy of the final thesis or dissertation.
MASTER’S DEGREE

The Department of BME offers both thesis and non-thesis options for the Master’s degree. A student seeking the Master’s degree with a thesis option is required to pass an oral final exam, and the non-thesis Master’s student is required to pass a written comprehensive examination.

Students may choose a thesis or nonthesis option for the Master of Engineering (M.E.) degree. To be eligible for admission to the M.E. program students must have earned a bachelor’s degree from an ABET-accredited college or they must complete articulation work for equivalence. Admission requirements of the Graduate School must be met. Students who do not meet the ABET requirement may be admitted to the Master of Science program. The nonthesis M.E. degree is a 30-credit course-work only degree (practice-oriented project or capstone course may be included in the 30 credits). At least 15 credits must be in the student’s major at the 5000 level or higher. The Thesis option requires 30 credits of course work which may include up to 6 semester credits of research numbered 6971 in all academic units. At least 12 credits, excluding 6971, must be in the student’s major field of study. (pg 42 - Graduate Catalog).

Time Limitation - All work, including transferred credit, counted toward the master’s degree must be completed during the seven years immediately preceding the date on which the degree is awarded. (pg 33 - Graduate Catalog).

Admission Requirements

The students admitted to the Department of BME for the Master’s degree will in general be expected to have an undergraduate upper division grade point average of at least 3.4 on a 4.0 scale, a GRE verbal plus quantitative score of at least 1200, where applicable, a TOEFL score of no less than 550 for the paper based and 213 for the computer based test. Three letters of recommendation are also required.

Course Requirements

Graduate credit is awarded for courses numbered 5000 and above. The program of course work for a master’s degree must be approved by the student’s advisor, supervisory committee, or faculty representative of the academic unit. No more than nine credits from a previous master’s degree program may be applied toward a second master’s degree. These credits are applied only with the written approval of the Dean of the Graduate School.

Degree Requirements

Unless otherwise specified, for any master’s degree, the student must earn a minimum of 30 credits as a graduate student at the University of Florida. No more than 9 of the 30 credits (earned with a grade of A, B+, or B) may be transferred from institutions approved for this purpose by the Dean of the Graduate School. At least half of the required credits, exclusive of 6971, must be in the field of study designated the major. (pg. 33 - Graduate Catalog).
Transfer of Credit

If appropriate, submit a Transfer Petition to the BME Academic Committee, only graduate-level (5000-7999) work, earned with a grade of B or better, is eligible for transfer of credit. A maximum of 15 transfer credits are allowed. These can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at the University of Florida (pg. 33 - Graduate Catalog). All courses must have a designation (i.e. engineering requirements, engineering electives, Department requirements, etc.).

Supervisory Committee

The supervisory committee should be appointed as soon as possible after the student has been admitted to the Graduate School but in no case later than the second semester of graduate study. (pg 33 - Graduate Catalog).

Their duties are to advise the student, to check on the student’s qualifications and progress, to supervise the preparation of the thesis, and to conduct the final exam. The student is responsible for forming a Supervisory Committee and providing the names of the committee members to the Department of Biomedical Engineering Graduate Student Office. The function of the committee is to guide the student through his/her thesis research and to administer the final examination.

The supervisory committee for a master’s degree with a thesis must consist of at least three members selected from the Graduate Faculty. At least two members including the chair must hold an academic appointment in the Department of BME. The chairperson is the student’s academic advisor and should advise the student in the selection of other members. The supervisory committee for a master’s degree without a thesis may consist of one member of the BME graduate faculty. The chairperson must be affiliated with the Department of BME and is the one who advises the student.

Thesis

Candidates for the master’s degree with thesis must prepare and present thesis (or equivalent in creative work) acceptable to their supervisory committees and the Graduate School. The candidate should consult the Graduate School Editorial Office for instructions concerning the form of the thesis. The University Calendar specifies final dates for submitting the original copy of the thesis to the Graduate School. (pg 34 Graduate Catalog).
Final Examination Procedures

Within six months prior to graduation, the supervisory committee will give the student an oral examination on the thesis, major and minor subjects, and matters pertaining to his/her field of study.

The student must let the GSO know of their graduation intentions the semester prior of graduation. This will allow time for course requirement checks. It is imperative that copies of the student’s thesis be given to the supervisory committee at least one week in advance of the final examination. The Department of BME must receive date, time, title, location, and abstract two weeks prior to the defense date. Graduation may be delayed for those who do not adhere to this rule. All supervisory committee members and the candidate must be present at the final examination. At the time of the examination, all committee members should sign the signature pages and the Final Examination Report.

These may be retained by the supervisory chair until acceptable completion of corrections. This examination may not be scheduled earlier than the semester preceding the term the degree is to be conferred. (pg 34 - Graduate Catalog). On the day of examination, advisor needs to pick up necessary forms at the Department of BME. The Chair of your Supervisory Committee should return the Final Examination Form with your file to the Department of BME.

Master’s Degree Non-Thesis Option

Final Exam Procedures

The ME and MS non-thesis master’s degrees require only 30 hours of course work. For the ME degree, an examination is not required, but at the discretion of the department, an oral or written examination may be given. For the MS degree, a comprehensive written or oral examination is required. This examination must be taken within 6 months of the date the degree is to be awarded. Results of the examinations are not final until reviewed by the Supervisory Committee. If the student fails the examination, he/she must retake the examination at the next scheduled time. The exam may be retaken only once. If a Master student applies to the PhD program and is accepted, he/she may choose to take the PhD Written Qualifying Examination and, upon successful completion, satisfy the Master’s Non-Thesis and the PhD Written Qualifying Examination simultaneously.
# DEPARTMENT OF BIOMEDICAL ENGINEERING
## CURRICULUM FOR MASTERS DEGREES

### Semester 1 (Fall Semester, Year 1)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Thesis</th>
<th>Non-Thesis</th>
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<tbody>
<tr>
<td>BME</td>
<td>5001</td>
<td>BME Anatomy &amp; Physiology I</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>BME</td>
<td>6707</td>
<td>Introduction to Problem Based Learning I</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BME</td>
<td>6936</td>
<td>Biomedical Engineering Seminar</td>
<td>1</td>
<td>1</td>
</tr>
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<td>*</td>
<td>5000-7999</td>
<td>Specialty Elective</td>
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### Semester 2 (Spring Semester, Year 1)

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<th>Dept</th>
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<tbody>
<tr>
<td>BME</td>
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<td>BME Anatomy &amp; Physiology II</td>
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<td>*** BME</td>
<td>6707</td>
<td>Introduction to Problem Based Learning II</td>
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<tr>
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<td>Biomedical Engineering Seminar</td>
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### Semester 3 (Summer Semester, Year 1)

<table>
<thead>
<tr>
<th>Dept</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>6010</td>
<td>BME Clinical Preceptorship</td>
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</tr>
<tr>
<td>BME</td>
<td>6971</td>
<td>Masters Research</td>
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<th>Non-Thesis SCH</th>
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<tbody>
<tr>
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<td>5000-7000</td>
<td>BME Elective</td>
<td>3 (var.)</td>
<td>10 (var.)</td>
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<tr>
<td>BME</td>
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<tr>
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<td>Masters Research</td>
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<td><strong>Sub Total SCH</strong></td>
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<td><strong>12</strong></td>
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</table>

* Refers to courses that students can take in the COE or COM to count for the engineering and specialty electives.
** Credits required for Non-thesis Masters Degree.
*** Masters Students are not required to take PBL II. If you would like to take PBL II you may count that course as a BME Elective.

| Total Credit Hours Required for MS Thesis/Non-Thesis | 30 | 30 |
DEPARTMENT OF BIOMEDICAL ENGINEERING  
CURRICULUM FOR  
DOCTOR OF PHILOSOPHY DEGREE  

Semester 1 (Fall Semester, Year 1)  

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course Number</th>
<th>Course Title</th>
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<tr>
<td>BME</td>
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Semester 2 (Spring Semester, Year 1)  

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<td>BME Elective</td>
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Semester 3 (Summer Semester, Year 1)  

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Semester 4 (Fall Semester, Year 2)  

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### Semesters 7 thru Graduation (PhD)

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* Refers to courses that students can take in the COE or COM to count for the engineering and specialty electives.

| Total Credit Hours Required for MS/ PhD | 90 |
DOCTOR OF PHILOSOPHY DEGREE

Admission Requirements

The students admitted to the Department of BME for the PhD degree will in general be expected to have undergraduate work and graduate work (if taken) equivalent to a 3.4 GPA on a 4.0 scale, a GRE verbal plus quantitative score of at least 1300, where applicable, a TOEFL score of no less than 550 for the paper based and 213 for the computer based test. At least three strong letters of recommendation, statement of purpose - This statement should include the field of study that you wish to pursue, your intended area of specialization, and why you have selected the University of Florida and the Department of BME.

Upon acceptance into the PhD program, the student has two semesters to identify a professor willing to guide the dissertation research. If no such professor can be found the student can be dismissed from the PhD program. Each student is encouraged to complete this as soon as possible but no later than the second semester.

Appointment of Supervisory Committee

Supervisory committees are nominated by the department chairperson, approved by the dean of the college concerned, and appointed by the Dean of the Graduate School. The committee should be appointed as soon as possible after the student has begun doctoral work and in general no later than the end of the second semester of equivalent full-time study. The dean of the Graduate School is an ex-officio member of all supervisory committees.

Duties and Responsibilities – Duties of the supervisory committee follow:
1. To inform the student of all regulations governing the degree sought. It should be noted, however, that this does not absolve the student from the responsibility of informing himself/herself concerning these regulations.
2. To meet immediately after appointment to review the qualifications of the student and to discuss and approve a program of study.
3. To meet to discuss and approve the proposed dissertation project and the plans for carrying it out.
4. To give the student a yearly letter of evaluation in addition to the S/U grades awarded for the research courses 7979 and 7980. The Chair should write this letter after consulting with the supervisory committee.
5. To conduct the qualifying examination or, in those cases where the examination is administered by the academic unit, to take part in it. In either event the entire committee must be present with the student for the oral portion of the examination. This examination must be given on campus.
6. To meet when the work on the dissertation is at least one half completed to review procedure, progress, and expected results and to make suggestions for completion.
7. To meet on campus when the dissertation is completed and conduct the final oral examination to assure that the dissertation is a piece of original research and a contribution to knowledge. No fewer than four faculty members, including all members of the supervisory committee shall be present with the candidate for this examination. Only members of the official supervisory committee may sign the
dissertation and they must approve the dissertation unanimously. (pg 35 Graduate Catalog).

Membership - The supervisory committee for a candidate for the doctoral degree shall consist of no fewer than four members selected from the Graduate Faculty. At least three members, including the chair, will be from BME, and at least one member will be drawn from a different educational discipline, unaffiliated with the Department of BME. At least one member should be from the College of Medicine or other health-related college. After the committee has been determined, a signed copy of the Supervisory Committee form must be filed with the GSO (Forms I-II) (pg 36 - Graduate Catalog).


Course Requirements

The course requirements for doctoral degrees vary from field to field and from student to student. A minimum of 90 credits beyond the bachelor’s degree is required for the Ph.D. degree in all fields. All master’s degrees counted in the minimum must have been earned in the last seven years.

Transfer of Credit

No more than 30 semester credits of a master’s degree from another institution will be transferred to a doctoral program. If a student holds a master’s degree in a discipline different from the doctoral program, the master’s work will not be counted in the program unless the academic unit petitions the Dean of the Graduate School. All courses beyond the master’s degree taken at another university to be applied to the Ph.D. degree must be taken at an institution offering the doctoral degree and must be approved for graduate credit by the Graduate School of the University of Florida. All courses to be transferred must be graduate level, letter graded with a grade of B or better and must be demonstrated to relate directly to the degree being sought. All such transfer requests must be made by petition of the supervisory committee no later than the third semester of Ph.D. study. The total number of credits (including 30 for a prior master’s degree) that may be transferred cannot exceed 45, and in all cases the student must complete the qualifying examination at the University of Florida. In addition, any prior graduate level credits earned at the University of Florida (e.g., a master’s degree in the same or a different discipline) may be transferred into the doctoral program at the discretion of the supervisory committee and by petition to the Graduate School. In such cases, it is essential that the petition demonstrate the relevance of the prior course work to the degree presently being sought. (pg 35 - Graduate Catalog).

PhD degree has the following restrictions:
1. At least 40 hours of 5000, 6000, or 7000 level BME courses are required. Course numbers 5905, 6905, 6910, 6940, 6971, 7979 and 7980 are not considered coursework for the purpose of this 40-credit requirement.
Registration in Research Courses

Advanced Research (7979) is open to doctoral students who have not yet been admitted into candidacy (7 and 8 classifications). Students enrolled in 7979 during the term they qualify for candidacy will stay in this registration unless the academic unit elects to change their enrollment to Research for Doctoral Dissertation (7980). Research for Doctoral Dissertation (7980) is reserved for doctoral students who have been admitted to candidacy (9 classification). (pg 37 - Graduate Catalog).

Annual Evaluation for PhD Students

The Supervisory Committee Chair, in consultation with the other committee members, will give each PhD student a yearly written evaluation of his/her progress towards his/her degree. The student is given an opportunity to discuss the evaluation with his/her Supervisory Committee Chair. Copies of this evaluation and of student comments are placed in the student’s academic file.

Qualifying and Admission to Candidacy Examinations

The purpose of the qualifying exam and candidacy exam (written and oral proposal) is to assess the student’s potential to perform scholarly research at the PhD level. The student is to be evaluated for:

- Depth of knowledge in research area (i.e., review of relevant literature).
- Breadth of knowledge in biomedical engineering fundamentals.
- Ability to formulate a research plan.
- Critical thinking.

Eligibility Requirements for Candidacy Examination:

1. Coursework: A student must maintain at least a 3.4 grade point average in core courses taken during the first two semesters in order to take the qualifying exam. (Exception: Students who do not fulfill this requirement may petition the supervisory committee in writing to combine the oral portion of the qualifying exam with the MS oral thesis defense following completion of other MS requirements. This will be granted only in exceptional cases.)

2. Preproposal for doctoral research: Each member of the supervisory committee will grade (S/U) a written, independent proposal based on the following criteria: depth and significance of the literature review, quality of research performance to date, comprehension of important issues in the field of study, plan for future research, and quality of writing. The proposal should be no more than 40 double-spaced pages including figures and references.

3. Written exam: This part consists of written question provided by the supervisory committee. The written exam may be given before or after the oral exam, but will be due no later than a month following the oral exam.

4. Oral Exam: The student is responsible for scheduling the exam with the committee members. The student will first summarize the research proposal then answer questions about the research plan and field general questions covering biomedical engineering fundamentals and other disciplines related to the research topic. Each
committee member will submit a letter grade for the oral portion of the qualifying exam.

5. Outcomes:
Qualifying Exam: A grade point average of 3.4 or higher in core courses and prior approval the pre-proposal by the supervisory committee constitute a passing grade for the qualifying portion of the exam. A student who fails the qualifying exam must complete the requirements for an MS degree before being eligible to re-qualify. The student must petition the committee in writing to retake their qualifying oral exam at the time of the MS thesis defense. If the student qualifies, the advancement-to-candidacy exam must be taken within six months following the MS defense.

Advancement to PhD Candidacy: Students must pass the qualifying portion of the exam to be eligible to advance to PhD candidacy. The decision for advancement to candidacy is based on the quality of the proposed research plan. Only students who present a well-defined research plan without significant deficiencies will advance to candidacy. This is a simple pass/fail decision. Students who advance to candidacy may bypass the MS degree and begin working directly toward the doctoral degree. Students who fail the advancement-to-candidacy exam but pass the qualifying exam must repeat the advancement to candidacy portion of the exam after addressing the deficiencies identified by the committee, but no later than six months following the previous attempt.

If the student fails the oral PhD qualifying exam, he/she may retake it only once. If a student fails the qualifying examination, the Graduate School will be notified. A reexamination may be requested, but it must be recommended by the student’s supervisory committee and approved by the Graduate School. At least one semester of additional preparation is considered essential before re-examination.

Time Lapse - Between the oral portion of the qualifying examination and the date of the degree there must be a minimum of two semesters. The semester in which the qualifying examination is passed is counted, provided that the examination occurs before the midpoint of the term. No more than five years may pass between the completion of the qualifying examination and the conferring of the degree.

The PhD student becomes a candidate for the PhD degree when the following requirements are satisfied:
1. The student’s academic record is satisfactory.
2. The student has a dissertation topic approved by his/her supervisory committee.
3. The student has passed the written and oral parts of the PhD qualifying exam.
4. The completed Admission to Candidacy form has been submitted to the GSO.

Final Examination and Doctoral Dissertation

Within six months prior to graduation and after the submission of the dissertation and completion of all other prescribed work for the degree, the doctoral candidate will be given a final examination by his/her supervisory committee. The PhD final examination consists of an oral defense of the research results that are described in the doctoral dissertation.

The Department of BME should be informed of the examination 2 weeks prior to the time that the dissertation is submitted. This will ensure sufficient time to process the Final Examination Report. Copies of the student’s dissertation must be given to the supervisory
committee members at least one week in advance of the final examination. **Graduation may be delayed for those who do not adhere to this rule.**

At the time of the defense, all committee members should sign the signature pages in the dissertation and sign the Final Examination Report. The final exam report is to be returned to the GSO for forwarding to the College Dean’s office and the Graduate School. Students will submit the original copy of their dissertation signed by the supervisory committee and the Dean of the College of Engineering to the Graduate School Editorial Office. The Editorial Office will then check for formatting corrections and return to the student for final corrections. The final dissertation must be submitted on bond paper before the Dean’s signature can be affixed to the signature page. The student is required to walk the dissertation along with the signature page to the Editorial Office. The Editorial Office will secure the signature of the Graduate School Dean. The BME and the College of Engineering copy must be corrected to reflect any final changes after the final examination and prior to a faculty vote on graduation.

All work for the PhD degree must be completed within five calendar years after the completion of the PhD qualifying exam.
BME COURSES AND ELECTIVES
Program Core Courses

BME 5001 - Biomedical Engineering Anatomy & Physiology I (3) The course covers the physiology of cells, bones and circulatory system from a Biomaterials, Biomechanics, Cellular & Tissue Engineering perspective.

BME 5002 - Biomedical Engineering Anatomy & Physiology II (3) The course covers the physiology of the human body, imaging techniques, and subsequent processing. Various imaging modalities will be discussed along with the appropriate processing methods to reveal details of the physiology and diagnosis.

BME 6010 - Clinical Preceptorship for Engineers (2) Instructor’s approval required. The Clinical Faculty have unique insights into the restraints on current medical practice imposed by conditions, which may be changed by application of engineering principles. Students shadow a clinical faculty member in a clinic and work with an engineering faculty member to examine some of these practices and restraints with a goal to propose and evaluate possible improvements.

BME 6936 - Biomedical Engineering Seminar (1) The seminar provides state of the art reports on engineering research and clinical experience. It is designed to inform students and faculty of current developments, opportunities, and needs in the field. Faculty are encouraged to attend.

BME 6707 – Problem Based Learning I & II (2) Problem based learning provides a team based interdisciplinary problem solving environment in which the students devise solutions and approaches to topical and real world biomedical engineering problems and technologies.

BME Electives

Any Engineering Graduate Course (5000 level and above) can count as a BME elective. Please refer to the graduate catalog for a listing of all courses.

BME 5500 - Biomedical Instrumentation (3) Prereq: Basic knowledge of physics and calculus is required. This course will present all the major methods for measuring physiological signals from the human body. Whenever possible, actual physiological monitors will be used for the students to try out.


BME 6330 - Cellular & Tissue Engineering (3) Application of engineering principles toward understanding property-function relationships in cells and tissues. Manipulation of cell and tissue properties or the design of bioartificial substitutes to alter, restore, or improve cell and tissue function.

BME 6400 - Theory and Instrumentation for Medical Image Acquisition (3) Physics of ionizing and non-ionizing radiation interactions with biological systems; radiation detection systems utilized in medical image acquisition; radiation sources for image generation; features of image quality; applications of these concepts to projection
radiography; fluoroscopy, nuclear medicine, computed tomography, magnetic resonance imaging, and ultrasound.

**BME 6360 – Neural Engineering** (3) Neural Engineering represents the application of Engineering to neuroscience including such diverse areas as neural tissue engineering, models of neural function, and neural interface technology. This course will focus on these areas primarily in the context of neural interfaces/prosthetics beginning with basic neural physiology and models of neural mechanisms to the advanced neural interfaces currently being developed and or produced commercially by the field.

**BME 6905 - Individual Study** (1-6; max: 8)
**BME 6938 - Special Topics in Biomedical Engineering** (1-4; max 6)
**BME 6938 – QNNE Seminar** (2) The seminar will focus upon recent advances in scientific and engineering approaches, such as neuroimaging, signal processing, pattern recognition, informatics, and nanotechnology to solving clinical research problems.
**BME 6938 – Interfacing BME and Rehabilitation** (3) Hands-on interdisciplinary course serving both graduate level biomedical engineering (COE) and rehabilitation science students (RSD), interfacing the expertise and knowledge base of improving the potential of persons with disability.
**BME 6938 – Multivariate Signal Processing** (3) This course will deal with the statistical analysis of biomedical signals from a multivariate time series analysis perspective. Starting from the probabilistic foundation of time series we introduce analysis concepts and methods both in the time domain and in the spectral domain. Whenever possible actual recordings from biomedical applications will be used to demonstrate the methods.
**BME 6938 – Biomedical Imaging** (3) This course covers modern medical imaging technologies from a biomedical engineering perspective. The physics, mathematics, instrumentation and clinical applications of all common medical imaging modalities including x-ray radiography, computed tomography (CT), ultrasound imaging, positron emission tomography (PET), and magnetic resonance imaging (MRI) will be discussed. Emerging imaging modalities including diffuse optical tomography (DOT), optical coherence tomography (OCT) and photoacoustic tomography (PAT) will also be introduced.

**Note:** Electives not listed need to be approved by the Department of Biomedical Engineering Academic Committee.

**BME Research**

**BME 6910 - Supervised Research** (1-5; max: 5) S/U
**BME 6940 - Supervised Teaching** (1-5; max: 5) S/U
**BME 6971 - Research for Master’s Thesis** (1-15) S/U
**BME 7979 - Advanced Research** (1-12) Research for doctoral students before admission to candidacy. Designed for students with a Master’s degree in the field of study or for students who have been accepted for a doctoral program. Not open to students who have been admitted to candidacy. S/U.

**Area of Specialization/Engineering Electives**

**BCH 4024 - Introduction to Biochemistry and Molecular Biology** (4) Prereq: CHM 2210-2211, 3215-3216, 3217, or consent of instructor. An introduction to physical
biochemistry, intermediary metabolism and molecular biology. Topics include a survey of structure, chemistry and function of proteins and nucleic acids, enzyme kinetics and mechanisms of catalysis; a survey of the pathways of carbohydrate, lipid and nitrogen metabolism and their metabolic control; regulation of gene expression at the level of DNA, RNA, and protein synthesis.

**CAP 5416 - Computer Vision** (3) Prereq: MAC 2312, CGN 3421 and C/C++ or Fortran. Introduction to image formation and analysis. Monocular imaging system projections, camera model calibration, and binocular imaging. Low-level vision techniques, segmentation and representation techniques, and high-level vision.

**CAP 5515 - Computational Molecular Biology** (3) Prereq: Algorithms related to molecular biology. Sequence comparisons, pattern matching, pattern extraction, graph techniques in phylogeny construction, secondary structure prediction, multiple sequence alignment, contig search, DNA computing, computational learning theory, and genetic algorithms.

**CAP 6516 - Medical Image Analysis** (3) Medical image formation, reconstruction mathematics (Fourier slice theorem, Abel, Hankel and Radon transforms), basic filtering techniques (low and high-pass), PDE-based image denoising and segmentation, K-Means and Fuzzy clustering, iso-surface extraction, basic differential geometry of curves and surfaces, splines, active models (“snakes”), dynamically deformable models, geodesic snakes, matching/registration with application to multi-modal co-registration.

**CAP 6737 - Visual Modeling** (3) Prereq: CAP 5416, 5705, or EEL 6562. Study of object shape modeling from point of view of geometry, topology, physics, and computational algorithms.

**CAP 5510 - Bioinformatics and Biocomputing** (3) This course is concerned with the processing of biological information in DNA and proteins. Topics include: sequence comparison, sequence, assembly, physical mapping of DNA, phylogenetic trees, genome rearrangements, gene identification, biomolecular cryptology, and molecular structure prediction.

**ECH 6126 - Thermodynamics of Reactions and Phase Equilibria** (3) Methods of treating chemical and phase equilibria in multi-component systems through the application of thermodynamics and molecular theory.

**ECH 6270 - Continuum Basis of Chemical Engineering** (3) Integrated introduction to transport processes in continuous media with emphasis on fluid mechanics and heat and mass transfer.

**ECH 6726 – Interfacial Phenomena I** (2) Air-liquid and liquid-liquid interfaces; surface-active molecules, adsorption at interfaces, foams, micro- and macro-emulsions, retardation of evaporation and damping of waves by films, surface chemistry of biological systems.

**ECH 6727 – Interfacial Phenomena II** (2) Prereq: CHM 2046 and 2046L. Solid-gas, solid-liquid, solid-solid interfaces. Adsorption of gases and surface-active molecules on metal surfaces, contact angle and spreading of liquids, wetting and dewetting, lubrication, biolubrication, flotation, adhesion, biological applications of surfaces.

**EEL 5701 - Foundations of Digital Signal Processing** (3) Analysis and design of digital filters for discrete signal processing; spectral analysis; fast Fourier transform.


**EEL 6562 - Image Processing and Computer Vision** (3) Pictorial data representation, feature encoding, spatial filtering; image enhancement; image segmentation; cluster
seeking; two-dimensional z-transforms; scene analysis; picture description language; object recognition; pictorial database; interactive graphics; picture understanding machine.


**EEL 6825 - Pattern Recognition and Intelligent Systems** (3) Decision functions; optimum decision criteria; training algorithms; unsupervised learning; feature extraction, data reduction; potential functions; syntactic pattern description; recognition grammars; machine intelligence.

**EGM 5111L – Experimental Stress Analysis** (3) Prereq: EGM 3520. Introduction to techniques of experimental stress analysis in static systems. Lecture and laboratory include applications of electrical resistance strain gauges, photoelasticity, brittle coatings, moiré fringe analysis, and X-ray stress analysis.

**EGM 5533 - Mechanics of Solids and Structures** (3) Prereq: EGM 3520. Bars, beams, thin-walled structures, and simple continua in the elastic and inelastic range. Virtual work approaches, elastic energy principles, plastic limit theorems, creep deformation procedures, introduction to instability and fracture mechanics. Design applications.

**EGM 5584 - Principles of Mechanics in Biomedical Engineering** (3) Prereq: EGN 3353C and EGM 3520. Introduction to the solid and fluid mechanics of biological systems. Rheological behavior of materials subjected to static and dynamic loading. Mechanics of the cardiovascular, pulmonary, and renal systems. Mathematical models and analytical techniques used in the biosciences.


**EGM 6322 – Principles of Engineering Analysis II** (3) Prereq: EGM 4313 or MAP 4341

**EGM 6570 – Principles of Fracture Mechanics** (3) Prereq: EGM 6611. Introduction to the mechanics of fracture of brittle and ductile materials. Linear elastic fracture mechanics; elastic-plastic fracture; fracture testing; numerical methods; composite materials; creep and fatigue fracture.

**EGM 6595 - Bone Mechanics** (3) Biology, composition, and mechanical properties of cortical bone tissue, cancellous bone tissue, and cartilage. Bone modeled as anisotropic elastic material, as bioviscoelastic material, and as composite material. Adaptation to stress and remodeling; articular cartilage.


**EGM 6812 - Fluid Mechanics I** (3) Prereq: EGM 3353C. Flow kinematics. Fundamental
laws and equations in integral and differential forms. Potential flows. Introduction to laminar flows in simple geometries, laminar and turbulent boundary layer flows. External flows. One-dimensional compressible flows.


**EMA 6001 – Properties of Maters – A Survey** (3) Prereq: bachelor’s degree in physics, chemistry or engineering. Review of physical properties of materials such as mechanical, electrical, optical, magnetic, and thermal properties.

**EMA 6105 – Fundamentals and Applications of Surface Science** (3) Prereq: CHM 2045, MAP 2302, or consent of instructor. Fundamental and experimental description of phenomena occurring at surface of solids, including structure, composition, atomic and molecular processes, and electronic properties. Experimental approaches and data used to support theoretical models.

**EMA 6165 - Polymer Physical Science** (3) Prereq: EMA 3066. Solid-state properties of amorphous and semi-crystalline polymers.

**EMA 6166 - Polymer Composites** (3) Physical and mechanical properties of polymers and polymer composites as related to preparation and microstructure.


**EMA 6461 – Polymer Characterization** (3) Prereq: EMA 3066. Use of broad variety of spectroscopic and other scattering phenomena in polymer research.

**EMA 6580 - Science of Biomaterials** (3) Prereq: undergraduate chemistry. Introduction to variables that control compatibility and performance of biomaterials, including physical and chemical properties, corrosion, fatigue, and interfacial histochemical changes.

**EMA 6581C - Polymeric Biomaterials** (4) Prereq: undergraduate chemistry and EMA 3066. Biomedical implant and device applications of synthetic and natural polymers. Biocompatibility and interfacial properties of polymers in physiological environment, especially concerning short-term devices (catheters) and long-term implants (intraocular lenses, vascular and mammary prostheses, etc.).

**EML 5591 - Biometrics** (3) Prereq: EGM 3511, EMA 3070, EEL 3003 or 3177, EML 3023. Human/machine interface examined. Basic human anatomy introduced. Physical capabilities and limitations explored in context of practical design problems. Injury prevention, both acute and cumulative, investigated.


EML 6716 - Advanced Fluid Dynamics (3) Prereq: EML 4702. Extends the previous fluid flow courses to include a wider range of subject material and provide background for convection heat transfer course.

ENU 5615 - Nuclear Radiation Detection and Instrumentation (3) Interaction of radiation with matter, radiation detector systems, pulse shaping, amplification, amplitude and time-analyzing circuitry; counting and measuring devices, and control systems for nuclear reactors.

ENU 5615L - Nuclear Radiation Detection and Instrumentation Lab (1) Interaction of radiation with matter, radiation detector systems, pulse shaping, amplification, amplitude and time-analyzing circuitry; counting and measuring devices, and control systems for nuclear reactors.

ENU 5626 - Radiation Biology (3) Course Objective: To provide a fundamental knowledge of the mechanisms and biological responses of human beings to ionizing and non-ionizing radiations through the study of the effects of radiation on biological molecules, cells, and man including cancer and mutagenesis. The course will develop the ability to make objective decisions regarding the relative risks and benefits of radiation use in a variety of applications.

ENU 5658 – Image Analysis with Medical Physics Applications (3) Imaging science within a radiographic context, linear systems theory and the theory of stochastic processes and their application to radiographic imaging systems (primarily x-ray and gamma ray imaging systems), linear filtering of noisy images, image reconstruction from projections, sampling theory, image quality evaluation (including human observer models and ROC analysis), and effects and uses of scatter radiation.

ENU 6051 - Radiation Interaction Basics and Applications I (3) Interaction of X-rays, gamma rays, neutrons, and charged particles with matter; radioactive decay, nuclear moments, and nuclear transitions. Application to basic problems in nuclear engineering sciences.


ENU 6659 – Nuclear Medicine Instrumentation and Procedure (2) Prereq: ENU 5615 or equivalent. Theory, evaluation, applications of detecting and imaging systems in nuclear medicine including collimators, scintillation probes, cameras, data-processing devices; uses of radionuclides in medicine for radiopharmaceutical preparation.

GMS 6421 – Cell Biology (4) Prereq: undergraduate biochemistry or cell biology or consent of instructor; taught in conjunction with 1st year IDP core course. Fundamental mechanism of cell functions, specializations, and interactions that account for the organization and activities of basic tissues.
APPOINTMENT OF SUPERVISORY COMMITTEE
Master of Science/Master of Engineering

This Committee is:
New  Changed  Date:

Last Name  First Name  Middle  UF ID Number:

Minor:  If applicable, must have member from the minor department

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All members of the Supervisory Committee must be appointed to the Graduate Faculty (special members are by petition).

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<th>Co-Chair (if applicable)</th>
<th>Name</th>
<th>P.O. Box #</th>
<th>Dept</th>
<th>Signature</th>
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</table>

Department Chair: _____________________________

SUPERVISORY COMMITTEE REQUIREMENTS FOR MASTER’S DEGREES
Your committee should be appointed as soon as possible but in no case later than the second semester of Graduate study. The masters degree with a thesis must consist of at least three members (including the Chair), and the degree without a thesis may consist of one member who advises (may be the Chair only) the student. If a minor is designated, the committee must include one graduate faculty member from the minor department.

* The external member is for students who have a minor.
APPOINTMENT OF SUPERVISORY COMMITTEE
Doctorate in Philosophy

This committee is:
New    Changed    Date:

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Middle</th>
<th>UF ID Number</th>
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Minor: If applicable, must have member from the minor department

<table>
<thead>
<tr>
<th>Degree Sought</th>
<th>Doctor of Philosophy</th>
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Began at UF

<table>
<thead>
<tr>
<th>Semester</th>
<th>Year</th>
<th>Graduation (anticipated date):</th>
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All members of the Supervisory Committee must be appointed to the Graduate Faculty (special members are by petition).

<table>
<thead>
<tr>
<th>Name</th>
<th>P.O. Box #</th>
<th>Dept</th>
<th>Signature</th>
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<tbody>
<tr>
<td>BME Chair</td>
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<tr>
<td>BME Faculty</td>
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<td></td>
<td></td>
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<tr>
<td>External *</td>
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<table>
<thead>
<tr>
<th>Co-Chair (if applicable)</th>
<th>Name</th>
<th>P.O. Box #</th>
<th>Dept</th>
<th>Signature</th>
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Department Chair: _____________________________

SUPERVISORY COMMITTEE REQUIREMENTS FOR Doctorate of Philosophy DEGREES
Your committee should be appointed as soon as possible but in no case later than the second semester of graduate study.
The Ph.D. supervisory committee must consist of at least four members (including the Chair). If a minor is designated, the committee must include one graduate faculty member from the minor department.

* The external member is for students who have a minor.
Program of Study Worksheet
Department of Biomedical Engineering (BME)
Master of Science Degree (Thesis)

Student Identification Number:  
Name:  
Entrance Date (term & year):  

Previous Degree School Date

UD GPA:  
GRE Scores: V Q AA Total:  
TOEFL Score:  

Area of Specialization:  
Minor:  
Current GPA:  

Date Supervisory Committee Formed:  
Supervisory Committee Chair:  
Supervisory Committee Members:  
External Member (if applicable):  

Language Requirement Met:  
Date of Thesis or Dissertation Defense:  
Master Comprehensive Exam Passed (Date):  
Admitted to Candidacy (Date):  
PhD Qualifying Exam Passed (Date):  

Title of Thesis:  
Anticipated Graduation Date:  
Actual Graduation Date:  

Semester 1 (Fall Semester, Year 1)

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<tr>
<td>BME</td>
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<td>BME Anatomy &amp; Physiology I</td>
<td>3</td>
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<tr>
<td>BME</td>
<td>6707</td>
<td>Introduction to Problem Based Learning I</td>
<td>2</td>
</tr>
<tr>
<td>BME</td>
<td>6936</td>
<td>Biomedical Engineering Seminar</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>6000-7999</td>
<td>Specialty Elective</td>
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<td>Sub Total SCH</td>
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### Semester 2 (Spring Semester, Year 1)

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<td>Biomedical Engineering Seminar</td>
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<tr>
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### Semester 3 (Summer Semester, Year 1)

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<td>BME Clinical Preceptorship</td>
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### Semester 4 (Fall Semester, Year 2)

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* Refers to courses that students can take in the COE or COM to count for the engineering and specialty electives.

Total Credit Hours 30

**Approvals:**

Supervisory Committee Chair:

Name: ____________________________ Date: ____________________________

Graduate Student Coordinator:

Name: ____________________________ Date: ____________________________
Program of Study Worksheet
Department of Biomedical Engineering (BME)
Master of Science Degree (Non-Thesis)

Student Identification Number:  
Name:  
Enterance Date (term & year):  

<table>
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<th>Previous Degree</th>
<th>School</th>
<th>Date</th>
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UD GPA:  
GRE Scores:  V  Q  AA  Total:  
TOEFL Score:  

Area of Specialization:  
Minor:  
Current GPA:  

Date Supervisory Committee Formed:  
Supervisory Committee Chair:  
Supervisory Committee Members:  
External Member (if applicable):  

Language Requirement Met:  
Date of Thesis or Dissertation Defense:  
Master Comprehensive Exam Passed (Date):  
Admitted to Candidacy (Date):  
PhD Qualifying Exam Passed (Date):  

Title of Thesis:  
Anticipated Graduation Date:  
Actual Graduation Date:  

Semester 1 (Fall Semester, Year 1)

<table>
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<th>Course Title</th>
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<tr>
<td>BME</td>
<td>6707</td>
<td>Introduction to Problem Based Learning I</td>
<td>2</td>
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<tr>
<td>BME</td>
<td>6936</td>
<td>Biomedical Engineering Seminar</td>
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<tr>
<td>*</td>
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Sub Total SCH | 9
### Semester 2 (Spring Semester, Year 1)

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<td>BME</td>
<td>6707</td>
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<td>2</td>
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<tr>
<td>BME</td>
<td>6936</td>
<td>Biomedical Engineering Seminar</td>
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<tr>
<td>*</td>
<td>6000-7999</td>
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### Semester 3 (Fall Semester, Year 2)

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* Refers to courses that students can take in the COE or COM to count for the engineering and specialty electives.

| Total Credit Hours | 30 |

**Approvals:**

- **Supervisory Committee Chair:**
  - Name: ___________________________  Date: ________________

- **Graduate Student Coordinator:**
  - Name: ___________________________  Date: ________________
Program of Study Worksheet  
Department of Biomedical Engineering (BME)  
Doctor of Philosophy

<table>
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<td>External Member (if applicable):</td>
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<td>PhD Qualifying Exam Passed (Date):</td>
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Anticipated Graduation Date: 
Actual Graduation Date: 

**Semester 1 (Fall Semester, Year 1)**

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<tr>
<td>BME</td>
<td>6707</td>
<td>Introduction to Problem Based Learning I</td>
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<tr>
<td>BME</td>
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### Semester 2 (Spring Semester, Year 1)

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### Semester 3 (Summer Semester, Year 1)

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### Semester 4 (Fall Semester, Year 2)

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<td>Advanced Research</td>
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### Semester 5 (Spring Semester, Year 2)

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<td>BME</td>
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<td>Advanced Research</td>
<td>(var.)</td>
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**Semester 6 (Summer Semester, Year 2)**

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* Refers to courses that students can take in the COE or COM to count for the engineering and specialty electives.

| Total Credit Hours | 90 |

**Approvals:**

Supervisory Committee Chair:

Name: ___________________________ Date: ___________________________

Graduate Student Coordinator:

Name: ___________________________ Date: ___________________________
BME Individual Work
Please type or write neatly

Course Number
BME 6905

Student’s Name

UF ID #

Credit Hours

Semester

Instructor Initials___________

Topic (No more than one paragraph):
BME Supervised Research
Please type or write neatly

<table>
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<td>Credit Hours</td>
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<td>Semester</td>
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Instructor Initials___________

Topic (No more than one paragraph):
BME 6938

Student’s Name

UF ID #

Credit Hours

Semester

Instructor Initials

Topic (No more than one paragraph):
Course Number

BME 6971

Student’s Name

UF ID #

Credit Hours

Semester

Instructor Initials

Topic (No more than one paragraph):
| **BME Advanced Research**  
| *Please type or write neatly*  

| **Course Number** | **BME 7979**  
| **Student’s Name** |  
| **UF ID #** |  
| **Credit Hours** |  
| **Semester** |  

**Instructor Initials**

**Topic (No more than one paragraph):**
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**Topic (No more than one paragraph):**