



Bioengineering Interdepartmental Graduate (BIG)  
Program  
Student Handbook

Department of Bioengineering  
University of California, Riverside  
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# BIG Student Handbook 2016-17

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# **BIG Student Handbook 2016-17**

## **Introduction**

Welcome to the Department of Bioengineering and the Bioengineering Interdepartmental Graduate (BIG) Program!

The Department of Bioengineering, established in 2006, is chaired by Professor Xiaoping Hu. The research vision is to build strength from expertise in biochemistry, biophysics, biology, and engineering to focus on critical themes that impact bioengineering.

The mission of the Department of Bioengineering at the University of California, Riverside focuses on two interrelated themes:

1. Advancing bioengineering research, and,
2. Preparing future leadership in bioengineering and related fields

Our unique interdisciplinary graduate program and ABET-accredited undergraduate program both combine building a solid fundamental foundation in biological science and engineering while simultaneously developing diverse communication skills for our students. BIG provides additional training in analytical, computational and laboratory skills in the most advanced quantitative bioengineering research. The result is a rigorous, but exceptionally interactive and welcoming educational training for Bioengineering students leading towards B.S., M.S. and Ph.D. degrees.

BIG is the umbrella for graduate level research effort associated with the faculty in the Department of Bioengineering as well as other participating faculty at UCR who have a passion for training graduate students in bioengineering. BIG offers a rigorous but exceptionally interactive and welcoming educational environment for graduate study leading to the M.S. and Ph.D. degrees.

This handbook provides much of the information you will need as you progress towards the completion of your graduate degree. This document should be used as a supplement to the official graduate student handbook that can be found on the UCR Graduate Division website at <http://graduate.ucr.edu/forms/GSHandbook.pdf>.

Please contact us at 951-827-4303 with any questions you may have. Welcome again to UCR and we look forward to working with you during your graduate career!

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## Getting Started

### Permanent Personal Identification Number (PermPIN)

The PermPin is a permanent six-digit number that is set by the Office of the Registrar once a student is admitted to the university. PermPINs are required for any web transactions, and is used to verify access to a variety of data, such as grades and confirmations. The PermPIN can be found on the Admission letter. If you have lost your PermPIN, check with our Graduate Student Assistant (GSA) or the Office of the Registrar.

### R'Card

All students are required to carry and show a permanent photo ID card for identification, most official transactions, to check out books from the libraries, and for entrance into the Student Recreation Center and various buildings on campus. Instructions for obtaining an R'Card can be found here: <http://ucrcard.ucr.edu/rcardinfo/obtaining-rcard-students.html>. Please note that you can upload a photo prior to being on campus, provided that you have set up your NetID. Cards can be picked up at the UCR Card Services office. A \$25 charge will be billed to your student account at the time of pickup. More detailed information regarding your R'Card can be found at <http://www.ucrcard.ucr.edu/Pages/default.aspx>.

### Email and Internet Access

When you enroll at UCR, you are automatically assigned an R'mail account. This account allows you to access your email account. Along with your account, you will also receive a system-generated login name or Net ID. You cannot change your NetID; it will stay the same throughout your time at UCR. Your initial password is your PermPIN number. If you forget it, you can take your student ID card to the Registrar's Office during business hours to reset it. To access your account or find your email address, go to <http://cnc.ucr.edu/iguide/>.

There are several options for wireless connectivity on campus. To start using the UCR wireless network, you need all of the following:

- Choose which network (mobilenet, ucrwpa, or eduroam) to use. Read the configuration pages.
- UCR Net ID - Faculty and staff will use their UCR Net ID to login to the wireless network. Please read the UCR Net ID information on the ESAI website for more information. Students already have wireless accounts set up automatically when they first enter UCR. Students may log in with their UCR Net ID and Permanent PIN. Guests may obtain wireless access by having their host contact the Computer Support Group.

More information can be found at <http://cnc.ucr.edu/wireless/>.

### Bioengineering Department

Please check in at the Department of Bioengineering Office in the Materials Sciences and Engineering (MSE) Building, Room 217. The Graduate Student Assistant (GSA), Graduate Advisor of Enrolled Students (GA), or the Financial and Administrative Officer (FAO) will help you with any questions you might have.

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## General Information

### GROWL

GROWL (<http://www.growl.ucr.edu>) is the campus web service for reviewing grades, checking financial aid, billing, degree programs, address changes, etc. Please refer to the 'Courses' section for directions on how to enroll in classes.

### Mail

Incoming mail and intercampus notices may be picked up from mailboxes in the department suite, MSE 217. Mail is distributed twice daily. Outgoing intercampus mail and official university mail can be deposited in the brown canvas bag also located in MSE 217 on the front reception desk. Students should not send and receive personal mail through the office address.

### Language Requirement

To meet the degree requirements of the Bioengineering program, all BIG students whose native language is not English must achieve a "Clear Pass" on the SPEAK test before the completion of their first year or they will be asked to leave the program. However, for those who receive a "conditional pass," a departmental committee will evaluate their English Proficiency before a final decision is made. The SPEAK test costs \$50.00 and the student is responsible for this fee when registering for the test.

### Financial Assistance

Most graduate students are supported on a continuing basis by Graduate Student Research Assistantships provided by their individual advisors. However, financial assistance is also available through several mechanisms. UCR offers several fellowships, which are available on a competitive basis. In addition, the Department of Bioengineering has a limited number of graduate student research and Teaching Assistant positions that are used for graduate student support.

Students are strongly encouraged to apply for support through federal agencies and private foundations. This is a valuable experience that will not only assist students financially while in school, but will also help to build up their resume and provide contacts for the future. Organizations that have awarded fellowships and research support to UCR students include the National Science Foundation (NSF), the National Institutes of Health (NIH), NASA, and the Fulbright Program. Students wishing to explore these and other sources of support should speak to the Graduate Advisor for Enrolled Students or consult the annual Register of Grant Support and other similar directories either at the reference department of the library or through the financial support section at the Graduate Division web page. There are also many sites devoted to various sources of aid for graduate students.

Dissertation Research Grants: Provide funds to doctoral candidates for research expenses associated with the dissertation. Applicants must be advanced to candidacy and plan to be registered during the period of the award. Proposals may be funded up to a maximum of \$1,000. These funds may not be used for preparing the dissertation copy or as a stipend for personal support. Contact the Graduate Division for applications.

Graduate Student Association (GSA) Mini-grants: Provide funds to assist in paying the travel expenses of a student who has been invited to present scholarly papers or posters at a regional and/or national professional conference. This program is administered by the Graduate Student Association and requires the departments to agree to provide matching funds. Contact the GSA or the Graduate Division for the mini-grant applications.

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## Other Support Definitions

Graduate students are supported from a variety of sources. Here is information on the various types of funding with definitions of the commonly-used acronyms:

Graduate Division Stipend: Usually awarded as part of a larger fellowship package, these dollars come directly from Graduate Division to the student through the Financial Aid System. The student will receive a lump sum “pay check” at the beginning of each quarter starting in late September (for the October 1 stipend check) through May (June 1 for stipend check).

Graduate Student Researcher (GSR): An employment title for graduate students conducting research (either independent or directed). Campus policy prohibits students from working more than 49% during the academic year. GSR appointments at 25% or more during the academic year are entitled to GSHIP and PFR (see below). Financial support for GSR employees is provided by faculty extramural grants and departmental general funds. Students are paid in arrears and receive their first check after their first month of work (i.e. a student who begins work in the fall quarter will not get a pay check until November 1).

Fee Differential: The left-over university mandatory fee amount for a student with a PFR and GSHIP and NRTR entitlements. This dollar amount changes as GSHIP and PFR increase. Most students are required to pay this.

Teaching Assistant (TA): This refers to employment titles that fall under the umbrella of an Academic Student Employee (ASE), including teaching assistant (TA), teaching fellows, associate instructors, and is for graduate students who are teaching part of a course (normally labs or discussion sections) under the guidance of a faculty member or instructor. Students may not be appointed at more than 50% during the academic quarter. If appointed at 25% or more time during an academic quarter, GSHIP and PFR will be awarded. See the United Auto Workers Union Contract for more information. TA funds are distributed to the departments by the Bourns College of Engineering Dean’s Office. Students are paid in arrears and receive their first check after their first month of work (i.e. a student who begins work in the fall quarter will not get a pay check until November 1). Graduate students undergoing training in teaching methodology (i.e., through BIEN 302) are not required to become ASEs.

Partial Fee Remission (PFR): Students who are appointed at 25% or more time during an academic quarter as a GSR or TA are entitled to PFR. This entitlement pays part (but not all) of the students’ mandatory university fees. If an award is placed on the system after the bills are printed, the student’s bill will not reflect the correct fees they owe.

Graduate Student Health Insurance (GSHIP): Students who are appointed at 25% or more time during an academic quarter as a GSR or TA are entitled to have their GSHIP fees paid for them. If an award is placed on the system after the bills are printed, the student’s bill will not reflect the correct fees they owe. The actual dollar amount of GSHIP changes as the insurance prices change from year to year. Students who have private Health Insurance comparable to the University’s coverage can apply for waivers of the GSHIP fees.

Non-Resident Tuition Remission (NRT or NRTR): Non-residents of California (either domestic or international) who are appointed at 45% or more as a GSR and are Ph.D. students are entitled to have their Non-Resident Tuition paid for them. If an award is placed on the system after the bills are printed the student’s bill will not reflect the correct fees they owe. International students cannot ever establish residency and will owe Non-Resident Tuition for their entire student careers. **However, when a Ph.D. student advances to candidacy, the Non-Resident Tuition is reduced by 100% for a period of three years.** Domestic non-resident students must establish California residency by the second year of study (this does not occur automatically; Ph.D. students must complete and submit required forms).

Department Grant In Aid (DGIA): Departments or individual faculty members with unrestricted funds (many federal grants will not allow payment of student fees) can grant fellowship-like awards

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to individual students. This is most often used to pay the student's fee differential. The Graduate Assistant can provide more information to you if needed.

## Research

Except for the M.S. Plan II, BIG Students are expected to perform original scholarly research to partially fulfill their degree requirements. The BIG program offers students the opportunity to engage in research with core faculty in the Department of Bioengineering as well as with the BIG Participating Faculty in other departments. As of July 2016, research related to the faculty in the Department of Bioengineering is summarized under five research focus areas:

- Biomaterials and Regenerative Medicine
- Biomedical Imaging
- Molecular and Cellular Engineering
- Computational Bioengineering
- Medical Devices

A list of the current bioengineering core faculty and links to their research can be found at <http://www.bioeng.ucr.edu/people/faculty.html>.

The BIG Participating Faculty includes an additional 40+ members from across the campus who have biomedical engineering or bioengineering interest. The departments in which these dedicated individuals reside range from Mechanical Engineering to the Biomedical Sciences Division in the School of Medicine. A complete listing of BIG Participating Faculty can be found at <http://www.bioeng.ucr.edu/people/bigfaculty.html>.

## Standard of Scholarship

Students must maintain a continuous record of acceptable progress toward their degree objective. For students with a research component to their degree program, this entails satisfactory completion of research degree requirements in a timely fashion. Students are considered to be making unacceptable progress and become subject to dismissal when:

- they fail to take their oral qualifying exam within four years
- they fail to fulfill program requirements such as exams or research in a timely and satisfactory manner
- they have not completed their programs within one year after reaching the program's normative time
- they fail to pass comprehensive or qualifying examinations in two attempts
- they fail to make progress in research for two consecutive quarters

## Finding a Lab / Rotations

Entering BIG students interested in research are expected to complete at least 3 rotations that are each 3 weeks in length by the end of their first quarter in the graduate program. These rotations can be under the supervision of both bioengineering core faculty or with BIG participating faculty in other departments. It is the student's responsibility to contact faculty to arrange these rotations, and to keep the Graduate Advisor of Enrolled Students informed regarding their rotation schedule.

Prior to the end of Fall quarter, students are expected to submit a ranked list of labs in which they would like to perform research, along with a summary of their research experience in each of their rotations, to the Graduate Advisor of Enrolled Students. The Graduate Advisor of Enrolled



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Students will then hold a meeting with all relevant faculty members, in which students will be assigned to research laboratories. BIG students will be advised of their laboratory assignment before the start of Winter quarter.

## **Filing Fee Status**

Students who have completed all degree requirements except for filing their dissertation/thesis are eligible for Filing Fee status during the final quarter of residence in lieu of paying student service fees. Students do not have to use Filing Fee status. Students on Filing Fee status pay only one-half of the Student Services Fee. Only one quarter on Filing Fee status is allowed. Please see the MS or PhD Filing Fee Forms for application deadlines.

## **Research Progress Evaluations**

Each BIG student is required, by both the Graduate Division and the Bioengineering Program, to have at least one Research Progress Evaluation (RPE) per year. This will allow determination of whether the student is making normal and acceptable progress towards completion of her/his Ph.D. dissertation or M.S. thesis.

### *Mandatory Research Progress Evaluation Meetings*

It is expected that all students hold at least one RPE meeting per year unless otherwise indicated from the Graduate Advisor of Enrolled Students. Students will present their research progress to at least 3 faculty members (usually members of the student's Qualifying Committee or MS Thesis Committee) simultaneously in a single session. This may include faculty participation via videoconferencing (e.g., Skype). Students are to work with their research advisor to select the members of this RPE Committee. If a student does not yet have a research advisor, the RPE committee will be formed by the Graduate Advisor of Enrolled Students. Following the meeting, the student's major professor and committee members will meet with the student to discuss their research progress. The results of any RPE meetings, as well as the overall performance of the student, will be reported in the student's annual review.

### *General Protocol for RPE*

RPE meetings will be initiated by the student, who will be expected to prepare an RPE Research Summary that will not exceed 2 pages in length as well as an RPE Summary Form to be presented to all members of the Committee at least 1 week in advance of the meeting. Coordination of a time, date, and location for a meeting that can be attended by her/his RPE Committee is the responsibility of the student. The student's major professor will chair the meeting. At the meeting, the student will make an oral presentation on their recent research progress, augmented by slides or other visual aids if necessary, and answer questions raised by the RPE Committee. The last phase of the meeting will be a private discussion of the RPE Committee members to evaluate the student's research progress. The meeting will end with the RPE Committee sharing its evaluation of the student's overall academic progress.

### *Student's Research Progress Evaluation Report*

The written report to be prepared by the student in advance of each RPE meeting consists of two parts: an RPE Form and an RPE Research Summary. The structure and format of the RPE Research Summary is left to the student, their research advisor(s) and RPE Committee. However, this document should be written with a minimum font size of 11 and not exceed 2 pages in total length. Each student's RPE Research Summary will be reviewed by the Graduate Advisor of Enrolled Students.

### *Graduate Student Reviews*

Following the RPE meeting, the committee members should work with the student's research advisor to complete and sign an RPE Evaluation Form. The objective of this form is to provide feedback on the student's progress, to highlight the student's effort and achievements and identify

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weaknesses and any remaining requirements necessary to demonstrate satisfactory academic progress. The review is also used to insure that the department and student are consistent with their perceived status. Consequences for failure to demonstrate academic progress are subject to the discretion of the student's major research supervisor, Department Chair, and Graduate Advisor of Enrolled Students.

In addition, the research advisors will work with the Graduate Advisor of Enrolled Students to generate an annual letter to each student that summarizes the content of RPE meetings over the past year. A copy of the letter is sent to the Bioengineering Graduate Advisor of Enrolled Students, Department Chair and the Graduate Division.

## Doctor of Philosophy (Ph.D.) Degree Program

The Ph.D. program is part of the BIG (Bioengineering Interdepartmental Graduate) Program. The Ph.D. program is heavily research focused and is intended for well-qualified individuals who wish to pursue leadership careers in academic or industrial research. The Ph.D. program requires approximately three years of full-time study beyond the master's degree but an M.S. is not required to enter into the Ph.D. program. The normative time to complete the Ph.D. degree is five years.

### Degree Requirements

In consultation with a faculty advisor, BIG Ph.D. students plan their program of study. A doctoral program generally involves two stages. The first stage is spent in fulfilling the requirements established by the program, typically a series of courses culminating in written and oral examinations. When all required course work, language, written and oral exams are successfully completed, the student is advanced to candidacy for the Ph.D. The second or in-candidacy stage is devoted primarily to independent research and to the preparation of the dissertation.

### Courses

The doctoral degree requires that at least 24 of the 36 required units be graduate-level courses. A maximum of 12 units of BIEN 297 and BIEN 299 may be used to satisfy the 36 unit requirement. None may be transfer units from a university outside the University of California. Once a student has been assigned to a research faculty advisor, students are expected to discuss and plan their course schedule with both the Graduate Advisor for Enrolled Students and their research faculty advisor to complete a program of study that includes:

1. A major area of study intended to increase the student's depth of knowledge in an engineering research specialty
2. A minor area of study intended to support and increase the student's breadth of knowledge in the major area

Please refer to the 'Courses' section for further details.

### Written Qualifying Examination

Students in the Ph.D. program must pass a written qualifying examination prior to taking the oral qualifying exam. The written qualifier will be prepared and graded by faculty and will be based on the Bioengineering Core Courses. Students must pass three subject exams to successfully complete the written qualifier. Students may have two attempts in passing. If the student does not pass one or more exams in the written qualifier, they may choose to repeat the tested subject exam again or test for another exam related to the Bioengineering Core Courses. Normally the

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exam will be taken prior to completion of four academic quarters in residence. The first qualifier is administered shortly after the Spring quarter each year. The second and final attempt is given after the following Fall quarter.

## Teaching

All Ph.D. students are required to gain teaching experience for at least one quarter. There are two methods of fulfilling this requirement: either through training in teaching methodology in BIEN 302 (Teaching Practicum) or as a TA (ASE) assigned to a specific course. BIEN 302 is designed to learn effective teaching methods for handling discussion sections; preparing and handling laboratory sections; preparing and grading homework, examinations, and lab reports; and student relations. TA assignments are made through mutual agreement of the student's PI, the graduate advisor, and department chair. The teaching experience requirement can be fulfilled at any point during the course of completing a doctoral degree.

## Research

The doctorate - the highest degree the University can bestow – requires the student complete a significant body of novel research at the highest level possible. It is therefore recommended that doctoral students begin their research as soon as possible. Students are required to begin this process by participating in research rotations during their first quarter in the program (please refer to the 'Finding a Lab/Rotations' section for further details).

## Oral Qualifying Examination

A Ph.D. Qualifying Committee consists of the student's faculty advisor and four (4) additional members who are nominated by the Graduate Advisor of Enrolled Students and approved by the Graduate Program Committee. The Chair of the Qualifying Committee is normally the student's Ph.D. advisor, who must be a voting member of the Academic Senate. At least two (2) members of the Ph.D. Qualifying Committee must be members of the BIG (Bioengineering Interdepartmental Graduate) Faculty. One member of the Qualifying Committee, designated the "outside member", should be from outside the BIG Program, but should be a voting member of the UC Academic Senate. Exceptions must be qualified for a UC faculty appointment, and must be supported by a memo of justification from the Graduate Advisor of Enrolled Students and approved as an exception by the Graduate Dean. The names of these committee members must be listed on 'PhD Form2', along with the date set for the exam. This must be filed with the Graduate Division at least 2 weeks prior to the date of the oral examination. After review of the nominations, the Graduate Dean appoints the Ph.D. Qualifying Committee on behalf of the Graduate Council. A memo need not be written for those holding Adjunct faculty positions.

The student is responsible for the preparation of a written proposal detailing the rationale, specific aims and approaches to be undertaken for her/his dissertation research. The proposal should clearly demonstrate the student's adequate preparation for the completion of his/her dissertation research. This includes, but is not limited to, a thorough review of the pertinent literature, a presentation and discussion of the candidate's own research, and a detailed research plan with sufficient breadth and depth for the completion of the dissertation. This document must be given to the Oral Qualifying Committee at least 2 weeks before the oral examination. A suggested template ('PhD Proposal Template') can be found in the 'Forms' section.

The qualifying oral dissertation proposal/defense is not open to the general public but members of the Academic Senate may attend. The recommendation of the committee must be reported to the Graduate Council within forty-eight (48) hours on 'PhD Form 3' (please see the 'Forms' section). Each committee member must sign the form. The student will be notified of the results immediately following the exam. If a student has passed the qualifying examination, a dissertation committee of 3 faculty must be listed on Form 3. All committee members should be in a position

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to offer guidance and be able to judge the scholarship of the dissertation work. If a student has failed the qualifying examination, the committee is required to make a recommendation for or against a second examination, ordinarily not to be given until at least three months have elapsed. The date of the second oral examination shall be communicated to the Graduate Division in writing at least two weeks prior to its occurrence. A third examination is not permitted.

## Advancement to Candidacy

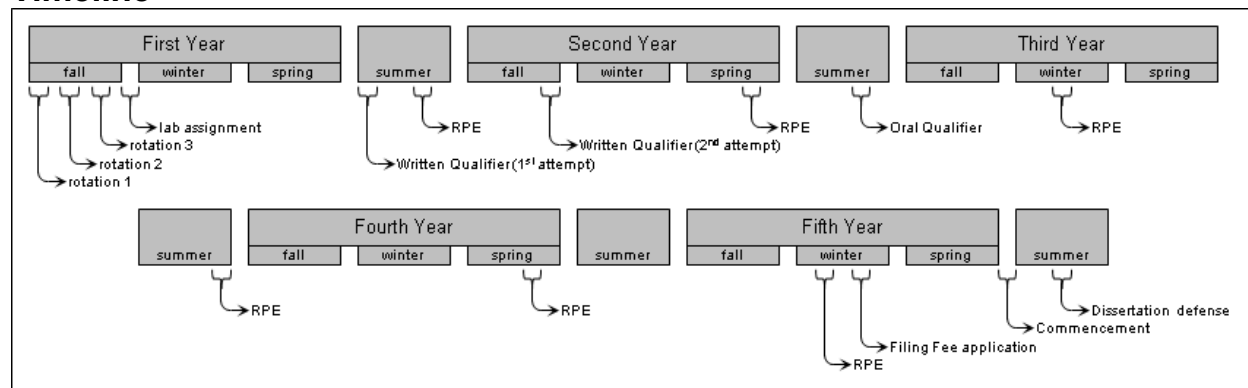
After successful completion of all required coursework, successful completion of both the Written and Oral Qualifying Examinations, and all other university and departmental requirements with the exception of completion of dissertation research, the student is eligible for formal advancement to candidacy. This is achieved by submission of a completed 'PhD Advancement' form (please see 'Forms' section) to the Graduate Division. Following advancement to candidacy, students formally focus on their dissertation research. The progress of the dissertation is monitored by the student's dissertation committee. Candidates should interact frequently with members of their dissertation committee to insure that dissertation progress is acceptable. A candidate is eligible for a maximum of three calendar years of non-resident tuition reduction.

## Dissertation Defense

The doctoral dissertation must be an original work of research in the candidate's chosen field of specialization. The doctoral committee determines the acceptability of the dissertation, and must be present when the student 'defends' its contents in a Final Oral Examination (Final Defense). Once the dissertation is approved, the student must file a copy of their dissertation electronically with the Graduate Division. Regulations on the format and filing deadline dates can be found at <http://graduate.ucr.edu/dissertation.html>. An original signature page must be filed with the Graduate Division as well.

For the dissertation defense, all members must be physically present. In exceptional circumstances determined in advance of examination scheduling and approved by Dean of the Graduate Division, one member of the examining committee (not the chair) may participate via video (e.g., Skype) or telephone conferencing. Exceptional circumstances may include but are not limited to: travel for research, or permanent residence, outside of the United States; participation in academic or research travel within the United States that cannot be shifted to accommodate the intended date of the oral examination or defense; hospitalization or other medical conditions that make it impossible to be physically present. A completed 'PhD Form 5' (found in the 'Forms' section) that has been signed by all approving committee members must be submitted to Graduate Division following successful completion of the Final Oral Examination.

## Timeline



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## Masters of Science (M.S.) Degree Program

The M.S. program is part of BIG (Bioengineering Interdepartmental Graduate) Program. The M.S. program is ideal for professionals seeking greater depth in several areas of bioengineering or individuals with biological science degrees who wish to enhance their foundation for employment in the many biotechnology fields.

Both thesis and non-thesis options are offered for the M.S. degree program (Plan I: Thesis and Plan II: Comprehensive Examination). **Students must notify the Graduate Advisor of Enrolled Students which of these two options they wish to pursue within their first quarter in the program.** Any changes from one Plan to the other must be discussed with and approved by both the Graduate Advisor of Enrolled Students and the student's Research Advisor.

Students must request permission to pursue a Master of Science in Bioengineering while simultaneously pursuing a Ph.D. in a program other than Bioengineering.

### Plan I

In addition to the following Bioengineering requirements, all applicants must meet the requirements for Plan I (Thesis) of the UCR Graduate Council Course Requirements. The normative time for completion is 2 years.

### Degree Requirements

#### Courses

The thesis-based Master's degree requires that at least 24 of the 36 required units be graduate-level courses. A maximum of 12 units of BIEN 297 and BIEN 299 may be used to satisfy the 36 unit requirement. Please refer to the Courses section for further detail.

#### Research

While it is not expected that a student pursuing a Master's degree have quite the same depth or breadth to their research as one pursuing a doctorate, a significant level of research is still required. For this reason, it is highly recommended that BIG students intending to complete a thesis-based Master's degree begin their research as soon as possible. Students can begin this process by participating in research rotations during their first quarter in the program (please refer to the 'Finding a Lab/Rotations' section for further details).

Shortly after the student is placed in a lab, the next step is to establish a thesis committee. A Master's thesis committee consists of three members, and must be approved in writing by the Graduate Advisor. The committee becomes responsible for the student's academic guidance and evaluation (please refer to the 'Research Progress Evaluation' section for further details).

#### Advancement to Candidacy

An application for Advancement to Candidacy ('MS Advancement' in the Forms section) can be filed once a student completes all required course work, but no later than the first day of the quarter in which they intend to graduate.

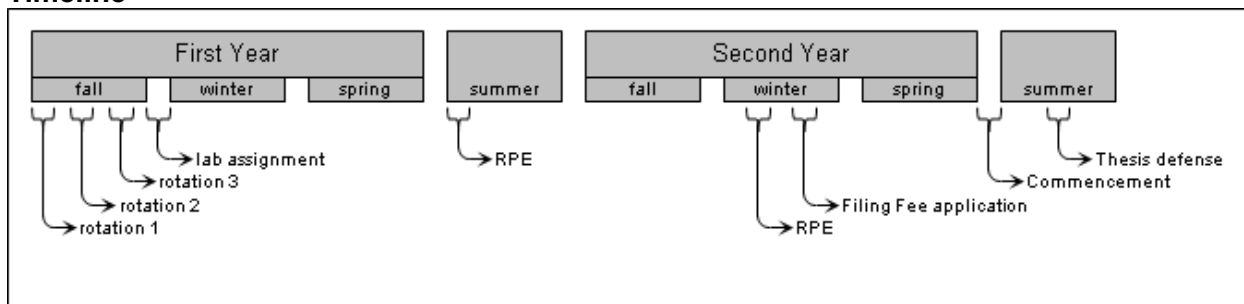
#### Thesis Defense

Completion of a thesis defense has two components: submission of a written document approved of by the thesis committee, and passing of a thesis defense. All members of the thesis committee must be present during the student's thesis defense. In exceptional circumstances determined in advance of examination scheduling and approved by the Dean of Graduate Division, one member of the examining committee (not the chair) may participate via video or telephone conferencing. Once the thesis is approved, a signed Report of Final Defense ('MS Defense' in the 'Forms' section) must be submitted, after which the student must file copies of their thesis electronically with the Graduate Division. An original signature page must be filed with the Graduate Division.

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Regulations on the format and filing deadline dates can be found at <http://www.graduate.ucr.edu/dissertation.html>.

## Timeline



## Plan II

This Plan is designed primarily for students who do not intend to pursue a Ph.D. in Bioengineering. In addition to the following requirements, all applicants must meet the requirements for Master's Degree Plan II (Comprehensive Examination). The normative time for completion of a Plan II M.S. is 1 year.

## Degree Requirements

### Courses

The examination-based Master's degree requires that at least 18 of the 36 required units be graduate-level courses. Units from BIEN 297 may not be used toward the 18 unit requirement. Units from BIEN 299 may not be used toward either the 18 or 36 unit requirement. Please refer to the Courses section for further detail.

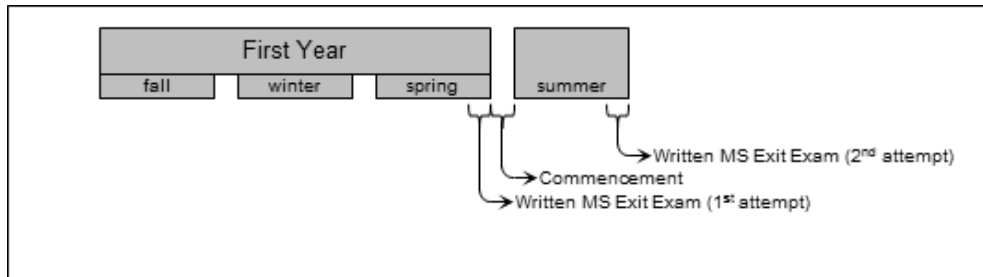
### Advancement to Candidacy

An application for Advancement to Candidacy ('MS Advancement' in the Forms section) must be filed no later than the first day of Spring Quarter.

### Written MS Exit Examination

The comprehensive written MS Exit Exam will be prepared and administered by the Graduate Examination Committee. Students must elect a minimum of 3 examination topics, related to the core courses offered by the Bioengineering Department, in which to take Written MS Exit Exam and notify the Graduate Advisor of Enrolled Students of these choices prior to Week 8 of the Spring Quarter. Subsequent to the examination, the Graduate Examination Committee will issue a passing or failing grade. If a student fails in the first attempt administered at the end of the Spring Quarter, he or she may retake the examination at the second and final scheduled comprehensive examination period prior to the start of the Fall Quarter. No more than two attempts to pass the exam are allowed.

## Timeline



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## Courses

BIG students have the flexibility to study a wide range of courses that can be targeted to the individual student's professional goals. However, so that all BIG students have a fundamental foundation in bioengineering, they must take key courses that will satisfy this core requirement. The elective list is substantial and also includes medical school courses offered in the UCR/UCLA Thomas Haider Program in Biomedical Sciences Graduate Program.

### Standards of Scholarship

Only courses in which grades of "A," "B," "C," or "S" are received are counted toward satisfying graduate degree requirements. To continue in good standing and obtain an advanced degree, students must maintain a minimum grade point average (GPA) of 3.00 in all upper division (100 level) and graduate (200 level) course work related to the degree. In addition, students must demonstrate acceptable progress toward their degree objectives, including satisfactory completion of all course work in a timely fashion. With regard to coursework, students are considered to be making unacceptable progress and become subject to dismissal when:

- They have 12 or more units of "I" grades outstanding
- The overall GPA falls below 3.00
- The quarterly GPA falls below 3.00 for two consecutive quarters;
- They fail to fulfill program requirements such as exams in a timely and satisfactory manner
- They have not completed their programs within one year after reaching the program's normative time
- They fail to pass comprehensive or qualifying examinations in two attempts

### Registration

Students in the BIG program must follow a slightly different protocol for registration than is listed in the UCR Graduate Student Handbook. All BIG students are required to discuss their course plan with the Graduate Advisor for Enrolled Students. Students participating in research are required to also discuss their course plan with their faculty advisor. A completed BIG Quarterly Advising Form (see Forms section) must be signed by the Graduate Advisor for Enrolled Students, and if applicable, the faculty advisor. The signed form is to be submitted to the Graduate Student Assistant, who will then enroll the student in their restricted courses.

### Core Courses

All BIG students are required to enroll in at least three core courses prior to advancement to candidacy. Other courses may be substituted but must be approved by the Bioengineering Graduate Advisor for Enrolled Students. Students from non-engineering backgrounds are required to take BIEN 264 or BIEN 270. The following lists the core courses and the quarter in which they will be taught in the 2016-17 academic plan (with the quarter indicated in parenthesis).

#### BIEN 223 - Engineering Analysis of Physiological Systems (Fall)

4 units, Lecture, 3 hours; individual study, 3 hours. Prerequisite(s): course work in basic biology, calculus, chemistry, and physics; graduate standing or consent of instructor. Provides a bioengineering approach to the physiological properties and interactions of various mammalian organ systems. Covers the nervous, muscular, cardiovascular, respiratory, and renal systems. Emphasizes the physical and engineering principles governing these systems by applying quantitative and analytical approaches.

#### BIEN 224 - Cellular and Molecular Engineering (Fall)

4 units, Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Emphasizes biophysical and engineering concepts intrinsic to specific topics at the cellular and molecular level. Includes receptor-ligand dynamics in cell signaling and function; DNA replication

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and RNA processing; cellular and protein sorting; control of gene expression; membrane structure, transport and traffic; biological signal transduction; and mechanics of cell division.

## BIEN 242 – Advanced Biomedical Optical Imaging (Winter)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 142 or equivalent; graduate standing or consent of instructor. Examines advanced theory and optimized design of biomedical optical imaging systems. Topics include a full understanding of the working principles of optical components, diagnostic light-tissue interaction, and design of imaging systems to exploit the interaction of light with biological phenomena.

## BIEN 245 - Optical Methods in Biology, Chemistry, and Engineering (Spring)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CHEM 109 or equivalent; graduate standing; consent of instructor. Covers the origin of fluorescence and other emission processes that modulate the characteristics of molecular emissions. Presents emission-based analytical and bioanalytical methods and techniques. Reviews state-of-the-art instrumentation, including their applicability, limitations, and source. Also provides interpretation and meaning of the measured signals as applied to biological systems.

## BIEN 249 - Integration of Computational and Experimental Biology (Winter)

4 units, Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): BIOL 005B; MATH 010B, MATH 046, PHYS 040C; graduate standing. A multidisciplinary introduction to computational methods used to analyze experimental biological data. Introduction to mathematical concepts needed to understand protein structure and dynamics, protein-protein interactions (structures and networks), gene regulatory networks, signal transduction networks, metabolic networks, and kinetic modeling of cellular processes. Also covers techniques used to derive experimental data.

## BIEN 264 - Biotransport Phenomena (not offered in 2016-17)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIEN 105 or equivalent; graduate standing or consent of instructor. Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems and biomedical engineering processes. Emphasizes momentum, mass transport, and interpretation of these processes. Topics include advanced development of governing conservation equations and the appropriate constitutive equations for transport in circulation and tissue.

## BIEN 270 - Transport with Reactions in Biological Systems (Spring)

Covers the mathematical expression and modeling of principles underlying the transport processes of biological systems reactions and biomedical engineering processes involving reactions. Topics include advanced development of chemical kinetics and reaction mechanisms of biological systems; enzymatic reactions; Michaelis-Menton kinetics; and cell-surface ligand-receptor kinetics.

## **Professional Development Requirement**

Students intending to pursue a Ph.D. are required to enroll in BIEN 401 in their first year and BIEN 402 in their second year. Masters students are required to take BIEN 402 in their first year. Please note that Masters students are not required to take BIEN 401 as a prerequisite for BIEN 402.

### BIEN 401 - Fundamentals of Proposal Preparation and Ethical Standards in Bioengineering (Fall)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. An introduction to effective proposal preparation and writing for bioengineering-related research. Also covers ethical standards of scientific research related to bioengineering. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

### BIEN 402 - Effective Writing for Bioengineering Research Publications (Spring)

4 units, Lecture, 4 hours. Prerequisite(s): BIEN 401. An introduction to effective manuscript writing for bioengineering-related research publications.

## **Colloquium Requirement**

Enrollment in the departmental colloquium is required in every quarter in which it is offered. Exceptions can be made to accommodate course scheduling conflicts, but these must be approved of by the Graduate Advisor

### BIEN 286 - Colloquium in Bioengineering (Fall, Winter, Spring)



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1 units, Colloquium, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Colloquia on current research topics in bioengineering and other related fields. Presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Bioscience Requirement

All BIG students must take at least one graduate level bioscience course chosen from the following list (or a suitable equivalent pending approval from the Graduate Advisor):

### BCH 210 - Biochemistry of Macromolecules

4 units, Lecture, 4 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; BCH 184 (may be taken concurrently); CHEM 109; graduate standing or consent of instructor. Discussion of recent advances in the knowledge of the molecular architecture of proteins and nucleic acids, especially with respect to new experimental approaches for analyzing their structure and function. Chemistry of the active site of enzymes.

### BCH 211 - Molecular Biology

3 units, Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in molecular biology of the biosynthesis and regulation of DNA, RNA, and proteins. Some topics covered include the following: molecular anatomy of genes and chromosomes; DNA repair and recombination; regulation of genes in the cell cycle; telomerase; RNA processing and splicing; RNA editing; regulation of normal genes and oncogenes; chaperones and protein targeting.

### BCH 212 - Signal Transduction and Biochemical Regulation

3 units, Lecture, 3 hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Advanced topics in signal transduction and biochemical regulation. Topics include protein kinases and protein phosphorylation; phosphatases and their role in regulation; function of phosphorylation events in regulation of metabolism and growth; calcium and other ion channels as signal transduction mechanisms; steroid hormones receptor super family; immune system signal transduction events.

### BIOL/CMDB 200 - Cell Biology

4 units, Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CBNS 101 or equivalent. An examination of the structure and function of eukaryotic cells and their components with emphasis on the key experiments that provide the foundation for our current knowledge. Covers topics such as cell membranes, intracellular trafficking, cell-to-cell interactions, motility, and the cytoskeleton.

### BIOL/CMDB 201 - Molecular Biology

4 units, Lecture, 3 hours; seminar, 1 hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 107A or equivalent. Covers the structure and inheritance of genetic material, the regulation of gene expression at the cellular and molecular level including molecular mechanisms for regulation of gene transcription, posttranscriptional regulation at the level of messenger RNA stability, processing, editing and translation, methods for gene mapping, and positional cloning.

### BIOL 203 - Cellular Biophysics

3 units, Lecture, 3 hours. Prerequisite(s): BIOL 200/CMDB 200; BIOL 201/CMDB 201; CHEM 109 or equivalent; or consent of instructor. Biophysical principles that determine cellular structure and function including diffusion, electrochemical gradients, transport, macromolecular interactions, and genetic recombination. Illustrative examples are used to highlight the importance of these principles in modern cell biology and physiology

### BIOL 221 - Microbial Genetics

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. In-depth coverage of the genetics of microbes. Emphasizes the primary data and the foundation of modern techniques using viruses, archae, prokaryotes, and eukaryotes. Includes genome sequences and organization, plasmids and other vectors, and mutation and genetic screens. Also covers transposable elements, recombination, and regulation of gene expression, development, and pathogenesis.

### NRSC 200A - Fundamentals of Neuroscience (Fall)

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3 units, Lecture, 3 hours. Prerequisite(s): graduate standing or consent of instructor. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior.

## Equivalent Selections from Biomedical Sciences Medical School Courses

BIG doctoral students have a unique opportunity to take the non-clinical medical school courses offered in the School of Medicine. However, BIG students cannot enroll in these courses during their first year in the program and must have Graduate Advisor of Enrolled Students approval. For more information on these courses, please refer to <http://medschool.ucr.edu/mep/mdcurriculum.html>.

## **BIG Electives**

BIG students can enroll in classes offered by the Department of Bioengineering as well as other departments. Enrollment in classes offered by other departments must be approved of by the Graduate Advisor for Enrolled Students and the instructor of the course in question. The following is a list of graduate electives offered by the Department of Bioengineering (suitable equivalents can be taken pending approval from the Graduate Advisor):

### BIEN 201 - Mathematical Methods for Bioengineering (Winter)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 146A or equivalent; first-year standing in the graduate program in Bioengineering. Provides a fundamental grounding in applied mathematics. Enables the provision of problems in biotransport and bioreaction kinetics. Topics include linear differential equations solutions; analytical methods for partial differential equations including separations of variables, similarity transforms, and perturbation methods; and numerical methods for bioengineering, regression techniques, and error analysis.

### BIEN 227 – Laser-tissue interactions (Winter)

3 units, Lecture, 2 hours; term paper, .5 hours; extra reading, 1 hour; written work, 1.5 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CS 005, MATH 046, PHYS 002C, or equivalents. Provides an overview of various types of interactions between lasers and biological tissues. Addresses methods of optical properties measurements, mathematical modeling of light propagation, and selected therapeutic applications of lasers. Includes one or two field trips to medical laser centers to observe laser treatment procedures.

### BIEN 234 - Orthopaedic Regenerative Engineering and Mechanobiology (Spring)

4 units, Lecture, 4 hours. Prerequisite(s): BIEN 110, BIEN 140A, BIOL 005A, and BIOL 005B, or equivalents; graduate standing or consent of instructor. Introduces advanced biomechanics and mechanobiology of skeletal tissues including bone and cartilage. Provides an understanding of structure-function relationship in biological tissues. Focuses on bone and cartilage regenerative engineering approaches based on scaffolds, stem cells, and mechanotransduction.

### BIEN 235 - Vascular Biomechanics and Engineering (Winter)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): BIOL 002, BIOL 005A, BIEN 105, or equivalent; graduate standing or consent of instructor. Provides detailed understanding of the crucial role of mechanical forces in guiding blood vessel formation and function in human health and disease. Topics include embryogenesis, wound repair, atherosclerosis, and cancer. Addresses the principles of biomaterials science and regenerative medicine for promoting therapeutic neovascularization.

### BIEN 236 - Nanomaterials for Regenerative Medicine (Fall)

4 units, Lecture, 4 hours. Prerequisite(s): BIOL 005C, CHEM 001C (or CHEM 01HC), MSE 001, or equivalents; graduate standing or consent of instructor. Covers recent advances in nanomaterial synthesis, fabrication, and characterization. Focuses on the medical applications of nanomaterials and nanotechnologies. Addresses methods of synthesis of nanomaterials such as nanoparticles, nanotubes, and nanofibers. Includes critical design criteria and assessment methods for properties of nanomaterials to meet medical requirements.

### BIEN 237 – Medical Diagnostics (Winter)

4 units, Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Provides an in-depth analysis of current topics in medical diagnostics. Focuses on critical reviews of recent journal articles on diagnostics and case studies of recent commercial diagnostic products. Topics include methods of biochemical detection, genotyping, DNA sequencing, medical imaging, hematology, microfluidics, epidemiology, and diagnostics for point-of-care and resource-limited settings.

### BIEN 251 - Biophotonics: Optical Microscopy and Its Biological Applications (not offered in 2016-17)

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3 units, Lecture, 2 hours; discussion, 1 hour. Prerequisite(s): graduate standing or consent of instructor. Examines the fundamentals of optical system design and system integration in light microscopy. Covers design components, including light sources, lenses, mirrors, dispersion elements, optical fibers, and detectors. Also covers optical system analysis, transfer functions, magnification, resolution, contrast, and molecular, cellular, organ, and organism applications.

## BIEN 268 - Bioengineering Experimentation and Analysis (not offered in 2016-17)

2 units, Laboratory, 3 hours; discussion, 1 hour; written work, 2 hours. Prerequisite(s): BIOL 005C, CHEM 001C, CS 005, MATH 046, PHYS 002C or equivalents or consent of instructor. Introduces measurement principles and data acquisition methods related to biomechanics and biochemical and bioelectrical signals from living systems. Addresses the fundamental mechanisms underlying the operation of various sensor types and the modern instruments illustrating noise analysis, filtering, signal processing, and conditioning. Includes experiments aimed at investigating physical responses of cells and tissues to a variety of stimuli.

## BIEN 271 - Video Bioinformatics: Multi-scale Analysis of Biological Systems (not offered in 2016-17)

2 units, Lecture, 2 hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the significant range for both the time and spatial scales of biological systems. Includes video imaging techniques, as well as how these spatial and time scales are analyzed for a better understanding of biological function. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor.

## Research Units

### BIEN 290 - Directed Studies

1-6 units, Individual study, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Faculty-directed individual study of selected topics in Bioengineering. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

### BIEN 297 - Directed Research

1-6 units, Outside research, 3-18 hours. Prerequisite(s): graduate standing; consent of instructor. Provides research opportunities for selected problems in bioengineering. Conducted under faculty supervision. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 15 units.

### BIEN 299 - Research for the Thesis or Dissertation

1-12 units, Outside research, 3-36 hours. Prerequisite(s): graduate standing; consent of instructor. Designated for research in bioengineering for the M.S. thesis or Ph.D. dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

## Teaching Units

### BIEN 302 - Teaching Practicum

1-4 units, Practicum, 3-12 hours. Prerequisite(s): graduate standing; appointment as a teaching assistant or associate in Bioengineering. Provides supervised teaching in undergraduate courses. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

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## **Thesis/Dissertation Format**

Regulations on the format and filing deadline dates can be found at <http://www.graduate.ucr.edu/dissertation.html>. A copy of the thesis/dissertation format guide can be found in the Forms section.

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## Troubleshooting

Graduate students are strongly encouraged to resolve conflicts directly and informally whenever possible. Successful dispute resolution requires clear and objective communication between the affected parties and good-faith efforts to establish common understanding and avoid subjective accusation. Unfortunately some disputes cannot be resolved informally. In such cases, graduate students should follow these procedures.

### **Employment Issues**

While every effort is made to place BIG students in an optimal research arrangement, occasional conflicts arise between a graduate student and their faculty research advisor. The first step toward resolving any such conflicts is clear and objective communication and identification of the problem(s). This should then be followed by good faith efforts to resolve the problem(s). If this informal process fails, the Graduate Advisor of enrolled students (or Department Chair as needed to avoid potential conflicts of interest) can serve as a mediator, either sitting in on a joint meeting between the student and research advisor or meeting with each separately. If this process fails to conclude in a satisfactory resolution to the conflict and/or the involved parties believe it to be of mutual benefit, a re-assignment of the student to a new lab can be discussed.

The UCR Graduate Student Handbook has guidelines for resolution of other GSR/TA grievances.

### **Appeals of Academic Decisions**

The procedure by which academic decisions, including outcomes of comprehensive and qualifying exams, may be appealed is described below. The person(s) initiating the appeal (hereby referred to as Appellant) can be students and faculty members, both core and participating, in the Bioengineering Interdepartmental Graduate program. Appeals should be submitted to the Graduate Advisor of enrolled students, or Department Chair as needed to avoid potential conflicts of interest, (hereby referred to as Mediator) within 30 days from the date that exam results are announced. Valid grounds for appeal are limited to two areas: (1) evidence of procedural error and/or (2) evidence of non-academic criteria being used to evaluate academic work, including personal bias and violations of campus non-discrimination policy.

#### Informal resolution

As a first step in an appeals procedure, informal resolution of disputes over academic decisions is strongly recommended before resorting to a formal appeal. Informal resolution can involve further communication among affected parties (e.g., a student and the chair of his/her exam committee). This must occur in the presence of a third party (e.g., graduate advisor, department chair) not involved in the initial dispute.

#### Formal resolution

If an information resolution cannot be reached, the formal appeal procedure is then started with preparation of a written statement that lays out the grounds of the appeal by Appellant. This statement is then presented to Mediator, who will determine the validity of the appeal and notify Appellant of their decision within two business days.

An appeal panel is then convened in the case of a valid appeal. While Appellant may make recommendations regarding the composition of the panel, final authority regarding panel members resides with Mediator. Panel members may be selected from faculty in the BIG program not involved in the decision under appeal. At least two panel members must have their primary appointment in the Bioengineering Department, and the panel must consist of an odd number of three or more. Mediator will inform Appellant of the final composition of the panel within 1 week of validation of the appeal. Mediator will also inform all other parties involved in the appeal.

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There are two components to the appeals process. The first is devoted to a finding of facts, during which the affected parties should separately meet with the panel. It is the responsibility of the affected parties to arrange for a time and place to present their side of the dispute to all panel members, individually or in groups, within one month of the start of the formal appeal. It is also the responsibility of the affected parties to answer any inquiries by the panel relevant to the case, and to provide written documentation as needed.

The second is a deliberation phase, in which the panel members convene to discuss the case. The final decision of the panel, determined by majority vote, will either have the initial academic decision stand or can deem the result invalid. A summary of the deliberations and the final decision will be conveyed to the Mediator (if they are not already on the panel), who will then relay this information to the Graduate Dean and the affected parties. Every effort will be made to reach this program-level decision within 60 days of the start of the formal appeal process.

## Graduate Division appeal

Affected parties may appeal to the Graduate Dean within 30 days of notification of the program-level decision ([http://graduate.ucr.edu/dispute\\_resolution.html](http://graduate.ucr.edu/dispute_resolution.html)).

## **Other Issues**

With the exception of Title IX/sexual harassment and student conduct issues that are addressed in the next section, other disputes arising from actions or inactions by faculty or administrators in graduate programs also should be handled first in an informal fashion, beginning with the faculty member(s) or administrator(s) involved, and then, if necessary, the Graduate Adviser or supervising administrator. If a satisfactory resolution cannot be achieved, the issue then should be taken to the student's Department Chair or Program Director. If a student still remains unsatisfied, an appeal may be submitted to the Graduate Dean or, in cases involving the Faculty Code of Conduct, the Dean of the student's school or college.

## **Additional Resources**

Graduate students who are unsure about which procedure to follow or who have questions about the policies affecting their lives at UCR should first contact the Associate Dean for Academic Affairs, or the Director of Student Affairs. The Office of the Ombudsperson also is available as a neutral and independent office for advice and guidance on dispute resolution approaches. For student conduct issues, please refer to Student Conduct and Academic Integrity Programs for more information. The University Affirmative Action Office and the Title IX/Sexual Harassment Office are available to help where questions or issues related to inappropriate conduct (discrimination or sexual harassment) is involved. In addition, the Office of Administrative Resolution is available as a general resource for students with complaints.

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## Links

Bioengineering Homepage

<http://www.bioeng.ucr.edu>

Graduate Division Student Handbook

<http://graduate.ucr.edu/forms/GSHandbook.pdf>

UCR Graduate Student Association

<http://www.gsa.ucr.edu>

Schedule of Classes Online

<http://www.classes.ucr.edu>

GROWL Online Registration

<http://ucribm.ucr.edu/Paws/PAWS.html>

UCR Libraries

<http://library.ucr.edu>

UCR Housing Office

<http://www.housing.ucr.edu>

City of Riverside (information about the city and surrounding areas)

<http://www.riversideca.gov>

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## Contact Information

Name	Title	Office	Phone XXXX	Email
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Victor G. J. Rodgers	Professor and Graduate Admissions Director	MSE 215	6241	<a href="mailto:vrodgers@engr.ucr.edu">vrodgers@engr.ucr.edu</a>
Jerome S. Schultz	Founding Chair and Distinguished Professor	MSE 203	2111	<a href="mailto:jssbio@engr.ucr.edu">jssbio@engr.ucr.edu</a>
Valentine I. Vullev	Associate Professor	MSE 235	6239	<a href="mailto:vullev@ucr.edu">vullev@ucr.edu</a>
Hong Xu	Sr. Development Engineer	MSE 233	7235	<a href="mailto:hongxu@engr.ucr.edu">hongxu@engr.ucr.edu</a>

Complete phone number (951) 827-XXXX. On campus dial 2-XXXX.



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## Forms

- [BIG Format Guide.pdf](#)
- [BIG RPE Form.pdf](#)
- [BIG RPE Evaluation Form.pdf](#)
- [BIG Quarterly Advising Form.docx](#)
- [MS Advancement.doc](#)
- [MS Defense.pdf](#)
- [MS Filing Fee.pdf](#)
- [PhD Advancement.doc](#)
- [PhD Filing Fee.pdf](#)
- [PhD Form 2.pdf](#)
- [PhD Form 3.pdf](#)
- [PhD Form 5.pdf](#)
- [PhD Oral QualifierTemplate.docx](#)