Biomedical Sciences MS

Together, the Graduate Student Handbook and your graduate program handbook should serve as your main guide throughout your graduate career. The Graduate Student Handbook includes university information, policies, requirements and guidance for all graduate students. Your program handbook describes the details about graduate study and requirements in your specific program. While both of these handbooks are wonderful resources, know that you are always welcome to talk with faculty and staff in your program and in the Graduate College.

The central activities and missions of a university rest upon the fundamental assumption that all members of the university community conduct themselves in accordance with a strict adherence to academic and scholarly integrity. As a graduate student and member of the university community, you are expected to display the highest standards of academic and personal integrity. Here are some resources to help you better understand your responsibilities:

- Academic Honesty
- Academic Integrity Training - Open to all graduate students at no cost

Introduction

Teaching Requirement

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Graduate Teaching Assistants for a minimum two semesters (one semester in at least one lab section). [www.ehs.ucf.edu](http://www.ehs.ucf.edu)

Lab and Safety Training

All Graduate Students are required to complete the following Lab and Safety Training Courses below. If you missed the scheduled training sessions during Orientation week, you must contact the Environmental Health and Training Office to schedule.

- Laboratory Safety
- Radiation Safety
- Bloodborne Pathogens
- Biosafety/Biomedical Waste

Curriculum
The Biomedical Sciences nontesis program requires a minimum of 33 credit hours of courses that includes a capstone experience. The program addresses the need of applicants who wish to pursue a teaching career in secondary schools, two-year and four-year colleges or other careers without an active research role. Nonthesis students are not considered for departmental graduate assistantships or tuition assistance.

**Required Courses—18 Credit Hours**

- BSC 6431 Practice of Biomedical Sciences (3 credit hours)
- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5 credit hours)
- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5 credit hours)
- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- MCB 6938 Seminar or IDS 7690 Seminar (1 credit hour, to be repeated by all students)

**Elective Courses—12 Credit Hours**

Nonthesis students take 12 credit hours of electives with 6 credit hours from the Biomedical Specialization and 6 credit hours from the Microbiology Specialization.

**Biomedical Specialization**

- BSC 5418 Tissue Engineering (3 credit hours)
- MCB 5225 Molecular Biology of Disease (3 credit hours)
- MCB 6226 Molecular Diagnostics (3 credit hours)
- PCB 5238 Immunobiology (3 credit hours)
- PCB 5236 Cancer Biology (3 credit hours)
- PCB 5275 Signal Transduction Mechanisms (3 credit hours)
- PCB 5527 Genetic Engineering and Biotechnology (3 credit hours)
- PCB 5709C Laboratory Virtual Simulations in Physiology (2 credit hours)
- PCB 5815 Molecular Aspects of Obesity, Diabetes, and Metabolism (3 credit hours)
- PCB 5834C Advanced Human Physiology (4 credit hours)
- IDS 5127 Foundation of Bio-Imaging Science (3 credit hours)
- PCB 5265 Stem Cell Biology (3 credit hours)
- GEB 5516 Technological Entrepreneurship (3 credit hours)
- Others: If approved by Graduate Committee

**Microbiology Specialization**

- MCB 5205 Infectious Processes (3 credit hours)
- MCB 5505 Molecular Virology (3 credit hours)
- MCB 5208 Cellular Microbiology: Host-Pathogen Interactions (3 credit hours)
- MCB 5654 Applied Microbiology (3 credit hours)
- MCB 6417C Microbial Metabolism (3 credit hours)
- MCB 5932 Current Topics in Molecular Biology (3 credit hours)
- MCB 5415 Cellular Metabolism (3 credit hours)
- MCB 5209 Microbial Stress Response (3 credit hours)
- PCB 6595 Regulation of Gene Expression (3 credit hours)
- PCB 5235 Molecular Immunology (3 credit hours)
- Others: If approved by Graduate Committee

**Capstone—3 Credit Hours**

- MCB 6026 Capstone Course (3 credit hours minimum)
An in-depth current literature research report on a relevant subject will be required for each student. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

An oral presentation on the written capstone report will be used as a final examination. A majority of the program faculty must be present for the final examination. Before graduation, the report should be submitted for consideration of publication as a review article in appropriate journals.

**Comprehensive Examination**

Nonthesis students must pass an oral comprehensive exam to qualify for the Master of Science degree.

Students must successfully pass an oral comprehensive examination to test the understanding of the basic concepts in the field and relevant applications. The comprehensive examination will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in dismissal from the program.

**Teaching Requirement**

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Graduate Teaching Assistants for a minimum two semesters (one semester in at least one lab section).

**Track Curriculum: Neuroscience**

The Neuroscience Track in the Biomedical Sciences MS program requires a minimum of 33 credit hours of courses that includes a capstone experience. Students take 18 credit hours of required core courses, 12 credit hours of elective courses relevant to neuroscience, a capstone project focusing on neuroscience and an oral comprehensive exam.

Nonthesis students are not considered for departmental graduate assistantships or tuition assistance.

**Required Courses—18 Credit Hours**

- BSC 6432 Biomedical Sciences I (5 credit hours)
- BSC 6433 Biomedical Sciences II (5 credit hours)
- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- MCB 6938 Seminar or IDS 7680 Seminar (1 credit hour, to be repeated by all students)
- PCB 5837 Molecular and Cellular Neuroscience (3 credit hours)

**Elective Courses—12 Credit Hours**

- SPA 6417 Cognitive/Communicative Disorders (3 credit hours)
- PCB 5275 Signal Transduction Mechanics (3 credit hours)
- ZOO 5748C Clinical Neuroanatomy (5 credit hours)
- ZOO 5749C Clinical Neuroscience (5 credit hours)
- CAP 6616 Neuroevolution and Generative and Developmental Systems (3 credit hours)
- PCB 5838 Cellular and Molecular Basis of Brain Functions (3 credit hours)
- BSC 5418 Tissue Engineering (3 credit hours)
- PCB 5709C Laboratory Virtual Simulations in Physiology (3 credit hours)
- MCB 5225 Molecular Biology of Disease (3 credit hours)
- PCB 5834C Advanced Human Physiology (4 credit hours)
- EXP 5254 Human Factors and Aging (3 credit hours)
• DIG 5875C Introduction to Modeling and Simulation (3 credit hours)
• IDS 6916 Simulation Research Methods and Practicum (3 credit hours)
• EXP 5208 Sensation and Perception (3 credit hours)
• PSB 5005 Physiological Psychology (3 credit hours)
• EXP 6116 Visual Performance (3 credit hours)
• EXP 6506 Human Cognition and Learning (3 credit hours)
• PSB 6348 The Neuroanatomical Basis of Psychological Function (3 credit hours)
• PSB 6328 Psychophysiology (3 credit hours)
• PSB 6352 Neuroimaging Design and Analysis Methods (3 credit hours)
• Other elective courses must be approved by the Program Coordinator.

Capstone—3 Credit Hours

• MCB 6026 Capstone Course (3 credit hours minimum)

An in-depth current literature research report in the area of Neuroscience will be required for each student. The student will select a faculty advisor to chair a faculty committee of three members for evaluation of the report.

The Capstone Process

Students are encouraged to contact faculty as early as possible in order to identify a faculty whose research focus complements the student's interest. The student and the mentor should select two additional faculty members to serve on the capstone evaluation committee.

Students must submit a signed Capstone Committee form to the Program Coordinator for approval as soon as the registration for the course is complete. The form must be submitted to the Program Office.

When you are ready to defend your Capstone project, you must register for the capstone course (MCB 6026) for three credit hours. It is important that the student register for the capstone course with the intention of completing the project at the end of the semester.

The Capstone Report

Evaluation of the capstone project requires a written report (in the format of a mini-review manuscript) and a presentation (project defense) in front of the capstone committee. No visitors are allowed during the capstone defense. Students may ask for advice and guidance from the project mentor/chair. The average capstone report ranges from 10 to 15 single-space pages in a manuscript format with proper citations. The student's Committee Chair will be responsible for checking the report for plagiarism using either Turnitin or iThenticate before the report is shared with the committee. The committee must receive the report at least one week before the time of presentation.

Note: The defense (presentation) must be held no later than one week before final exam week.

The Capstone Defense/Comprehensive Exam

The capstone defense and comprehensive exam evaluation is designed to assess the student's knowledge and understanding of the project and other relevant subjects in the field. Questions asked by the capstone committee to evaluate the student as competent in the field will satisfy the requirement of the comprehensive exam. The oral presentation will take place in the form of a 30-40 minute seminar and will be followed by questions and discussion.

The student will be evaluated on performance in all three sections (written report, oral presentation and ability to answer questions).

Should the student fail, a second opportunity will be provided within two weeks of the first attempt. A second failure will result in an Unsatisfactory (U) grade in the course and dismissal from the program.
Comprehensive Examination

Students must pass an oral comprehensive exam to qualify for the Master of Science. The oral comprehensive exam tests the student's understanding of the basic concepts in the field and relevant applications. The comprehensive exam will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within two weeks of the first attempt. A second failure will result in dismissal from the program.

Teaching Requirement

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Graduate Teaching Assistants for a minimum of one semester (one semester in at least one lab section).

Research Shadowing (Optional)

Students are encouraged to discuss with their capstone mentor the possibility of joining the lab for research shadowing of other graduate students. Acquired lab skills should assist students with the capstone project and with future endeavors.

Timeline for Completion

Students must meet with MS Program Coordinator to review Plan of Study.

Year 1

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
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</thead>
<tbody>
<tr>
<td>• BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5.0)</td>
<td>• BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5.0)</td>
<td>• Elective (3.0)</td>
</tr>
<tr>
<td>• MCB 6938 Lecture/Seminar (1.0)</td>
<td>• MCB 6938 Lecture/Seminar (1.0)</td>
<td>• MCB 6026 Capstone/Comprehensive Exam (3.0)</td>
</tr>
<tr>
<td>• MCB 6407C (Laboratory Methods in Molecular Biology) (3.0)</td>
<td>• Elective (3.0)</td>
<td>• Teaching One Lab Section</td>
</tr>
</tbody>
</table>

Semester Total: 9 credit hours                                    Semester Total: 9 credit hours                                    Semester Total: 9 credit hours

Year 2

Fall

• BSC 6431 Practice of Biomedical Sciences (3.0)
• Elective (3.0)
• Elective (3.0)
• Teaching One Lab Section

Semester Total: 9 credit hours

Students are required to complete a Plan of Study specifying course degree requirements.

Examination Requirements
Capstone Report

Evaluation of the capstone project requires a written report (in a format of a mini-review manuscript), and a presentation (project defense) in front of the capstone committee. Students may ask for advice and guidance from the project mentor/chair. The average capstone report ranges from 10-15 single-space page in a manuscript format with proper citations. The capstone report must be checked using iThenticate.com by the committee chair before the report is shared with the committee.

The committee must receive the capstone report one week before scheduled presentation date. The defense (presentation) must be held no later than one week before final exam week. No visitors are allowed during the capstone defense.

Capstone Defense/Comprehensive Examination

Nonthesis students must pass an oral comprehensive exam to qualify for the Master of Science degree. The capstone defense and comprehensive exam evaluation is designed to evaluate the student knowledge and understanding of the project and other relevant subjects in the field. Questions asked by the capstone committee to evaluate the student competent in the field will satisfy the requirement of the comprehensive exam. The oral presentation in a form of 30-40 min seminar should be followed by questions and discussion. The student will be evaluated on performance in all three sections (written report, oral presentation and ability to answer questions).

Should the student fail, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in “U” in the course and dismissal from the program.

Report

Policy Statement on Academic Integrity

Since integrity is such a critical part of science and scientific training, any incident of cheating or other forms of academic misconduct by biomedical sciences graduate students may result in dismissal from the MS Program. The MS program in Biomedical Sciences, as well as all the graduate programs organized in the Burnett School of Biomedical Science, holds students to the highest standards of academic conduct and scientific conduct.

There are many forms of misconduct, both in academics and in science. In science these primarily include the falsification or fabrication of data during one’s research project, or the plagiarism of text, figures or data from another’s work (such as a published paper). All are misconduct, and other examples of misconduct will be discussed during the ethics portion of the course required of all students (Practice in Biomedical Science).

In academics, the unauthorized use of electronic devices during exams, or any other means to gain an advantage during an examination would also be considered an example of academic misconduct. The use of another student’s work who previously took a course would also be considered academic misconduct. Both the student who supplied such material and the student who attempts to use such material are both in violation of the standards.

Many other examples exist and common sense should dictate to the student what is and is not permissible. If you question whether an action could be considered misconduct (academic or scientific) – ask the MS program coordinator or BSBS director. Ignorance of what constitutes misconduct is not an excuse.

Disciplinary Actions

The MS program reserves the right to carry out full disciplinary action against student misconduct. Any documented case of scientific or academic misconduct represents immediate grounds for removal from the program. The incident will be reported to the student’s PI, the Graduate Committee, and the UCF Office of Student Misconduct. The Graduate Committee will have the authority to dismiss the student from the MS Program after reviewing the case.

Graduate Research
UCF has three fundamental responsibilities with regard to graduate student research. They are to (1) support an academic environment that stimulates the spirit of inquiry, (2) develop the intellectual property stemming from research, and (3) disseminate the intellectual property to the general public. Students are responsible for being informed of rules, regulations and policies pertaining to research. Below are some general policies and resources.

**Research Policies and Ethics Information:** UCF's Office of Research & Commercialization ensures the UCF community complies with local, state and federal regulations that relate to research. For polices including required Institutional Review Board (IRB) approval when conducting research involving human subjects (e.g. surveys), animal research, conflict of interest and general responsible conduct of research, please see their website: [www.research.ucf.edu](http://www.research.ucf.edu) > Compliance.

**UCF's Patent and Invention Policy:** In most cases, UCF owns the intellectual property developed using university resources. The graduate student as inventor will according to this policy share in the proceeds of the invention. Please see the current UCF Graduate Catalog for details: [www.graduatecatalog.ucf.edu](http://www.graduatecatalog.ucf.edu) > Policies > General Graduate Policies.

To learn more about the Burnett School of Biomedical Sciences visit [med.ucf.edu/biomed](http://med.ucf.edu/biomed).

### Financial Support

Non-thesis master's students in this program are not eligible to receive a Graduate Teaching Assistantship (GTA) or tuition remission from the program. If you are interested in applying for loans or externally funded need-based awards, visit the Office of Student Financial Assistance website at [finaid.ucf.edu](http://finaid.ucf.edu) and complete the Free Application for Federal Student Aid (FAFSA), which is available January 1 each year.

**Teaching Assistantship (GTA)**

- When available: for up to 20 hours per week (0.5 FTE), at $5,000 per semester
- Assignment based on background and experience, as well as proficiency in English

**Research Assistantship (GRA)**

When available: for up to 20 hours per week (0.5 FTE), at $5,000 per semester

**Fellowships and Scholarships**

University fellowships are awarded each Spring (by early March) for the following academic year

**Tuition Waivers**

Tuition waivers are subject to College budget. Students receiving tuition waivers must be in full-time status.

**Programmatic Guidelines**

- A student is eligible to receive financial support in the form of a Graduate Assistantship.
- A Teaching Assistantship or a Graduate Research Assistantship and the accompanying of available tuition remission is provided for no more than a total of five long semesters (i.e., Fall and Spring).
- Students receiving assistantships are expected to: 1) meet graduate school regulation regarding the SPEAK test, etc. b) complete the Biosafety/Radiation work-shop, and c) to demonstrate dedication to research and teaching responsibilities. For research assistantship recipients, absence in the sponsoring laboratory for a period of more than three weeks may result in temporary or permanent withholding of the assistantship.
- A student's eligibility to receive financial support will be reviewed at the end of each Fall and Spring semester. The review will be conducted by the student's Thesis Advisory Committee and the appropriate recommendation will be made to the
Graduate Coordinator, who will provide the Chair with the final list of eligible students for the following semester. This review will also serve as the student’s evaluation of progress in the Plan of Study, and a one-page written evaluation will be submitted to the Graduate Coordinator.

- It is required that the first Thesis Advisory Committee meeting be held no later than end of the first year in the program. In this meeting, the student is expected to show progress for course work and to present to the committee a sound-thesis proposal.

- It is required that personal contact information be updated regularly with the Graduate Coordinator: a local mailing address, a local telephone number, and an e-mail address.

The Policies and Procedures of the Master of Science Program of the Department of Molecular Biology and Microbiology are subject to future changes approved by the Program Faculty. These changes may take immediate effect as appropriate.

For additional information about funding for graduate school, please visit Funding for Graduate School.

Graduate Student Associations

The Graduate Student Association (GSA) is UCF’s graduate organization committed to enrich graduate students’ personal, educational and professional experience. To learn more or get involved, please visit www.gsa.ucf.edu. For individual department or graduate program organizations, please see program advisor.

Professional Development

Teaching and Learning

The Faculty Center for Teaching and Learning (FCTL) promotes excellence in all levels of teaching at the University of Central Florida. They offer several programs for the professional development of Graduate Teaching Assistants at UCF.

- GTA Training (mandatory for employment as a GTA)
  This training provides information and resources for students who will be instructors in a two-day workshop. The seminars cover a variety of topics, including course development, learning theories, lecturing, and academic freedom. Those interested in additional training can also attend an optional training session that normally follows the mandatory training.

- Preparing Tomorrow’s Faculty Program
  This certificate program (12-weeks for domestic students, 16-weeks for international students) consists of group and individualized instruction by Faculty Center staff and experienced UCF professors. Textbooks and materials are provided, and a stipend is offered to current UCF students who complete the certificate. International students are provided the same training as well as information regarding language immersion and tricks and cultural awareness as a way of knowing what to expect from American students.

For more information: www.fctl.ucf.edu > Events > GTA Programs or call 407-823-3544.

Pathways to Success Workshops

Coordinated by the College of Graduate Studies, the Pathways to Success program offers free development opportunities for graduate students including workshops in Academic Integrity, Graduate Grantsmanship, Graduate Teaching, Personal Development, Professional Development, and Research. For more information and how to register, please visit www.students.graduate.ucf.edu/pathways/.

Graduate Research Forum
The Graduate Research Forum will feature poster displays representing UCF’s diverse colleges and disciplines. It is an opportunity for students to showcase their research and creative projects and to receive valuable feedback from faculty judges. Awards for best poster presentation in each category will be given and all participants will receive recognition.

The College of Graduate Studies and the Graduate Student Association invite all UCF students, community, and employers to attend the Graduate Research Forum. For more information, contact researchweek@ucf.edu.

**Graduate Excellence Awards**

Each year, the College of Graduate Studies offers graduate students who strive for academic and professional excellence the opportunity to be recognized for their work. The award categories include the following:

**Award for Excellence by a Graduate Teaching Assistant** – This award is for students who provide teaching support and assistance under the direction of a lead teacher. This award focuses on the extent and quality of the assistance provided by the student to the lead instructor and the students in the class. (Not intended for students who are instructor of record)

**Award for Excellence in Graduate Student Teaching** – This award is for students who serve as instructors of record and have independent classroom responsibilities. The focus of this award is on the quality of the student’s teaching and the academic contributions of those activities.

**Award for the Outstanding Master’s Thesis** – It recognizes graduate students for excellence in the master’s thesis. The focus of this award is on the quality and contribution of the student’s thesis research. Excellence of the master’s thesis may be demonstrated by evidence such as, but not limited to: publications in refereed journals, awards and recognitions from professional organizations, and praise from faculty members and other colleagues in the field.

For the nomination process and eligibility criteria, see the College of Graduate Studies website www.graduate.ucf.edu/GradAwards.

**Other**

Students should take opportunities to present a poster or a topic of research at a conference. To obtain financial support to present at a conference (other than through your program) or to engage in comparable creative activity at a professional meeting, visit the Graduate Travel Fellowship section at www.graduate.ucf.edu.

For information about the Council of Southern Graduate Schools (CSGS) thesis and dissertation awards, see their website: www.csgs.org > Awards.

**Job Search**

UCF’s Career Services department offers a wide range of programs and services designed to assist graduate students. These services include evaluation and exploration of career goals, preparation for the job search and job search resources. To learn more, visit their website at www.career.ucf.edu.

For specific services or resources provided by the academic program, please contact the graduate program director or academic advisor.

**Forms**

- **College of Graduate Studies Forms**
  A listing of forms and files for the College of Graduate Studies.

- **Graduate Petition Form**
  When unusual situations arise, petitions for exceptions to policy may be requested by the student. Depending on the type of appeal, the student should contact his/her program adviser to begin the petition process.
• **Traveling Scholar Form**
  Required form of graduate students who would like to take advantage of resources available on another campus, but not available at UCF; for example, special course offerings, research opportunities, unique laboratories and library collections.

### Useful Links

- [Academic Calendar](#)
- [Ask UCF](#)
- [Biomedical Sciences Department](#)
- [Bookstore](#)
- [Campus Life](#)
- [Campus Map (Interactive)](#)
- [College of Graduate Studies](#)
- [Counseling Center](#)
- [Financial Assistance](#)
- [Graduate Catalog](#)
- [Graduate Student Association](#)
- [Graduate Student Center](#)
- [Knights Email](#)
- [Learning Online](#)
- [NID Help](#)
- [Pathways to Success](#)
- [Recreation Center](#)
- [Register for Classes](#)
- [Student Health Services](#)
- [Student Technology Center (Computer Labs)](#)
- [Thesis and Dissertation Process](#)
- [UCF Golden Rule Student Handbook](#)
- [UCF Library Online](#)
- [Writing Center](#)