

**UNIVERSITY OF CALIFORNIA, IRVINE  
DEPARTMENT OF BIOMEDICAL ENGINEERING**

**GRADUATE STUDENT  
SURVIVAL HANDBOOK  
AY 2020-2021**

DEPARTMENT CHAIR:

Professor Zoran Nenadic, D.Sc.  
3120 Natural Sciences II Email:  
znenadic@uci.edu

ASSOCIATE CHAIR FOR GRADUATE AFFAIRS:

Professor Michelle Digman, Ph.D.  
3103 Natural Sciences II  
Email: mdigman@uci.edu

ACADEMIC COORDINATOR:

Maggie Mulcare  
3120 Natural Sciences II  
Email: mmulcare@uci.edu

GRADUATE AND PROFESSIONAL STUDIES:

204 Rockwell Engineering Center  
Email: gradengr@uci.edu

## **I. FOREWORD**

Welcome to the Biomedical Engineering Graduate Program at UCI! This manual provides specific information on policies, procedures, and timelines that will assist you in your career as a graduate student. The goal of the UCI Biomedical Engineering Program is to train 21st century biomedical engineers for jobs in the biomedical and biotechnology industries, healthcare professions, and academia. Located at a world-class research university deep in the heart of the nation's "biomedical device and technology capital," we are uniquely positioned to build upon our existing strengths in nanoscale systems, biophotonics, bio-opto-electronics, biomedical computation, biomedical signal processing, biomechanics, neuro-engineering and tissue engineering to achieve this goal. Furthermore, the collaborative integration of The Henry Samueli School of Engineering, the School of Medicine, the School of Biological Sciences, the School of Physical Sciences, and the Donald Bren School of Information and Computer Sciences, all with unique individual strengths, provide a "new millennium" approach to biomedical engineering.

### **KEY MILESTONES FOR A MASTERS DEGREE**

#### **YEAR 1**

- Complete core and elective courses
- Match with a faculty research advisor

#### **YEAR 2**

- Complete focused research project
- Submit written thesis

### **KEY MILESTONES FOR A PH.D. DEGREE:**

#### **YEAR 1**

- Complete core and some elective courses
- Complete two laboratory rotations
- Pass preliminary examination
- Match with a faculty research advisor

#### **YEAR 2**

- Complete depth courses (two graduate level elective courses with approval of advisors)
- Research
- Form graduate advisory committee
- Pass qualifying exam

#### **YEAR 3**

- Research
- Present preliminary results in BME seminar series

#### **YEARS 4 & 5**

- Research
- Complete dissertation
- Pass final examination

## TABLE OF CONTENTS

I.	<b>FOREWORD</b> KEY MILESTONES FOR A MASTER'S DEGREE KEY MILESTONES FOR A PH.D. DEGREE	2
II.	<b>THE MISSION</b>	4
III.	<b>ENTRANCE REQUIREMENTS</b>	4
IV.	<b>GETTING STARTED</b>	5
V.	<b>COURSE REQUIREMENTS</b> CORE COURSES ELECTIVE COURSES SPECIAL COURSES LAB ROTATIONS	6
VI.	<b>DEGREE REQUIREMENTS</b> MASTER'S PROGRAM DOCTORAL PROGRAM CHANGE OF DEGREE LEVEL CHANGE OF MAJOR	9
VII.	<b>FINANCIAL SUPPORT</b> FIRST YEAR SUPPORT GRADUATE STUDENT RESEARCHERS TEACHING ASSISTANTSHIPS	15
VIII.	<b>MISCELLANEOUS INFORMATION</b>	15
IX.	<b>BIOMEDICAL ENGINEERING FACULTY &amp; AFFILIATES</b>	16
X.	<b>IMPORTANT PEOPLE AND CONTACT INFORMATION</b>	19
XI.	<b>IMPORTANT FORMS</b>	20

## II. THE MISSION

The graduate program in biomedical engineering is an interdisciplinary program with participating faculty from the Department of Biomedical Engineering, The Henry Samueli School of Engineering, the School of Biological Sciences, the School of Physical Sciences, the School of Medicine, and the School of Information & Computer Science. A successful biomedical engineer is able to describe and analyze biomedical and biological systems in a quantitative fashion, and communicate effectively with physicians to solve biomedical problems. Thus, at a minimum, a biomedical engineer must demonstrate competence in quantitative analysis, and biological and biomedical structure and function. The degrees awarded are either the M.S. in Biomedical Engineering or the Ph.D. in Biomedical Engineering.

## III. ENTRANCE REQUIREMENTS

Because of its interdisciplinary nature, biomedical engineering attracts students with a variety of backgrounds. Thus, the requirements for admission are tailored to students with either an engineering or science background. The requirements are as follows:

1. A bachelor's degree either in engineering, physical sciences, or biological sciences discipline.
2. Coursework: Minimum coursework requirements for admission to the program include the following: a) six quarters of calculus, b) three quarters of calculus-based physics, c) three quarters of chemistry, and d) two quarters of biology (equivalent to UCI's BioSci 98 & 99 or BME 50A & 50B). Students without an engineering undergraduate degree may be required to take additional relevant undergraduate engineering courses. Any additional course requirements will be specifically determined by the BME Graduate Committee on a case-by-case basis. Any course deficiencies should be completed before enrollment in the fall entrance quarter.
3. Standardized Tests: Submission of the General Test of the Graduate Record Examination (minimum quantitative plus verbal scores of 310), or minimum combined MCAT scores of 30 in Physics, Quantitative Methods, and Science Problems are required. In addition, a minimum score of 94 or higher on the TOEFL iBT is required of all foreign students whose native language is not English.
4. Grade Point Average (GPA): Minimum overall GPA of 3.20 (on a 4.0 scale).
5. Letters of Recommendation: At least three (3) letters of recommendation are required.
6. If an applicant has a non-quantitative undergraduate background (i.e., Humanities, Business, etc.), yet shows great promise of success in BME graduate studies, the Chair of the Graduate Committee will devise a plan of study for the applicant upon recommendation of the faculty committee and formal interview.

Exceptionally promising UCI undergraduates with a cumulative grade point average of 3.5 or above, or participants in the Campus wide Honors Program in their junior, senior or fifth year of undergraduate study, may apply for admission through The Henry Samueli School of Engineering's accelerated M.S. and M.S./Ph.D. program. An Accelerated Admissions Program Application can be obtained from the HSSoE Graduate Counselor. However, these students must satisfy the coursework and letters of recommendation requirements as described above.

Our application process is online: for more information, refer to <http://www.eng.uci.edu/bme/admissions>. Please be advised that our deadlines and admission criteria are strict.

The Department of Biomedical Engineering considers any act of academic dishonesty as a very serious issue. We reserve the right to rescind admission if there is evidence of dishonesty. Academic dishonesty applies equally to electronic media and print, and involves text, images and ideas. It includes but is not limited to: Cheating, Dishonest Conduct, Plagiarism. For a complete definition of these terms, go to: <http://www.editor.uci.edu/catalogue/appx/appx.2.htm>

## IV. GETTING STARTED

**Getting to Irvine:** Irvine is located in Orange County, about 40 miles south of Los Angeles and 70 miles north of San Diego. The closest airports are Los Angeles International (LAX) and John Wayne/Santa Ana/Orange County (SNA). John Wayne Airport is small with easy access and is only 10 minutes from campus. The airfares tend to be a bit more expensive and the airport does not offer international flights. LAX is a much larger airport with many international flights. LAX is about a 60 minute drive to UCI. There are shuttles available at the airport that can take you to the UCI campus or to John Wayne Airport.

Upon arriving in Irvine, one of the first things you should do is to check in with the staff at the Department of Biomedical Engineering. Contact information and location of these individuals is found in Section IX of this handbook. When you check in you will be asked to fill out an information sheet with your local address and contact information.

**Housing:** Once you arrive on campus, you may need assistance to find housing. On-campus housing is limited. Students who have not applied for on-campus housing before arrival may encounter a lengthy wait depending upon personal preferences and the housing complex requested. However, the housing office can help you begin looking for off-campus housing. The general information number for the housing office is (949) 824-7247.

**Establishing Residency:** All students planning to attend graduate school at UC Irvine (i.e., United States citizens, US permanent residents, or foreign nationals) must file a *Statement of Legal Residence* (SLR) with the Registrar's Office. You must complete a new Statement even if you attended UCI as an undergraduate student. The *Statement of Legal Residence* is available on-line through the Registrar's Office web site: <http://www.reg.uci.edu>. Please file your residency statement electronically through the web page. **You must complete a *Statement of Legal Residence* in order to register for classes.**

If you are a citizen or permanent resident of the United States but not currently a resident of the State of California, you will want to acquire this status as soon as possible. It is expected that all full time graduate students who are eligible for California residency will have established this by the beginning of the second year of enrollment. Once residency is established your Zotbill will indicate fees only and not tuition. Moreover, time spent in California as a student may be used to meet State residency requirements. You should contact the Residence Office (215 Aldrich Hall, 949/824-6129, [regres@uci.edu](mailto:regres@uci.edu)) for information about residency reclassification.

**Register for Classes:** It is the student's responsibility to check when their enrollment window is open for each quarter. This information can be found at: <http://www.reg.uci.edu>, where the Academic & Administrative Calendar is posted with enrollment window dates. The deadlines to enroll and pay fees are **September 16, 2019, December 16, 2019 and March 16, 2020** for the upcoming fall, winter and spring

Students who do not enroll in classes during the published registration period are subject to a late service fee. Students enrolled in zero (0) units at the close of business at the end of the second week of classes are assessed a \$50 late enrollment fee. The signature of the HSSoE Associate Dean is required for late enrollment after the second week of classes.

**Mail, Email, Computer Accounts:** Campus and US mail is delivered daily. All students will have a mailbox assigned to them in the BME Business Office (Natural Sciences II, Room 3120). Hours of operation for the BME Business Office are 8:00 a.m. - 5:00 p.m.

UCI is well equipped with computer resources. The Network and Academic Computing Services (NACS, (949) 824-2222) offers seminars on topics associated with computing. NACS can also help you establish a central computer account as well as your UCINET identification, which will be needed to establish an email account. You can activate your UCINETID (see <http://activate.uci.edu>) at the beginning of Summer Session I.

**Keys, Desks, etc.:** After completing a lab safety course, you will be eligible to be issued keys to the building(s) and lab(s) where you will be conducting your research. Contact **Sally Avila** in the BME Business Office.

## V. COURSE REQUIREMENTS

You should become familiar with the descriptions of academic policies and graduate degrees in the Research and Graduate Studies section of the UCI general catalogue. **As a full-time student, you are required to maintain full time enrollment status of 12 units each quarter.** You are expected to satisfactorily complete at least 12 units of academic credit applicable to the graduate program in each regular academic quarter (fall, winter and spring) and satisfy all requirements of the academic program according to a schedule approved by the graduate advisor of biomedical engineering. Only grades A, A-, B+, B, and S represent satisfactory progress and may be applied toward advanced degree requirements. Graduate students are not permitted to take courses as a Pass/No Pass Option. One UCI elective course in which a grade of B- was earned may be accepted toward the degree requirements. The B- exception will not be granted for BME core classes. You may not apply courses graded pass or not pass toward any degree or satisfactory progress requirements. A grade point average below the B level (3.0) is not satisfactory, and a student whose grade point average is below that level is subject to academic disqualification by the Dean of Graduate Division.

**Note:** A graduate student who has not demonstrated satisfactory progress is not eligible for paid appointments, such as a Graduate Student Researcher or Teaching Assistant, and may not hold a fellowship or other award, which is based upon academic merit. This includes appointment as a pre-doctoral trainee on federal training grants. Academic merit is set at an overall GPA greater than 3.5, passing the required examinations within the time specified for the graduate program, matching with a research advisor, and maintaining overall progress toward completion of the program.

**Part-Time Study Program:** Part-time study for credit leading to a graduate degree is available if good educational reason exists, as determined by the academic unit. To take advantage of reduced fees for part-time status, quarterly course enrollment is limited to eight units or less for graduate students. Students enrolled in excess units after the Friday of the third week of instruction are liable for full fees. In addition to all other required fees, students approved for part-time status pay one-half of the Educational Fee and, if applicable, one-half of the Nonresident Tuition Fee. Graduate students should refer to the Research and Graduate Studies section of the UCI General catalogue.

**Core Courses:** Both the M.S. and Ph.D. degrees require the students to complete 42 course units. These units include 30 core units, two elective course units (8 units), and four units of independent research. The four independent research units (BME 296, 297, 299) can be arbitrarily distributed over the quarters (See Special Courses section). Core requirements (a maximum of three courses) can be waived for students entering the Ph.D. program with an M.S. degree in Biomedical Engineering. The core courses cover the basics of cells, tissues, and physiology at the microscopic and macroscopic scale, engineering mathematics, and clinical theory. The core courses and descriptions are:

### Fall

1. **BME 210 Molecular and Cellular Engineering** (4 units): Engineering of physiological function at the genetic, cellular, and tissue scales. Topics include cloning and genetic engineering, extracellular matrix biomaterials, principles of regenerative medicine and tissue engineering, and experimental design. [If BME 160 was taken in our undergraduate program, it may be substituted for equivalent elective course, with a qualifying grade. Must be approved by Graduate Advisor and Graduate Division. Approval is NOT guaranteed.]
2. **BME 220 Quantitative Physiology: Sensory Motor Systems** (4 units): A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems. Concurrent with BME 120. [If BME 120 was taken in our undergraduate program, it may be substituted for an equivalent elective course, with a qualifying grade. Must be approved by Graduate Advisor and Graduate Division. Approval is NOT guaranteed.]
3. **BME 230A Applied Engineering Mathematics I** (4 units): Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics.
4. **BME 298 Seminars in Biomedical Engineering** (2 unit, F,W,S): Presentation of advanced topics and reports of current research efforts in biomedical engineering. Designed for graduate students in the biomedical engineering program. May be repeated for credit.
5. Elective course (4 units)

#### Winter

1. **BME 221 Quantitative Physiology: Organ Transport Systems** (4 units): A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems. [If BME 121 was taken in our undergraduate program, it may be substituted for equivalent elective course, with a qualifying grade. Must be approved by Graduate Advisor and Graduate Division. Approval is NOT guaranteed.]
2. **BME230B Applied Engineering Mathematics II** (4 units): Advanced engineering mathematics for biomedical engineering. Focuses on biomedical system identification. Includes fundamental techniques of model building and testing such as formulation, solution of governing equations (emphasis on basic numerical techniques), sensitivity theory, identifiability theory, and uncertainty analysis.
3. **BME 298 Seminars in Biomedical Engineering** (see Fall quarter).
4. Elective course (4 units)

#### Spring

1. **BME 240 Introduction to Clinical Medicine for Biomedical Engineering** (4 units): An introduction to clinical medicine for graduate students in biomedical engineering. Lectures and rotations through Nephrology, Gastroenterology, Pulmonary & Critical Care Cardiology.
2. **BME 298 Seminars in Biomedical Engineering** (see Fall quarter).
3. Elective course (4 units)

As students rotate in faculty laboratories, they should also register for at least four independent research units. (Descriptions are listed under Special Courses). Contact BME Business Office if you do not see a course code in the Schedule of Classes for the professor with whom you want to enroll in research units.

**Elective Courses:** The two elective courses (8 units) required to fulfill the course requirements for the M.S. and four elective courses (16 units) for the Ph.D. degrees are offered within the Department of Biomedical Engineering, The Henry Samueli School of Engineering, School of Biological Science, School of Physical Science, or School of Medicine. The courses should be chosen to meet the specific needs of the student. The electives must provide breadth in biomedical engineering, but also provide specific skills necessary to the specific research the student may undertake as part of the degree requirements. Upper division undergraduate courses may be selected upon approval of the BME Graduate Advisor. However, these courses will only count as ½ credit towards degree requirements. Approval for any course not listed below must be obtained from the BME Graduate Advisor, prior to enrolling in the course. The criteria for approval of these courses are: 1) the knowledge provided in these courses is necessary for the student's thesis, and 2) no similar graduate course exists. Elective requirements can be waived for students entering the Ph.D. program with a M.S. degree in Biomedical Engineering. Below are the elective courses to be offered in 2018/19 by the BME Department:

#### Fall

1. **BME 232 Introduction to Computational Biology** (4 units): The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions.
2. **BME 290 Critical Thinking and Writing** (4 units): Critical thinking and writing are essential ingredients for success in scientific research. Examines examples from the scientific literature to extract principles of good scientific reasoning, experimental design, and writing.

#### Winter

1. **BME 213/DevBio 232 Systems Cell & Developmental Biology** (4 units): Introduces concepts needed to understand cell and developmental biology at the systems level, i.e., how the parts (molecules) work together to create a complex output. Emphasis on using mathematical/computational modeling to expand/modify insights provided by intuition.
2. **BME 233 Dynamic Systems in Biology and Medicine** (4 units): Introduces principles of system theory to analyze biological, biochemical, physiological, and bioengineering systems. Analytical and computational tools are used to model and analyze dynamic systems such as population, neuronal and heart dynamics, biochemical and physiological systems, oxygen diffusion and similar.
3. **BME 238 Spectroscopy and Imaging of Biological Systems** (4 units): Principles of spectroscopy; absorption; molecular orbitals; multiphoton transitions; Jablonski diagram; fluorescence anisotropy; fluorescence decay; quenching; FRET; excited state reactions; solvent relaxations; instruments; microscopy: wide field, LSM, TPE;

fluorescent probes, fluctuations spectroscopy; optical resolution and super-resolution; CARS and SHG microscopy.

4. **BME 251 Engineering Medical Optics** (4 units): Principles of optics and photonics, integration of optical components into systems and devices, and analysis of physiologic signals obtained from Biophotonics measurements.
5. **BME 260 Microfluids and Lab-On-A-Chip** (4 units): Introduction to microfluidics and state-of-the-art micro Total Analysis Systems ( $\mu$ TAS). Lab-on-a-Chip for biomolecular assays with device design principles for microscale sample preparation, flow transport, biomolecular manipulation, separation and detection, and the technologies for integrating these devices into microsystems.

#### Spring

1. **BME 212 Cardiovascular Tissue Engineering** (4 units): Advanced topics in biomaterials and tissue engineering with a special focus on applications in the cardiovascular system. Devices including vascular grafts and stents, heart valves, and cardiac tissue patches will be examined.
2. **BME 215 Linking Modeling and Experiments in Bioengineering** (4 units): Overview of modeling based on experimental techniques in bioengineering. Construct and evaluate models of varying complexity and to relate them to experimental data.
3. **BME 234 Neuroimaging Data Analysis** (4 units): Knowledge and understanding of recent techniques for the analysis of healthy and pathological structure and function in neuroimaging data.
4. **BME 262 Microimplants** (4 units): Essential concepts of biomedical implants at the micro scale. Design, fabrication, and applications of several microimplantable devices including cochlear, retinal, neural, and muscular implants.

**Special Courses:** Besides the formal lecture oriented courses that comprise the core and elective requirements, there are a series of special courses for which you will enroll in at various times during your study. These special course titles are listed below.

1. **BME 295 Special Topics in Biomedical Engineering** (1 to 4 units F, W, S): Topics vary. Studies in selected areas of Biomedical Engineering. Topics addressed vary each quarter.
2. **BME 296 Masters of Science Thesis Research** (1 to 16 units F, W, S): Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.
3. **BME 297 Doctor of Philosophy Dissertation Research** (1 to 16 units F, W, S): Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.
4. **BME 299 Individual Research** (1 to 16 units F, W, S): Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

**Lab Rotations:** Ph.D. students are required to rotate in a minimum of two labs during the first year. The purpose of the rotations is to offer an opportunity to become more familiar with the research performed by BME faculty and affiliated faculty that the students are considering as their doctoral advisors. It is during these rotations that you will experience first-hand the research environment in these laboratories and also have the opportunity to discuss the potential for matching and financial support with the faculty. It is important that you take advantage of the lab rotations in order to increase your chances of finding a match and securing your financial support for the duration of your dissertation research. Master's students are encouraged to stay in one lab to focus on their thesis research and are not required to rotate.

International students who are matched with a research advisor prior to coming to UCI will remain in the same lab over the duration of the first year. They are expected to continue to be matched with their advisor for the second year and beyond unless there is a compelling reason to switch. For domestic students, only in the event where a student has a strong desire to remain in one lab and they have already discussed funding and matching with the professor(s), will the student be allowed to remain in that lab for the duration of their rotations. These arrangements must be approved by the Graduate Advisor.

## VI. DEGREE REQUIREMENTS

For course requirements, see Section V. For links to various forms, see Section XI.

**Master's Degree:** The M.S. degree requires completing designated course work and conducting a focused research project. Students must successfully complete a minimum of 42 units of course work beyond the bachelor's degree, as listed under "Core Requirement" and "Elective Requirement" above. A maximum of eight M.S. research units (i.e., BME296) may be applied toward the 42-unit requirement. If you were a UCI BME undergraduate student, you most likely took some core classes with graduate students. As a master's student, you have the option to substitute other courses for the coursework you have already completed, with the permission (email is sufficient) of the graduate advisor and only if you received a grade of B+ or better in these core courses. However, you will still need to complete 42 units for your M.S. degree. If you took an elective course as an undergraduate, you are not eligible to take the graduate equivalent and receive course credit (i.e., BME 136/BME 236 Engineering Optics for Biomedical Applications). Master's students are encouraged to stay in one lab to focus on their thesis research and are not required to rotate.

In addition, students must select a thesis advisor and complete an original research investigation including a written thesis. A thesis project may be conducted during an internship in the local biomedical industry. Feel welcome to contact the Graduate Advisor to learn more about this option.

The thesis committee is comprised of three members, with your thesis advisor serving as the chair of your committee. The majority of the members must be BME core or affiliated faculty. *Students must advance their MS degree one quarter prior to filing the thesis.* The approved thesis must be filed electronically at the UCI Thesis/Dissertation Submission Site ([www.etsadmin.com/uci](http://www.etsadmin.com/uci)). The degree will be granted upon the recommendation of the Chair of the Department of Biomedical Engineering and the HSSoE Associate Dean of Student Affairs. The normal time-to-degree for the Master's degree is one to two years, with the maximum allowable time of three years.

**Doctoral Program:** The Ph.D. requires an original and significant body of research that advances the discipline and culminates with the oral and written presentation of a dissertation. You may enter the Ph.D. program directly with a B.S. in engineering or related science such as biology, chemistry, or physics provided you have met the course requirements previously described. The graduate committee will handle applicants on a case-by-case basis, and any specific additional courses required of you will be made explicit at the time of admission.

You must match with a faculty advisor (BME core or affiliated faculty) after passing the preliminary exam. You and your faculty advisor will agree upon an individual program of study. There are no additional core course requirements beyond that of the M.S. degree. However, two depth courses are required in Year Two, in preparation for the qualifying exam.

Six milestones are required for students in the Ph.D. program:

1. **Successful completion of 42 units of coursework beyond the bachelor's degree (see Section V):** If you were a UCI BME undergraduate student, you most likely took some core classes with graduate students and may ask to have these grad core course requirements waived. As a Ph.D. student, you have the option to substitute other courses for the coursework you have already completed, with the permission (email is sufficient) of the graduate advisor and only if you received a grade of A- or better in these core courses. However, you will still need to complete the 42 unit requirement. If you took an elective course as an undergraduate, you are not eligible to take the graduate equivalent and receive course credit (i.e., BME 136/BME 236 Engineering Optics for Biomedical Applications).
2. **Successful completion of the preliminary exam:** All 1<sup>st</sup> year MS/PhD and PhD students are required to take the Preliminary Exam, which will be offered during the Spring quarter. The Preliminary Exam is an oral exam where the students will present and be examined on a scientific paper from a research area that loosely aligns with their future thesis. These areas are organized by clusters: Biomolecular/Genetic Engineering; Biophotonics; Cardiovascular Engineering; Nano/Micro Engineering; Neuroengineering, and Tissue Engineering. Passing will be determined based on: scholarship; analysis; Q&A; organization and delivery. Passing of the Preliminary Exam is required to maintain in good standing. Students are strongly encouraged to attend the Preliminary Exam information session in the Winter quarter prior to the exam.

If the student fails the preliminary exam on the first attempt, he/she will be offered a second and final chance within

the next 6 months. Written feedback will be provided to students identifying deficiencies to be rectified in the second attempt.

Students who do not pass the preliminary exam on their second attempt will not be allowed to continue in the Ph.D. program. However, they may receive a Master's degree upon completion of an original research investigation including a written thesis (refer to Master of Science Degree requirements). In the event a student decides not to continue in the PhD program, the thesis requirement for the MS degree is still enforced.

3. **Area of Specialization:** During the second year, the student is expected to take at least two graduate elective courses (depth courses as mentioned above) related closely to the research topic he/she will be working on (area of specialization). These courses will be selected jointly with the research advisor. The purpose of the specialization courses is to further strengthen the depth of fundamental understanding in the subject area needed to perform the doctoral research topic of choice. Depth areas could include possible disciplines such as fluid dynamics, cell & tissue engineering, biophotonics, bioMEMS, biocomputation, biomechanics, drug delivery, etc. If you choose a non-BME course, an approval must be obtained from the BME Graduate Advisor, prior to enrolling in the course. These courses must be taken prior to the qualifying exam. The student will be expected to master this area of specialization and be prepared to be questioned during the qualifying exam.
4. **Formal advancement to candidacy by successfully passing the qualifying exam:** You must select a committee for the advancement process. The committee must be approved by the BME Graduate Advisor, and The Henry Samueli School of Engineering Graduate Student Affairs Office. There is a form that must be filled out for this approval. Please see BME Business Office to receive this form.

Advancement to candidacy must be completed by the end of the summer of your second academic year. Special exceptions can be made, but a formal request with justification must be supplied in writing to the BME Graduate Advisor. Advancement to candidacy occurs upon passing the qualifying exam. The qualifying exam will consist of an oral and written presentation of original work completed thus far, and a coherent plan for completing a body of original research. The qualifying exam will be presented to your graduate advisory committee. The graduate advisory committee will be selected by you and your faculty advisor and must have a minimum of five (5) faculty members (including the faculty advisor). Of these five (5) faculty members, three (3) must be biomedical engineering faculty with at least one (1) being core BME faculty. The fifth member must have his/her primary appointment outside HSSoE and cannot be a BME-affiliated faculty. Professors with adjunct appointments cannot serve as the chair of a committee, however, they can serve as a co-chair, with a core or affiliated BME faculty serving as the second co-chair. As stated above, the BME Graduate Advisor, in conjunction with the HSSoE Graduate Student Affairs Office, reserves the right for final approval of your qualifying committee membership.

The qualifying exam must be taken by the end of the summer of your third year to stay on track and to demonstrate satisfactory progress towards the Ph.D. The exam has two parts: 1) a written proposal, and 2) an oral presentation. On the day of your exam, you must fill out and present the Ph.D. Form I for your committee to sign at the completion of the exam. On this form you will need to place an asterisk (\*) next to the names of the faculty whom you designate as the members of your final dissertation committee (minimum of three). Please note that the majority of these final members must come from the BME department with one (1) being a core BME faculty. For instance, if you composed a committee of three, then two members must be from BME; if you composed a committee of four, then three need to be from BME; and if you composed a committee of five, then three must be from BME. There is no exception to this rule: the majority must always come from the BME department. This committee must be approved by the BME Graduate Advisor.

- a. *Written proposal*: The written portion of the exam should accomplish the following goals: i) demonstrate proficiency in written expression of scientific and engineering methods and results, ii) demonstrate satisfactory progress in an original research area, and iii) demonstrate a firm and well thought-out plan for completing the remaining features of the dissertation research. The proposal plan must articulate the overall objectives of the research dissertation and outline detail methodologies, experimental procedures, and/or designs of new devices/instrumentation to complete the work. The student must receive approval from his/her research advisor before proceeding to take the exam. Prior to providing the written proposal to the committee, it is expected that the research advisor has read through it and provided feedback to the student to make appropriate revisions.

The following guidelines apply: The research plan of the proposal should be approximately 30 pages (double-spaced, 12 point font). The organization of the written document (or individual sections of the document) should be roughly as follows:

1. Abstract (1 pg)
2. Research plan (~25 pgs)
  - 2.1. Introduction (2 pages)
  - 2.2. Hypotheses/objectives/specific aims/goals (1-2 pages)
  - 2.3. Background information (3-4 pages)
  - 2.4. Significance of work (1/2 page)
  - 2.5. Preliminary results (5-6 pages)
  - 2.6. Research design and methods (10-12 pages)
  - 2.7. Anticipated timetable (1 page)
3. Summary (1 page)
4. References
5. Appendix (can include publications in review, in press, or published)

The written document should be given to the faculty committee one week before the date of the oral presentation.

- b. *Qualifying Exam Format*: i) The oral presentation demonstrates proficiency in oral expression of scientific and engineering methods and results and the ability to explain and elaborate on details of the project in a spontaneous fashion. The presentation should take approximately 30 minutes to 1 hour, with the remaining time allotted to questions from the committee. The total exam time should be 2 hours. The presentation should follow roughly the outline of the written document, but specifically elaborating on any difficult methods or interpretation of preliminary results. ii) Testing of proficiency in specialty graduate courses. As mentioned above, after the first year, an area of specialization (depth) will be designated for students to take a minimum of two additional graduate courses during the second year. The students will be expected to be proficient in these subjects during the qualifying exam to go along with the proposal defense. If you passed the qualifying exam, the written proposal is considered as equivalent to a MS thesis, and your MS degree in BME will be conferred. Those students qualifying in the summer will receive a Fall Master's degree. iii) ***Students must advance their MS degree one quarter prior.*** It is the requirement of the HSSoE that the Qualifying Exam take place on one day at one time, with all committee members in attendance. If it is not possible for all members to be physically in attendance, one member (maximum) can be present via video conference with the use of Skype or another similar application. However, original signatures of all committee members are required on the PhD I form.
5. **Students in their 3rd or 4th year must present results of their current research in the BME seminar series** (20-25 min seminar with 5-10 min discussion): The academic coordinator will allocate a date and invite you for your presentation. The advisor and at least one member of the graduate committee are required to attend, and a written assessment of the student's academic progress is retained in the department records.
6. **Completion of a significant body of original research and the submission of a written and an oral defense of an acceptable dissertation:** The Ph.D. will be awarded upon submission and oral defense of an acceptable written dissertation. It is the requirement of the HSSoE that a dissertation defense take place on one day at one time with all members of the Doctoral Committee in attendance. The defense must be open to the public. At the defense, you must present Ph.D. Form II to your doctoral committee to have them sign off on the successful passing of your examination. Remember that your final doctoral committee members must be the same members who you selected

by placing an asterisk next to their names on Ph.D. Form I. If you plan to deviate from the original membership, notify the BME Business Office so an exceptional request can be submitted to Graduate Division prior to your defense date. You will need your committee to sign the cover page of your dissertation before submitting it to the University Archives. The degree will be granted upon the recommendation of the dissertation committee and the Dean of Graduate Studies. Completion of the Ph.D. is expected in four to five years following completion of the B.S. degree, although a maximum of seven years is allowed.

Students entering the Ph.D. program with an M.S. degree in Biomedical Engineering cannot receive another M.S. degree from UCI. Therefore, the requirements for milestone (1) can be waived, and the award of the Ph.D. degree is based on achieving milestones (2)-(6). Note that you still have to pass the prelim exam, and it is advised to check the content of the core courses that will be tested in the prelim exam.

## Suggested Doctoral Degree Plan

### First year

*Classes:* Your first year will be spent primarily taking classes to fulfill the course requirements previously described, and preparing for the Spring preliminary examination. You must enroll in at least 12 units each quarter to be a full-time student. See Section V for a sample program. It is important to note that the course offerings are subject to change.

*Faculty Advisor Matching:* You are required to register for a minimum of two quarters of BME 299 (independent study) for a total of at least four units (you may register for three different quarters if you so choose) with a faculty member of your choice. You are responsible for arranging this by contacting the faculty with whom you would like to rotate (except for international students – see “Lab Rotations” on page 9). These lab rotations allow students to find out more details about a particular lab and potential thesis advisors. Once you pass the preliminary exam, formal faculty advisor matching will take place. Beginning in the summer of your first year, financial support may come from your advisor. During the summer, you can be paid up to 100% but not less than 49%; during the academic year you are paid at 49%. ***It is very important that you begin the matching process early in your first year, so you have your financial support in place once you pass the preliminary exam.***

### Second year

*Classes:* In addition to BME 297 and BME 298, classes in the second year will be primarily elective courses that are needed to complete the course requirements for the degree. As mentioned above, an area of specialization is designated and at least two graduate elective “depth” courses are required for the student to take during this second year.

*Research:* A major portion of your time in the second year will be to begin your independent research project in the laboratory of your faculty advisor. Generally, this consists of substantial background research and learning of new experimental and theoretical techniques that are relevant to your new project.

### Third year and beyond

*Classes:* You will most likely not be taking any formal lecture courses beyond the second year. In order to maintain full time status you should register for 12-16 units of BME 297 each quarter.

*Research:* Your goal should be to gather enough preliminary results to establish a firm plan to complete your dissertation, which will be presented during the qualifying exam. The qualifying exam should be taken by the end of the summer of your third year and a doctoral committee should be identified to guide and direct the ensuing dissertation research.

Once the qualifying exam is completed, you will spend the remaining time in the third, fourth and fifth (if necessary) years completing your proposed research. You will present results of your research in the BME seminar series once, either in the third or fourth year. Your work will culminate with the completion and defense of the dissertation.

*Dissertation and final examination:* Your dissertation must present basic research on an original experimental problem in Biomedical Engineering. The research will demand an intensive concentration of your time, effort and energy, and your faculty advisor will encourage you to work with greater independence as progress is achieved. You are encouraged to seek consultation with faculty members and other scientists and professionals outside the university to make the research experience as enriching as possible.

When you and/or your advisor feel you have learned how to do original and independent research and have produced publishable results, you should present your results to your doctoral committee in the form of a written dissertation and final oral defense. The doctoral committee supervises a final examination, the focus of which is proficiency in all aspects of the dissertation research topic. Ordinarily, the final examination will be given just before the completion of the dissertation and while you are in residence during a regular academic session. However, you can be on filing fee and still complete and defend your dissertation. Please see the Graduate Division website on current students and current student forms for more information. At least two weeks prior to your defense, you must send the abstract of your dissertation to the BME Graduate Academic Counselor, so the announcement of your defense can be sent to all members of the academic community. The defense is usually conducted in the same format as a seminar and is subject to final approval by the committee.

The doctoral committee certifies that the completed dissertation is satisfactory through the signatures of all committee members on the signature page of the completed dissertation. The final copy must meet the university's requirements for style, format, and appearance before the degree can be conferred. For the thesis and dissertation manual refer to: [http://www.lib.uci.edu/libraries/collections/special/uci\\_td/td6.html](http://www.lib.uci.edu/libraries/collections/special/uci_td/td6.html)

After the dissertation has been approved by the doctoral committee, it must be filed electronically at the UCI Thesis/Dissertation Submission Site ([www.etsadmin.com/uci](http://www.etsadmin.com/uci)). Go to <http://www.grad.uci.edu/academics/degree-completion/electronic-submission.html> for complete details. You must also provide one copy of the dissertation for each member of your doctoral committee. Upon submission of the PhD II form and approval of the dissertation by Library Archives, the PhD degree will be conferred by Graduate Division.

A student who expects to complete all requirements for an advanced degree in a given quarter must be advanced to candidacy for that degree before the first day of the quarter in which the degree will be conferred. Students must complete the graduate student diploma and commencement form and are responsible for providing accurate information that will be printed on their diploma and in the commencement program. Questions regarding eligibility to participate in spring commencement and the logistics of commencement exercises should be directed to the Graduate Division.

**Change of Degree Level from M.S. to Ph.D.:** If you were admitted to the BME Department as a terminal Master's student and during your first two years of study, you decide that you would like to remain at UCI to pursue a Ph.D. degree, this option is available providing the following requirements are met.

1. Provide a recommendation letter from the faculty member(s) with whom you wish to match, which explicitly states financial support, by the end of Winter Quarter in the year you wish to convert
2. Pass the preliminary exam in Spring Quarter
3. Submit the following paperwork after you pass the preliminary exam:
  - a. Change of Degree Level Form
  - b. PhD Advisor Verification Form
  - c. Revised Statement of Purpose
  - d. One additional letter of support from a BME core faculty member
  - e. *International Students Only: Visa renewal paperwork, obtained from the International Center*

Under no circumstances will a student be permitted to change their degree level without the approval of the BME Graduate Admissions Committee and the Associate Chair of Graduate Studies.

**Change of Degree Level from Ph.D. to M.S.:** If you were admitted to the BME Department without a MS degree in Biomedical Engineering, your MS degree will be conferred by the time you pass the Qualifying Exam. ***You must have advanced your MS a quarter prior.*** If you want to change your degree level before you passed this exam, you would have to fulfill all requirements as listed under Section VI, "Master's Degree", and submit your request via an official form.

**Change of Major from MCB or MD/PhD to Biomedical Engineering:** Students admitted into the Math and Computational Biology Gateway Program (MCB) or the Medical Scientist Training Program (MSTP) can transfer into the Department of Biomedical Engineering to pursue a PhD degree. The requirements are that you must be in good academic standing within your home department and submit a new Statement of Purpose, current transcript, and letter of recommendation/support from the BME faculty who will be your advisor. Once this is approved by the Associate Chair of Graduate Studies, the Change of Major form can be submitted to Graduate Division. Some coursework taken in the student's home department may be transferable to BME, which will be approved on a case-by-case basis by the BME Graduate Advisor.

The deadline for transferring into the BME program is August 15. This will ensure the process is complete and all approvals have been received, prior to the registration deadlines for the fall quarter. Students will not be permitted to take the preliminary exam prior to transferring into the BME program.

## VII. FINANCIAL SUPPORT

### First Year Support

The Department of Biomedical Engineering provides financial support for first year Ph.D. or M.S./Ph.D. students. This support package includes a stipend and full tuition and fees for students while they complete the course requirements in the first academic year. Continued funding for year two and beyond can be in the form of a TAship, Graduate Student Researcher, or fellowship, and is contingent upon satisfactory progress in the program, which includes passing all core courses, passing the preliminary exam and matching with a thesis advisor. It is the responsibility of the student to match with a thesis advisor in order to make satisfactory progress towards the degree objective. Once a student passes the preliminary exam, he/she is expected to match with a faculty advisor and pursue research full time in order to maintain satisfactory progress. If the student does not pass the preliminary exam, the BME Department and faculty advisor are under no obligation to continue financial support. Matching with an advisor will not be considered official until the student has passed the preliminary exam.

### Graduate Student Researchers

A graduate student researcher performs research related to his or her degree program in an academic department or research unit under the direction of a faculty member. Appointment as a graduate student researcher, in combination with other university appointments, may not exceed 49% during the academic quarters. During the summer recess, appointments may be increased to 100%. This type of appointment will likely comprise the bulk of your financial support and will be through individual research grants from your faculty advisor.

Student fees (including graduate student health insurance fee) and nonresident tuition, if applicable, may be paid for graduate student researchers with an appointment of 25% time or more by the hiring funding source, including federal grants and contracts. Students eligible for appointments as student researchers are so notified at the time of acceptance into the graduate program.

As a minimum, Biomedical Engineering graduate student researchers must be employed at the 49% level year round. The Department of Biomedical Engineering strongly recommends that graduate student researchers are employed at levels higher than 49% during the summer months.

### Teaching Assistantships

The Biomedical Engineering Department will be allocating teaching assistantships in proportion to undergraduate enrollments. A limited number of these assistantships will be available each year to faculty members who are involved in teaching undergraduate courses. The final decision of TA allocations lies with the department chair. Students in the program may be eligible for additional teaching assistantships in the School of Biological Sciences, the School of Physical Sciences, and the HSSoE, and should contact these schools about potential opportunities if interested.

When being paid from a fellowship, students get paid at the beginning of the month, for the month you are about to work. When being paid by a TA-ship or by a PI/advisor as a GSR payroll appointment, students get paid at the end of the month for the month you just worked. Transitioning from a fellowship to a payroll GSR appointment creates a 2 month period between paychecks that you will need to plan for.

## VIII. MISCELLANEOUS INFORMATION

### Work-related Injuries

Any work-related injury must be immediately reported to your supervisor/faculty advisor. In addition, you must also inform the BME Business Office.

## IX. BIOMEDICAL ENGINEERING FACULTY AND AFFILIATES

### BME FACULTY

#### **ZORAN NENADIC, D.Sc.**

*William J. Link Chair and Professor of Biomedical Engineering; Electrical Engineering and Computer Science*

**Research Interests:** adaptive biomedical signal processing, control algorithms for biomedical devices, brain-machine interfaces, modeling and analysis of biological neural networks

[znenadic@uci.edu](mailto:znenadic@uci.edu) - <http://cbmspc.eng.uci.edu>

#### **KYRIACOS ANTHANASIOU, Ph.D., P.E.**

*Henry Samueli Chair in Engineering and Distinguished Professor of Biomedical Engineering; Director of DELTAi (Directing Engineering & Life-science Translational Advances @ Irvine)*

**Research Interests:** understanding and enhancing the healing processes of musculoskeletal tissues as well as the body's cartilaginous tissues, effecting translation of engineering innovations to clinical use, especially in terms of instruments and devices

[athens@uci.edu](mailto:athens@uci.edu) - <http://sites.uci.edu/deltai/>

#### **MICHAEL W. BERNS, Ph.D.**

*Arnold and Mabel Beckman Chair in Laser Biomedicine and Professor of Surgery; Biomedical Engineering; Developmental and Cell Biology*

**Research Interests:** photomedicine, laser microscopy, and biomedical devices

[mwberns@uci.edu](mailto:mwberns@uci.edu) — <http://www.bli.uci.edu/> - <http://www.robotase.ucsd.edu/>

#### **ELLIOT BOTVINICK, Ph.D.**

*Professor of Surgery; Biomedical Engineering; Beckman Laser Institute*

**Research Interests:** laser microbeams, cellular mechanotransduction, mechanobiology

[elliott.botvinick@uci.edu](mailto:elliott.botvinick@uci.edu) - <http://botvinick.bli.uci.edu/>

#### **GREGORY J. BREWER, Ph.D.**

*Adjunct Professor of Biomedical Engineering*

**Research Interests:** neuronal networks, decoding brain learning and memory, brain-inspired computing, Alzheimer's disease, brain aging, neuron cell culture

[gjbrewer@uci.edu](mailto:gjbrewer@uci.edu)

#### **JAMES P. BRODY, Ph.D.**

*Associate Professor of Biomedical Engineering; Chemical Engineering and Materials Science*

**Research Interests:** bioinformatics, micro-nanoscale systems

[jpbrody@uci.edu](mailto:jpbrody@uci.edu) - <http://brodylab.eng.uci.edu/>

#### **ZHONGPING CHEN, Ph.D.**

*Professor of Biomedical Engineering; Chemical Engineering and Materials Science; Electrical Engineering and Computer Science; Otolaryngology; Surgery*

**Research Interests:** biomedical optics, optical coherence tomography, bioMEMS, biomedical devices

[z2chen@uci.edu](mailto:z2chen@uci.edu) — <http://chen.bli.uci.edu/>

#### **BERNARD CHOI, Ph.D.**

*Professor of Surgery; Biomedical Engineering; Beckman Laser Institute*

**Research Interests:** biomedical optics, in vivo optical imaging, microvasculature, light-based therapeutics

[choib@uci.edu](mailto:choib@uci.edu) - <http://choi.bli.uci.edu/>

#### **MICHELLE DIGMAN, Ph.D.**

*Associate Professor of Biomedical Engineering*

**Research Interests:** biophotonics, fluorescence Spectroscopy and microscopy, nano-scale imaging, mechanotransduction, cancer cell migration, fluorescence lifetime and metabolic mapping

[mdigman@uci.edu](mailto:mdigman@uci.edu) - <http://www.lfd.uci.edu/> - <https://sites.google.com/site/usibrprogram2013/>

**TIMOTHY DOWNING, Ph.D.**

*Assistant Professor of Biomedical Engineering*

**Research Interests:** stem cell and tissue engineering, regenerative biology, cell reprogramming, epigenomics, mechanobiology

[tim.downing@uci.edu](mailto:tim.downing@uci.edu)

**ANTHONY DURKIN, Ph.D.**

*Associate Professor of Biomedical Engineering*

**Research Interests:** spatial frequency domain imaging, wide field functional imaging, quantitative near-infrared spectroscopy of superficial tissues, chemometrics, fluorescence spectroscopy, quantitative spectral imaging

[adurkin@uci.edu](mailto:adurkin@uci.edu) - <http://durkin.bli.uci.edu/>

**ENRICO GRATTON, Ph.D.**

*Professor of Biomedical Engineering, Physics and Astronomy, and School of Physical Sciences*

**Research Interests:** design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues

[egratton@uci.edu](mailto:egratton@uci.edu) - <http://www.lfd.uci.edu>

**ANNA GROSBERG, Ph.D.**

*Associate Professor of Biomedical Engineering; Chemical Engineering and Materials Science*

**Research Interests:** computational modeling of biological systems, biomechanics, cardiac tissue engineering

[grosberg@uci.edu](mailto:grosberg@uci.edu) - <http://grosberglab.eng.uci.edu>

**JERED HAUN, Ph.D.**

*Assistant Professor of Biomedical Engineering; Chemical Engineering and Materials Science*

**Research Interests:** nanotechnology, molecular engineering, computational simulations, targeted drug delivery, clinical cancer detection

[jered.haun@uci.edu](mailto:jered.haun@uci.edu)

**ELLIOT HUI, Ph.D.**

*Associate Professor of Biomedical Engineering*

**Research Interests:** microscale tissue engineering, bioMEMS, cell-cell interactions, global health diagnostics

[ehui@uci.edu](mailto:ehui@uci.edu) - <http://hui.bme.uci.edu>

**TIBOR JUHASZ, Ph.D.**

*Professor of Ophthalmology; Biomedical Engineering*

**Research Interests:** laser-tissue interactions, highprecision microsurgery with lasers, laser applications in ophthalmology, corneal biomechanics

[tjuhasz@uci.edu](mailto:tjuhasz@uci.edu)

**ARASH KHERADVAR, M.D., Ph.D.**

*Professor of Biomedical Engineering; Mechanical and Aerospace Engineering; and Medicine*

**Research Interests:** cardiac mechanics, cardiovascular devices, cardiac imaging

[arashkh@uci.edu](mailto:arashkh@uci.edu) - <http://kheradvar.eng.uci.edu>

**MICHELLE KHINE, Ph.D.**

*Professor of Biomedical Engineering; Chemical Engineering and Materials Science*

**Research Interests:** development of novel nano- and micro-fabrication technologies and systems for single cell analysis, stem cell research, in-vitro diagnostics

[mkhine@uci.edu](mailto:mkhine@uci.edu) - <http://shrink.eng.uci.edu/>

**CHRISTINE KING, Ph.D.**

*Assistant Professor of Teaching*

**Research Interests:** engineering and STEM education, active learning, wireless health systems, rehabilitation, brain-computer interfaces, robotics

[kingce@uci.edu](mailto:kingce@uci.edu)

**FRITHJOF KRUGGEL, .M.D., Ph.D.**

*Professor of Biomedical Engineering*

**Research Interests:** biomedical signal and image processing, anatomical and functional neuroimaging in humans, structure-function relationship in the human brain

[fkruggel@uci.edu](mailto:fkruggel@uci.edu) — <http://sip.eng.uci.edu>

**ABRAHAM P. LEE, Ph.D.**

*Professor of Biomedical Engineering; Mechanical and Aerospace Engineering; Director of Micro/Nano Fluidics*

*Fundamentals Focus (MF3) Center* **Research Interests:** Lab-on-a-Chip health monitoring instruments, drug delivery micro/nanoparticles, integrated cell sorting microdevices, lipid vesicles as carriers for cells and biomolecules, high throughput droplet bioassays, microfluidic tactile sensors

[aplee@uci.edu](mailto:aplee@uci.edu) — <http://biomint.eng.uci.edu/> - <http://www.inrf.uci.edu/mf3/>

**CHANG LIU, Ph.D.**

*Assistant Professor of Biomedical Engineering; Chemistry*

**Research Interests:** genetic engineering, directed evolution, synthetic biology, chemical biology

[ccl@uci.edu](mailto:ccl@uci.edu) - <http://liulab.com>

**WENDY LIU, Ph.D.**

*Associate Professor of Biomedical Engineering; Chemical Engineering and Materials Science*

**Research Interests:** cell and tissue engineering, biomaterials, microfabricated technologies, mechanotransduction

[wendy.liu@uci.edu](mailto:wendy.liu@uci.edu) - <http://liu.bme.uci.edu/>

**BETH LOPOUR, Ph.D.**

*Assistant Professor of Biomedical Engineering; Mechanical and Aerospace Engineering*

**Research Interests:** computational neuroscience, signal processing, mathematical modeling, epilepsy, translational research

[beth.lopour@uci.edu](mailto:beth.lopour@uci.edu) - <http://lopour.eng.uci.edu/>

**WILLIAM C. TANG, Ph.D.**

*Professor of Biomedical Engineering; Electrical Engineering and Computer Science*

**Research Interests:** micro-electro-mechanical systems (MEMS) nanoscale engineering for biomedical applications, microsystems integration, microimplants, microbiomechanics, microfluidics

[wctang@uci.edu](mailto:wctang@uci.edu) - <http://wctgroup.eng.uci.edu>

**BME AFFILIATED FACULTY**

For a complete list of BME Affiliated Faculty go to <http://engineering.uci.edu/dept/bme/faculty-staff/affiliated>

## **X. IMPORTANT PEOPLE AND CONTACT INFORMATION**

BIOMEDICAL ENGINEERING BUSINESS OFFICE  
3120 Natural Sciences II

ZORAN NENADIC, D.Sc.  
Department Chair  
(949) 824-8155  
[znenadic@uci.edu](mailto:znenadic@uci.edu)

MICHELLE DIGMAN, Ph.D.  
Associate Chair for Graduate Affairs  
[mdigman@uci.edu](mailto:mdigman@uci.edu)

AMY RUTH  
Department Manager  
(949) 824 – 5184  
[aruth@uci.edu](mailto:aruth@uci.edu)

SALLY AVILA  
Academic Personnel/Payroll Analyst  
(949) 824-9755  
[slavila@uci.edu](mailto:slavila@uci.edu)

JAMES SHYU  
Course Lab Manager  
(949) 824-1978  
[shyuj@uci.edu](mailto:shyuj@uci.edu)

MAGGIE MULCARE  
Academic Coordinator  
(949) 824-3494  
[mmulcare@uci.edu](mailto:mmulcare@uci.edu)

JULIANNE VU  
Administrative Analyst  
(949) 824-9196  
[jevu@uci.edu](mailto:jevu@uci.edu)

### **HSSOE GRADUATE STUDENT AFFAIRS OFFICE STAFF**

JEAN BENNETT  
Director  
Graduate and Professional Studies  
204 Rockwell Engineering Center  
(949) 824-6475  
[jean.bennett@uci.edu](mailto:jean.bennett@uci.edu)

MARK BANDERAS  
Assistant Director  
Graduate and Professional Studies  
204 Rockwell Engineering Center  
(949) 824-3562  
[mark.banderas@uci.edu](mailto:mark.banderas@uci.edu)

## **XI. IMPORTANT FORMS**

Below is a list of several important forms required during your study here at UCI. **You are responsible for completing your own forms.**

### **PLAN OF STUDY FORM**

To be completed by the first month in the biomedical engineering program. Complete the first section and return to BME Business Office

### **PH.D. FACULTY RESEARCH ADVISOR VERIFICATION FORM**

Newly admitted students must be matched with a faculty research advisor no later than 12 months after the student's first quarter of Ph.D. study. Continuing students who are switching advisors (for whatever reason) must match with a new faculty research advisor no later than by the end of the subsequent quarter (excluding summer term).

### **ADVANCEMENT TO CANDIDACY/FINAL REPORT FOR THE MASTERS DEGREE**

Necessary for obtaining the Master's degree. Please note that you must advance at least one quarter before completion of your M.S. degree

### **GENERAL PETITION FOR GRADUATE STUDENTS**

Submit this form when you want to petition for transfer of courses into a program, when you want to substitute a course for another required course, or for a B- to count towards your degree requirements (you are allowed one B- to be used toward your M.S. degree for a non-core course).

### **NOMINATION OF PH.D. QUALIFYING EXAMINATION COMMITTEE**

The Nomination of Ph.D. qualifying examination committee form must be reviewed in the student's department and submitted at least two weeks before the date of the Ph.D. Qualifying Examination.

### **REPORT OF THE PH.D. CANDIDACY COMMITTEE (PH.D. FORM I)**

On the day of your qualifying exam, complete Ph.D. Form I and obtain signatures from your chair and committee members. (See previous sections for committee composition) After the final signatures have been obtained, submit the form with the \$90 Advancement to Candidacy Fee to Graduate Division, 120 Aldrich Hall.

### **REPORT ON THE FINAL EXAMINATION FOR PH.D. DEGREE (PH.D. FORM II)**

Upon completion of your defense and approval of the dissertation, the Doctoral Committee recommends the conferral of the Ph.D. degree. This form must be signed by the committee members and the dissertation is filed with the University Archives.

### **ACADEMIC LEAVE OF ABSENCE**

A Leave of Absence can be granted for up to one year (3 quarters) for temporary interruption of a student's academic program.

### **FILING FEE PETITION**

Students who have completed all requirements for a M.S. or Ph.D. degree except for the official submission of their thesis or dissertation, are eligible to submit this petition. A Filing Fee Petition can be submitted for one quarter only and is a reduced fee in lieu of other student fees.