

# HANDBOOK

## Graduate Programs

*Department Biomedical Engineering*

*Florida International University*

Date: 03/25/2025

Version: 2.0



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## Overview:

This handbook provides essential information about the PhD graduate program in the department of Biomedical Engineering at Florida International University, from coursework, requirements for candidacy, important forms and resources to perform successfully in our programs. It also summarizes the most important policies and procedures of our PhD graduate program.

## List of Forms:

<https://gradschool.fiu.edu/students/#studentforms>

- Annual Student Evaluation and Mentoring Form (PDF)
- Form D-1 (PDF) Appointment of Dissertation Committee
- Non-FIU Commitment Form (PDF) To be used with the D-1 where applicable
- Form D-1r (PDF) Appointment of Revised Dissertation Committee
- Form D-2 (PDF) Program for Doctoral Degree and Application for Candidacy
- Form D-3 (PDF) Doctoral Dissertation Proposal
- Form D-5 (PDF) Preliminary Approval of Dissertation and Request for Oral Defense
- Final ETD Approval Form (PDF) Approval of defense, dissertation, and electronic submission of dissertation.

## PhD curriculum:

### Credit Requirements

The PhD program requires a total of **75 credit hours** beyond the BS degree. These credits are comprised of a minimum of **27 hours of coursework** and a minimum of **15 hours of dissertation credit**. Applicants having a Master's Degree in Biomedical Engineering or closely related field from an accredited institution are given a maximum of 30 transferred semester hours. Courses to be transferred must comply with the categories and requirements of the FIU Biomedical Engineering (BME) PhD 27 credit hours of coursework. Transfer of courses is subject to approval by the graduate program director (GPD) upon review of the respective syllabi and consultation with the student advisor. The graduate program committee and the academic advisor may also recommend that students take additional courses based on their research needs and deficiencies. PhD students from science and engineering areas other than biomedical engineering will be expected to complete undergraduate **remedial courses** selected to prepare them for graduate courses in their area of interest. Required remedial courses for each student are defined and approved by the GPD at the beginning of the first semester of enrollment. The FIU BME PhD graduate program requires the completion of these background courses with no grades below "C" and a grade point average of 3.0 or better. GPD and major advisor (if defined) must be consulted as to when the courses need to be taken. **The plan must be in writing.** Completion of these remedial courses is required before submission of the D-2 form. International students are encouraged to contact the GPD early in the program to discuss eligibility to take undergraduate courses. The students will be required to provide a plan "*in writing*". *Official transcripts* are required to evaluate courses to be transferred and remedial requirements.

### Coursework Requirements

The program of study will require completion of courses (beyond the BS degree) in the following categories:

- *Engineering Mathematics*
- *Life Science*
- *BME Electives*

No. of credits for each course are in brackets. **Approval by the GPD, upon recommendation by the major advisor, is required to take any course not listed in this section as part of the 27 credits of coursework.**

#### *Engineering Mathematics* – minimum of 6 credits

Courses in this area must cover the broad areas of **statistics** and **theoretical/numerical modeling**. PhD students have to take 1 course (3 credits) from the list of Statistics courses and 1 course (3 credits) from the list of theoretical/numerical modeling courses.

#### List of courses on Statistics

STA 5126	Fundamentals of Design of Experiments (3)	Fall	Regular
STA 6176	Biostatistics (3)	Spring	Regular
STA 5206	Design of Experiments I (3)	Fall	Regular
STA 6746	Multivariate Statistical Analysis (3)	Fall	Rarely offered
STA 6244	Data Analysis I (3)	Fall	Rarely offered
STA 7707	Multivariate Methods I (3)	Fall	Rarely offered
STA 7708	Multivariate Methods II (3)	Fall	Rarely offered

**List of courses on Theoretical/ Numerical Modeling**

BME 6705	Nonlinear Systems in Life Sciences (3)	Fall	Regular
BME 6990	FEA in Biomedical Design (3)	Fall	Regular
BME 6716	Mathematical Model of Cells (3)	Fall/Spring	Rarely offered
BME 6715	Mathematical Model of Phys Sys (3)	Fall/Spring	Rarely offered

**Life Science – minimum of 6 credits**

The life science courses may be selected from the following approved list. FIU BME PhD program requires students to take at least one of the two Physiology/Engineering courses (BME 5410/5411).

BME 5410	Physiology/Engineering I (3)	Fall	Regular
BME 5411	Physiology/Engineering II (3)	Spring	Regular
BME 6019	Clinical Research Experience (1)	Fall/Spring	Regular
CHM 5506	Physical Biochemistry (3)	Fall	Rarely offered
PCB 5725	Membrane Signal Transduction (3)	Fall	Rarely offered
PCB 5835	Neurophysiology (3)	Fall	Rarely offered
PCB 5835L	Neurophysiology (1)	Fall	Rarely offered
PCB 6025	Molecular and Cellular Biology I (3)	Fall	Regular
PCB 6027	Molecular and Cellular Biology II (3)	Spring	Regular
PCB 6176C	Biological Electron Microscopy (5)	Fall	Rarely offered
PCB 6933	Trends in Neurobiology (2)	Fall	Rarely offered
PHY 6716	Advanced Biophysics (3)	Fall	Rarely offered
PHZ 5370	Nanoscience (3)	Fall	Rarely offered
PHZ 6255	Molecular Biophysics (3)	Fall	Rarely offered
ZOO 5745	Advanced Neuroanatomy (3)	Fall	Rarely offered
ZOO 5746	Comparative Neurobiology (4)	Fall	Rarely offered
ZOO 5785	Advanced Neurobiology (3)	Fall	Regular
ZOO 6782	Sensory systems in Neurobiology (3)	Springs	Odd Years
BSC 6936	Motor systems in Neurobiology	Springs	Even Years
CHM 6036	Advanced Biochemistry 1 (3)	Fall	Regular
CHM 6037	Advanced Biochemistry 2 (3)	Spring	Regular
BCH 6108	Biochemical Techniques (3)	Fall	No Data

**BME Electives – 15 credit hours or more**

Courses in this area must cover the major and minor specialty areas of the student. The three current specialty areas within biomedical engineering are:

1. *Basic Research in Engineered Tissue Model Systems and related biomechanics*
2. *Therapeutic and Reparative Neurotechnology*
3. *Diagnostic Bioimaging and Sensor Systems*

In order to prepare PhD students to work in a variety of BME subjects, it is required that 3 courses (9 credit hours) are taken in the major specialty area and 1 course (3 credit hours) in each of the minor specialty areas. The major specialty area must be declared before D-1 is submitted. Exception of this rule must be approved by the major advisor, and communicated in writing to the GPD.

**Basic Research in Engineered Tissue Model Systems** and related biomechanics

BME 5036	Biotransport Processes	Fall	Odd years
BME 5105	Intermediate Biomaterials Science	Fall/Spring	Rarely offered
BME 5316	Molecular Bioprocess Eng	Fall/Spring	Rarely offered
BME 6266	Advanced Biofluid Mechanics	Spring	Regular
BME 5336	Cell/Tissue Eng I: Theory & Method	Fall	Regular
BME 6645	Drug Trans Modeling	Fall	Alt 2020/2022
BME 6715	Math Model Phys Sys	Fall	Rarely offered
BME 6716	Math Model of Cell Systems	Fall	Rarely offered
BME 6335	Artificial Organs	Fall/Spring	Rarely offered
BME 5233	Biomechanics of Cardiovascular Systems	Spring	Regular
BME 5200	Orthopedic Biomechanics	Spring	Regular
BME 6990	FEA in Biomedical Design	Fall	Regular

**Therapeutic and Reporative Neurotechnology**

BME 5200	Orthopedic Biomechanics	Spring	Regular
BME 5505C	Eng Foundations Med Imaging Instrument	Spring	Regular
BME 6421	Electrophys Phenomena in Biological Tissue	Spring	Regular
BME 6564	Optical Imaging Biomed	Spring	Odd years
BME 6565	Quantitative Microscopy and Visualization	Fall	Regular
BME 6716	Math Model of Cell Systems	Fall	Rarely offered
EEE 6285	Biosignal Processing I	Fall	Regular
EEE 6286	Biosignal Processing II	Fall	Regular
EEL 5820	Digital Image Processing	Fall	Regular
EEL 6836	Computer Vis of Brain Electrical Activity	Fall	Regular
BME 6717	Comput Anal & Simul Physiol Proc	Spring	Regular
BME 5803	Biomedical Device Design	Fall	Regular

**Diagnostic Bioimaging and Nanosensor Systems**

BME 5560	BME Optics	Fall	Regular
BME 5573	Nanomed	Spring	Rarely offered
BME 5578	Bio & Commercialization of Nanomedicine	Spring	Rarely offered
BME 6532	Molecular Imaging	Spring	Regular
BME 6545	Biosensor and Nanobioelectronics	Fall	Rarely offered
BME 6563	Optical Spectroscopy	Spring	Even years
BME 6564	Optical Imaging Biomed	Spring	Odd years
BME 6717	Comput Anal & Simul Physiol Proc	Spring	Regular
EEE 6285	Biosignal Processing I	Fall	Regular
EEE 6286	Biosignal Processing II	Fall	Regular
EEL 5820	Digital Image Processing	Fall	Regular

EEL 6821	Computer Vision	Fall	Regular
EEL 6836	Computer Vis of Brain Electrical Activity	Fall	Regular
BME 5505C	Eng Foundations Med Imaging Instrument	Spring	Regular

**Biomedical Engineering Seminar** (BME 7938 Doctoral BME Seminar 0 credit)

Doctoral students must attend at least 15 BME Wallace Coulter series seminars, during the course of their PhD study. Students need to sign in for these events when attending them. The graduate student sign-in sheets are provided during the seminars.

Updated schedules and live videos of the seminars can be viewed at <https://bme.fiu.edu/seminars/>. Once the required number of seminars has been met, students need to mandatorily register for the BME 7938 course any semester before graduation. All students with 15 seminars attended will receive a grade “P”. The BME 7938 section will be opened under the GPD.

*The schedules for all courses referred above may be subject to changes.* Please consult the course instructor before planning the coursework for each semester.

Independent studies: Up to 6 credit hours of independent studies (BME 6905) can be taken towards the requirement of 27 credits of coursework. If so, a syllabus of the independent study course must be provided by the course instructor to the graduate program director before the hold on the independent study course can be removed. Independent studies must be designed to prepare the student in specific areas of technology/methodology and also to introduce them to new scientific areas of research. As this is a graded activity, a rubric with information about the structure of the course and the assessment criteria must be clearly defined and discussed with the student/advisor before the course begins. The amount of work must be in correspondence with the credits taken (1-3). Independent studies must be recommended by the advisor based on feedback from the dissertation committee (D-1). If the D-1 form has not been approved, this course must be discussed with the GPD. The instructor of the BME 6905 must be a BME faculty member, but does not need to be a member of the dissertation committee.

Supervised Research: Once the D-1 form is filed, up to 6 credit hours of Supervised Research (BME 6910) can be taken under a given faculty member (generally, the advisor). The structure of research, goals and assessment criteria must be clearly defined and discussed with the student before the course begins. The students can enroll in 3 more Supervised Research credits under an additional faculty member, if required. It is recommended that the student enroll in supervised research in a relevant field related to the dissertation topic. For students with no D-1 on file, Supervised Research must be approved by the GPD.

Dissertation credits: After submission of the D-2 form, to remain in full time status, the student must enroll in at least 3 Dissertation credits (BME 7980) each semester (covered by the tuition waiver offered by FIU if the student is on contract). After entering into candidacy, students must be continuously enrolled until graduation. Students must be in candidacy for at least one year (3 semesters) before being eligible to graduate.

Sections for the independent study (BME 6905), supervised research (BME 6910) and dissertation credits (BME 7980) should be opened by the respective faculty member. A syllabus for BME 6905 must be provided by the course instructor to the graduate program director before the hold on the independent study course can be removed.

**Course Requirements for Graduate Studies in Biomedical Engineering for applicants with a Non-Engineering or Non-Biomedical Engineering Academic Background**



### **Non-engineering academic background**

In addition to the normal requirements for graduation, during your course of study at FIU you will be required to complete all of the following courses (or show evidence of prior successful completion of an equivalent course):

MAC 2311 Calculus I  
MAC 2312 Calculus II  
MAC 2313 Multivariable Calculus  
MAP 2302 Differential Equations  
CHM 1045 General Chemistry I  
CHM 1045L General Chemistry I Lab  
PHY 2048/2049 Physics I/II w/Calculus  
PHY 2048L/2049L Physics I/II Lab  
BME 3632 Biomedical Engineering Transport  
EEL 3110/L Circuit Analysis  
EGM 3503 Applied Mechanics

### **Non-biomedical (engineering) academic background**

In addition to the normal requirements for graduation, during your course of study at FIU you will be required to complete all of the following undergraduate courses:

- BME 3403 Engineering Analysis of Biological Systems I
- BME 3404 Engineering Analysis of Biological Systems II

Or equivalent courses from the Department of Biological Science

- PCB 3703 Human Physiol. I
- PCB 3704 Human Physiol. II

Or show evidence of prior successful completion of at least two semesters of biology, physiology, or the equivalent biomedical related life science courses, examples:

PCB 3702 Interm Human Physiol  
BMS 6501 Medical Physiology  
PCB 2099 Foundations of Human Physiology  
PCB 4733 Human Systemic Physiology I  
PCB 4734 Human Systemic Physiology II

*Note: It is recommended to take the remedial courses within the first two semesters of the PhD program.*

### **Process to transfer credits from other programs:**

There are two types of transfer of credits: 1) Internal Institution and 2) External Institution. The BME PhD program may accept up to 20% of the required coursework (~ 6 credits) of graduate credit earned from another institution beyond a bachelor's degree. An exception to the 20% limitation is made for courses contained within an earned master's or doctoral degree. For such courses, the maximum is one credit fewer than half of the total credits required by the PhD program (i.e., ~12 credits). To transfer courses from another program, students must have an approved D-1 form. Exceptions to this requirement must be approved by the GPD. Waiver of any of the requirements for transfer of courses requires the approval of the GPD (or the chairperson), the Dean of the College and the Dean of the UGS.

#### Requirements to Transfer Courses:

- 1- The student has a grade of 3.0 or better (on a scale of 4.0)
- 2- The course was taken at an accredited institution
- 3- The course must be relevant (as judged by the dissertation committee)

- 4- The course must be listed in the official transcript sent to the “admission office” by the institution where the course was taken.
- 5- The date of completion of the courses to be transferred will be no longer than 9 years at the time of graduation with a doctoral degree. This requirement does not apply to credits earned as part of a completed graduate degree.

To transfer credits from another institution, a Memo must be prepared by the advisor (or GPD) with the rationale for the request and a table with the following information.

FIU Course	Transf. Course	University	Grade	% Overlap	Course Description
Equivalent course in our PhD program <i>e.g., BME 6564</i>	List the course to be transferred <i>e.g., M296A</i>	<i>e.g., UCLA</i>	<i>e.g., A</i>	Overlap between the two courses <i>e.g., 65 %</i>	A brief description of the course to be transferred

The Memo must list the course syllabi in an appendix. The Memo must be sent to the GPD by the advisor for final approval. If approved, the GPD will submit the request to the FIU Office of Registrar.

### Removal of Holds:

Advising hold: An advising hold on the student’s Panthersoft interface is to be removed prior to registration of classes.

- For students who do not have the D-1 form on file, decision of enrollment in courses must be discussed with the advisor assigned on the offer letter. For these students, the final removal of the advisor hold will be approved by the GPD.
- If the student’s offer letter does not declare a faculty advisor (e.g., students with scholarships/fellowships), courses must be discussed directly with the program GPD.
- For students with a filed D-1 form, the student’s thesis advisor removes the hold.

Insurance hold: Students must contact the Program Administrative-Coordinator/Specialist in the BME department for removal of the insurance hold on their account. In case of delays and special cases, students may contact the GPD and/or the University Graduate School (UGS), to facilitate resolving issues.

For information about Health Insurance, please refer to:

### **FIU Student Health Services**

#### **Division of Student Affairs**

11200 SW 8th Street, SHC, 132-139 Miami, FL 33199

Phone: (305) 348-2688

Fax: (305) 348-3336

Hours: Monday-Friday: 8:00 A.M. - 5:00 P.M.

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Website: [studenthealth.fiu.edu](http://studenthealth.fiu.edu)

Follow us on Twitter: [@FIUSHS](https://twitter.com/FIUSHS)

### MS en-route

Students in the BME PhD program may obtain an MS degree in Biomedical Engineering, upon submission and approval of their D3 form (after doctoral dissertation proposal). Courses must satisfy the BME MS

program. Only courses taken at FIU will count towards the MS en-route. **Procedure:** Every semester, the CEC will provide to the BME department a list of students with potential eligibility for the MS en-route. The GPD, in coordination with the major advisor, will review student files. If approved, a memorandum by the GPD (or advisor) will be submitted to UGS with the eligibility confirmation for each student.

## UM/FIU Exchange Program

The UM/FIU program enables doctoral students at FIU to enroll for up to 6 credits of pre-approved courses at UM.

**Application Deadlines:** Fall: July 1<sup>st</sup>, Spring: November 22<sup>nd</sup>, Summer: April 1<sup>st</sup>.

The Application Process: Student completes and signs Section A and the Student Agreement. Student's academic advisor completes and signs Section B. Student submits form to the FIU UGS for approval. The FIU communicates with the University of Miami (UM) to process paperwork and evaluate for approval. Upon approval, UM enrolls the visiting student into the approved courses. The student receives UM information and instructions through the FIU contact. Students must have the approval of FIU UGS in order to officially participate in the program. International students (F-1 or J-1 status) will need to also submit a copy of their I-20 or DS-2019, written approval from the International Students and Scholar Services (ISSS) office to participate in the program and proof of insurance. The form can be found in the following link: <https://gradschool.fiu.edu/wp-content/uploads/2020/11/WritableFIU-UM-Exchange-Application2020current.pdf>

**IMPORTANT:** If you wish to DROP a course within the program, you must do so by the posted drop date for your home institution. As a participant in the FIU/UM Exchange program, you must DROP through the program coordinator for FIU.

### Program Coordinators

**FIU Program Coordinator:** Karla Ortega, Associate Director, [ortegak@fiu.edu](mailto:ortegak@fiu.edu) (305) 348-2455

**UM Program Coordinator:** Tyrone Henry Jr., Assistant Director, [t.henry1@miami.edu](mailto:t.henry1@miami.edu) (305) 284-4155

**Relevant Courses in the Medical Physics Concentration Area (Department of Biomedical Engineering, UM):** Neuroscience (3 credits), Radiobiology and Physics (3 credits), Radiation Therapy Physics (3 credits), Radiation Protection (3 credits), Radiation Dosimetry and Physics (3 credits)

## Annual Evaluation:

The annual evaluation is an important exercise for a PhD student.

For PhD students with a thesis committee (D-1) on file, the annual evaluation consists of three sequential steps:

1. A dissertation committee meeting to discuss student progress and future plans. The student must mandatorily meet the dissertation committee in person, to discuss progresses achieved during the year under evaluation and goals for the coming year. In cases of a committee member not being able to attend in person, teleconferencing facilitating discussion with the rest of the committee must be set up.
2. A discussion with advisor about the annual evaluation. In order to optimize the annual evaluation process, the student and his/her advisor should formulate the listing of achievements and goals, in accordance with the suggestions by the committee (step 1).
  - Complete the annual evaluation form. **Quick Instructions** are provided below.

For PhD students with no committee (D-1) on file, the students are required to discuss achievements/goals first with the potential advisor and then with the GPD.

The Annual evaluation needs to be completed by every student, on a yearly basis, by May 31<sup>st</sup>.

### QUICK INSTRUCTIONS

**Step 1** – Log into your Student Portal to initiate your Annual Evaluation Form

- Log into your Student Portal at: <https://my.fiu.edu/>
- On your Student Center, under your To Do List, click hyperlink labeled Annual Evaluation – Pending
- To initiate form, click on tab labeled Add a New Value

**Step 2** – Review populated information to ensure accuracy. Before completing required sections 1 and 2:

- If you do have a dissertation committee on file and it is not accurate, please do not complete the form until your committee is updated. To update your committee, you must first submit a revised committee (D-1r) form to the UGS. Once approved and your committee is updated, you can proceed to the completion of your form.
- If your committee is accurate, check Committee Member Box to confirm and continue with sections 1 and 2.
- If you do not have a committee on file, continue with sections 1 and 2

**Step 3** – Click on Submit button in section 7 to route form to the next level of approver

**Step 4** – Once your form is reviewed and signed off by Major Professor(Advisor)/GPD, complete section 5: (Please check periodically your “To Do” list in order to follow up the entire process)

- Enter date of your evaluation meeting with your committee and/or GPD (if you do not have committee)
- Check box to confirm meeting and review of evaluation
- Click on the Submit button to route it to the next level of approval

In section 2, clearly list your accomplishments using a bullet format and identify multiple specific goals for your next evaluation period. These goals must be **measurable outcomes** and should be **previously discussed** either with the advisor/committee (D-1 on file) or potential-advisor/GPD (no D-1 on file). *General statements including ‘being more productive’ or ‘completing experimental setup for my dissertation are not acceptable. Specific listing of goals is mandatory, for e.g., ‘will complete the simulation study about mechanical deformations of the knee under XYZ stress condition’; ‘will prepare a manuscript with recent results about propagation of electrical activity in the muscle and submit it to a peer reviewed journal.’* Section 3 (performance summary and future goals) is to be completed by the advisor,

which should be in agreement with section 2. Advisor must complete evaluation of core competences (section 4) according to student performance in the academic year, as per discussion in his/her committee. If the student falls into the category of “Occasionally does not meet expectation” or “Consistently does not meet expectations” for any of the core competencies, advisor must complete section 6 (Student Performance Improvement Plan). Section 5 is to be completed by the student after advisor feedbacks and must be used to indicate any comments/concerns.

**Further instructions on the procedure can be found online at**

**<http://gradschool.fiu.edu/documents/OnlineAnnualEvaluationProcess-%20FIU2017final.pdf>**

A detailed guide for completing the process can be found at the following link

**<https://gradschool.fiu.edu/students/doctoral-annual-student-evaluation/>**

## Formation of the Dissertation Committee

### **Form D-1: Appointment of Dissertation Committee**

The doctoral student works with the potential advisor who matches the student’s areas of interest and project to put together the doctoral thesis committee. The committee is designed to accommodate gaps in knowledge and to strengthen areas of research pertaining to the dissertation.

### **Instructions and Helpful Information for D-1 Form Appointment of Dissertation Committee (D-1)**

#### **1. DEADLINES**

D-1 is to be completed at the time your committee is formed but no later than 4 semesters before the anticipated graduation semester. Deadlines for submission of subsequent forms to the UGS are available at: <http://gradschool.fiu.edu/current-students-calendar-deadlines.shtml>

<http://gradschool.fiu.edu/calendar-deadlines/#doctoral>. Submit the D-1 form (Page 3) to the Academic units well before the deadline to allow sufficient time for approval and signature. Ultimately, it is the student's responsibility to make sure forms are received by the UGS on time and that all deadlines are met.

#### **2. ACTIVE STATUS ENROLLMENT REQUIREMENTS**

Doctoral students who have not advanced to candidacy are **required** to be enrolled in at least 1 graduate credit hour in the term in which they submit D-1. Doctoral candidates are required to be enrolled in at least 3 dissertation credits. D-1 form will not be processed without proof of current enrollment. The form will be returned to the major professor. Further information regarding the UGS graduate active and full-time status policies is available at:

<https://policies.fiu.edu/files/759.pdf>.

#### **3. INSTRUCTIONS**

All information must be **typed**. It should be understood that all dissertation committee members are appointed by the Dean of the University Graduate School on the recommendation of the unit.

- The committee is comprised of at least four (4) members of the Graduate Faculty (GF).
- The major professor (advisor) must be a member of the GF and must be an expert in the subject of the dissertation.
- At least two members of the committee must be from the unit offering the graduate program and one must be from outside of the department or school but within FIU.
- Additional members may be appointed.

If there is a co-major professor being designated, please complete name and signature in the line assigned for co-major professors ONLY. Co-major Professors must have DAS status. Type the names of the committee members, obtain their original signatures, and confirm they are members of FIU’s GF. Confirm that the major professor holds DAS. After confirming GF and DAS status, check the “Verified” boxes

next to each name.

The list of GF is available at <http://gradschool.fiu.edu/facultystaff/>. Note that any individual currently associated with FIU as an employee must have GF status to serve on dissertation committees. If additional committee members **do not** have FIU GF status, these individuals must understand the time commitment required to read the doctoral student's proposal, participate in annual progress meetings and attend the dissertation defense. Non-FIU GF committee members must submit a CV and complete the Commitment Form for Non-FIU Committee Members. These documents must be submitted with D-1 form. Non-FIU GF must be approved by the UGS. It is the responsibility of the student and academic unit/college to ensure that the proposed committee meets the University's minimum committee composition requirements. D-1 forms that do not meet minimum committee composition requirements will be returned to the major professor. Original signatures from all committee members are required on D-1 form. Complete checklist and attach documentation as needed.

- Provide a copy of your class schedule to show proof of current enrollment in graduate credit hours. Access: **my.fiu.edu** → Choose the Student Tab → Under "Academics" choose "Class Schedule" in the drop-box → Choose the arrow next to the drop-box to continue → Choose the current academic semester to continue → Show only the enrolled classes and "filter" → Click File → Print Preview → Pull drop-box which states "Only the selected frame" → Print the entire enrollment class schedule
- Provide a brief summary (no more than 2 pages) of the expertise of your committee members. The summary should identify the expected contributions of each committee member and his/her qualifications to serve in that capacity (a paragraph on each member is sufficient).
- If additional committee members **do not** have FIU GF status, a full CV, a brief statement of expertise related to student's project, and confirmation of commitment of time must be attached.

Submit the D-1 form and required documentation to Chair/GPD and the Dean of the College for approval. Submit the hardcopy form to the UGS for final approval.

#### **4. ADDITIONAL INFORMATION**

To check the status of your form, please log on to **my.fiu.edu**, and check under the "To Do List" Section. If your GPA is below 3.0, see your academic advisor in order to make a plan to raise your GPA above 3.0; you **cannot** graduate with a GPA below 3.0.

##### **Form D-1r: Modifications to the Dissertation Committee**

In case the student decides to make a change (add/ remove members) in his/her dissertation committee, Form D-1r needs to be filed with UGS.

#### **Instructions and Helpful Information for D-1r Form Appointment of Revised Dissertation Committee (D-1r)**

##### **1. DEADLINES**

D-1r is to be completed as soon as a revised committee is formed.

##### **2. ACTIVE STATUS ENROLLMENT REQUIREMENTS**

Doctoral students who have not advanced to candidacy are required to be enrolled in at least 1 graduate credit hour in the term in which they submit the D-1r. The D-1r form will not be processed without proof of current enrollment. The form will be returned to the major professor. Further information regarding the UGS graduate active and full-time status policies is available at:

<https://policies.fiu.edu/files/759.pdf>.

### 3. INSTRUCTIONS

All information must be **typed**. It should be understood that all dissertation committee members are appointed by the Dean of the University Graduate School on the recommendation of the unit. See the instructions above for the requirements for a Dissertation Committee (D-1). From the drop down menu, choose the role (major professor, co-major professor or member) of the committee member leaving the committee. Type and obtain original signatures from members leaving the committee. From the drop down menu, choose the role (major professor, co-major professor or member) of the committee member being added. Type the names of the committee members, obtain their original signatures, and select their status from the drop down menu to verify that they hold GF Status. If additional committee members **do not** have FIU Graduate Faculty status, these individuals must understand the time commitment required to read the doctoral student's proposal, participate in annual progress meetings and attend the dissertation defense. Non- FIU Graduate Faculty committee members must submit a CV, a brief statement of expertise related to student's project, and confirmation of commitment of time. These documents must be submitted with the D-1r form. Non-FIU Graduate Faculty must be approved by the UGS. D-1r forms that do not meet minimum committee composition requirements will be returned to the major professor. Complete checklist and attach documentation as needed.

- Provide a copy of your class schedule to show proof of current enrollment in graduate credit hours. Instructions are given in the section for the D-1 form.
- Provide a brief summary (no more than 2 pages) of the expertise of your new committee members. The summary should identify the expected contributions of each new committee member and his/her qualifications to serve in that capacity (a paragraph on each new member is sufficient).
- If additional committee members **do not** have FIU GF status, a full CV, a brief statement of expertise related to student's project, and confirmation of commitment of time must be attached.

Submit D-1r form and required documentation to Major Professor, Chair/Program Director and the Dean of the College for approval. Submit hardcopy form to the UGS for final approval.

### 4. ADDITIONAL INFORMATION

To check the status of your form, please log on to **my.fiu.edu**, and check under the "To Do List" Section. If your GPA is below 3.0, see your academic advisor in order to make a plan to raise your GPA above 3.0; you **cannot** graduate with a GPA below 3.0. Please note that if a major-professor or co-major professor is changing roles to that of a dissertation committee member or vice versa, please make sure to select the corresponding role from the drop down menu.

## Qualifying Examination, Candidacy Requirements, and Final Defense:

Students must demonstrate graduate knowledge acquisition in three incremental stages in order to be awarded a PhD in Biomedical Engineering:

- Qualifying Exam (QE) – To become a Doctoral Candidate
- Proposal Defense (oral & written)
- Final Defense (oral & written)

### PhD Qualifying Exam

#### Objective

The purpose of the QE is to test the readiness of a PhD student to conduct research (i.e., graduate level BME knowledge and research skills). The exam comprises two parts: **1)** a *written proposal* and **2)** an *oral defense*. The written proposal provides a scaffold for the oral defense, but the latter itself focuses on determining whether the student has incorporated the fundamental knowledge needed for proceeding towards his/her future PhD research. The student must be able to demonstrate a broad understanding of the basic biomedical engineering principles relevant to the proposal. In addition to knowledge obtained from the coursework and relevant literature, students will also be tested for knowledge of experimental strategies and the ability to think on their feet and across the “pitfalls” (controls, alternative approaches, etc.). The QE will be held once per year. Students will receive the QE prompt at the end of the spring semester. The student will then compose the written proposal during the summer semester and complete the oral defense at the beginning of the following fall semester. Specific instructions on format and timing are provided below.

#### Timing

- A student with a prior MS degree shall pass the qualifying exam after the first year in the program.
- A student with only a BS degree shall pass the qualifying exam after the second year in the program.

*Exceptions must be approved by the QE committee*

Prior to taking the QE, the PhD student must:

- Form his/her PhD committee (D-1)
- Must declare a major specialty area
- Complete the following coursework requirement
  1. Have **taken and passed** one of these two Life Science courses
    - Physiology for engineering I
    - Physiology for Engineering II
  2. Have **taken and passed** one of these Statistics courses
    - Fundamentals of Design of Experiments
    - Design of Experiments I
    - Multivariate Statistical Analysis
    - Data Analysis I
    - Biostatistics
    - Multivariate Methods I
    - Multivariate Methods II
  3. Have **taken/passed or be taking** at least 3 BME electives
  4. Have **taken/passed** all required remedial courses (*only for non-BME PhD students*)

#### QE Committee



The QE committee will be formed by four BME faculty members with GF status. If the faculty advisor is one of the QE committee members, a temporary substitute will be designated by the GPD. The composition of the QE committee will be: **a)** one graduate program committee member and **b)** one faculty member per specialty area to ensure a multidisciplinary research approach. The current specialty areas are: **1)** Basic research in engineered tissue model systems and related biomechanics; **2)** Diagnostic bioimaging and sensor systems; and **3)** Therapeutic and reparative neurotechnology. Whenever expertise in a non-BME area is needed, the QE committee could invite an external faculty member based on recommendations from the faculty advisor. QE committee members will serve for a term of two years. Two members will be rotated every year. The major advisor will participate in the oral defense, but cannot vote on the outcome of the QE.

### Exam Procedure

- (1) Funding Opportunity Announcement (FOA). Following a call from the QE chair during the spring semester, **the parent F31 FOA will be created by the faculty advisor** and submitted by the advisor to the QE committee for review. The review process might take several rounds. After approval, the QE committee will provide the final FOA to the student during the **first week of the semester**. Details for the FOA preparation are given in **Appendix I**. The topic of the proposal should be relevant, but not directly related, to the PhD research of the student. Advisor may consider the QE as a tool to expand student knowledge in new technological/methodological areas of potential use in his/her dissertation, as well as to cover important gaps in his/her knowledge of a specific BME subject. After the FOA is submitted to the student, **no interaction between the faculty advisor and the student** should occur in regards to the QE content. The student may contact the GPD for clarification.
- (2) Construct the written proposal during the summer semester. The written proposal must be delivered to the committee at least **two weeks prior to the oral defense** (details in **Appendix II**).
- (3) The QE committee will prepare **five mandatory questions** for the student. Mandatory questions will be elaborated on the following issues: *Significance, Innovation, Approach* and *Environment*. These questions will be provided to the student **at least one week before the oral defense**. The student should prepare the answers to be presented during the oral defense.
- (4) Defense of the research proposal (20-30 min) in front of the QE committee and advisor. The oral defense should take place before the end of the semester (details in **Appendix III**). The proposal presentation will be followed by the student's answers to the five mandatory questions (10 min). Finally, the QE committee will ask questions (20-40 min) about: **a)** the scientific premise "*hypothesis-vs. modeling/technology-driven*", **b)** the BME instrumentation used/developed in the proposal, **c)** the methods employed for data analytics, **d)** the BME theoretical framework and concepts underlying the proposal, **e)** the related clinical need(s) and the overall significance, and **f)** the innovative aspects of the proposal. The use of a (blank) white board during the oral defense is appropriate. If necessary, the Chair may stop the oral defense for a brief discussion, or to allow the student to take a short break.

### Outcome

The committee will decide the student's advancement to candidacy based on both the written proposal and the oral defense. The exam outcome will be either pass or fail. A student who fails the first attempt may retake the exam again **one month after receiving final written recommendation from the QE committee**. The written recommendation (including review of the shortcomings and guidance) should be provided to the student within **three days** after the QE. A student who fails the second attempt will be dismissed from the program. The QE committee will provide a written explanation of the dismissal recommendation. The student can submit an appeal for consideration by the QE committee. The QE committee will review the appeal and provide a written response within 1 –week of the appeal.

A student who has successfully passed the Qualifying Exam and completed all the coursework will be formally admitted to PhD candidacy.

## **Form D-2: Program for Doctoral Degree and Application for Candidacy**

### **Instructions and Information for Form D-2**

#### **1. DEADLINES**

The D-2 form for candidacy (Page 3) must be submitted to UGS by no later than five business days before the first day of classes. Candidacy forms must be on file and approved by UGS by the first day of classes in the term in which the student advances to doctoral candidacy. Students cannot register in dissertation credits without an approved D-2 on file at UGS.

#### **2. CONTINUOUS ENROLLMENT REQUIREMENTS**

After achieving doctoral candidacy, doctoral candidates are **required** to be enrolled in at least 3 dissertation credit hours every term, including summer. The D-2 form will not be processed without proof of current enrollment. Further information regarding the UGS continuous enrollment policies is available at <https://policies.fiu.edu/files/783.pdf>.

#### **3. INSTRUCTIONS FOR PROGRAM DIRECTOR/CHAIR**

Verify the following before submitting D-2 to the UGS.

- Students graduate GPA  $\geq 3.0$
- Student is currently enrolled in at least 3 graduate credits
- All official transcripts relevant to transfer courses are available in the student's electronic record.
- No grades of "Incomplete" are in student's record
  - If an incomplete grade is showing, attach a copy of the change of grade form(s)
  - Make sure that **all** coursework is graded (even courses that are not part of the student's program of studies), including current term enrollment

Attach the following documentation with D-2.

- If any of the doctoral credits were taken as a non-degree seeking student, attach a copy of the Graduate GPA Course Inclusion form. The form can be found at: <https://onestop.fiu.edu/forms-and-policies/all-forms/>.
- If your program requires that D-3 is submitted with D-2, provide signed D-3 and relevant required documents.

Submit hardcopy form to the UGS for final approval.

#### **4. ADDITIONAL INFORMATION**

Do not submit D-2 to the UGS if the student has not successfully completed all of the coursework requirements, the program's comprehensive examinations and the dissertation proposal (if relevant). If student fails final attempt at candidacy exam and is discontinued from the program, please notify the UGS. To check the status of your form, please log on to **my.fiu.edu**, and check under the "To Do List" Section. We highly encourage all students to check the status of each form as it is the responsibility of each student to ensure the form is submitted to UGS.

## Thesis Proposal

The student will be required to prepare a formal dissertation proposal, and successfully defend the content of the proposal before his/her advisory committee. The defense will consist of 35-40minute presentation followed by general questions from the audience (10-15 minutes). Afterward, the student will be required to address specific questions from the committee (closed door). Immediately following the proposal defense, the student's dissertation committee will vote to pass the proposal, to have the student resubmit the proposal within six months, or to dismiss the student from the PhD program. A student can only resubmit his/her proposal once. The major professor and the committee members must read and approve of the revised proposal prior to resubmission to the UGS.

### Components of a Proposal:

Overall, the proposal should demonstrate that the student understands the work to be conducted, its significance and has consulted and read the appropriate literature in formulating the proposal. The expectation of all thesis and dissertation research is that publishable new knowledge will result. The formal proposal submitted to the BME department should have the following specifics:

- Maximum page limit of 12 pages with single spacing
- Font styles - Arial/Times-Roman
- Font size - 11
- 1 inch margins on top and bottom; 0.75 inches on the left and right sides
- Title, abstract and references are not included in the page limit.
- The proposal must conform to accepted norms in the use of grammar, construction, spelling and punctuation.

### *The components of the thesis proposal are:*

1. **Introduction/Statement of Problem:** A current, concise, and scholarly presentation of the research problem that gives clear evidence that the student has reviewed the current literature relevant to the planned research and has an understanding of the significance and nature of the problem. The introduction should contain a statement of the problem that is outlined in a manner such that a non-specialist will understand the problem and reason it was chosen. This section will be answering the following questions: What is the problem to be studied? Why is this problem worthy of study?
2. **Background/Theory:** This section of the proposal will provide the appropriate detail at a level such that a specialist will be informed of current developments in the field that are important to the understanding and conducting research on the problem. This section should provide specialists sufficient information about the state-of-art or knowledge in this field that they will be able to critically evaluate the proposal that follows. This Background/Theory section will answer the following question: What work has been done by others and is relevant to the proposed problem?
3. **Main objective of thesis proposal:** A well-defined objective statement of the thesis is to be clearly outlined.
4. **Research questions, rationale, hypothesis and methods:**

**Specific Statement of Research Questions/Objectives:** All research problems can be concisely stated in the form of a series of questions or objectives. These serve to define and subdivide the planned work into sequential or parallel steps that will, in combination, lead to the completion of the research. These questions should be well informed by the introduction and background sections that precede them. They should define experiments, observations, or actions that will be undertaken in the course of the research.

**Hypotheses:** In many instances hypotheses can be formulated that are based upon the expectations of the outcomes from experiments or observations. Hypotheses should be formulated where there is ample basis for their formulation and they should be clear and supported by the Introduction/Statement and Background/Theory sections. Hypotheses will often be critically dependent upon the methods and experimental design and conditions.

**Methods/Experimental Design/Techniques:** This subsection should include sufficient detail and sophistication to enable an expert reviewer in the field to evaluate if the approaches planned for answering the questions or carrying out the objectives are understood by the author and are consistent with the hypotheses. Instrumentation to be used must be discussed and if it is to be constructed details must be provided. In cases that involve statistical evaluation of information and data, sufficient information should be provided so that the reviewer can evaluate whether or not statistically meaningful results and conclusions may be based on the design and quantity of data to be collected. A discussion of the validity of possible conclusions must be included in this section.

Question 1: - rationale, hypothesis and methods/experiments

Question 2 – rationale, hypothesis and methods/experiments

Question 3 – rationale, hypothesis and methods/experiments

:

Question n – rationale, hypothesis and methods/experiments

**References Cited:** The references cited in the body of the proposal should be included at the end in a format consistent with those of the scholarly journals/publications of the discipline. For citing the internet, see UGS internet citation policy.

**Timeline:** A clear timeline outlining the plan until thesis defense is to be provided. Format of a Gantt chart is preferred.

### **Form D-3: Doctoral Dissertation Proposal**

#### **Instructions and Helpful Information for Form D-3**

##### **1. DEADLINES**

D-3 form (Page 3) is to be completed at least 3 semesters before the anticipated graduation semester. Deadlines for submission of forms to the UGS are available at: <http://gradschool.fiu.edu/calendar-deadlines/#doctoral>. Submit forms to the Academic units well before the deadline to allow sufficient time for approval and signature. Ultimately, it is the student's responsibility to make sure forms are received by the University Graduate School on time and that all deadlines are met. D-3 forms must be submitted to the Dean's office at least one week before the deadline for UGS to allow time for its review.

##### **2. ACTIVE STATUS ENROLLMENT REQUIREMENTS**

Doctoral students who have not advanced to candidacy are **required** to be enrolled in at least 1 graduate credit hour in the term in which they submit D-3. Doctoral candidates are required to be enrolled in at least 3 dissertation credits. D-3 form will not be processed without proof of current enrollment. The form will be returned to the major professor. Further information regarding the UGS graduate active and full-time status policies is available at:

<https://policies.fiu.edu/files/759.pdf>.

##### **3. INSTRUCTIONS**

All information must be **typed**. If applicable, prior to filing the abbreviated proposal with the UGS, the dissertation committee should meet with the student for an oral defense of the full proposal. Type the names of the committee members and obtain their original signatures. If one of the committee members is

unavailable to sign, he/she can give the Department Chair written authorization to sign on his/her behalf. Complete checklist and attach documentation as needed.

- Provide a copy of your class schedule to show proof of current enrollment in graduate credit hours. Instructions are given in the section for the D-1 form.
- Attach the abbreviated proposal (no more than 5 pages plus references in a scholarly style appropriate to the discipline) that clearly outlines background information related to the research topic, research question/hypotheses, methods, and statistics/analysis to be used (Refer to the Proposal Guidelines available at: [http://gradschool.fiu.edu/documents/Proposal\\_Guidelines.pdf](http://gradschool.fiu.edu/documents/Proposal_Guidelines.pdf)).
- Attach a copy of the Responsible Conduct of Research (RCR) certificate. (Instructions available at: <http://research.fiu.edu/rcr/>).
- If dissertation involves human subjects, attach the IRB memorandum of approval. (Instructions available at: <http://research.fiu.edu/irb/>).
- If dissertation involves vertebrate animal research, attach the IACUC memorandum of approval. (Instructions available at: <http://research.fiu.edu/iacuc/>).
- If dissertation involves recombinant DNA, attach the IBC memorandum of approval (Instructions available at: <http://research.fiu.edu/ibc/>).
- Attach authorization if one of the committee members has given consent for the Department Chair to sign on his/her behalf.
- 

Submit D-3 form and required documentation to Chair/Program Director and the Dean of the College for approval.

The D-3 form must be submitted to the Dean's office at least one week before the deadline for UGS to allow time for its review. Submit hardcopy form to the UGS for final approval.

#### **4. ADDITIONAL INFORMATION**

It is understood that the dissertation may evolve in directions quite different from the Dissertation Proposal, and that the proposal is not intended to restrict the normal development of a research project. The dissertation proposal is in no way a contract between the University and the student. Depending on the outcome of the research, the dissertation may require substantially more work than anticipated at the stage of the dissertation proposal. The termination of a line of research and the adoption of a substantially new dissertation project will require the oral defense of a new proposal and approval of the proposal by the UGS.

Any questions regarding IRB/IACUC procedures should be directed to your college IRB or IACUC representatives or to Christopher Grayson at (305) 348-2494/E-mail: [irbiacuc@fiu.edu](mailto:irbiacuc@fiu.edu).

To check the status of your form, please log on to **my.fiu.edu**, and check under the "To Do List" Section. If your GPA is below 3.0, see your academic advisor in order to make a plan to raise your GPA above 3.0; you **cannot** graduate with a GPA below 3.0.

#### **REMINDER**

You must apply for graduation in the same semester in which you anticipate graduating. Please refer to <https://onestop.fiu.edu/> and <http://gradschool.fiu.edu/calendar-deadlines/#doctoral> for graduation deadlines.

#### **Final Thesis Defense**

All students in the PhD program are required to complete a dissertation under the supervision of an advisor and committee. When the dissertation research is completed, the student should schedule a final defense with the dissertation committee. The dissertation, with an approval cover letter from the advisor, should

be given to the committee for review not less than four weeks before the scheduled defense. The candidate should prepare to summarize the dissertation in the manner of a technical paper using appropriate visual aids in 40 minutes or less. Following the presentation, the candidate will answer questions related to the work from the audience and/or the committee. At the conclusion of the defense, the committee will agree upon the outcome of pass or fail and report the results to the Graduate School. Following the exam, the student will implement the committee's suggestions for improving the draft document. Each committee member must sign the approval form in the final document. Copies of the approved dissertation must be provided to the advisor, Department, and the University Graduate School. Students should become familiar with the University Graduate School's regulations and deadlines available on line at <http://gradschool.fiu.edu>. It is critically important that PhD candidates publish their research before defending the dissertation.

#### **Form D-5: Preliminary Approval of Dissertation and Request for Oral Defense**

#### **Instructions and Helpful Information for Form D-5**

<https://gradschool.fiu.edu/wp-content/uploads/2020/02/D-5-Instructions-and-Form-02192020.pdf>

#### **1. DEADLINES**

The D-5 form (Page 3) must be submitted to the UGS at least **3 WEEKS BEFORE** the date of the defense or by the UGS deadline (whichever date is the earliest). The defense announcement must conform to the UGS format (example in **Appendix IV**), and both a hard copy and an electronic version must be submitted to ensure full processing of your defense request. Deadlines for submission of forms to the UGS are available at <http://gradschool.fiu.edu/calendar-deadlines/#doctoral>. Submit forms to the Academic units well before the deadline to allow sufficient time for approval and signatures. The forms must be submitted to the Dean's office at least one week prior to the UGS deadline. Ultimately, it is the student's responsibility to make sure forms are received by the University Graduate School on time and that all deadlines are met.

#### **2. CONTINUOUS ENROLLMENT REQUIREMENTS**

Doctoral candidates are **required** to be enrolled in at least 3 dissertation credit hours in the term in which they submit D-5. D-5 form will not be processed without proof of current enrollment. Further information regarding the UGS continuous enrollment policies is available at: <https://policies.fiu.edu/files/783.pdf>.

#### **3. INSTRUCTIONS**

All information must be **typed**. The final examination committee will consist of all members of the dissertation committee and any other members of the GF as may be appointed by the Dean of the UGS. Type the names of the committee members and obtain their original signatures. If one of the committee members is unavailable to sign, he/she can give the Department Chair written authorization to sign on his/her behalf. It is expected that all committee members will be present for the dissertation defense. It is possible for one committee member to attend via video conference or teleconference technology, however prior approval must be obtained from the UGS through a Petition for Exception to Graduate Requirements. Please contact your academic unit to initiate this process. Complete checklist and attach documentation as needed.

- Provide a copy of your class schedule to show proof of current enrollment in graduate credit hours. Instructions are given in the section for the D-1 form.
- Provide a hard copy of the Dissertation Defense Announcement in standard UGS format. Announcement must conform to the UGS standard. (See Additional Information below)
- Provide an electronic version of the dissertation defense announcement to the UGS as a Word document. Send to [ugs@fiu.edu](mailto:ugs@fiu.edu)

- Provide a copy of the entire Dissertation in standard UGS format (Refer to Regulations for Thesis and Dissertation Preparation Manual available at: <https://gradschool.fiu.edu/wp-content/uploads/2020/09/2020-2021-ETD-Student-Manual-reduced-file-size.pdf>).  
A full guide can be found in the following link: <https://library.fiu.edu/etd>
- Be sure to include the following in the dissertation copy:
  - o Signature page (unsigned). Be advised that you must use one of the dissertation approval page templates (see example signature page below).
  - o Title Page (mandatory), Abstract (mandatory), Table of contents (mandatory), List of tables (mandatory for 5 or more tables), List of figures (mandatory for 5 or more figures), References (mandatory), VITA (mandatory), Copyright Page (optional), Dedication (optional), Acknowledgments (optional), Appendices (optional).
- Attach authorization if one of the committee members has authorized the Department Chair to sign on his/her behalf.

Submit D-5 form and required documentation to Chair/Program Director and the Dean of the College for approval. Submit hardcopy form to the UGS for final approval.

#### **4. ADDITIONAL INFORMATION**

##### **Dissertation Defense Announcement:**

- The announcement should be prepared in accordance with the template available at: <http://gradschool.fiu.edu/documents/SampleDefenseAnnouncement.pdf>
- It should include the date, time, and venue and should be no longer than one page.
- The abstract, part of the announcement, should be written in a scholarly style appropriate to the discipline.

To check the status of your form, please log on to my.fiu.edu, and check under the “To Do List” Section. If your GPA is below 3.0, see your academic advisor in order to make a plan to raise your GPA above 3.0.; you **cannot** graduate with a GPA below 3.0.

##### **REMINDER**

You must apply for graduation in the same semester in which you anticipate graduating. Please refer to <https://onestop.fiu.edu/> and <http://gradschool.fiu.edu/calendar-deadlines/#doctoral> for graduation deadlines.

In order to ensure PhD dissertations meet the appropriate standards of originality, UGS now requires that major professors of doctoral students create an originality report in Turnitin of the dissertation documents that are sent along with the D5 forms. Major professors that do not have a Turnitin account can visit the following website that contains the appropriate information:

<http://ecampus.fiu.edu/faculty-turnitin-plagiarism-framework.html>

The first page of the report with the name of the professor (when submitting the document to Turnitin, professors need to use their names as authors) and the page indicating the similarity index need to be submitted with the D5 forms. UGS will not accept the document, D5 forms without these two pages from the report. The originality report is now part of the checklist on these forms.

#### **Form ETD: Final Electronic Thesis or Dissertation (ETD) Approval**

Doctoral and master’s thesis students must submit this form to complete their thesis/dissertation requirements. The form includes:



- A non-exclusive license giving FIU permission to archive and distribute the electronic work.
- A section that allows doctoral students to allow the University Graduate School to post their dissertations to ProQuest's ETD and subject databases (free service).
- Embargo options.
- Review and Acceptance section with signatures of student, major professor(s), committee members, Graduate Program Director or Department Chair, Dean of College or School, and Dean of University Graduate School.

## 1. DEADLINES

Complete the Final ETD Approval form after a final copy of the dissertation is approved by the committee. Deadlines for submission of this form to the UGS are available at:

<http://gradschool.fiu.edu/calendar-deadlines/#doctoral>.

Submit form to the Academic units before the deadline to allow sufficient time for approval and signature. The final EDT must be submitted to the Dean's office at least one week before the UGS deadline. Ultimately, it is the student's responsibility to make sure the form is received by the University Graduate School on time.

## 2. CONTINUOUS ENROLLMENT REQUIREMENTS

Enrollment of at least 3 dissertation credit hours OR 1 thesis credit hour is required in the term that the student submits this form. The final ETD Approval form will not be processed without proof of current enrollment. Further information regarding the UGS continuous enrollment policies is available at:

<https://policies.fiu.edu/files/783.pdf>

## 3. INSTRUCTIONS

All information must be **typed**. Complete information and instructions on the ETD process can be found at: <http://libguides.fiu.edu/etd>. Final ETD Approval submissions must also include the following:

- Certificate of Completion from Survey of Earned Doctorates (Ph.D. only). Complete Survey at: <https://sed-ncses.org>.
- For SACS accreditation purposes, submit a full version of your CV (this is different from the 2- page VITA in your dissertation) (Doctoral students only).
- Copyright release from publishers if any part of the thesis or dissertation has been published.

Submit Final ETD Approval form and required documentation to Major Professor, Committee, Graduate Program Director or Department Chair, and the Dean of the College for approval. The EDT form must be submitted to the Dean's office at least one week before the deadline for UGS to allow time for its review. Submit hardcopy form to the UGS for final approval. After submission, you will receive an email with upload instructions within a month of graduation. Hard copy of thesis or dissertation **is not** required.

## 4. BINDING DISSERTATIONS

BME department requires their students to provide additional bound copies. Although the signature page ii **MUST** be in the ETD, submission of physical signature page ii to UGS is **NOT** required. However, you may submit signed, physical copies for binding for your own records, if you choose. Listed below are binding companies that have agreed to provide special pricing for binding personal copies:

**Boca Bookbinding, Inc.**

Tel 407-654-0003 (Orlando based)

**International Assets**

Tel 305-421-4184 (Miami based)

For questions regarding this form and the requirements, please contact UGS: (305) 348-2455 or



[etd@fiu.edu](mailto:etd@fiu.edu). To check the status of your form, please log on to [my.fiu.edu](http://my.fiu.edu), and check under the “To Do List” Section.

## Students Contracts:

Research Assistant (RA) contracts are initiated by the faculty member with the available research funding (i.e., the PI of the research grant). Teaching Assistant (TA) and Graduate Assistant (GA) contracts are initiated by the Chair/GPD accordingly to the available departmental funding (Wallace Coulter Foundation, E&G - CEC). The department currently offers two GA positions to support the activities of the Undergraduate and Graduate Program Committees, respectively. RA and TA/GA contracts are prepared by the Program Administrative-Coordinator. After approval by Chair and PI/supervisors, contracts are referred to the Dean Office for execution. Appointment is contingent upon full-time enrollment (9 graduate credits in Fall and Spring; 6 graduate credits in Summer) and satisfactory academic and work performance (GPA of 3.0 or higher). After achieving doctoral candidacy, doctoral candidates are required to be enrolled in at least 3 dissertation credit hours every term, including summer. However, eligibility for contracts will be discussed on individual bases for students with a GPA below 3.3 (GPD and advisor).

It is required by UGS that students under RA and TA/GA contracts read/sign the GRADUATE ASSISTANT EMPLOYMENT AGREEMENT (Downloadable from the FIU UGS website). The signed document must be provided to the Program Administrative-Coordinator by the deadline specified in the form. All students under contracts are mandatorily required to complete online the Sign-On packet available at <https://hr.fiu.edu/employees-affiliates/new-employee/>. The students will receive email notifications about the status of the applications. To be under a contract, the student should have a GPA of at least 3.0. The department will have to petition for any exception.

**Tuition Waiver:** Tuition waiver will be requested on the contract whenever available by the GPD. The tuition waivers for Tas/Gas are approved by the Dean's Office. Students not on contract will not get a waiver. Tuition waivers for RAs must be included in the research grants. Exceptions for RA tuition waivers from the CEC should be approved by the Dean's Office.

**Stipend:** TA/GA stipends are defined by the university. RA stipends are defined by the PI of the research grant based on the requested budget and rates defined by the university. Payments are bi-weekly and based on the FIU payroll calendar (<https://hr.fiu.edu/payroll-calendars-schedules/>).

**VISA – International Students:** Before the QE (Approved D-2 Form), international students must be enrolled as full-time students (9 credits/semester) to maintain the F1 VISA status. After the D-2 Form is approved, a petition must be initiated by the student in order to be enrolled only in 3 credits/semester.

## Complementary Funding:

### DEA/DYF Fellowships

FIU offers several fellowships for both prospective and current students:  
<http://gradschool.fiu.edu/students/funding/fellowships/>

#### **Doctoral Evidence Acquisition Fellowship (DEA):**

The Doctoral Evidence Acquisition (DEA) Fellowship is specifically intended to support doctoral students for whom their current means of financial support would significantly interfere with or preclude their ability to collect the evidence needed for their doctoral research. A DEA Fellow is awarded a stipend to enable evidence acquisition that otherwise would not be possible. Evidence acquisition activities that might be supported by the DEA Fellowship include, but are not limited to, off-campus library/archive research, field work, experiments, interviews, collection of specimens, etc. Preference will be given for

applications which require off-site field work or data collection. Please Note: Applicants who have been in a program for more than 4 years (beginning their 13th term in semester they are applying) are not eligible to apply for the DEA fellowship.

### **Dissertation Year Fellowship (DYF):**

The Dissertation Year Fellowship (DYF) provides support to highly-qualified FIU doctoral students during the writing phase of their dissertation. It is intended to facilitate the timely completion of high-quality manuscripts and dissertations. Dissertation Fellows are expected to graduate within one year after receiving the award.

The UGS will continue to use the Academic Works portal (<https://fiu.academicworks.com/>) for the DEA/DYF Fellowship. The Department will be contacted with instructions once DEA/DYF applications are ready for review after the student deadline. The GPD will finally nominate students for a DEA/DYF Award via Academic Works.

We encourage our PhD students to apply to fellowships/scholarships. In order to promote applications to scholarships/fellowships, the department, to the discretion of the Chair, will supplement funding from scholarships/fellowships to appropriate stipend levels. We encourage PhD students on the last year of their PhD dissertation work to apply to the DYF fellowship. Priority for TA support from the department will be given to students that have been very proactive in applying to fellowships/scholarships.

### **External Funding**

Whether PhD students are supported by an assistantship or are seeking funding sources to support your research, they could also consider applying to external funding. FIU UGS provides a list of external funding opportunities (<http://gradschool.fiu.edu/students/funding/external-funding/>). Outside funding, fellowships, travel awards will be also important for the students to present their research. Students are encouraged to compete for best poster/paper awards at conferences.

### **Travel Funding**

*Department Travel Funding:* The department will provide a \$300/year complementary funding for travelling to each PhD student.

*UGS Travel Funding:* The Graduate & Professional Student Committee (GPSC) provides graduate students with travel funding to help cover the cost of attendance and/or participation in conference, research, and professional development activities. GPSC travel funding requests and post-travel documents should be submitted using the UGS online system (<http://gradschool.fiu.edu/gpsc/>).

PhD students are also encouraged to compete for best poster/paper awards at conferences/workshops.

## Department Administration:

**Maria Vanessa Baez-Moncada**



BMME Program Coordinator  
Office: EC 2600  
Phone: (305) 348-6950  
Email : [mbaezmon@fiu.edu](mailto:mbaezmon@fiu.edu)

**Claudia Estrada**



Program Specialist  
Office: EC 2610  
Phone: (305) 348-6717  
Email: [claudia.estrada1@fiu.edu](mailto:claudia.estrada1@fiu.edu)

**Jorge Riera, Ph.D.**



Associate Professor  
Interim Chair of BME  
Office: EC 2602  
Phone: (305) 348-4948  
Email: [jrieradi@fiu.edu](mailto:jrieradi@fiu.edu)

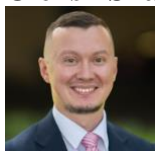
## Graduate Program Committee:

### **Joshua Hutcheson, Ph.D.**



Associate Professor  
Graduate Program Director, BME  
Office: EC 2612  
Phone: (305) 348-0157  
Email: [jhutches@fiu.edu](mailto:jhutches@fiu.edu)

### **Oleksii Shandra, Ph.D.**



Assistant Professor  
Office: EC 2671  
Phone: (305) 348-0240  
Email: [oshandra@fiu.edu](mailto:oshandra@fiu.edu)

### **Anu Godavarty, Ph.D.**



Professor  
Office: EC 2675  
Phone: (305) 348-7340  
Email: [godavart@fiu.edu](mailto:godavart@fiu.edu)

### **Jessica Ramella-Roman Ph.D.**



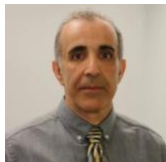
Associate Professor  
Office: AHC4 330  
Phone: (305) 348-3015  
Email: [jessica.ramella@fiu.edu](mailto:jessica.ramella@fiu.edu)

### **Anamika Prasad, Ph.D.**



Associate Professor  
Office: EC 2678  
Phone: (305) 348-6965  
Email: [anprasad@fiu.edu](mailto:anprasad@fiu.edu)

### **Hamid Shahrestani**



Associate Teaching Professor  
Office: EC 2601  
Phone: (954) 993-6110  
Email: [hshahres@fiu.edu](mailto:hshahres@fiu.edu)

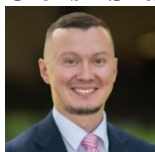
## Qualifying Exam Committee

### **Anamika Prasad, Ph.D.**



Associate Professor  
QE Committee Chair  
Office: EC 2678  
Phone: (305) 348-6965  
Email: [anprasad@fiu.edu](mailto:anprasad@fiu.edu)

### **Oleksii Shandra, Ph.D.**



Assistant Professor  
Office: EC 2671  
Phone: (305) 348-0240  
Email: [oshandra@fiu.edu](mailto:oshandra@fiu.edu)

### **Anu Godavarty, Ph.D.**



Professor  
Office: EC 2675  
Phone: (305) 348-7340  
Email: [godavart@fiu.edu](mailto:godavart@fiu.edu)

### **Shuliang Jiao, Ph.D.**



Professor  
Office: AHC4 332  
Phone: (305) 348-4984  
Email: [shjiao@fiu.edu](mailto:shjiao@fiu.edu)

## **Appendix I: Guidelines for faculty advisors to create the FOA.**

The FOA should be prepared following NIH standards for the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (**Parent F31**)

<https://grants.nih.gov/grants/guide/pa-files/PA-18-671.html>

The proposal should include:

### **Section I. Funding Opportunity Description**

#### **- The NRSA overall goal** *(please insert this paragraph)*

The overall goal of the NIH Ruth L. Kirschstein National Research Service Award (NRSA) program is to help ensure that a diverse pool of highly trained scientists is available in appropriate scientific disciplines to address the Nation's biomedical, behavioral, and clinical research needs. NRSA fellowships support the training of pre-and postdoctoral scientists, dual-degree investigators, and senior researchers. More information about NRSA programs may be found at the Ruth L. Kirschstein National Research Service Award (NRSA) website

<https://researchtraining.nih.gov/programs/fellowships>

#### **- A well-defined topic for the research project**

Provide details about:

a) The specific clinical/research needs

b) The types of research design, methods, and techniques this FOA will focus on

### **Section II. Award Information**

#### **- Award Budget** (impact on the proposed approach)

#### **- Award Project Period**

### **Section IV. Application and Submission Information**

#### **- Content and Form of Application Submission**

- o Page Limitations, font size (Arial 11) and margins (Narrow)
- o Summary (30 lines)
- o Narrative (3 sentences)
- o Specific Aims (1 page)
- o Research Strategy (6 pages)

<https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/page-limits.htm#fell>

#### **- Actual Submission Dates and Times**

## Appendix II: Proposal structure (for PhD students only).

Grant Writing Tips Sheets:

<https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm>

The required elements of your proposal include:

Project Summary/Abstract (30 lines)

Provide the **overall goal** for the entire application and indicate **specific aims** to be accomplished in your proposal.

Specific Aims (1 Page\*): See guidelines here:

<http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>

[http://cfar.med.miami.edu/documents/NIH\\_Specific\\_Aims\\_Template.pdf](http://cfar.med.miami.edu/documents/NIH_Specific_Aims_Template.pdf)

Research Strategy (6 Pages\*):

Organize the Research Strategy in the subsections identified below.

### 1) **Significance and Innovation**

- *Define the problem to be addressed (clinical/research needs)*
- *Discuss limitation in current knowledge/methodologies*
- *Provide the scientific premise: “hypothesis- vs. modeling/technology- driven*
- *Outline innovative components in the proposed technology/method/design*

### 2) **Preliminary data**

*Example*

- *Describe the technology/method/design to be developed, as new or adapted from existing ones, which address diverse aspects of the proposed research.*
- *Summarize preliminary data documenting the technology/methodology’s potential to achieve both sensitivity and specificity comparable those currently in use.*

### 3) **Research Plan**

Develop research strategies to address the **specific aims** of the proposal. The strategies should contain designs of experiments, methods of data analysis, statistical power analysis, expected outcomes, and alternative approaches.

### 4) **Milestones and timeline**

A timeline (Gantt chart) including milestones is required. Milestones are goals that create go/no-go decision points in the project and must include clear and quantitative objective criteria for success. Provide appropriately detailed (quantitative) criteria by which milestone achievement will be assessed.

Bibliography & References Cited (No Page Limit)

Facilities & Other Resources (No Page Limit)

Equipment (No Page Limit)



## Appendix III: Evaluation

### Written Proposal Evaluation

The QE committee will use the following criteria to evaluate the written proposal:

#### *Significance*

Does the project address a critical barrier to progress in the field? Was the scientific premise clearly defined and supported by preliminary work? Are the specific aims well-connected? How will scientific knowledge and technical/methodological capability be improved after a successful completion of the aims? What is the overall impact on society?

#### *Innovation*

Does the application seek to shift current research/clinical practice paradigms by utilizing novel theoretical concepts, methods, instrumentation or interventions? Are the proposed innovations radical or incremental?

#### *Approach*

Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? Was the statistical power analysis appropriate? Was there strong biomedical engineering content in the proposal?

#### *Environment*

Will the scientific environment in which the work will be done contribute to the probability of success? Is institutional support, equipment and other physical resources available to the investigators adequate for the project proposed?

### Oral Defense

At the beginning of the QE, the student will make an uninterrupted 20-30 minute oral defense describing the proposal. A PowerPoint presentation is appropriate (but not required) during this initial period, in particular, to display essential graphics, videos, etc. The proposal presentation will be followed by the student's answers to the five mandatory questions (10 min). This is followed by the examination itself (20-40 min), which is free-flowing and at the discretion of the QE committee. During this last step, the QE committee will evaluate student understanding of: **a)** the scientific premise "*hypothesis- vs. modeling/technology- driven*", **b)** the BME instrumentation used/developed in the proposal, **c)** the methods employed for data analytics, **d)** the BME theoretical frameworks and concepts underlying the proposal, **e)** the related clinical needs and the overall significance, and **f)** the innovative aspects proposed by the student. The primary focus of the oral defense should not be the preliminary data. It should focus on the background, experimental approaches, what you want to accomplish and how this fits in the "big picture." Faculty advisors will not be allowed to respond to questions unless requested by the QE committee.

### Grading

Following the oral defense, the QE committee will vote: **Pass** (3/4) or **Fail**. The preliminary vote is anonymous, and is to be followed by an open discussion among the QE committee members, and then a final vote. The advisor should not be present at any time during the grading process. The external faculty member does not have voting right.

## Appendix IV: Example of defense announcement according to UGS format

### UNIVERSITY GRADUATE SCHOOL BULLETIN ANNOUNCEMENT

Florida International University  
University Graduate School

Doctoral Dissertation Defense

#### Abstract

The Relationship of Thymulin Activity, Immune Parameters of HIV Disease Progression and Substance Use in a Cohort of HIV Seropositive Alcohol and Drug Users

by

Carlin Rafie

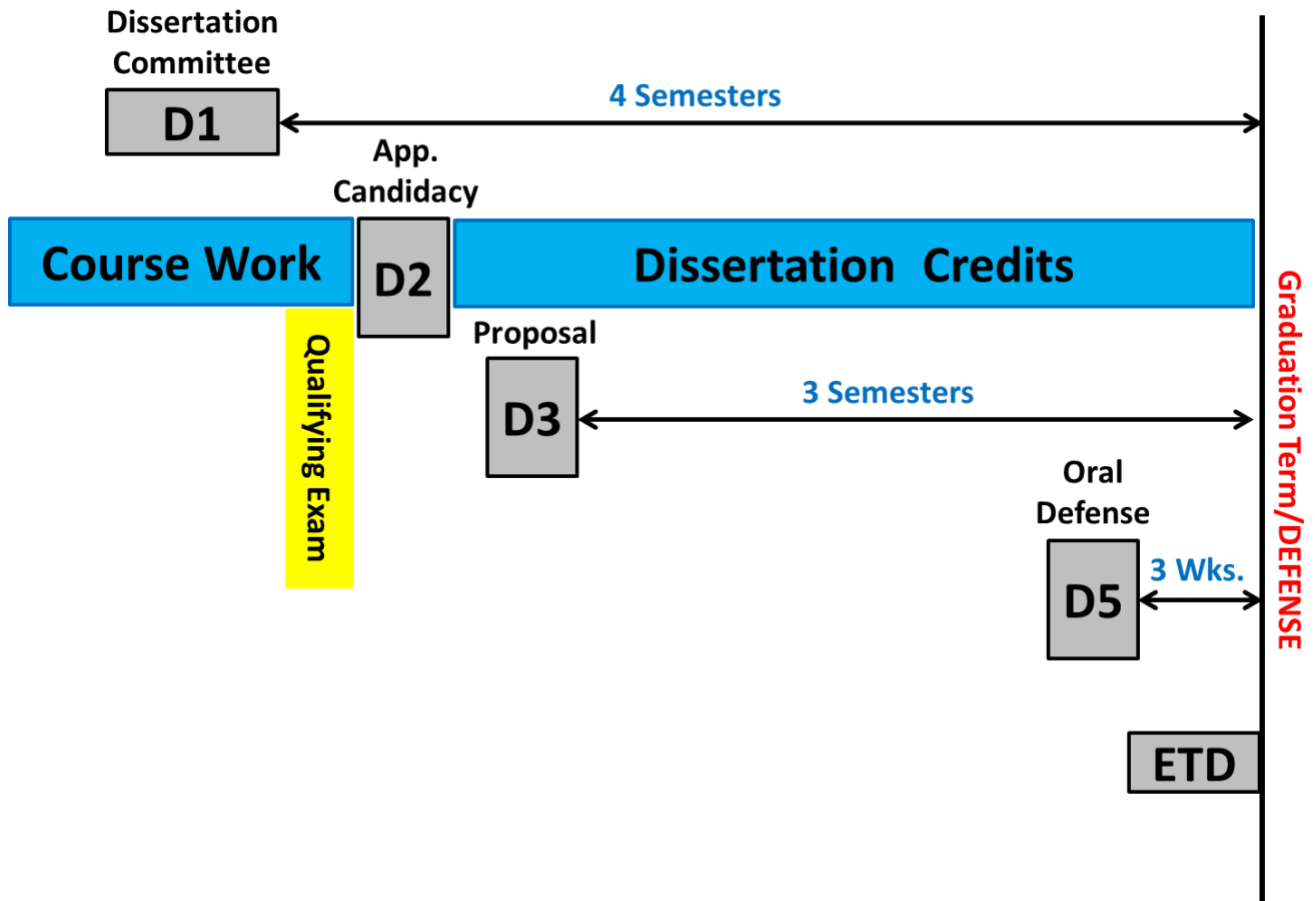
Zinc is essential for the activity of thymulin, a thymic hormone involved in T-lymphocyte differentiation and activation. Zinc deficiency is widespread in populations with HIV infection, and HIV+ drug users are particularly susceptible to zinc deficiency and immune suppression. This dissertation explored the relationship of zinc-bound active thymulin to plasma zinc, CD4+ and CD8+ cell count, the CD4+/CD8+ ratio, and drug use in HIV-infected drug users.

Zinc-bound active thymulin was assessed in plasma of HIV+ drug users who were participating in a 30 month zinc supplementation trial. Plasma from 80 participants at the 12 month visit, and 40 of these same participants, randomly selected, at the baseline visit were assessed for zinc-bound active thymulin levels using a modification of the rosette inhibition assay. Thymulin activity was directly associated with CD4+ cell count ( $\beta = 0.127$ ,  $p = 0.002$ ) and inversely associated with cocaine use ( $\beta = -0.908$ ,  $p = 0.026$ ;  $R^2 = 0.188$ ,  $p = 0.019$ ) independent of HIV viral load, age, gender and antiretroviral use. An increase in thymulin activity was 1.4 times more likely when the CD4+ cell count increased (OR = 1.402, 95%CI: 1.006 – 1.956), independent of change in viral load, antiretroviral use, and age. Participants who used cocaine consistently, were 7.6 times less likely to have an increase in thymulin activity (OR = 0.133, 95%CI: 0.017 – 1.061). There was a direct correlation between change in plasma zinc and change in zinc-bound active thymulin ( $r = 0.243$ ,  $p = 0.13$ ). Analysis of CD4+ cell count decline in 222 participants in the zinc supplementation trial across the 30 months showed that both crack cocaine use and heavy alcohol use accelerated CD4+ cell count decline.

Thymulin activity is directly associated with HIV disease progression, measured by CD4+ cell count, and is depressed with cocaine use independent of antiretroviral use and HIV viral load. Cocaine and heavy alcohol accelerate CD4+ cell count decline. The effect of cocaine on thymic output requires further evaluation as a mechanism for the association of cocaine use with faster HIV disease progression.

Date: November 24, 2008  
Time: 10:00 a.m.  
Place: University Park, HLSII 556

Department: Dietetics and Nutrition  
Major Professor: Dr. Marianna Baum



### Timeline Diagram

*The number of semester represents the minimum requirement*